

Vol. 6

Arthur E. Martell
Robert M. Smith *Editors*

Critical Stability Constants

Second Supplement

CRITICAL STABILITY CONSTANTS

Volume 6: Second Supplement

CRITICAL STABILITY CONSTANTS

- Volume 1 • Amino Acids
- Volume 2 • Amines
- Volume 3 • Other Organic Ligands
- Volume 4 • Inorganic Complexes
- Volume 5 • First Supplement
- Volume 6 • Second Supplement

CRITICAL STABILITY CONSTANTS

Volume 6: Second Supplement

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and Arthur E. Martell**

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PREFACE

Over the past twenty five years the Commission on Equilibrium Data of the Analytical Division of the International Union of Pure and Applied Chemistry has been sponsoring a noncritical compilation of metal complex formation constants and related equilibrium constants. This work was extensive in scope and resulted in publication of two large volumes of *Stability Constants* by the Chemical Society (London). The first volume, edited by L.G. Sillen (for inorganic ligands) and by A.E. Martell (for organic ligands), was published in 1964 and covered the literature through 1962. The second volume, subtitled Supplement No.1, edited by L.G. Sillen and E. Hogfeldt (for inorganic ligands), and A.E. Martell and R.M. Smith (for organic ligands), was published in 1971 and covered the literature up to 1969. These two large compilations attempted to cover all papers in the field related to metal complex equilibria (heats, entropies, and free energies). Most recently a noncritical compilation of organic ligands by D.D. Perrin (Pergamon Press) extended coverage of the literature through 1973 and a similar volume for inorganic ligands by E. Hogfeldt covered through 1974. Since it was the policy of the Commission during that period to avoid decisions concerning the quality and reliability of the published work, the compilation would frequently contain from ten to twenty values for a single equilibrium constant. In many cases the values would differ by one or even two orders of magnitude, thus frustrating readers who wanted to use the data without doing the extensive literature study necessary to determine the correct value of the constant in question.

Because of difficulties of this nature, and because of the general lack of usefulness of a noncritical compilation for teaching purposes and for scientists who are not sufficiently expert in the field of equilibrium to carry out their own evaluation, we have decided to concentrate our efforts in this area toward the development of a critical and unique compilation of metal complex equilibrium constants. Although it would seem that decisions between available sets of data must sometimes be arbitrary and therefore possibly unfair, we have found that the application of reasonable guidelines leads directly to the elimination of a considerable fraction of the published data of doubtful value. Additional criteria and procedures that were worked out to handle the remaining literature are described in the *Introduction* of this book. Many of these methods are quite similar to those in other compilations of critical data.

In cases where a considerable amount of material has accumulated, it is felt that most of our critical constants will stand the test of time. Many of the data listed, however are based on only one or a very few literature references and are subject to change when better data come along. It should be fully understood that this compilation is a continually changing and growing body of data, and will be revised from time to time as new results of these systems appear in the literature. The present volume represents the second supplement to the original four volumes, and covers the literature that has appeared through 1985.

The scope of these tables includes the heats, entropies, and free energies of all metal ion complexation reactions involving organic and inorganic ligands. Volume 1 (1974), 2 (1975), 3 (1977), and 4 (1976) covered the range of different types of ligands of binary complexation reactions in aqueous solutions through 1973, mid-1974, 1975 and 1974 respectively. Volume 5 (1982) supplemented the previous four volumes to extend the coverage through 1979. Reviews of complexes involving transuranium metals (75DC), manganese (79Sc), 8-hydroxyquinoline (79SZ) lanthanides (80Fb), NTA (82Ab), inorganic ligands (82Hc), organophosphorus ligands (82K), acetylacetone (82SL), plutonium halides (83F), indium (83Ta), uranium hydrolysis (84Ab), uranium (84BC) (84Ra), histidine,

phenylalanine, tyrosine, L-DOPA, tryptophan (84P), ethylenediamine (84Pa), and macrocycles (85IB), were of significant aid in making the coverage more complete.

The authors thank the Chemistry Department of Texas A&M University for the provision of secretarial assistance.

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College Station, Texas

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Arthur E. Martell

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INTRODUCTION

Purpose

This compilation of metal complex equilibrium (formation) constants and the corresponding enthalpy and entropy changes represent the authors' selection of the most reliable values among those available in the literature. In many cases wide variations in published constants for the same metal complex equilibrium indicate the presence of one or more errors in ligand purity, in the experimental measurements, or in calculations. Usually, the nature of these errors is not readily apparent in the publication, and the reader is frequently faced with uncertainties concerning the correct values. In the course of developing noncritical compilations of stability constants, the authors have long felt that these wide variations in published work constitute a serious impediment to the use of equilibrium data. Thus these critical tables were developed in order to satisfy what is believed to be an important need in the field of coordination chemistry.

Scope

These tables include all organic and inorganic ligands for which reliable values have been reported in the literature. The present volume supplements the first five volumes to make the coverage more current.

New ligands and revisions of previous critical values are included. When new values require revision or additional values at other ionic strengths become available, the entire new set of values is repeated for that metal ion with that ligand, and supercedes the previous set. These new sets now become the recommended critical values. When a new set of metal constants is included, the proton ligand constants are also included, even if they have not been revised. Reference to the ligand page in the previous volumes is given just below the ligand name.

Selection Criteria

When several workers are in close agreement on a particular value, the average of their results has been selected for that value. Values showing considerable scatter have been eliminated. In cases where the agreement is poor and few results are available for comparison, more subtle methods were needed to select the best value. This selection was often guided by a comparison with values obtained for other metal ions with the same ligand and with values obtained for the same metal ion with similar ligands.

While established trends among similar metal ions and among similar ligands were valuable in deciding between widely varying values, such guidelines were used cautiously, so as not to overlook occasionally unexpected real examples of specificity or anomalous behavior. When there was poor agreement between published values and comparison with other metal ions and ligands did not suggest the best value, the results of more experienced research groups who had supplied reliable values for other ligands were selected. When such assurances were lacking, it was sometimes possible to give preference to values reported by an investigator who had published other demonstrably reliable values obtained by the same experimental method.

In some cases the constants reported by several workers for a given group of metal ions would have similar relative values, but would differ considerably in the absolute

magnitudes of the constants. Then a set of values from one worker near the median of all values reported were selected as the best constants. By this method it is believed that internal consistency was preserved to a greater extent than would be obtained by averaging reported values for each individual metal ion. When an important constant was missing from the selected set of values, but was available in another set of values not selected for this compilation, the missing constant was obtained by adjusting the nonselected values by a common factor, which was set so as to give the best agreement between the two groups of data.

Values reported by only one investigator are included in these tables unless there was some reason to doubt their validity. It is recognized that some of these values may be in error, and that such errors will probably not be detected until the work is repeated by other investigators, or until more data become available for analogous ligands or other closely related metal ions. Some values involving unusual metal ions have been omitted because of serious questions about the composition of their complexes, and the formulation of the equilibrium quotients.

Papers deficient in specifying essential reaction conditions (e.g., temperature, ionic strength, nature of supporting electrolyte) were not employed in this compilation. Also used as a basis for disqualification of published data is lack of information on the purity of the ligand. Frequent deficiencies are lack of calibration of potentiometric apparatus, and failure to define the equilibrium quotients reported in the paper. Papers in which both temperature and ionic strength are not controlled have been omitted from the bibliography.

A bibliography for each ligand is included so that the reader may determine the completeness of the literature search employed in the determination of critical values. The reader may also employ these references to make his own evaluation if he has any questions or reservations concerning this compilation.

Arrangement

The arrangement of the tables is based on the placement of similar ligands together. Ligands containing carboxylic acid functional groups are placed together except for aminocarboxylic acids and for phenolic carboxylic acids, which are listed with the phenols. Within each group of tables, ligands with a smaller number of coordinating groups are placed before those with a larger number of coordinating groups. Next there is a table of protonation constants for ligands for which no stability constants or only questionable metal stability constants are reported. Finally, there is a list of other ligands considered but not included in the tables for various reasons, such as, for example, failure to meet the selection criteria described above.

Metal Ions

The metal ions within each table are arranged in the following order: Hydrogen, alkali metals, alkaline earth metals, lanthanides (including Sc and Y), actinides, transition metals, and posttransition metals. Within each group the order is increasing oxidation state of the metal, and within each oxidation state the arrangement follows the periodic table from top to bottom and from left to right. An exception is that Cu^+ , Ag^+ , Pd^{2+} , and Pt^{2+} are included with the posttransition metals.

Equilibrium

An abbreviation equilibrium quotient expression in the order products/reactants is included for each constant, and periods are used to separate distinct entities. Charges have been omitted as these can be determined from the charge of the metal ion and the abbreviated ligand formulas (such as HL) given after the name. Water has not been included in the equilibrium expressions since all of the values cited are for aqueous solutions. For example, $\text{ML}_2/\text{M.L}^2$ for Cu^{2+} and acetic acid would represent the equilibrium: $\text{Cu}^{2+} + 2\text{CH}_3\text{CO}_2^- = (\text{CH}_3\text{CO}_2)_2\text{Cu}$. The symbol M represents the metal ion given

in the first column and may include more than one atom as in the case of Hg_2^{2+} . The symbol H_{-1} (H_{-2} , etc), is used for the ionization from the complexed ligand of a proton that would not be ionized in the absence of the metal ion. Apart from specifying that the proton dissociates from the ligand rather than from coordinated water, formulas such as CuH_{-2}L should not be considered to in any way imply the source of the proton(s) displaced. The constants reported therefore do not have any microscopic implications, a principle which applies to all the thermodynamic constants ($\log K$, ΔH° , ΔS°) reported in this volume and all previous volumes.

Equilibria involving protons are written as stability constants (protonation constants) rather than as ionization constants to be consistent with the metal complex formation constants. Consequently the ΔH° and ΔS° values have signs opposite to those describing ionization constants. Solids and gases are identified by (s) and (g) respectively and are included for identification purposes even though they are not involved in the equilibrium quotient.

Log K Values

The $\log K$ values are the logarithms of the equilibrium quotients given in the second column at the specified conditions of temperature and ionic strength. The selected values are those considered to be the most reliable of the ones available. In some cases the value is the median of several values and in other cases it is the average of two or more values. The range of other values considered reliable is indicated by + or - quantities describing the algebraic difference between the other values and the selected values. The symbol ± 0.00 indicates that there are one or more values which agree exactly with the stated value to the number of significant figures given. Values considered to be of questionable validity are enclosed in parentheses. Such values are included when the evidence available is not strong enough to exclude them on the basis of the above criteria. Values concerning which there are considerable doubts have been omitted.

The $\log K$ values are given for the more commonly reported ionic strengths. The ionic strengths most used are 0.1, 0.5, 1.0, 2.0, 3.0, and 0. Zero ionic strength is perhaps more important from a theoretical point of view, but several assumptions are involved in extrapolating or calculating from the measured values. The Davies equation is often used to calculate constants to zero from low-ionic-strength measurements. It was established from results obtained with monovalent ions and its extension to divalent and trivalent ions is extremely questionable. Values listed at 0.1 ionic strength may also include ionic strengths from 0.05 to 0.2, especially when results of several workers are averaged. Footnotes give conditions for values measured under conditions differing from those listed at the top of the table. Letters for footnotes, in the majority of cases, are uniform throughout the volume and refer to the same conditions.

The temperature of 25°C was given preference in the tables because of its widespread use in equilibrium measurements and reporting other physical properties. When available, enthalpy changes (ΔH°) were used to calculate $\log K$ at 25°C when only measurements at other temperatures were available.

Other temperatures frequently employed are 20°C, 30°C, and 37°C. These are not included in the tables when there is a lack of column space and ΔH° is available, since they may be calculated using the ΔH° value. Values at other temperatures, especially those at 20°C and 30°C, were converted to 25°C to facilitate quantitative comparisons with the 25°C values listed.

Equilibria involving protons have been expressed as concentration constants in order to be more consistent with the metal ion stability constants which involve only concentration terms. Concentration constants may be determined by calibrating the electrodes with solutions of known hydrogen ion concentrations or by conversion of pH values using the appropriate hydrogen ion activity coefficient. When standard buffers are used, mixed constants (also known as Bronsted or practical constants) are obtained which include both activity and concentration terms. Literature values expressed as mixed constants have

been converted to concentration constants by using the hydrogen ion activity coefficients determined in KCl solution before inclusion in the tables. In some cases, papers were omitted because no indication was given as to the use of concentration or mixed constants. Some papers were retained despite this lack of information when it could be ascertained which constant was used by comparing to known values or by personal communication with the authors. For those desiring to convert the listed protonation constants to mixed constants, the following values should be added to the listed values at the appropriate ionic strength (the tabulation applies only to single proton association constants):

<u>Ionic strength</u>	<u>Increase in log K</u>
0.05	0.09
0.10	0.11
0.15	0.12
0.2	0.13
0.5	0.15
1.0	0.14
2.0	0.11
3.0	0.07

The values in the tables have not been corrected for complexation with medium ions for the most part. There are insufficient data to make corrections for most of the ligands, and in order to make values between ligands more comparable, the correction has not been made in the few cases where it could be made. In general the listed formation constants at constant ionic strength include competition by ions from KNO_3 and NaClO_4 and are somewhat smaller than they would be if measured in solutions of tetraalkylammonium salts. This is especially significant for phosphonic acids, phosphates, and polycarboxylic acids. The background electrolyte for these ligands has been indicated in the footnotes. The normal effect is $\text{Li}^+ > \text{Na}^+ > \text{K}^+$ and is most significant at high background electrolyte concentration with the constants for a proton or metal ion with the deprotonated ligand. If all of the constants in a column of a table were measured in the same alkali metal ion background, only the first entry has a footnote. With two or more sets of measurements using different alkali metal ion backgrounds, footnotes are added for equilibria where the effect is expected to be significant.

The accuracy of protonation constants determined by measurement of hydrogen ion concentrations at pH values above 12 or below 2 are questioned because of the uncontrolled and unknown changes in liquid junction potentials resulting from the partial replacement of the supporting electrolyte anions and cations by much more highly conducting hydroxide or hydrogen ions, as the case may be. For experimental techniques which do not involve liquid junctions, depending on the concentration of the supporting electrolyte, there may be considerable change in the ionic strength due to change in the nature of the supporting electrolyte from that of the inert added salt to a mixture containing a considerable fraction of the original anion or cation replaced by hydroxide or hydrogen ion. The ionic strength is known to vary with the nature of the electrolyte, and to change considerably when the change involves added hydroxide or hydrogen ions.

Equilibria involving B(III), As(III), Ge(IV), and Te(V) complexes with polyhydroxy ligands have been written showing the loss of a proton on complex formation. Thus the equilibrium quotient $\text{M}(\text{H}_2\text{L})\cdot\text{H}/\text{M}(\text{OH})_3\cdot\text{L}^2$ is employed for the reaction of B(III) with ethylene glycol as a representation for the reaction. These equilibria are often reported in the literature with the ionization constant of the metal species ($\text{H}_2\text{MO}_3\cdot\text{H}/\text{M}(\text{OH})_3$) divided into this quotient, thus eliminating the proton from the complex formation reaction.

Ethalpy Values

The enthalpy of complexation values (ΔH°) Listed in the tables have the units kcal/mole because of the widespread use of these units by workers in the field. These may be converted to SI units of kJ/mole by multiplying the listed values by 4.184.

Calorimetrically determined values and temperature-variation determined values from cells without liquid junction were considered of equal validity for the tables. Other temperature-variation determined values were rounded off to the nearest kcal/mole and were enclosed in parentheses because of their reduced accuracy. Other values considered to be reliable but differing from the listed value were indicated by + or - quantities describing the algebraic difference between the other values and the selected values.

The magnitude of ΔH° may vary with temperature and ionic strength, but usually this is less than the variation between different workers and little attempt has been made to show ΔH° variation with changing conditions except for certain carefully measured equilibria such as the protonation of hydroxide ion and of ammonia. These ΔH° values may be used for estimating log K values at temperatures other than those listed, using the relationship

$$\frac{\Delta H^\circ}{2.303RT^2} = \frac{d \log K}{dT}$$

or, at 25°C

$$\log K_2 = \log K_1 + \Delta H^\circ (T_2 - T_1)(0.00246)$$

This assumes that $\Delta C_p = 0$, which is not necessarily the case. The greater the temperature range employed, the greater the uncertainty of the calculated values.

Entropy Values

The entropy of complexation values (ΔS°) listed in the tables have the units cal/mole/degree and have been calculated from the listed log K and ΔH values, using the expression

$$\Delta G^\circ = \Delta H^\circ - T\Delta S^\circ$$

or, at 25°C

$$\Delta S^\circ = 3.36(1.363 \log K + \Delta H^\circ).$$

These entropy values have been rounded off to the nearest cal/mole/degree, except in cases where ΔH° values were quite accurate.

It should be noted that all ΔH and ΔS values listed in the tables refer to the unit molal standard states (infinite dilution in pure H_2O), or in the presence of supporting electrolyte, to a modified standard state (unit molal at infinite dilution in the supporting electrolyte) and therefore should be designated ΔH° and ΔS° .

Bibliography

The references considered in preparing each table are given at the end of the table. The more reliable references are listed after the ions for which values are reported. In some tables groups of similar metal ions have been grouped together for the bibliography. The term "Other references" is used for those reporting questionable values, or values at conditions considerably different from those used in the tables, or values for metal ions not included in the tables because of questionable knowledge about the forms of their complexes. These additional references are cited to inform the reader of the extent of the literature search made in arriving at the selected values. Some values in this volume are repeated from a previous volume but the references are not repeated unless there was an error in the previous volume. Therefore those desiring a complete set of references must also consult the Bibliography of the previous volumes.

The bibliographical symbols used represent the year of the reference and the first letter of the surnames of the first two listed authors. In cases of duplication, letters a, b, c, etc., or the first letter of the third author's name are employed. The complete reference is given in the bibliography at the end of each volume.

Miscellaneous Comments

The formulation of polynuclear complexes is often made on the basis of improving the fit to the experimental data and not on experimental evidence for their existence. They should therefore be used with caution since other sets of complexes might equally fit the data.

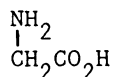
A knowledge of the optical activity of potentially optically active ligands in binary or higher complexes is necessary for the characterization of the complexes. When the optical activity is not stated or a DL-mixture is used, there is considerable doubt as to the precise nature of the complex and the values are placed in parentheses.

Hydrolysis constants are usually expressed as proton ionizations in the tables except when the author gives them as hydroxide stability constants and fails to give the value of the constant for the ionization of water employed in the calculations.

In a work of this magnitude, there will certainly be errors and a few pertinent publications will have been overlooked by the compilers. We should like to request those who believe they have detected errors in the selection process, know of publications that were omitted, or have any suggestions for improvement of the tables, write to:

A.E. Martell, or R.M. Smith
Department of Chemistry
Texas A&M University
College Station, Texas 77843, U.S.A.

It is the intention of the authors to publish more complete and accurate revisions of these tables as demanded by the continually growing body of equilibrium data in the literature.

 $\text{C}_2\text{H}_5\text{O}_2\text{N}$

Aminoacetic acid (glycine)
(Other values in Vol.1, p.1 and Vol.5, p.1)

HL

Metal ion	Equilibrium	Log K 25°, 0.1	Log K 25°, 1.0	Log K 25°, 0	ΔH 25°, 0	ΔS 25°, 0
H^+	HL/H.L	9.56 $\pm$ 0.02 9.54 ^b $\pm$ 0.03	9.62 $\pm$ 0.06 9.26 ⁿ $\pm$ 0.04	9.778 $\pm$ 0.00 9.82 ^d 10.14 ^e $\pm$ 0.07	-10.6 $\pm$ 0.0 -12.2 ^e -1.0 $\pm$ 0.1	9.2
	$\text{H}_2\text{L}/\text{HL.H}$	2.36 $\pm$ 0.04 2.36 ^b $\pm$ 0.04	2.45 $\pm$ 0.05 2.30 ⁿ $\pm$ 0.05	2.350 $\pm$ 0.00 2.61 ^d 2.74 ^e $\pm$ 0.06		7.4
Mg^{2+}	ML/M.L	1.34 ^b $\pm$ 0.0		(2.08) _e 1.53 ^e 2.26 ^e	(+1) ^s	(9) ^{b*}
	$\text{ML}_2/\text{M.L}^2$					
Ca^{2+}	ML/M.L	1.05 1.0 ^q $\pm$ 0.0	1.03 ⁿ	1.39 $\pm$ 0.04 (0.75) ^e	(0) ^r	(6)
	MHL/M.HL	0.30	0.45 ⁿ		(+2) ^r	(8) ^{a#}
Y^{3+}	ML/M.L	3.5				
La^{3+}	ML/M.L	3.1				
Pr^{3+}	ML/M.L	3.3				
Nd^{3+}	ML/M.L	3.26 $\pm$ 0.1				
	ML/MOHL.H	8.22				
	MHL/M.HL	0.93				
Sm^{3+}	ML/M.L	3.5				
Eu^{3+}	ML/M.L	3.5				
	MHL/M.HL			0.74 ^d	(+3) ^t	(13) ^d
Gd^{3+}	ML/M.L	3.4				
	MHL/M.HL	0.73				
Tb^{3+}	ML/M.L	3.6				
Dy^{3+}	ML/M.L	3.6				
Ho^{3+}	ML/M.L	3.7				
Er^{3+}	ML/M.L	3.7				
Yb^{3+}	ML/M.L	3.9				
Lu^{3+}	ML/M.L	3.9				
Th^{4+}	MHL/M.HL		2.55		+1.0 ^c	15 ^c
	$\text{M}(\text{HL})_2/\text{M.L}^2$		4.21		+2.1 ^c	26 ^c
	$\text{M}(\text{HL})_3/\text{M.L}^3$		5.54		+2.6 ^c	34 ^c
NpO_2^+	ML/M.L	3.31				
	$\text{ML}_2/\text{M.L}^2$	5.44				
PuO_2^+	ML/M.L	3.04				
UO_2^{2+}	MHL/M.HL	1.43	1.16		+0.9 ^c	8 ^c
	$\text{M}(\text{HL})_2/\text{M.L}^2$		2.20		+1.1 ^c	14 ^c

^a25°,0.1; ^b25°,0.5; ^c25°,1.0; ^d25°,2.0; ^e25°,3.0; ⁿ37°,0.15; ^q20°,0.7; ^r10-37°,0;

^s0-30°,0.09; ^t0-40°,2.0; *assuming ΔH for 0.09 = ΔH for 0.5; #assuming ΔH for 0 = ΔH for 0.1

Glycine (continued)

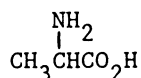
Metal ion	Equilibrium	Log K 25°, 0.1	Log K 25°, 1.0	Log K 25°, 0	ΔH 25°, 0	ΔS 25°, 0
Cr ²⁺	ML/M.L		4.21			
	ML ₂ /M.L ²		7.27			
Fe ²⁺	ML/M.L	(4.13)	3.83 ^j	4.31 ^e 4.21 ^e	(-3.6)	(8)
	ML ₂ /M.L ²	(7.65)				
Ni ²⁺	ML/M.L	5.78 ^b ±0.05 5.66 ^b ±0.06	5.65 ±0.05 5.59 ⁿ	6.18 ±0.00	-4.5 ^a ±0.5	11 ^a
	ML ₂ /M.L ²	10.58 ±0.07 10.46 ^b ±0.1	10.46 ±0.09 10.24 ⁿ	11.13 ±0.1	-9.1 ^a ±0.4	18 ^a
	ML ₃ /M.L ³	14.0 ±0.2 13.95 ^b ±0.1	13.92 ±0.1 13.7 ⁿ		-14.7 ^a ±0.2	15 ^a
Cu ²⁺	ML/M.L	8.12 ±0.06 8.10 ^b ±0.07	8.11 ±0.02 7.94 ⁿ ±0.07	8.57 ±0.05 8.30 ^d	-6.3 ^a ±0.5	16 ^a
	ML ₂ /M.L ²	15.0 ±0.1 14.9 ^b ±0.1	14.9 ±0.0 14.6 ⁿ ±0.1	15.64 ±0.05 15.3 ^d	-13.1 ^a ±0.5	25 ^a
Fe ³⁺	ML/M.L		(10.0) ^j	(9.25) ^e		
	MHL/M.HL			2.03 ^e		
	M(HL) ₂ /M.(HL) ²			3.7 ^e		
	M ₂ L ₂ /M ² .L ²			22.3 ^e		
	M ₂ L ₂ /M ₂ OHL ₂ .H			3.03 ^e		
	M ₂ H ₂ L ₄ /M ² .H ² .L ⁴			46.13 ^e		
VO ²⁺	ML/M.L		6.51			
	ML ₂ /M.L ²		11.82			
	MHL/ML.H		4.30			
	MHL ₂ /ML ₂ .H		4.81			
	ML/MOHL.H		5.2			
	MOHL/M(OH) ₂ .L.H		7.6			
	ML ₂ /MOHL ₂ .H		7.72			
	M ₂ (OH) ₂ L ₂ /(MOHL) ²		2.5			
Ag ⁺	ML/M.L	3.20 3.16 ^b ±0.02		3.28 ^e	-4.6 ^b	-1 ^b
	ML ₂ /M.L ²	6.63 6.60 ^b ±0.05		6.89 6.96 ^e	-11.5 ^b	-8 ^b
	MHL/ML.H			6.7 ^e		
	ML/MOHL.H			9.76 ^e		
(CH ₃) ₃ Pb ⁺	ML/M.L	1.48 ^u				
	MHL/M.HL	0.11 ^u				
Zn ²⁺	ML/M.L	4.96 ±0.03 4.85 ^b ±0.05	4.89 4.87 ⁿ ±0.04	5.38 ±0.1	-2.7 ^a ±0.7	14 ^a
	ML ₂ /M.L ²	9.19 ±0.08 9.07 ^b ±0.07	9.07 8.96 ⁿ ±0.05	9.81 ±0.2	-5.8 ^a ±0.6	23 ^a
	ML ₃ /M.L ³	11.6 ±0.1 11.5 ^b ±0.1	11.5 11.3 ⁿ ±0.0	12.3	-9.4	25

^a25°, 0.1; ^b25°, 0.5; ^d25°, 2.0; ^e25°, 3.0; ^h20°, 0.1; ^j20°, 1.0; ⁿ37°, 0.15; ^u25°, 0.3

Glycine (continued)

Bibliography:

H⁺ 67CIH, 74ER, 74GN, 76b, 77MMJ, 78AM, 79ZR, 80DM, 81AB, 81FM, 81IS, 81VZB, 82BDM, 82BP, 82CSM, 82DR, 82FN, 83BRT, 83DN, 83DR, 83ER, 85CFH, 85DD, 85MK;
 K⁺ 85DD; Ni²⁺ 78BBC, 81FM, 83BDM, 85CFH;
 Mg²⁺ 51Mb, 82BP, 82SV; Cu²⁺ 74GN, 76B, 76MM, 77MMJ, 78AM, 80BAa, 81FM, 81IS, 82CSM, 82DR, 84BBP, 85CFH;
 Ca²⁺ 51Mb, 82BP, 82SV, 85DD; Fe³⁺ 82BPa;
 Y³⁺-Lu³⁺ 65Ka, 79HJ, 81KB; VO²⁺ 82FNa;
 Th⁴⁺ 83BRT; Ag⁺ 80OZ;
 NpO₂⁺, PuO₂⁺ 68EW; (CH₃)₃Pb⁺ 81BR;
 UO₂²⁺ 58LD, 83BRT; Zn²⁺ 81AB, 81FM, 85CFH;
 Cr²⁺ 83MDN;
 Fe²⁺ 82BP;
 Other references: 64K, 65PP, 71FD, 71MB, 71RMS, 72GH, 73VB, 74KI, 76Bb, 79BJ, 79SP, 80AB, 80BJ, 80DD, 80DM, 80MZ, 80NSb, 80NW, 80OZ, 80Sa, 80SK, 81AAP, 81DD, 81Ma, 81PBA, 81PC, 81PU, 81Ra, 81RC, 81RK, 81RSa, 81VSA, 82BPa, 82MN, 82MO, 82RB, 82VS, 83AP, 83BJ, 83FA, 83GZS, 83HD, 83ISK, 83IT, 83MD, 83NR, 83RH, 83RV, 83SV, 83VN, 83VP, 83YW, 84ABO, 84Gb, 84J, 84JMB, 84LSS, 84MR, 84PBP, 84YS, 84ZX, 85BA, 85GS, 85RRb, 85RSG, 85SA, 85SGT, 85TG, 85TS, 85VD, 85VP

C₃H₇O₂N

L-2-Aminopropanoic acid (alanine)
 (Other values in Vol.1, p.4 and Vol.5, p.3)

HL

Metal ion	Equilibrium	Log K 25°, 0.1	Log K 25°, 1.0	Log K 25°, 0	ΔH 25°, 0	ΔS 25°, 0
H ⁺	HL/H.L	9.71 _a ±0.02 9.65 _b ±0.05	9.72±0.05 9.38 _n ±0.02	9.867 9.87 _d 10.25 _e ±0.05	-10.8±0.2 -11.4 _b -11.8 _c	8.9
	H ₂ L/HL.H	2.31 _a ±0.04 2.31 _b ±0.02	2.30±0.01 2.31 _n ±0.06	2.348 _d 2.62 _e 2.75 _e ±0.04	-0.7±0.1 _b -1.0 _b	8.4
Nd ³⁺	MHL/M.HL	0.64				
Eu ³⁺	MHL/M.HL			0.74 _d		
Ni ²⁺	ML/M.L	5.40 _a ±0.08 5.31 _b ±0.1	5.40 -0.01 5.26 _n	5.82±0.01	-3.6 _a ±0.4 -4.0 _c	13 ^a
	ML ₂ /M.L ²	9.91 _y ±0.10 9.73 _b ±0.2	(9.91)±0.01 9.57 _n	10.51±0.03	-7.8 _a ±0.9 -8.9 _c	19 ^a
	ML ₃ /M.L ³	12.8 _b ±0.1 12.7 _b ±0.0	(13.0)±0.1 12.4 _n		-13.5 _c	14 ^c
Cu ²⁺	ML/M.L	8.11 _a ±0.05 8.06 _b ±0.04	8.09 7.94 _n ±0.06	8.55±0.04 8.25 _d	-5.2 _a ±0.4 -6.4 _b	20 ^a
	ML ₂ /M.L ²	14.9 _y ±0.1 14.8 _b ±0.1	14.9 14.5 _n ±0.2	15.5±0.1 15.2 _d	-11.9 _a ±0.4 -12.1 _b	28 ^a

^a25°, 0.1; ^b25°, 0.5; ^c25°, 1.0; ^d25°, 2.0; ^e25°, 3.0; ⁿ37°, 0.15;

^yL-, D-, and DL-isomers have the same values.

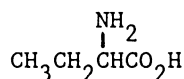
Alanine (continued)

Metal ion	Equilibrium	Log K 25°, 0.1	Log K 25°, 1.0	Log K 25°, 0	ΔH 25°, 0	ΔS 25°, 0
Zn ²⁺	ML/M.L	4.58 _b ± 0.07	4.55 _b ± 0.10	4.95 ± 0.2	-1.6 ^a ± 0.2	16 ^a
		4.56 _b ± 0.07	4.53 ⁿ ± 0.09			
	ML ₂ /M.L ²	8.63 _y ± 0.08	8.54 ± 0.2	9.23 ± 0.3	-4.3 ^a ± 0.1	25 ^a
		8.54 _b ± 0.02	8.51 ⁿ			
	ML ₃ /M.L ³	10.6 ^b ± 0.0	10.6 ⁿ			

^a25°, 0.1; ^b25°, 0.5; ⁿ37°, 0.15; ^yL-, D-, and DL-isomers have the same value.

Bibliography:

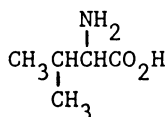
H⁺ 67CIH, 74GN, 76B, 78VV, 80LT, 82GF, 82HA, 83ACC, 83TST, 84BPB, 84DA, 85AJO, 85CFH, 85VD;
 Nd³⁺ 73SY; Cu²⁺ 74GN, 82GF, 82NDE, 83ACC, 84BPB,
 Eu³⁺ 71ALN; 84DA, 85AJO, 85CFH;
 Ni²⁺ 76B, 85CFH; Zn²⁺ 81G, 82HA, 83ACC, 85MK, 85CFH;
 Other references: 69Pb, 71MB, 73VB, 75EA, 76Bma, 77B, 77GO, 77SG, 79BJa, 80DD, 80FS, 80GL, 80NSb,
 80OF, 80RR, 80Sa, 81APa, 81Ma, 81MN, 81PU, 81RK, 81RSa, 81UP, 81Vsa, 82BCS, 82CGB, 82MO, 82NDE,
 82VD, 83AP, 83FA, 83GZS, 83HD, 83IT, 83KGa, 83NM, 83RV, 84J, 84LS, 84SCa, 85BA, 85SGT, 85SN



C ₄ H ₉ O ₂ N		DL-2-Aminobutanoic acid					HL
		(Other values in Vol.1, p.6 and Vol.5, p.4)					
Metal ion	Equilibrium	Log K 25°, 0.1	Log K 25°, 1.0	Log K 25°, 0	ΔH 25°, 0	ΔS 25°, 0	
H ⁺	HL/H.L	9.63 ±0.03	(9.74)	9.831	-10.8 ^a ±0.1	8.7	
	H ₂ L/HL.H	2.32 ±0.03	2.32 ±0.02	10.24 ^e 2.284 2.79 ^e	-0.4 -0.6	9.1	
Pb ²⁺	ML/M.L			5.04 ^e			
	MHL/ML.H			6.43 ^e			

^a25°, 0.1; ^e25°, 3.0

Bibliography: H⁺ 76B, 81MTN; Ni²⁺ 76B; Pb²⁺ 81MTN;
 Other references: 80NSb, 80RR, 80SS, 81Ma, 82MO, 83GZS



C ₅ H ₁₁ O ₂ N		L-2-Amino-3-methylbutanoic acid (valine)				HL
		(Other values in Vol.1, p.9 and Vol.5, p.5)				
Metal ion	Equilibrium	Log K 25°, 0.1	Log K 25°, 1.0	Log K 25°, 0	ΔH 25°, 0	ΔS 25°, 0
H ⁺	HL/H.L	9.49 ±0.03	9.50 ±0.06	9.718	-10.8 ±0.2	8.2
		9.44 _b ±0.05	9.17 ⁿ ±0.03		-11.4 ^c	
	H ₂ L/HL.H	2.26 ±0.02	2.34 ±0.04	2.286	-0.2 ±0.1	9.8
		2.26 _b ±0.06	2.27 ⁿ			

^b25°, 0.5; ^c25°, 1.0; ⁿ37°, 0.15

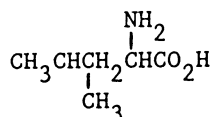
A. PRIMARY AMINES

Valine (continued)

Metal ion	Equilibrium	Log K 25°, 0.1	Log K 25°, 1.0	Log K 25°, 0	ΔH 25°, 0	ΔS 25°, 0
Ni ²⁺	ML/M.L	5.42 $\pm$ 0.03	5.26		-4.2 ^c	10 ^c
		5.30 ^b				
	ML ₂ /M.L ²	9.72 ^y $\pm$ 0.1 9.36 ^b	9.58		-8.7 ^c	15 ^c
	ML ₃ /M.L ³	12.2 ^b 11.8 ^b	12.39		-13 ^c	13 ^c
Cu ²⁺	ML/M.L	8.09 $\pm$ 0.04 7.98 ^b	7.94 ⁿ $\pm$ 0.01		-5.5 ^a	19 ^a
	ML ₂ /M.L ²	14.9 ^y $\pm$ 0.1 14.7 ^b	14.60 ⁿ $\pm$ 0.01		-11.5 ^a $\pm$ 0.2	30 ^a
	MHL/ML.H		2.5 ⁿ $\pm$ 0.1			
	MHL ₂ /ML ₂ .H		3.78 ⁿ $\pm$ 0.0			

^a25°, 0.1; ^b25°, 0.5; ^c25°, 1.0; ⁿ37°, 0.15; ^yL- and DL-isomers have the same value.

Bibliography: H⁺ 73MS, 81EBS, 83AO, 84BBP, 85RT, 85VD; Ni²⁺ 73MS, 81EBS; Cu²⁺ 83AO, 84BBP; Other references: 64K, 70MR, 71MB, 73VB, 77GO, 79SP, 80MJ, 80RR, 80Sa, 80SGa, 81AP, 81PBA, 82Cgb, 82KP, 82LB, 82NM, 83AP, 83GZS, 83NM, 84SCa, 84SY, 85BA, 85MK, 85SGT

C₆H₁₃O₂N

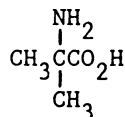
L-2-Amino-4-methylpentanoic acid (leucine)
(Other values in Vol.1, p.11 and Vol.5, p.6)

HL

Metal ion	Equilibrium	Log K 25°, 0.1	Log K 25°, 1.0	Log K 25°, 0	ΔH 25°, 0	ΔS 25°, 0
H ⁺	HL/H.L	9.59 $\pm$ 0.03	(9.48)	9.747	-10.8 ^a $\pm$ 0.1	8.4
		9.59 ^b $\pm$ 0.01	9.25 ⁿ $\pm$ 0.02			
	H ₂ L/HL.H	2.30 ^b $\pm$ 0.05	2.36 ⁿ	2.329	-0.4 $\pm$ 0.0	9.3
		2.34 ^b $\pm$ 0.08	2.28 ⁿ $\pm$ 0.04			
Mn ²⁺	ML/M.L	2.49				
Cu ²⁺	ML/M.L	8.25 $\pm$ 0.07	7.97 ⁿ $\pm$ 0.07		-5.6 ^a	19 ^a
	ML ₂ /M.L	15.2 $\pm$ 0.1	14.6 ⁿ $\pm$ 0.1		-11.5 ^a	31 ^a
	MHL/ML.H		3.3 ⁿ			
	MHL ₂ /ML ₂ .H		4.6 ⁿ			
Zn ²⁺	ML/M.L	4.56	4.51 ⁿ			
	ML ₂ /M.L ²	8.74	8.56 ⁿ			
	ML ₃ /M.L ³	11.8				
	ML/MOHL.H		8.64 ⁿ			
	MHL ₂ /ML ₂ .H		6.3 ⁿ			

^a25°, 0.1; ^b25°, 0.5; ⁿ37°, 0.15

Bibliography: H⁺ 71MB, 80FS, 83ZR, 84BPB, 85RT, 85VD; Mn²⁺ 83SF; Cu²⁺ 80FS, 83ZR, 84BPB; Zn²⁺ 80FS; Other references: 65PP, 73VB, 82NM, 84PBP, 85MK, 85SGT, 85SRV

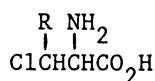


$\text{C}_4\text{H}_9\text{O}_2\text{N}$ 2-Amino-2-methylpropanoic acid HL
(Other values in Vol.1, p.13 and other reference on Vol.5, p.455)

Metal ion	Equilibrium	Log K 25°, 0.1	Log K 25°, 1.0	Log K 25°, 0	ΔH 25°, 0	ΔS 25°, 0
H^+	HL/H.L	10.10 _b	10.11	10.206 _e	-11.4 ±0.3	8.4
		10.07 _b		10.58 _e		
	$\text{H}_2\text{L}/\text{HL.H}$	2.34 _b	2.48 ±0.01	2.357 _e	-0.9 -0.5	7.8
Pb^{2+}	ML/M.L	2.33 _b		2.84 _e		
	MHL/ML.H			5.16 _e		
				6.72 _e		

_b25°,0.5; _e25°,3.0

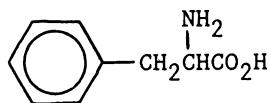
Bibliography: H^+ 76B,81MTN; Ni^{2+} 76B; Pb^{2+} 81MTN;
Other reference: 80RR



$\text{C}_x\text{H}_y\text{O}_2\text{NCl}$ DL-2-Amino-3-chloroalkanoic acid HL

<u>Ligand</u>	<u>Metal ion</u>	<u>Equilibrium</u>	<u>Log K</u> <u>25°. 0.1</u>
R= H	H ⁺	HL/H.L	8.18
		H ₂ L/HL.H	2.0
DL-2-Amino-3-chloro-propanoic acid	Zn ²⁺	ML/M.L	4.63
		ML ₂ /M.L ₂	(8.65) ^w
		ML ₃ /M.L ₃	(10.9) ^w
(C ₃ H ₆ O ₂ NCl)	Al ³⁺	ML/M.L	3.98
		ML ₂ /M.L ₂	(6.0) ^w
	Ga ³⁺	ML/M.L	4.63
R= CH ₃	H ⁺	HL/H.L	8.07
		H ₂ L/HL.H	(1.5)
DL-2-Amino-3-chloro-butanoic acid	Zn ²⁺	ML/M.L	4.75
		ML ₂ /M.L ₂	(8.67) ^x
	Al ³⁺	ML/M.L	4.13
ML ₂ /M.L ₂		(6.33) ^x	
(C ₄ H ₈ O ₂ NCl)	Ga ³⁺	ML/M.L	4.89
		ML ₂ /M.L ₂	(9.0) ^x

^wOptical isomerism not stated; ^xDL-mixture
Bibliography: 81TMM

 $C_9H_{11}O_2N$

L-2-Amino-3-phenylpropanoic acid (phenylalanine)
(Other values in Vol.1, p.18 and Vol.5, p.9)

HL

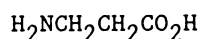
Metal		Log K	Log K	Log K	ΔH	ΔS
<u>ion</u>	<u>Equilibrium</u>	<u>25°, 0.1</u>	<u>25°, 1.0</u>	<u>25°, 0</u>	<u>25°, 0.1</u>	<u>25°, 0.1</u>
H^+	HL/H.L	9.09 ± 0.04	9.07 ± 0.02	9.31	-10.7 ± 0.5	6
		9.06 ^b ± 0.02	8.76 ⁿ ± 0.01	9.61 ^e		
	H ₂ L/HL.H	2.19 ± 0.05	2.19 ± 0.01	2.20	-1.0 ± 0.5	7
		2.22 ^b ± 0.05	2.20 ⁿ ± 0.01	2.75 ^e		
Cu^{2+}	ML/M.L	7.80 ± 0.1	7.62 ⁿ ± 0.03	8.25	-5.1 ± 0.4	19
				8.25 ^e		
	ML ₂ /M.L ²	14.7 ^y ± 0.1	14.8	15.4	-11.5 ± 0.6	30
			14.3 ⁿ -0.1	15.6 ^e		
Zn^{2+}	ML/M.L	4.25 ± 0.05	4.21 ⁿ		-1.0 ± 0.2	17
	ML ₂ /M.L ²	8.25 ^y ± 0.05	8.17 ⁿ		-2.4 ± 0.2	29

^b25°, 0.5; ^e25°, 3.0; ⁿ37°, 0.15; ^yL-, D-, and DL-isomers have the same value.

Bibliography: H^+ 78AM, 78MST, 80JH, 81ABb, 82KT, 84ACa, 84GD, 85RT;

Cu^{2+} 78AM, 84ACa, 84BBP, 84GD; Zn^{2+} 78MST, 81ABb, 84ACa;

Other references: 61BN, 71MB, 72GH, 73VB, 76GK, 79DM, 79MJ, 80JM, 80PB, 80RR, 81PU, 81Ra, 81UP, 81VSa, 83NM, 84P, 84PB, 85MK, 85SGT, 85VD

 $C_3H_7O_2N$

3-Aminopropanoic acid (β -alanine)
(Other values in Vol.1, p.20 and Vol.5, p.10)

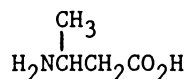
HL

Metal		Log K	Log K	Log K	ΔH	ΔS
<u>ion</u>	<u>Equilibrium</u>	<u>25°, 0.1</u>	<u>25°, 1.0</u>	<u>25°, 0</u>	<u>25°, 0.1</u>	<u>25°, 0.1</u>
H^+	HL/H.L	10.10 ± 0.02	10.14 ± 0.04	10.295	-11.3 ± 0.0	9.2
		10.09 ^b ± 0.03		10.65 ^e		
	H ₂ L/HL.H	3.53 ± 0.03	3.67 ± 0.01	3.551	-1.1 ± 0.1	12.6
		3.57 ^b ± 0.1		4.03 ^e		
Cr^{2+}	ML/M.L		3.89			
Ni^{2+}	ML/M.L	4.54 ± 0.04	4.45	4.99	-3.8	10
		4.46 ^b				
	ML ₂ /M.L ²	7.87 ± 0.09	7.75		-6.1 ^t	16
		7.84 ^b				
	ML ₃ /M.L ³	9.7	9.9			
		9.6 ^b				
Ag^+	ML/M.L	3.35 ^b ± 0.02		3.58 ^e	-5.4 ^b	-3 ^b
	ML ₂ /M.L ²	7.10 ^b ± 0.02		7.46 ^e	-12.4 ^b	-9 ^b
	MHL/ML.H			7.3 ^e		
	ML/MOHL.H			9.70 ^e		

^b25°, 0.5; ^e25°, 3.0; ^t22°, 0.1

Bibliography: H^+ 67CIH, 76Ba, 80JH, 80OZ, 82NDE; Cr^{2+} 83MDN; Ni^{2+} 76Ba; Ag^+ 80OZ;

Other references: 76BS, 77Ba, 79Bjb, 80DD, 80RR, 80Sa, 81APa, 81DD, 81NSa, 81RK, 81RS, 82GF, 83AP, 84LS

C₄H₉O₂N

DL-3-Aminobutanoic acid
(Other values in Vol.1, p.21 and Vol.5, p.10)

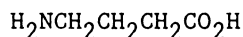
HL

Metal		Log K	Log K	ΔH	ΔS
<u>ion</u>	<u>Equilibrium</u>	<u>25°, 0.1</u>	<u>25°, 1.0</u>	<u>25°, 0.1</u>	<u>25°, 0.1</u>
H ⁺	HL/H.L	10.04 ±0.02	10.22	-11.0	9
	H ₂ L/HL.H	3.43 -0.01	3.54	(0) ^s	(16)
Ni ²⁺	ML/M.L	4.58 ±0.02	4.36	-2.7	12
	ML ₂ /M.L ²	(7.89) ^w ±0.03	(7.76) ^w	-5.6	17

^s15-40°, 0.2; ^woptical isomerism not stated.

Bibliography: 76Ba;

Other references: 81Ma, 81NSa

C₄H₉O₂N

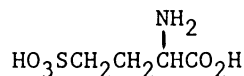
4-Aminobutanoic acid
(Other values in Vol.1, p.21 and Vol.5, p.11)

HL

Metal		Log K	Log K	Log K	ΔH	ΔS
<u>ion</u>	<u>Equilibrium</u>	<u>25°, 0.1</u>	<u>25°, 1.0</u>	<u>25°, 0</u>	<u>25°, 0.1</u>	<u>25°, 0.1</u>
H ⁺	HL/H.L	10.28	10.43	10.556	-12.2 ±0.2	7.4
		10.33 ^b ±0.02		4.031	-0.4 ±0.0	17.1
	H ₂ L/HL.H	4.06 3.99 ^u	4.07			
Nd ³⁺	MHL/M.HL	1.72				
Ni ²⁺	ML/M.L		3.54			

^b25°, 0.5; ^u25°, 0.25Bibliography: H⁺, Ni²⁺ 76Ba; Nd³⁺ 73SY;

Other references: 80RR, 81Ma, 81NSa

C₄H₉O₅NS

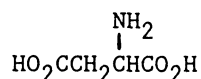
DL-2-Amino-4-sulfobutanoic acid (homocysteic acid)

HL

Metal		Log K
<u>ion</u>	<u>Equilibrium</u>	<u>25°, 0.1</u>
H ⁺	HL/H.L	8.93
	H ₂ L/HL.H	2.11
Cu ²⁺	ML/M.L	7.92
	ML ₂ /M.L ²	(14.39) ^x

^xDL-mixture

Bibliography: 83TST

 $\text{C}_4\text{H}_7\text{O}_4\text{N}$

L-Aminobutanedioic acid (aspartic acid)
(Other values in Vol.1, p.24 and Vol.5, p.12)

 H_2L

Metal ion	Equilibrium	Log K 25°, 0.1	Log K 25°, 1.0	Log K 25°, 0	ΔH 25°, 0.1	ΔS 25°, 0.1
H^+	HL/H.L	9.65 $\pm$ 0.08 9.52 ^b $\pm$ 0.06	9.53 $\pm$ 0.08 9.29 ⁿ $\pm$ 0.02	10.002 9.75 ^d 10.01 ^e	-9.5 $\pm$ 0.1 -10.0 ^c	12
	$\text{H}_2\text{L}/\text{HL.H}$	3.70 $\pm$ 0.05 3.64 ^b $\pm$ 0.08	3.66 $\pm$ 0.1 3.63 ⁿ $\pm$ 0.04	3.900 $\pm$ 0.01 3.86 ^d 4.07 ^e	-1.1 $\pm$ 0.0 -1.2 ^c	13
	$\text{H}_3\text{L}/\text{H}_2\text{L.H}$	(1.9) $\pm$ 0.1 (1.9) ^b $\pm$ 0.0	(1.9) $\pm$ 0.1 (1.9) ⁿ $\pm$ 0.0	1.990 2.16 ^d 2.35 ^e	-1.6 $\pm$ 0.2 -2.0 ^c	3
Am^{3+}	ML/M.L ML ₂ /M.L ²	4.81 6.75	4.53 ^q 6.65 ^q			
UO_2^{2+}	ML/M.L		3.52 ^q			
Ni^{2+}	ML/M.L ML ₂ /M.L ² MHL/ML.H	7.15 $\pm$ 0.02 6.90 ^b 12.40 ^y $\pm$ 0.10 12.26 ^b 4.05			-2.8 -3.7 ^c -8.0 -9.1 ^c	23 30
Cu^{2+}	ML/M.L ML ₂ /M.L ² MHL/ML.H MHL ₂ /ML ₂ .H M ₂ L/ML.M M ₂ L ₂ /ML ₂ .M	8.88 $\pm$ 0.08 8.67 ^b 15.87 ^y $\pm$ 0.07 15.55 ^b 3.70 $\pm$ 0.05 4.0 $\pm$ 0.2 1.51 3.6	8.69 15.71	8.83 ^d 16.00 ^d	-6.1 -12.4 -2.4	20 31 9
Zn^{2+}	ML/M.L ML ₂ /M.L ² MHL/ML.H ML/MOHL.H MOHL.M/M ₂ (OH) ₂ L.H	(5.84) ^p 5.60 ^b $\pm$ 0.06 10.15 ^p 10.0 ^b $\pm$ 0.1	5.97 ⁿ $\pm$ 0.04 10.14 ⁿ $\pm$ 0.04 4.93 ⁿ $\pm$ 1.0 8.38 ⁿ 8.04 ⁿ			
Al^{3+}	MHL/M.HL MHL/MOH(HL).H	2.17 ^b 3.84 ^b				
In^{3+}	ML/M.L ML ₂ /M.L ² MHL ₂ /ML ₂ .H	9.56 16.7 4.75				

^b25°, 0.5; ^c25°, 1.0; ^d25°, 2.0; ^e25°, 3.0; ⁿ37°, 0.15; ^p30°, 0.1; ^q25°, 0.7;

^yL- and DL-isomers have the same value.

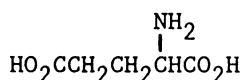
Bibliography: H^+ 28M, 74GN, 82BG, 82GF, 82VKI, 83WL, 84CDD, 84DA;

Am^{3+} , UO_2^{2+} 84SC; Zn^{2+} 82BG, 83WL;

Ni^{2+} 83VK; Al^{3+} 84CDD;

Cu^{2+} 74GN, 82GF, 84DA, 84LO, 84LOW; In^{3+} 84PGa;

Other references: 65K, 67CIH, 71MB, 73VB, 80CKP, 80SSG, 81Ma, 81MS, 81PU, 81RSa, 82CPG, 82VN, 83HD, 83IT, 83Sc, 84J, 84MR, 85Ba, 85RT

C₅H₉O₄N

L-2-Aminopentanedioic acid (glutamic acid)
(Other values in Vol.1, p.27 and Vol.5, p.13)

H₂L

Metal		Log K	Log K	Log K	ΔH	ΔS
<u>ion</u>	<u>Equilibrium</u>	<u>25°, 0.1</u>	<u>25°, 1.0</u>	<u>25°, 0</u>	<u>25°, 0.1</u>	<u>25°, 0.1</u>
H ⁺	HL/H.L	9.59 ±0.09	9.42 ±0.01	9.95 ±0.01	-9.8 ±0.3	11
		9.41 ^b ±0.01	9.23 ⁿ ±0.05	9.89 ^e		
	H ₂ L/HL.H	4.20 ±0.08	4.20	4.42 ±0.1	-0.8 ±0.2	17
		4.1 ^b ±0.1	4.06 ⁿ ±0.03	4.54 ^e		
	H ₃ L/H ₂ L.H	2.18 ±0.1	(2.39)	2.23 ±0.07	-0.3 ±0.5	9
		2.10 ^b	2.10 ⁿ ±0.08	2.57 ^e		
Ni ²⁺	ML/M.L	5.58	5.50 ⁿ			
	ML ₂ /M.L ²	9.62	9.69 ⁿ			
	ML ₃ /M.L ³		11.9 ⁿ			
	MHL/ML.H		4.87 ⁿ			
Cu ²⁺	ML/M.L	8.31 ±0.05	8.17 ⁿ		-5.0	21
	ML ₂ /M.L ²	14.9 ^y ±0.1	14.5 ⁿ		-11.6 ±0.2	29
	MHL/ML.H	4.15 ±0.05	4.09 ⁿ ±0.04		-1.6	14
	M ₂ L/ML.M	2.11				
Zn ²⁺	ML/M.L	4.49 ^b	4.72 ⁿ ±0.04			
	ML ₂ /M.L ²	8.25 ^b	8.3 ⁿ ±0.2			
	ML ₃ /M.L ³	9.8 ^b				
	ML/MOHL.H		8.04 ⁿ			
Al ³⁺	MHL/M.HL	2.30 ^b				
	MHL/MOH(HL).H	3.50 ^b				

^b25°,0.5; ^e25°,3.0; ⁿ37°,0.15; ^yL- and DL-isomers have the same value.

Bibliography: H⁺ 82BG,82PM,84DA,85CFH,85RT;

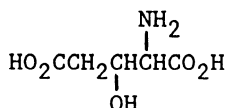
Ni²⁺ 85CFH;

Zn²⁺ 82BG,85CFH;

Cu²⁺ 84DA,85CFH;

Al³⁺ 84CDD

Other references: 65K,71MB,73VB,80CKP,80SKa,80SSG,80YU,82CCF,82CGb,82PMa,82VN,83FA,83IT,83KM,84D,84SCa,85BA

C₅H₉O₅N

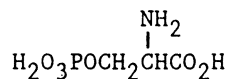
DL-2-Amino-3-hydroxypentanedioic acid (3-hydroxyglutamic acid)

H₂L

Metal		Log K
<u>ion</u>	<u>Equilibrium</u>	<u>25°, 0.1</u>
H ⁺	HL/H.L	9.06
	H ₂ L/HL.H	4.08
	H ₃ L/H ₂ L.H	2.09
Zn ²⁺	ML/M.L	4.65
	ML ₂ /M.L ²	(8.36) ^x
Al ³⁺	ML/M.L	4.87
Ga ³⁺	ML/M.L	6.78
	ML ₂ /M.L ²	(11.2) ^x

^xDL-mixture

Bibliography: H⁺ 81TM; Zn²⁺-Ga³⁺ 78T

 $\text{C}_3\text{H}_8\text{O}_6\text{NP}$

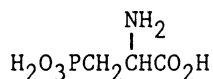
L-2-Amino-3-phosphopropanoic acid (L-phosphoserine)
(Other values in Vol.1, p.29 and other references in Vol.5, p.425)

 H_3L

Metal		Log K	Log K	Log K
ion	Equilibrium	25°, 0.1	25°, 1.0	25°, 0
H^+	HL/H.L	9.72 ±0.03	9.54	
	$\text{H}_2\text{L}/\text{HL.H}$	5.67 ±0.03	5.65	6.19
	$\text{H}_3\text{L}/\text{H}_2\text{L.H}$	2.11 ±0.04	(1.92)	
	$\text{H}_4\text{L}/\text{H}_3\text{L.H}$	(0.7)		
Zn^{2+}	ML/M.L	5.88		
	$\text{ML}_2/\text{M.L}^2$	(9.72) ^w		
Al^{3+}	ML/M.L	4.79		
	$\text{ML}_2/\text{M.L}^2$	(8.81) ^w		
	$\text{ML}_3/\text{M.L}^3$	(10.68) ^w		
Ga^{3+}	ML/M.L	6.18		
	$\text{ML}_2/\text{M.L}^2$	(9.87) ^w		

^woptical isomerism not stated.Bibliography; H^+ 80VN; Zn^{2+} - Ga^{3+} 81TMM;

Other reference: 83MB

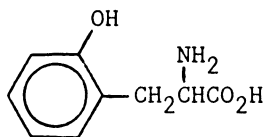
 $\text{C}_3\text{H}_8\text{O}_5\text{NP}$

DL-2-Amino-3-phosphonopropanoic acid
(Other reference in Vol.5, p.425)

 H_3L

Metal		Log K	Log K
ion	Equilibrium	25°, 0.1	25°, 1.0
H^+	HL/H.L	10.68	10.41
	$\text{H}_2\text{L}/\text{HL.H}$	6.05	5.93
	$\text{H}_3\text{L}/\text{H}_2\text{L.H}$	2.34	2.32
Zn^{2+}	ML/M.L	6.63	6.48
	$\text{ML}_2/\text{M.L}^2$	(11.79) ^x	(11.42) ^x
	MHL/ML.H	6.21	6.05
	$\text{MHL}_2/\text{ML}_2.\text{H}$	(7.97) ^x	(6.09) ^x
Al^{3+}	ML/M.L		13.12 ^x
	$\text{ML}_2/\text{M.L}^2$		(21.40) ^x
	MHL/ML.H		3.22
	$\text{MHL}_2/\text{ML}_2.\text{H}$		(4.80) ^x
Ga^{3+}	ML/M.L		14.55
	$\text{ML}_2/\text{M.L}^2$		(23.50) ^x
	MHL/ML.H		2.52
	$\text{MHL}_2/\text{ML}_2.\text{H}$		(5.48) ^x

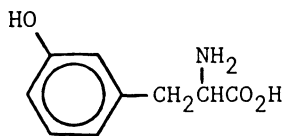
^xDL-mixtureBibliography: H^+ 84SM; Zn^{2+} 84SMa; Al^{3+} , Ga^{3+} 85SMa

 $C_9H_{11}O_3N$

DL-2-Amino-3-(2-hydroxyphenyl)propanoic acid (o-tyrosine)
(Other reference in Vol.1, p.30)

 H_2L

Metal		Log K	ΔH	ΔS
ion	Equilibrium	25°, 0.1	25°, 0.1	25°, 0.1
H^+	HL/H.L	11.01 -0.5	-6.7 -0.1	28
	$H_2L/HL.H$	8.67 -0.2	-9.3 -0.3	8
	$H_3L/H_2L.H$	2.41	-0.9	8
Mn^{2+}	MHL/M.HL	2.73	-0.7	10
	$MHL_2/M.H.L^2$	(17.8) ^x	-6.9	58
	$MHL_2/ML_2.H$	(10.1) ^x	-6.0	26
Co^{2+}	MHL/M.HL	3.99	-1.2	14
	$M(HL)_2/M.(HL)^2$	(7.53) ^x	-2.6	26
	$M(HL)_2/MHL_2.H$	(8.6) ^x	(-7.4)	(15)
	$MHL_2/ML_2.H$	(9.9) ^x	-5.7	26
Ni^{2+}	MHL/M.HL	4.95	-3.0	13
	$M(HL)_2/M.(HL)^2$	(9.24) ^x	-6.9	19
	$M(HL)_2/MHL_2.H$	(8.94) ^x	-5.3	23
	$MHL_2/ML_2.H$	(10.00) ^x	-5.7	27
Cu^{2+}	MHL/M.HL	7.84 -0.9	-5.0 +0.6	19
	$M(HL)_2/M.(HL)^2$	(14.79) ^x -2	-12.6 +3	25
	$M(HL)_2/MHL_2.H$	(9.11) ^x -0.3	-5.5 +0.1	23
	$MHL_2/ML_2.H$	(9.97) ^x -0.3	-5.9 +0.2	26
Zn^{2+}	MHL/M.HL	4.21	-2.2	12
	$M(HL)_2/M.(HL)^2$	(8.51) ^x	-4.4	24
	$MHL/ML.H$	8.46	-6.0	19
	$M(HL)_2/MHL_2.H$	(8.66) ^x	(-10.3)	(5)
	$MHL_2/ML_2.H$	(9.59) ^x	(-7.9)	(17)

^xDL-mixtureBibliography: H^+ 82KT; Mn^{2+} - Zn^{2+} 84KG $C_9H_{11}O_3N$

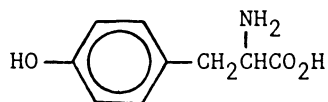
DL-2-Amino-3-(3-hydroxyphenyl)propanoic acid (m-tyrosine)
(Other reference in Vol.1, p.30)

 H_2L

Metal		Log K	ΔH	ΔS
ion	Equilibrium	25°, 0.1	25°, 0.1	25°, 0.1
H^+	HL/H.L	10.04 ±0.06	-6.6 ±0.2	24
	$H_2L/HL.H$	8.95 ±0.02	-9.6 ±0.5	9
	$H_3L/H_2L.H$	2.22 ±0.00		

m-Tyrosine (continued)

Metal ion	Equilibrium	Log K 25°, 0.1	ΔH 25°, 0.1	ΔS 25°, 0.1
Mn ²⁺	MHL/M.HL	2.85	-1.0	10
	M(HL) ₂ /M.(HL) ₂	(4.9) ^x	-1.5	17
	M(HL) ₂ /MHL ₂ .H	(8.9) ^x	-5.5	22
	MHL ₂ /ML ₂ .H	(10.2) ^x	-9.8	14
Co ²⁺	MHL/M.HL	4.02	-1.4	14
	M(HL) ₂ /M.(HL) ₂	(7.47) ^x	-2.8	25
	M(HL) ₂ /MHL ₂ .H	(9.0) ^x	-6.0	21
	MHL ₂ /ML ₂ .H	(10.1) ^x	-8.6	17
Ni ²⁺	MHL/M.HL	5.15	-3.7	11
	M(HL) ₂ /M.(HL) ₂	(9.64) ^x	-7.9	18
	M(HL) ₃ /M.(HL) ₃	(12.93) ^x	-11.2	22
	M(HL) ₂ /MHL ₂ .H	(9.11) ^x	-5.3	24
	MHL ₂ /ML ₂ .H	(9.74) ^x	-6.9	21
	M(HL) ₃ /MH ₂ L ₃ .H	(9.02) ^x	-4.4	27
	MH ₂ L ₃ /MHL ₃ .H	(9.52) ^x	-5.8	24
	MHL ₃ /ML ₃ .H	(10.17) ^x	-5.7	27
Cu ²⁺	MHL/M.HL	7.83 ±0.01	-5.6 ±0.1	17
	M(HL) ₂ /M.(HL) ₂	(14.7) ^x ±0.1	-12.3 ±1.0	26
	M(HL) ₂ /MHL ₂ .H	(9.1) ^x ±0.1	-5.8 ±0.5	22
	MHL ₂ /ML ₂ .H	(10.1) ^x ±0.2	-6.4 ±0.1	25
Zn ²⁺	MHL/M.HL	4.23	-2.1	12
	M(HL) ₂ /M.(HL) ₂	(8.37) ^x	-4.9	22
	MHL/ML.H	(8.34) ^x	-9.1	8
	M(HL) ₂ /MHL ₂ .H	(9.0) ^x	(-7.1)	17
	MHL ₂ /ML ₂ .H	(9.36) ^x	-9.1	12

^xDL-mixtureBibliography: H⁺ 76IH,82KT; Mn²⁺-Zn²⁺ 84KGC₉H₁₁O₃NL-2-Amino-3-(4-hydroxyphenyl)propanoic acid (tyrosine)
(Other values in Vol.1, p.31 and Vol.5, p.14)H₂L

Metal ion	Equilibrium	Log K 25°, 0.1	Log K 25°, 3.0	Log K 25°, 0	ΔH 25°, 0.1	ΔS 25°, 0.1
H ⁺	HL/H.L	10.10 ±0.05 10.03 ^b	10.39	10.47	-6.4 ±0.6	25
	H ₂ L/HL.H	9.04 ±0.05 9.00 ^b	9.43	9.19	-9.6 ±0.5	9
	H ₃ L/H ₂ L.H	2.24 ±0.04	2.81		-0.4 ±0.2	9
	MHL/M.HL	3.14			-0.7	12
Mn ²⁺	M(HL) ₂ /M.(HL) ₂	5.8			-1.2	23
	M(HL) ₂ /MHL ₂ .H	8.9			-5.5	22
	MHL ₂ /ML ₂ .H	10.1			-9.6	14

^b 25°, 0.5

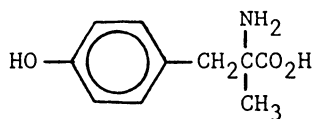
Tyrosine (continued)

Metal ion	Equilibrium	Log K 25°, 0.1	Log K 25°, 3.0	Log K 25°, 0	ΔH 25°, 0.1	ΔS 25°, 0.1
Co ²⁺	MHL/M.HL	4.0 ±0.1				
	M(HL) ₂ /M.(HL) ₂	7.5 ±0.3			-2.6	26
	M(HL) ₃ /M.(HL) ₃	10.4				
	MHL/ML.H	9.29				
	M(HL) ₂ /MHL ₂ .H	9.2 ±0.2			-6.0	22
	MHL ₂ /ML ₂ .H	9.9 ±0.1			-10.0	12
	M(HL) ₃ /MH ₂ L ₃ .H	9.6				
	MH ₂ L ₃ /MHL ₃ .H	9.9				
	MHL ₃ /ML ₃ .H	10.0				
Ni ²⁺	MHL/M.HL	5.07 ±0.07			-2.6 ±0.6	14
	M(HL) ₂ /M.(HL) ₂	9.4 ^y ±0.1			-6.0 ±1	23
	M(HL) ₃ /M.(HL) ₃	12.5 ±0.1			-10.0	24
	MHL/ML.H	9.35				
	M(HL) ₂ /MHL ₂ .H	9.4 ±0.1			-5.7	24
	MHL ₂ /ML ₂ .H	9.85 ±0.06			-6.2	24
	M(HL) ₃ /MH ₂ L ₃ .H	9.2 ±0.1			-4.4	27
	MH ₂ L ₃ /MHL ₃ .H	9.8 ±0.2			-5.7	26
	MHL ₃ /ML ₃ .H	10.2 ±0.2			-6.0	27
Cu ²⁺	MHL/M.HL	7.85 ±0.05			-5.7 ±0.4	17
	M(HL) ₂ /M.(HL) ₂	14.7 ^y ±0.1			-12.6 ±0.1	25
	MHL/ML.H	7.35				
	M(HL) ₂ /MHL ₂ .H	9.36 ±0.07			-5.9 ±0.3	23
Zn ²⁺	MHL ₂ /ML ₂ .H	10.12 ±0.06			-6.1 ±0.3	26
	MHL/M.HL	4.22 ±0.06			-1.8 ±0.4	13
	M(HL) ₂ /M.(HL) ₂	8.25 ^y ±0.05			-4.6 ±0.6	22
	MHL/ML.H	8.2 -0.06			-9.0	7
	M(HL) ₂ /MHL ₂ .H	8.91 ±0.03			-7.4 -1	16
	MHL/ML ₂ .H	9.4 ±0.1			-9.6	11

^yD-, L-, and DL-isomers have the same value.

Bibliography: H⁺ 52TR, 82KT, 82PS, 84ACa, 85BCP, 85LSC, 85RT; Mn²⁺-Zn²⁺ 82PS, 84ACa, 84KG, 85LSC

Other references: 71MB, 73VB, 80PB, 81PU, 84AO, 84P, 84PB, 84PBP, 85BA

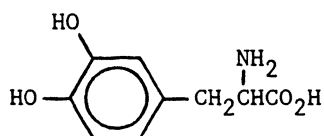


C₁₀H₁₃O₃N L-2-Amino-2-methyl-3-(4-hydroxyphenyl)propanoic acid (methyltyrosine)

H₂L

Metal ion	Equilibrium	Log K 25°, 0.1
H ⁺	HL/H.L	10.24
	H ₂ L/HL.H	9.14
	H ₃ L/H ₂ L.H	2.16
Cu ²⁺	MHL/M.HL	7.81
	M(HL) ₂ /M.(HL) ₂	14.53
	MH ₂ L/MHL.H	(2.1)
	M(HL) ₂ /MHL ₂ .H	9.27

Bibliography: 79FL

C₉H₁₁O₄NL-2-Amino-3-(3,4-dihydroxyphenyl)propanoic acid (L-DOPA)H₃L

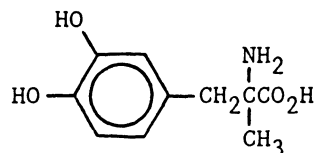
(Other values in Vol.1, p.33 and Vol.5, p.15)

Metal ion	Equilibrium	Log K 25°, 0.1	Log K 20°, 0.37	Log K 25°, 1.0	ΔH 25°, 0.1	ΔS 25°, 0.1
H ⁺	HL/H.L	(13.4) ±0.0		(13.4)	(-10) ^s	(28)
	H ₂ L/HL.H	9.81 ±0.04	9.87	9.74	(-9) ^s ±1	(15)
		9.70 ^b				
	H ₃ L/H ₂ L.H	8.75 ±0.10	8.81	8.71	(-9) ^s ±0	(10)
		8.68 ^b				
	H ₄ L/H ₃ L.H	2.20 ±0.03	(2.04)	2.31		
		2.11 ^b				
Mn ²⁺	MHL/M.HL	4.36				
	M(HL) ₂ /M.(HL) ₂	10.20				
	MHL/ML.H	9.62				
	M(HL) ₂ /MHL ₂ .H	9.68				
	MHL ₂ /ML ₂ .H	11.32				
Co ²⁺	MH ₂ L/M.H ₂ L	3.68 ±0.07				
	MHL/M.HL	5.70				
	M(HL) ₂ /M.(HL) ₂	9.34				
	MHL/ML.H	9.09				
	MH ₃ L ₂ /M(HL) ₂ .H	8.96				
	M(HL) ₂ /MHL ₂ .H	9.73				
	MHL ₂ /ML ₂ .H	11.0				
Ni ²⁺	MH ₂ L/M.H ₂ L	4.88 ±0.03		(4.96)		
		4.80 ^b				
	M(H ₂ L) ₂ /M.(H ₂ L) ₂	8.9 ±0.3	8.72	(9.16)		
		8.74 ^b				
	M(H ₂ L) ₃ /M.(H ₂ L) ₃	11.88 ^b				
	MH ₂ L/MHL.H	8.0 ±0.3				
	M(H ₂ L) ₂ /M(H ₂ L)HL.H	7.87				
	M(H ₂ L)HL/M(HL) ₂ .H	9.00				
	M(HL) ₂ /M(HL)L.H	9.66				
	M(HL)L/ML ₂ .H	11.47				
Cu ²⁺	MH ₂ L/M.H ₂ L	7.53 ±0.05	7.60	7.6		
		7.54 ^b				
	M(H ₂ L) ₂ /M.(H ₂ L) ₂	14.3 ±0.1	(14.5)			
		14.2 ^b				
	M(H ₂ L) ₂ /M(H ₂ L)HL.H	6.75 ±0.05				
	M(H ₂ L)HL/M(HL) ₂ .H	8.40 ±0.07				
	M(HL) ₂ /M(HL)L.H	9.6 ±0.1				
	M(HL)L/ML ₂ .H	10.30 ±0.06				
Cd ²⁺	MH ₂ L/M.H ₂ L	3.04	(3.61)			
	MH ₃ L ₂ /MH ₂ L.HL	6.01				

^b25°, 0.5; ^s1-45°, 0.1Bibliography: H⁺ 73AW, 80JH, 83DA, 83KG;Mn²⁺, Co²⁺ 83KG, 83KGa;Ni²⁺ 77BP, 83KG;

Other references: 57YN, 79YK, 83GC, 84P, 84PB

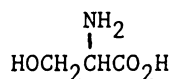
Cu²⁺ 77BP, 83DA;Cd²⁺ 83DA;



$C_{10}H_{13}O_4N$ L-2-Amino-2-methyl-3-(3,4-dihydroxyphenyl)propanoic acid (methyldopa) H_3L

Metal		Log K
<u>ion</u>	<u>Equilibrium</u>	<u>25°, 0.15</u>
H^+	$H_2L/HL.H$	9.99 ± 0.01
	$H_3L/H_2L.H$	$8.88 - 0.01$
	$H_4L/H_3L.H$	2.24
Cu^{2+}	$MH_2L/M.H_2L$	7.63
	$M(H_2L)_2/M.(H_2L)_2$	14.04
	$MH_3L/MH_2L.H$	(1.96)
	$M(H_2L)_2/MH_3L_2.H$	5.77
	$MH_3L_2/MH_2L_2.H$	8.74
	$MH_2L_2/MHL_2.H$	(11.1)
	$MHL_2/ML_2.H$	(9.9)
	$M_2H_2L_2/M^2.H^2.L^2$	(27.29)
	$M_2H_2L_2/M_2L_2.H^2$	(10.40)
	$M_3H_2L_3/M^3.H^2.L^3$	(36.9)
	$M_4H_2L_4/M^4.H^2.L^4$	(46.6)

Bibliography: H^+ 73AW, 79FL; Cu^{2+} 79FL



$C_3H_7O_3N$ L-2-Amino-3-hydroxypropanoic acid (serine) HL
(Other values in Vol.1, p.35 and Vol.5, p.16)

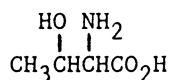
Metal		Log K	Log K	Log K	ΔH	ΔS
<u>ion</u>	<u>Equilibrium</u>	<u>25°, 0.1</u>	<u>25°, 1.0</u>	<u>25°, 0</u>	<u>25°, 0.1</u>	<u>25°, 0.1</u>
H^+	$HL/H.L$	9.05 ± 0.03	9.00 ± 0.04	9.209	-10.3 ± 0.2	7
		8.99 ^b	$8.72^n - 0.01$	$9.53^e \pm 0.08$		
	$H_2L/HL.H$	2.13 ± 0.04	2.19 ± 0.06	2.187	$-1.2 - 0.1$	6
		2.24 ^b	$2.09^n \pm 0.03$	$2.50^e \pm 0.10$		
Mg^{2+}	$ML/M.L$			1.03 ^e		
Ca^{2+}	$ML/M.L$			1.43		
				1.00 ^e		
Nd^{3+}	$MHL/M.HL$	0.99				
UO_2^{2+}	$MHL/M.HL$	0.87 ^b				
CH_3Hg^+	$ML/M.L$		6.93			
Zn^{2+}	$ML/M.L$	4.60 ± 0.06	$4.48^n - 0.01$	4.90 ^e	-2.3	13
	$ML_2/M.L^2$	$(8.5)^w \pm 0.2$	$8.29^n \pm 0.03$	9.28 ^e	-4.9 -1	22
	$ML_3/M.L^3$		10.6 ⁿ	11.9 ^e		

^b25°, 0.5; ^e25°, 3.0; ⁿ37°, 0.15; ^woptical isomerism not stated.

Bibliography: H^+ 81JI, 82BKa, 84AO, 85BPa, 85MK, 85VD;

Mg^{2+} , Ca^{2+} 85BPa; Nd^{3+} 73SY; UO_2^{2+} 57LW; CH_3Hg^+ 81JI; Zn^{2+} 72GH, 82BKa, 85MK;

Other references: 64K, 71MB, 73VB, 80Sa, 81G, 81RK, 81RS, 81UP, 82CGB, 82NM, 83FA, 83HD, 83NM, 84PBP, 84SCa

 $\text{C}_4\text{H}_9\text{O}_3\text{N}$

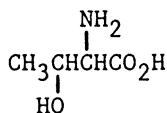
L-2-Amino-3-hydroxybutanoic acid (threonine)
(Other values in Vol.1, p.37 and Vol.5, p.17)

HL

Metal		Log K	Log K	Log K	ΔH	ΔS
<u>ion</u>	<u>Equilibrium</u>	<u>25°, 0.1</u>	<u>25°, 1.0</u>	<u>25°, 0</u>	<u>25°, 0.1</u>	<u>25°, 0.1</u>
H^+	HL/H.L	8.96 $\pm$ 0.03	8.97 $\pm$ 0.01	9.100	-10.0 $\pm$ 0.2	7
		8.92 ^b $\pm$ 0.06	8.58 ⁿ $\pm$ 0.01	9.35 ^e		
	$\text{H}_2\text{L}/\text{HL.H}$	2.21 $\pm$ 0.05	2.25 $\pm$ 0.09	2.088	-1.3 $\pm$ 0.1	6
		2.24 ^b $\pm$ 0.04	2.12 ⁿ $\pm$ 0.04	2.41 ^e		
Nd^{3+}	MHL/M.HL	0.88				
Co^{2+}	ML/M.L	4.37 $\pm$ 0.07	(4.16) ⁿ		-1.9 $\pm$ 0.8	14
	$\text{ML}_2/\text{M.L}^2$	7.9 ^y $\pm$ 0.1	(7.45) ⁿ		-5.0 $\pm$ 0.5	19
	$\text{ML}_3/\text{M.L}^3$		(8.82) ⁿ			
	$\text{ML}_2/\text{MOHL}_2.\text{H}$	9.70				
Cu^{2+}	ML/M.L	7.96 $\pm$ 0.07	7.9 $\pm$ 0.1	8.43	-5.5 $\pm$ 0.2	18
			7.79 ⁿ -0.2	8.61 ^e	(-4.3) ^e	
	$\text{ML}_2/\text{M.L}^2$	14.6 ^y $\pm$ 0.1	14.7 $\pm$ 0.2	15.4	-11.6 $\pm$ 0.2	28
			14.3 ⁿ -0.3	16.1 ^e	(-11.2) ^e	
	MHL/ML.H	3.59				
	ML/M(OH)L.H	3.10	6.2 ⁿ			
	$\text{MOHL}/\text{M(OH)}_2\text{L.H}$	10.57				
	$\text{ML}_2/\text{M(OH)}_2\text{L.H}$	9.83 ^y $\pm$ 0.01	9.89			
			9.61 ⁿ			
	$\text{MOHL}_2/\text{M(OH)}_2\text{L}_2.\text{H}$	10.78 ^y $\pm$ 0.00	11.19			
Zn^{2+}	ML/M.L	4.6 $\pm$ 0.1	4.47 ⁿ -0.04		-2.5	13
	$\text{ML}_2/\text{M.L}^2$	8.5 ^y $\pm$ 0.1	8.28 ⁿ -0.1		-5.3	21
	ML/M(OH)L.H	8.6				
	$\text{ML}_2/\text{M(OH)}_2\text{L.H}$	9.9				

^b25°, 0.5; ^e25°, 3.0; ⁿ37°, 0.15; ^yL-, D-, and DL-isomers have about the same value.

Bibliography: H^+ 71MB, 77S, 82KB, 82KP, 84AO, 84SPa, 85VD; Nd^{3+} 73SY; Co^{2+} 82KP; Cu^{2+} 77S, 82KB, 82RP, 84AO; Zn^{2+} 80KBa, 81G, 85MK; Other references: 72GH, 73VB, 80Sa, 80Ga, 81Ra, 83NM

 $\text{C}_4\text{H}_9\text{O}_3\text{N}$

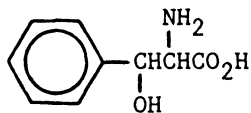
L-allo-Threonine
(Other references in Vol.1, p.395 and Vol.5, p.18)

HL

Metal		Log K	Log K	Log K	ΔH	ΔS
<u>ion</u>	<u>Equilibrium</u>	<u>25°, 0.1</u>	<u>25°, 1.0</u>	<u>25°, 0</u>	<u>25°, 0</u>	<u>25°, 0</u>
H^+	HL/H.L	8.83	8.92	9.096	-10.2 $\pm$ 0.2	7.4
	$\text{H}_2\text{L}/\text{HL.H}$	2.11	2.09	2.108	-0.7	7.3
Co^{2+}	ML/M.L	4.13			-2.0 ^a	12 ^a
	$\text{ML}_2/\text{M.L}^2$	7.17			-3.1 ^a	22 ^a
	$\text{ML}_2/\text{MOHL}_2.\text{H}$	9.45				
Cu^{2+}	ML/M.L	7.59	7.59		-5.5 ^a	16 ^a
	$\text{ML}_2/\text{M.L}^2$	14.01	14.17		(-10.0) ^a	31 ^a
	ML/MOHL.H	3.26				
	$\text{MOHL}/\text{M(OH)}_2\text{L.H}$	10.55				

^a25°, 0.1

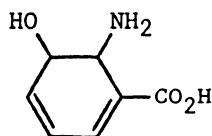
Bibliography: 82KP

 $C_9H_{11}O_3N$ 2-Amino-3-hydroxy-3-phenylpropanoic acid (phenylserine)

HL

(Other references in Vol.1, p.38)

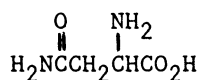
Isomer	Metal ion	Equilibrium	Log K 25°, 0.1	ΔH 25°, 0.1	ΔS 25°, 0.1
erythro-	H^+	HL/H.L	8.69 $\pm$ 0.02	-9.3	9
		H ₂ L/HL.H	(1.8) $\pm$ 0.2		
	Cu^{2+}	ML/M.L	7.75 $\pm$ 0.01	-5.0	19
		ML ₂ /M.L ²	14.4 -0.3	-10.5	31
		ML ₂ /M(H ₋₁ L)L.H	9.78		
		M(H ₋₁ L)L/M(H ₋₁ L) ₂ .H	11.19		
	Zn^{2+}	ML/M.L	4.57		
		ML ₂ /M.L ²	8.56		
		ML ₃ /M.L ³	10.59		
	Al^{3+}	ML/M.L	3.98		
		ML ₂ /M.L ²	6.0		
	Ga^{3+}	ML/M.L	4.63		
threo-	H^+	HL/H.L	8.87		
		H ₂ L/HL.H	(1.7)		
	Cu^{2+}	ML/M.L	7.99		
		ML ₂ /M.L ²	14.7		
		ML ₂ /M(H ₋₁ L)L.H	9.51		
		M(H ₋₁ L)L/M(H ₋₁ L) ₂ .H	10.79		

Bibliography: H^+ 78T,85Sc; Cu^{2+} 85Sc; Zn^{2+} - Ga^{3+} 78T $C_7H_9O_3N$ L-trans-2-Amino-3-hydroxy-2,3-dihydrobenzoic acid

HL

Metal ion	Equilibrium	Log K 25°, 0.1
H^+	HL/H.L	8.56
	H ₂ L/HL.H	3.36
Cu^{2+}	ML/M.L	6.25
	ML ₂ /M.L ²	11.28
	ML ₂ /M(H ₋₁ L)L.H	9.61
	M(H ₋₁ L)L/M(H ₋₁ L) ₂ .H	9.86

Bibliography: 82HHP

 $\text{C}_4\text{H}_8\text{O}_3\text{N}_2$

L-2-Aminobutanedioic acid 4-amide (asparagine)
(Other values in Vol.1, p.40 and Vol.5, p.18)

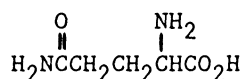
HL

Metal	Equilibrium	Log K 25°, 0.1	Log K 25°, 1.0	Log K 25°, 3.0	ΔH 25°, 0.1	ΔS 25°, 0.1
ion						
H^+	HL/H.L	8.72 $\pm$ 0.02	8.68 $\pm$ 0.01	9.30	-9.8 $\pm$ 0.1	7
		8.64 ^b			(-12.1) ^e	
	$\text{H}_2\text{L}/\text{HL.H}$	2.15 $\pm$ 0.01	2.12 $\pm$ 0.03	2.59	-1.1	6
		2.11 ^b			-1.2 ^e	
CH_3Hg^+	ML/M.L		6.32			

^b25°, 0.5; ^e25°, 3.0

Bibliography: 81JI;

Other references: 73VB, 80Sa, 81Ma, 81PU, 84KW

 $\text{C}_5\text{H}_{10}\text{O}_3\text{N}_2$

L-2-Aminopentanedioic acid 5-amide (glutamine)
(Other values in Vol.1, p.41 and Vol.5, p.19)

HL

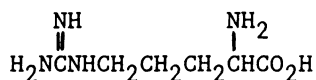
Metal	Equilibrium	Log K 25°, 0.1	Log K 37°, 0.15	Log K 25°, 3.0	ΔH 25°, 0.1	ΔS 25°, 0.1
ion						
H^+	HL/H.L	9.00 $\pm$ 0.03	8.70 $\pm$ 0.02	9.64	-9.9	8
		8.94 ^b			(-12.2) ^e	
	$\text{H}_2\text{L}/\text{HL.H}$	2.18 $\pm$ 0.03	2.19 $\pm$ 0.01	2.72	-0.8	7
		2.14 ^b			-1.1 ^e	
Ni^{2+}	ML/M.L	5.16	4.98	5.56	-3.2 ^e	15 ^e
	$\text{ML}_2/\text{M.L}^2$	9.42	9.02	10.28	-8.6 ^e	18 ^e
	$\text{ML}_3/\text{M.L}^3$		11.6	13.8	-13.1 ^e	19 ^e
Cu^{2+}	ML/M.L	7.70 $\pm$ 0.08	7.48 -0.2	9.05	-5.6	16
					(-3.9) ^e	
	$\text{ML}_2/\text{M.L}^2$	14.1 $\pm$ 0.1	13.6 -0.2	16.5	-11.7	25
					(10.3) ^e	
Zn^{2+}	ML/M.L		4.23 $\pm$ 0.05	4.83		
	$\text{ML}_2/\text{M.L}^2$		7.81 $\pm$ 0.1	9.17		
	$\text{ML}_3/\text{M.L}^3$			11.8		
	$\text{ML}_2/\text{MOHL}_2.\text{H}$		5.57			

^b25°, 0.5; ^e25°, 3.0

Bibliography:

 H^+ , Cu^{2+} 82KB, 85CFH; Ni^{2+} 85CFH; Zn^{2+} 80KBa, 85CFH.

Other references: 72GH, 73VB, 80JK, 80Sa, 81Ma, 84KW

 $\text{C}_6\text{H}_{14}\text{O}_2\text{N}_4$

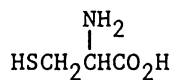
L-2-Amino-5-guanidopentanoic acid (arginine)
(Other values in Vol.1, p.43 and Vol.5, p.20)

 H_2L

Metal		Log K	Log K	Log K	ΔH	ΔS
ion	Equilibrium	$25^\circ, 0.1$	$20^\circ, 1.0$	$25^\circ, 0$	$25^\circ, 0$	$25^\circ, 0$
H^+	HL/H.L	(12.1) ± 0.0				
	$\text{H}_2\text{L}/\text{HL.H}$	9.01 ± 0.04	9.21	8.991	-10.6 ± 0.1	5.6
			8.74 ⁿ ± 0.04			
	$\text{H}_3\text{L}/\text{H}_2\text{L.H}$	2.03 ± 0.08	2.19	1.823	-1.0	5.0
			2.02 ⁿ -0.3			
Cu^{2+}	MHL/M.HL	7.50 ± 0.06	7.38 ⁿ			
	$\text{M}(\text{HL})_2/\text{M} \cdot (\text{HL})^2$	13.8 ± 0.2	13.66 ⁿ			
	$\text{M}_2\text{L}_2/\text{M}^2 \cdot \text{L}^2$		3.17 ⁿ			
Zn^{2+}	MHL/M.HL	4.15 ± 0.04	4.05 ⁿ ± 0.02			
	$\text{M}(\text{HL})_2/\text{M} \cdot (\text{HL})^2$	8.07 ± 0.05	7.88 ⁿ -0.3			

ⁿ37°, 0.15Bibliography: H^+ 71MB, 81ABb, 83Ad; Cu^{2+} 83AD; Zn^{2+} 81ABb;

Other references: 28M, 73VB, 81PU, 82NS, 83HD

 $\text{C}_3\text{H}_7\text{O}_2\text{NS}$

L-2-Amino-3-mercaptopropanoic acid (cysteine)
(Other values in Vol.1, p.47 and Vol.5, p.21)

 H_2L

Metal		Log K	Log K	Log K	ΔH	ΔS
ion	Equilibrium	$25^\circ, 0.1$	$25^\circ, 1.0$	$25^\circ, 0$	$25^\circ, 0.1$	$25^\circ, 0.1$
H^+	HL/H.L	10.36 ± 0.1	10.1 ± 0.1	10.74 ± 0.04	-8.5 ± 0.1	19
		10.2 ^b ± 0.1	10.08 ⁿ ± 0.04	10.70 ^e ± 0.02	-9.7 ^e	16 ^e
	$\text{H}_2\text{L}/\text{HL.H}$	8.16 ± 0.05	8.10 ± 0.03	8.36 ± 0.03	-8.1 ± 0.4	10
		8.13 ^b ± 0.02	7.94 ⁿ ± 0.03	8.71 ^e ± 0.07	-9.3 ^e	9 ^e
	$\text{H}_3\text{L}/\text{H}_2\text{L.H}$	(1.9) ± 0.1	(1.9)	(1.7)		
		(1.9) ^b	(1.9) ⁿ ± 0.1	2.40 ^e ± 0.04	-0.1 ^e	11 ^e
Co^{2+}	ML/M.L	8.00				
	$\text{ML}_2/\text{M} \cdot \text{L}^2$	14.20				
	$\text{M}_2\text{L}_3/\text{M}^2 \cdot \text{L}^3$	26.34				
	$\text{M}_3\text{L}_4/\text{M}^3 \cdot \text{L}^4$	37.98				
Ni^{2+}	ML/M.L	9.82 -0.2	9.60			
		(9.83) ^h				
	$\text{ML}_2/\text{M} \cdot \text{L}^2$	20.07 -0.4	(19.22) ⁿ		(-14) ^s	(45)
		20.19 ^h ± 0.03				
	MHL/ML.H	4.96 ^h				
	$\text{M}_2\text{L}_3/\text{M}^2 \cdot \text{L}^3$	33.0 ^h	31.5 ⁿ			
	$\text{M}_3\text{L}_4/\text{M}^3 \cdot \text{L}^4$	45.7 ^h				
CH_3Hg^+	ML/M.L	16.6 ± 0.1	15.7			
	MHL/M.HL	15.2 ± 0.1	14.81			

^b25°, 0.5; ^e25°, 3.0; ⁿ37°, 0.15; ^h20°, 0.1; ^s15-40°, 0.2

Cysteine (continued)

Metal ion	Equilibrium	Log K 25°, 0.1	Log K 25°, 1.0	Log K 25°, 0	ΔH 25°, 0.1	ΔS 25°, 0.1
(CH ₃) ₃ Pb ⁺	ML/M.L	5.96 ^u				
	MHL/M.HL	4.99 ^u				
	MH ₂ L/M.H ₂ L	0.3 ^u				
Pb ²⁺	ML/M.L	12.3 ± 0.3	12.20			
		12.21 ^b		12.21 ^e	(-10) ^t	(22) ^e
	ML ₂ /M.L ²		(15.9)	18.6 ^e		
	MHL/M.HL		(5.97)	6.64 ^e	(-4) ^t	(17) ^e
	MHL ₂ /MHL.L			9.9 ^e	(-13) ^t	(2) ^e
	ML ₂ /MOHL ₂ .H			11.3 ^e		
Bi ³⁺	MHL/M.HL	12.28 ^b				
	M(HL) ₂ /M.(HL) ²	20.76 ^b				

^b25°, 0.5; ^e25°, 3.0; ^u25°, 0.3; ^t10-40°, 3.0

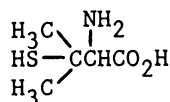
Bibliography: H⁺ 66WS, 69CM, 71MB, 80AMR, 81JI, 82Na, 83AC, 83BA, 83HS, 83KP, 85BCP, 85CFH;

Co²⁺ 83HS; (CH₃)₃Pb⁺ 81BR;

Ni²⁺ 83CFH; Pb²⁺ 82BCS, 82Na;

CH₃Hg⁺ 81JI, 81RR, 83AC; Bi³⁺ 82Na;

Other references: 61S, 64K, 72GPW, 73RS, 73VB, 75RF, 80PB, 80SDB, 81BCJ, 81MC, 82NAN, 82NM, 82VN, 83BV, 83NM, 84KP, 85SN

C₅H₁₁O₂NS

D-2-Amino-3-mercapto-3-methylbutanoic acid (penicillamine)
(Other values in Vol.1, p.48 and Vol.5, p.22)

H₂L

Metal ion	Equilibrium	Log K 25°, 0.1	Log K 25°, 1.0	Log K 25°, 0
H ⁺	HL/H.L	10.6 ± 0.1	10.50	11.01
		10.7 ^h ± 0.1	10.4 ⁿ ± 0.2	
	H ₂ L/HL.H	7.95 ± 0.05	7.92	8.60
		8.05 ^h ± 0.05	7.71 ⁿ ± 0.04	
	H ₃ L/H ₂ L.H	(1.9) ± 0.1	(1.9)	2.43
		(1.9) ^h ± 0.1	(1.9) ⁿ ± 0.2	
Co ²⁺	ML/M.L	8.98		
	ML ₂ /M.L ²	16.88		
	MHL ₂ /ML ₂ .H	6.44		
	M ₂ L ₃ /M ² .L ³	28.35		
CH ₃ Hg ⁺	ML/M.L	16.8 ± 0.2		
	MHL/M.HL	14.77 ± 0.02		
(CH ₃) ₃ Pb ⁺	ML/M.L	5.62 ^u		
	MHL/ML.H	4.05 ^u		
Zn ²⁺	ML/M.L	(9.5) ± 0.1	10.12 ⁿ	
		(9.59) ^h		
	ML ₂ /M.L ²	19.40 ± 0.02	(18.81) ⁿ	20.52
		19.56 ^h		
	MHL/ML.H	5.14		

^h20°, 0.1; ⁿ37°, 0.15; ^u25°, 0.3

Penicillamine (continued)

Metal ion	Equilibrium	Log K 25°, 0.1	Log K 25°, 1.0	Log K 25°, 0
(Zn ²⁺)	M(HL)L/ML ₂ .H	6.0 ^y ± 0.1 5.99 ^h		6.27
	M(HL) ₂ /M(HL)L.H	5.38 ^y ± 0.05 5.8 ^h		5.93
	ML ₂ /MOHL ₂ .H			(11.96)
	M ₃ HL ₄ /M ³ .H.L ⁴			53.8
	M ₃ HL ₄ /M ₃ L ₄ .H			6.25
Cd ²⁺	ML/M.L	10.9 ± 0.0	10.74 ⁿ	12.68
	ML ₂ /M.L ₂	20.33	(17.68) ⁿ	20.68
	MHL/M.HL	5.94		6.14
	M(HL) ₂ /M.(HL) ²			12.51
	MHL ₂ /ML ₂ .H		6.99 ⁿ	7.63
	ML ₂ /MOHL ₂ .H	10.46		11.54

^h20°, 0.1; ⁿ37°, 0.15; ^yD- and DL-isomers have about the same value.

Bibliography: H⁺ 71WM, 82AK, 82HA, 83BA, 83HS, 83SL, 83WW, 84TC;

Co²⁺ 83HS;

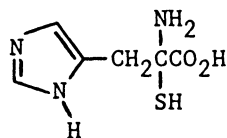
Zn²⁺ 84JS;

CH₃Hg⁺ 81RR, 83AC;

Cd²⁺ 82AK, 82HA

(CH₃)₃Pb⁺ 81BR;

Other references: 65PP, 75RF, 77MO, 80CJ, 81BCJ



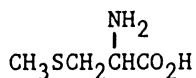
C₆H₉O₂N₃S

DL-2-Mercaptohistidine

Metal ion	Equilibrium	Log K 25°, 0.1	ΔH 25°, 0.1	ΔS 25°, 0.1
H ⁺	HL/H.L	11.77	(-13) ^s	(10)
	H ₂ L/HL.H	8.59	(-10) ^s	(6)
Mn ²⁺	ML/M.L	4.1		
	ML ₂ /M.L ²	(8.6) ^w		
Fe ²⁺	ML/M.L	5.80		
	ML ₂ /M.L ²	(11.11) ^w		
Co ²⁺	ML/M.L	7.64		
	ML ₂ /M.L ²	(12.43) ^w		
Ni ²⁺	ML/M.L	9.31		
	ML ₂ /M.L ²	(15.68) ^w		
Zn ²⁺	ML/M.L	9.16		
	ML ₂ /M.L ²	(17.2) ^w		
Cd ²⁺	ML/M.L	9.08		
	ML ₂ /M.L ²	(17.0) ^w		
Hg ²⁺	ML/M.L	12.4		
Pb ²⁺	ML/M.L	10.27		

^s5-35°, 0.1; ^woptical isomerism not given.

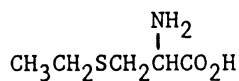
Bibliography: 82TSb

C₄H₉O₂NS

L-2-Amino-3-(methylthio)propanoic acid (S-methylcysteine)
(Other values in Vol.1, p.49 and other references in Vol.5, p.426)

HL

Metal ion	Equilibrium	Log K 25°, 0.1	Log K 25°, 0.5	Log K 25°, 0	ΔH 25°, 0.1	ΔS 25°, 0.1
H ⁺	HL/H.L	8.8 ±0.1	8.76 ±0.02	8.97	-10.1	6
	H ₂ L/HL.H	(1.8)	2.00 -0.01			
Ag ⁺	MHL/M.L	2.68	2.47			
	M(HL) ₂ /M.(HL) ₂	5.2	(4.00)			
	MHL/ML.H	7.11	(6.19)			
	MHL ₂ /ML ₂ .H		(6.71)			
	M(HL) ₂ /ML ₂ .H	13.48	13.10			
	M(H ₂ L)(HL)/M(HL) ₂ .H		(1.9)			
	M ₂ L/M ² .L		(7.08)			
	M ₂ L ₂ /M ₂ L.L		(5.98)			

Bibliography: H⁺ 81PSK,84TS; Ag⁺ 81PSK,84TS; Other reference: 81PSC₅H₁₁O₂NS

L-2-Amino-3-(ethylthio)propanoic acid (S-ethylcysteine)

HL

Metal ion	Equilibrium	Log K 25°, 0.1	Log K 25°, 1.0	Log K 25°, 0
H ⁺	HL/H.L	8.65	8.75 ±0.03	8.90
		8.73 ^b		
	H ₂ L/HL.H	(1.9) ^b	(1.9) ±0.0	2.12
		(2.0) ^b		
Co ²⁺	ML/M.L		3.97	4.25
	ML ₂ /M.L ²		7.9	7.95
	ML ₂ /MOHL ₂ .H		10.27	
Ni ²⁺	ML/M.L		5.16	5.38
	ML ₂ /M.L ²		9.93	10.30
	ML ₃ /M.L ³		12.67	13.10
Cu ²⁺	ML/M.L		7.80	8.02
	ML ₂ /M.L ²		14.54	15.10
Ag ⁺	MHL/M.L	2.88 ^b		
	M(HL) ₂ /M.(HL) ₂	(4.53) ^b		
	MHL/ML.H	(6.43) ^b		
	MHL ₂ /ML ₂ .H	(6.97) ^b		
	M(HL) ₂ /MHL ₂ .H	(5.25) ^b		
	M(H ₂ L)HL/M(HL) ₂ .H	(2.01) ^b		
	M ₂ L/M ² .L	(7.46) ^b		
	M ₂ L ₂ /M ₂ L.L	(6.19) ^b		
Zn ²⁺	ML/M.L		4.2	
	ML ₂ /M.L ²		8.3	
	ML ₂ /MOHL ₂ .H		9.38	
Cd ²⁺	ML/M.L		3.76	
	ML ₂ /M.L ²		7.44	
	ML ₂ /MOHL ₂ .H		10.06	
Pb ²⁺	ML/M.L		4.80	
	ML ₂ /M.L ²		7.43	
	MHL/ML.H		5.06	
	ML/MOHL.H		8.43	

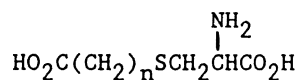
^b25°, 0.5Bibliography: H⁺ 81CPS,81SBa,81TMM,84TS; Co²⁺-Cu²⁺,Zn²⁺,Cd²⁺ 81CPS; Ag⁺ 84TS; Pb²⁺ 81SBa

$\begin{array}{c} \text{NH}_2 \\ \\ \text{CH}_3\text{SCH}_2\text{CH}_2\text{CHCO}_2\text{H} \end{array}$						
C ₅ H ₁₁ O ₂ NS <u>DL-2-Amino-4-(methylthio)butanoic acid (methionine)</u> HL						
(Other values in Vol.1, p.50 and Vol.5, p.24)						
Metal ion	Equilibrium	Log K 25°, 0.1	Log K 25°, 1.0	Log K 25°, 3.0	ΔH 25°, 0.1	ΔS 25°, 0.1
H ⁺	HL/H.L	9.06 ±0.02	9.02 ±0.02	(9.69)	-10.2°	7
	H ₂ L/HL.H	9.08 ^b ±0.01	8.79 ⁿ -0.01			
		2.10 ±0.08	2.22 ±0.04	(2.70)	(0) ^s	(10)
		2.15 ^b ±0.05	2.15 ⁿ ±0.02			
Cu ²⁺	ML/M.L	9.86 ±0.01	7.58 ⁿ ±0.09			
	ML ₂ /M.L ²	14.6 ^y ±0.1	13.9 ⁿ ±0.2			
Ag ⁺	MHL/M.HL	3.15	3.37 ^b			
	M(HL) ₂ /M.(HL) ²	6.48	(5.88) ^{b,x}			
	MHL/ML.H	6.99	(7.7) ^b			
	MH ₂ L/MHL.H		(1.9) ^b			
	MHL ₂ /ML ₂ .H		(8.59) ^{b,x}			
	M(HL) ₂ /MHL ₂ .H		(7.59) ^{b,x}			
	M(H ₂ L)HL/M(HL) ₂ .H		(2.20) ^{b,x}			
	M(H ₂ L) ₂ /M(H ₂ L)HL.H		(1.7) ^{b,x}			
	M ₂ L/M ² .L		(7.46) ^{b,x}			
	M ₂ L ₂ /M ₂ L.L		(6.03) ^{b,x}			
CH ₃ Hg ⁺	ML/M.L	7.40	7.2			
	MHL/M.HL	1.94				

^b25°, 0.5; ⁿ37°, 0.15; ^o20°, -0; ^s10-40°, 0.09; ^xDL-mixture;
^yL- and DL-isomers have about the same value.
 Bibliography: H⁺ 71MB, 81JI, 81PSK, 84BPB, 84TS;
 Co²⁺, Ni²⁺, Zn²⁺, Cd²⁺ 82NMa; Ag⁺ 81PSK, 84TS;
 Cu²⁺ 82NMa, 84BPB; CH₃Hg⁺ 75FR, 81JI;
 Other references: 64K, 65PP, 73VB, 80JK, 81MC, 81PU, 82RB, 83HD, 83NM, 84MC, 84Mca, 84MR, 85MK

$\begin{array}{c} \text{NH}_2 \\ \\ \text{CH}_3\text{CH}_2\text{SCH}_2\text{CH}_2\text{CHCO}_2\text{H} \end{array}$						
C ₆ H ₁₃ O ₂ NS <u>DL-2-Amino-4-(ethylthio)butanoic acid (ethionine)</u> HL						
(Other values in Vol.1, p.51)						
Metal ion	Equilibrium	Log K 25°, 0.1	Log K 25°, 1.0			
H ⁺	HL/H.L	9.05 ±0.03	9.02 ±0.08			
	H ₂ L/HL.H	2.18 -0.4	2.22 ±0.01			
Ag ⁺	MHL/M.HL	3.3	3.75			
	M(HL) ₂ /M.(HL) ²	5.76	(6.37) ^x			
	MHL/ML.H		(7.7)			
	MH ₂ L/MHL.H		(1.9)			
	MHL ₂ /ML ₂ .H		(8.70) ^x			
	M(HL) ₂ /ML ₂ .H ²	14.27	(16.13) ^x			
	M(H ₂ L)(HL)/M(HL) ₂ .H		(2.35) ^x			
	M(H ₂ L) ₂ /M(H ₂ L)(HL).H		(1.7) ^x			
	M ₂ L/M ² .L		(7.93) ^x			
	M ₂ L ₂ /M ₂ L.L		(6.16) ^x			

^xDL-mixture
 Bibliography: H⁺ 81PSK, 84MC, 84Mca, 84TS; Ag⁺ 81PSK, 84TS

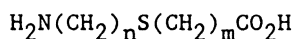
 $\text{C}_x\text{H}_y\text{O}_4\text{NS}$ L-2-Amino-3-(carboxyalkylthio)propanoic acid H_2L

<u>Ligand</u>	<u>Metal ion</u>	<u>Equilibrium</u>	<u>Log K</u> <u>25°, 0.1</u>	<u>Log K</u> <u>25°, 2.0</u>
n= 1	H^+	HL/H.L	8.89	9.12
-(carboxymethyl-thio)-			9.01 ^c	
(S-carboxymethyl-cysteine)		$\text{H}_2\text{L}/\text{HL.H}$	3.36	3.52
($\text{C}_5\text{H}_9\text{O}_4\text{NS}$)		$\text{H}_3\text{L}/\text{H}_2\text{L.H}$	1.99	2.04
			1.91 ^c	
(Other reference in Vol.1, p.396	Co^{2+}	$\text{ML}/\text{M.L}$	4.90	5.05
		$\text{ML}_2/\text{M.L}^2$	8.52	9.11
and other values in Vol.5, p.25)	Zn^{2+}	$\text{ML}/\text{M.L}$	5.12	(5.04)
		$\text{ML}_2/\text{M.L}^2$	9.26	(9.07)

n= 2	H^+	HL/H.L		9.08
-(2-carboxyethyl-thio)-		$\text{H}_2\text{L}/\text{HL.H}$		4.36
		$\text{H}_3\text{L}/\text{H}_2\text{L.H}$		2.14
($\text{C}_6\text{H}_{11}\text{O}_4\text{NS}$)	Co^{2+}	$\text{ML}/\text{M.L}$		4.46
		$\text{ML}_2/\text{M.L}^2$		8.04
(Other values in Vol.5, p.25)		$\text{ML}_3/\text{M.L}^3$		10.15
	Zn^{2+}	$\text{ML}/\text{M.L}$		4.61
		$\text{ML}_2/\text{M.L}^2$		8.67

^c25°, 1.0

Bibliography: 80MAH

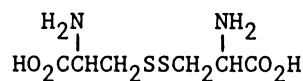
 $\text{C}_x\text{H}_y\text{O}_2\text{NS}$ ω-Amino-thiaalkanoic acid

HL

<u>Ligand</u>	<u>Metal ion</u>	<u>Equilibrium</u>	<u>Log K</u> <u>25°, 0.5</u>	<u>ΔH</u> <u>25°, 0.5</u>	<u>ΔS</u> <u>25°, 0.5</u>
n= 2, m= 1	H^+	HL/H.L	9.53	-11.78	4.1
		$\text{H}_2\text{L}/\text{HL.H}$	3.18	+0.05	14.7
5-Amino-3-thia-pentanoic acid	Ni^{2+}	$\text{ML}/\text{M.L}$	6.14	-5.4	10
		$\text{ML}_2/\text{M.L}^2$	11.53	-10.8	17
($\text{C}_4\text{H}_9\text{O}_2\text{NS}$)	Cu^{2+}	$\text{ML}/\text{M.L}$	7.25	-4.8	17
		$\text{ML}_2/\text{M.L}^2$	13.40	-11.1	24
		$\text{MHL}/\text{ML.H}$	3.70	-7.0	-7
		$\text{MHL}_2/\text{ML}_2.\text{H}$	4.57		
	Ag^+	$\text{MHL}/\text{M.HL}$	2.61		
		$\text{M}(\text{HL})_2/\text{M.}(\text{HL})^2$	(4.44)		
		$\text{MHL}/\text{ML.H}$	(6.99)		
		$\text{MH}_2\text{L}/\text{MHL.H}$	(2.52)		
		$\text{MHL}_2/\text{ML}_2.\text{H}$	(8.07)		
		$\text{M}(\text{HL})_2/\text{MHL}_2.\text{H}$	(6.22)		
		$\text{M}(\text{H}_2\text{L})\text{HL}/\text{M}(\text{HL})_2.\text{H}$	(2.65)		
		$\text{M}(\text{H}_2\text{L})_2/\text{M}(\text{H}_2\text{L})\text{HL.H}$	(2.02)		
		$\text{M}_2\text{L}/\text{M}^2.\text{L}$	(7.37)		
		$\text{M}_2\text{L}_2/\text{M}_2\text{L.L}$	(5.85)		

ω -Amino-thiaalkanoic acid (continued)

Ligand	Metal ion	Equilibrium	Log K 25°, 0.5	ΔH 25°, 0.5	ΔS 25°, 0.5
n= 3, m= 1	H^+	HL/H.L	10.19	-13.07	2.8
		$H_2L/HL.H$	3.35	+0.38	16.6
6-Amino-3-thia- hexanoic acid	Ni^{2+}	ML/M.L	4.16	-3.5	7
		$ML_2/M.L^2$	7.41	-7.7	8
(C ₅ H ₁₁ C ₂ NS)	Cu^{2+}	ML/M.L	6.87	-3.4	20
		MHL/M.HL	1.63	+0.4	9
		$M(HL)_2/M.(HL)^2$	2.74	+2.3	20
n= 2, m= 2	H^+	HL/H.L	9.50	-12.6	2.3
		$H_2L/HL.H$	3.94	-0.07	17.8
6-Amino-4-thia- hexanoic acid	Ni^{2+}	ML/M.L	3.74	-3.3	6
		$ML_2/M.L^2$	6.92	-7.1	7
(C ₅ H ₁₁ O ₂ NS)	Cu^{2+}	ML/M.L	6.24	-3.7	16
		$ML_2/M.L^2$	10.75	-9.2	18
		MHL/ML.H	4.45	-8.2	-7
	Ag^+	MHL/M.HL	2.78		
		$M(HL)_2/M.(HL)^2$	(4.64)		
		MHL/ML.H	(7.2)		
		$MH_2L/MHL.H$	(3.52)		
		$MHL_2/ML_2.H$	(8.06)		
		$M(HL)_2.MHL_2.H$	(5.97)		
		$M(H_2L)(HL)/M(HL)_2.H$	(3.75)		
		$M(H_2L)_2/M(H_2L)(HL).H$	(3.26)		
		$M_2L/M^+.L$	(7.61)		
		$M_2L_2/M_2L.L$	(5.9)		

Bibliography: H^+ - Cu^{2+} 83HT; Ag^+ 84TSC₆H₁₂O₄N₂S₂3,3'-Dithiobis(L-2-aminopropanoic acid) (cystine)
(Other references in Vol.1, p.55 and Vol.5, p.26)H₂L

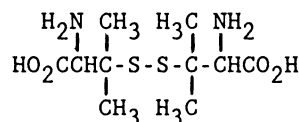
Metal ion	Equilibrium	Log K 20°, 0.15	Log K 37°, 0.15
H^+	HL/H.L	8.80	8.59 $\pm$ 0.01
	$H_2L/HL.H$	8.03	7.90 $\pm$ 0.05
	$H_3L/H_2L.H$		2.05 $\pm$ 0.05
	$H_4L/H_3L.H$		(1.5) $\pm$ 0.1
Ni^{2+}	$ML_2/M.L^2$		11.73
	MHL/M.HL		4.91
	$M_2L/M^2.L$		10.21
	$M_2L_2/M^2.L^2$		17.54
Cu^{2+}	MHL/M.HL		7.50 $\pm$ 0.02
	$M_2L/M^2.L$		14.86
	$M_2L_2/M^2.L^2$		28.15 $\pm$ 0.09

Cystine (continued)

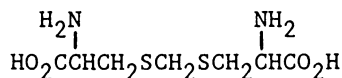
Metal ion	Equilibrium	Log K 20°, 0.15	Log K 37°, 0.15
Zn ²⁺	ML/M.L		6.67 ±0.02
	MHL/M.HL		4.25 ±0.05
	M ₂ L/M ₂ .L		10.07
Cd ²⁺	ML/M.L		8.22

Bibliography: H⁺ 81BKB, 82HA, 85CFH;Ni²⁺ 85CFH;Cu²⁺ 81BKB;

Other reference: 72GH

Zn²⁺ 80AMR, 82HA, 85CFH;
Cd²⁺ 82HA;C₁₀H₂₀O₄N₂S₂ 3,3'-Dithiobis(D-2-amino-3-methylbutanoic acid) (penicillamine disulfide) H₂L

Metal ion	Equilibrium	Log K 25°, 0.15	Log K 37°, 0.15	Log K 25°, 0.4
H ⁺	HL/H.L	8.72	8.47	8.57
	H ₂ L/HL.H	7.77	7.42	7.62
	H ₃ L/H ₂ L.H	2.0	(1.9)	
	H ₄ L/H ₃ L.H	(1.0)	(1.2)	
Cu ²⁺	ML/M.L		7.22	
	ML ₂ /M.L ²	14.31		
	MHL/M.HL		6.92	
	M(HL) ₂ /M.(HL) ²	13.81		
	M ₂ L ₂ /M ² .L ²	26.87	27.40	
	M ₂ HL ₂ /M ₂ L ₂ .H	4.23		
Zn ²⁺	ML/M.L		5.18	
	MHL/M.HL		3.14	

Bibliography: H⁺ 73PA, 81LMP, 84TC; Cu²⁺ 73PA, 81LMP; Zn²⁺ 73PAC₇H₁₄O₄N₂S₂ 3,3'-(S,S'-Methylenedithio)bis(L-2-aminopropanoic acid) (dienkolic acid) H₂L
(Other reference in Vol.1, p.396)

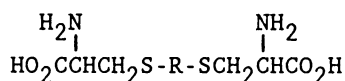
Metal ion	Equilibrium	Log K 25°, 0.1	Log K 20°, 0.1	ΔH 25°, 0.1	ΔS 25°, 0.1
H ⁺	HL/H.L	8.97 ±0.02	9.15	(-13) ^s	(2)
	H ₂ L/HL.H	8.16 ±0.00	8.30	(-11) ^s	(2)
	H ₃ L/H ₂ L.H	2.17 ±0.03	2.15	(-1) ^s	(6)
	H ₄ L/H ₃ L.H		(1.4)		
Co ²⁺	ML/M.L	6.27			
	ML ₂ /M.L ²	8.79			
	MHL/ML.H	6.55			

^s5-30°, 0.1

Dienkollic acid (continued)

Metal ion	Equilibrium	Log K 25°, 0.1	Log K 20°, 0.1	ΔH 25°, 0.1	ΔS 25°, 0.1
Ni ²⁺	ML/M.L	8.66			
	ML ₂ /M.L ²	12.94			
	MHL/ML.H	5.40			
Ag ⁺	ML/M.L		8.69		
	MHL/ML.H		6.40		
Zn ²⁺	ML/M.L	7.45			
	ML ₂ /M.L ²	11.46			
Hg ²⁺	ML/M.L		19.0		

Bibliography: H⁺, Ag⁺ 75SS; Co²⁺, Ni²⁺, Zn²⁺ 81BLb; Hg²⁺ 80NSD



C_xH_yO_zN₂S₂ 3,3'-(S,S'-Alkylenedithio)bis(L-2-aminopropanoic acid)

H₂L

<u>Ligand</u>	<u>Metal ion</u>	<u>Equilibrium</u>	<u>Log K</u> <u>25°, 0.5</u>
R= -CH ₂ CH ₂ - -Ethylene-	H ⁺	HL/H.L	9.13
		H ₂ L/HL.H	8.36
(C ₈ H ₁₆ O ₄ N ₂ S ₂)	Ag ⁺	ML/M.L	8.32
		MHL/ML.H	6.05
	Hg ²⁺	ML/M.L	19.8
R= -CH ₂ CH ₂ CH ₂ - -Trimethylene-	H ⁺	HL/H.L	9.15
		H ₂ L/HL.H	8.38
(C ₉ H ₁₈ O ₄ N ₂ S ₂)	Ag ⁺	ML/M.L	9.05
		MHL/ML.H	5.95
	Hg ²⁺	ML/M.L	20.1
R= -CH ₂ CH ₂ CH ₂ CH ₂ - -Tetramethylene-	H ⁺	HL/H.L	9.20
		H ₂ L/HL.H	8.46
(C ₁₀ H ₂₀ O ₄ N ₂ S ₂)	Ag ⁺	ML/M.L	9.21
		MHL/ML.H	6.05
	Hg ²⁺	ML/M.L	20.2
R= $\begin{array}{c} \text{OH} \\ \\ -\text{CH}_2\text{CHCH}_2- \end{array}$ -2-Hydroxy- trimethylene-	H ⁺	HL/H.L	9.20
		H ₂ L/HL.H	8.36
		H ₃ L/H ₂ L.H	2.19
		H ₄ L/H ₃ L.H	(1.5)
(C ₉ H ₁₈ O ₅ N ₂ S ₂)	Ag ⁺	ML/M.L	8.97
		MHL/ML.H	5.97

Bibliography: H⁺, Ag⁺ 75SS; Hg²⁺ 80NSD

		$\begin{array}{c} \text{NH}_2 \\ \\ \text{H}_2\text{NCH}_2\text{CHCO}_2\text{H} \end{array}$			
$\text{C}_3\text{H}_8\text{O}_2\text{N}_2$		<u>DL-2,3-Diaminopropanoic acid</u>		HL	
		(Other values in Vol.1, p.56 and Vol.5, p.27)			
Metal		Log K	Log K	ΔH	ΔS
<u>ion</u>	<u>Equilibrium</u>	<u>25°, 0.1</u>	<u>25°, 0.5</u>	<u>25°, 0.2</u>	<u>25°, 0.2</u>
H^+	HL/H.L	9.40 -0.01	9.35	-10.0	9
	$\text{H}_2\text{L}/\text{HL.H}$	6.68 ± 0.02	6.55	-9.5	-1
	$\text{H}_3\text{L}/\text{H}_2\text{L.H}$	(1.3) ± 0.0		-0.5	4
Ni^{2+}	ML/M.L	8.15 ± 0.02		-6.2	16
	$\text{ML}_2/\text{M.L}^2$	(15.21) ^x ± 0.06		(-13.0) ^x	(26)
	MHL/ML.H	5.29 ± 0.02		-6.9	1
	$\text{M(HL)}_2/\text{MHL}_2.\text{H}$	(5.28) ^x ± 0.04			
	$\text{MHL}_2/\text{ML}_2.\text{H}$	(5.90) ^x ± 0.02		(-7.7) ^x	(1)
Zn^{2+}	ML/M.L	6.31			
	$\text{ML}_2/\text{M.L}^2$	(11.66) ^x			
	MHL/ML.H	6.28			
	$\text{M(HL)}_2/\text{MHL}_2.\text{H}$	(6.19) ^x			
	$\text{MHL}_2/\text{ML}_2.\text{H}$	(6.77) ^x			
	$\text{ML}_2/\text{MOHL}_2.\text{H}$	(5.37) ^x			
^x DL-mixture					
Bibliography: 81FGK; Other references: 81JM,81NS					

		$\begin{array}{c} \text{NH}_2 \\ \\ \text{H}_2\text{NCH}_2\text{CH}_2\text{CHCO}_2\text{H} \end{array}$			
$\text{C}_4\text{H}_{10}\text{O}_2\text{N}_2$		<u>L-2,4-Diaminobutanoic acid</u>		HL	
		(Other values in Vol.5, p.27)			
Metal		Log K		ΔH	ΔS
<u>ion</u>	<u>Equilibrium</u>	<u>25°, 0.1</u>		<u>25°, 0.2</u>	<u>25°, 0.2</u>
H^+	HL/H.L	10.21 ± 0.02		-11.4	8
	$\text{H}_2\text{L}/\text{HL.H}$	8.19 ± 0.04		-10.2	3
	$\text{H}_3\text{L}/\text{H}_2\text{L.H}$	(1.7) ± 0.2		-1.3	3
Ni^{2+}	ML/M.L	8.94 ± 0.03			
	$\text{ML}_2/\text{M.L}^2$	15.97			
		(16.34) ^x			
	$\text{ML}_3/\text{M.L}^3$	(19.8) ^x			
	MHL/ML.H	5.88 ± 0.05			
	$\text{M(HL)}_2/\text{MHL}_2.\text{H}$	(6.03) ^x			
	$\text{MHL}_2/\text{ML}_2.\text{H}$	6.87			
		(6.78) ^x			
	$\text{M(HL)}_3/\text{MH}_2\text{L}_3.\text{H}$	(6.94) ^x			
Zn^{2+}	$\text{MH}_2\text{L}_3/\text{MHL}_3.\text{H}$	(7.12) ^x			
	$\text{MHL}_3/\text{ML}_3.\text{H}$	(9.69) ^x			
	ML/M.L	6.70			
	$\text{ML}_2/\text{M.L}^2$	(12.30) ^x			
	MHL/ML.H	7.27			
	$\text{M(HL)}_2/\text{MHL}_2.\text{H}$	(7.23) ^x			
	$\text{MHL}_2/\text{ML}_2.\text{H}$	(8.02) ^x			
^x DL-mixture					
Bibliography: 81FGK; Other reference: 81NS					

$$\begin{array}{c} \text{NH}_2 \\ | \\ \text{H}_2\text{NCH}_2\text{CH}_2\text{CH}_2\text{CHCO}_2\text{H} \end{array}$$

$\text{C}_5\text{H}_{12}\text{O}_2\text{N}_2$ L-2,5-Diaminopentanoic acid (ornithine) HL
 (Other values in Vol.1, p.57 and Vol.5, p.28)

Metal		Log K	Log K	Log K	ΔH	ΔS
<u>ion</u>	<u>Equilibrium</u>	<u>25°, 0.1</u>	<u>25°, 1.0</u>	<u>25°, 0</u>	<u>25°, 0.2</u>	<u>25°, 0.2</u>
H^+	HL/H.L	10.52 ±0.04	10.46	10.755	-12.4	7
			10.10 ⁿ			
	$\text{H}_2\text{L}/\text{HL.H}$	8.78 ±0.05	8.58	8.690	-11.3	2
			8.43 ⁿ			
	$\text{H}_3\text{L}/\text{H}_2\text{L.H}$	(1.9) ±0.2	(1.8) ⁿ	1.705	-0.9	6
Ni^{2+}	MHL/M.HL	4.6 ±0.1	4.40		-4.8	5
	$\text{M}(\text{HL})_2/\text{M.}(\text{HL})^2$	8.5 ±0.2	8.12		-8.7	10
	$\text{M}(\text{HL})_3/\text{M.}(\text{HL})^3$	11.4 ±0.3				
	MHL/ML.H	8.18 ±0.04				
	$\text{M}(\text{HL})_2/\text{MHL}_2.\text{H}$	8.36 ±0.04			-10.8	2
	$\text{MHL}_2/\text{ML}_2.\text{H}$	9.35 ±0.08			-9.2	12
Cu^{2+}	MHL/M.HL	7.36 ±0.07	7.17		-6.1	13
			7.20 ⁿ			
	$\text{M}(\text{HL})_2/\text{M.}(\text{HL})^2$	13.5 ±0.1	13.3		(-12.9) ^x	18
		(13.5) ^x	13.2 ⁿ			
	MHL/ML.H	7.2 ±0.1	(7.5) ⁿ			
	ML/MOHL.H		8.9 ⁿ			
	$\text{M}(\text{HL})_2/\text{MHL}_2.\text{H}$	9.0 ±0.1	8.8 ⁿ		(-11.2) ^x	4
		(9.2) ^x				
	$\text{MHL}_2/\text{ML}_2.\text{H}$	9.9 ±0.1	(9.8) ⁿ		(-11.6) ^x	6
		(10.1) ^x				
Zn^{2+}	MHL/M.HL	3.75 ±0.02	3.60			
			(3.86) ⁿ			
	$\text{M}(\text{HL})_2/\text{M.}(\text{HL})^2$	6.44	(7.18) ⁿ			
		(6.81) ^x				
	MHL/ML.H	8.08	8.00 ⁿ			
	ML/MOHL.H		8.55 ⁿ			
	$\text{M}(\text{HL})_2/\text{MHL}_2.\text{H}$	(8.54) ^x	8.19 ⁿ			

ⁿ35°, 0.15; ^xDL-mixture
 Bibliography: H^+ , Cu^{2+} 84DA; Ni^{2+} , Zn^{2+} 81FGK; Other reference: 81NS

$$\begin{array}{c} \text{NH}_2 \\ | \\ \text{H}_2\text{NCH}_2\text{CH}_2\text{CH}_2\text{CH}_2\text{CHCO}_2\text{H} \end{array}$$

$\text{C}_6\text{H}_{14}\text{O}_2\text{N}_2$ L-2,6-Diaminohexanoic acid (lysine) HL
 (Other references in Vol.1, p.58 and other values in Vol.5, p.29)

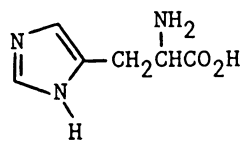
Metal		Log K	Log K	Log K	ΔH	ΔS
<u>ion</u>	<u>Equilibrium</u>	<u>25°, 0.1</u>	<u>37°, 0.15</u>	<u>25°, 1.0</u>	<u>25°, 0.2</u>	<u>25°, 0.1</u>
H^+	HL/H.L	10.68 ±0.02	10.27 ±0.04	10.56	-12.8 -0.1	6
	$\text{H}_2\text{L}/\text{HL.H}$	9.15 ±0.05	8.87 ±0.04	9.05	-10.9 ±0.4	5
	$\text{H}_3\text{L}/\text{H}_2\text{L.H}$	2.19 ±0.04	2.13 ±0.07	2.23	-0.5	8
Ni^{2+}	MHL/M.HL	4.88 ±0.05	4.81		-4.5	7
	$\text{M}(\text{HL})_2/\text{M.}(\text{HL})^2$	9.0 ±0.1	8.96	9.00 ^y	-10.4	6
	$\text{M}(\text{HL})_3/\text{M.}(\text{HL})^3$	11.9 ±0.2			-13.1	10

^yL- and DL-isomers have the same value.

Lysine (continued)

Metal ion	Equilibrium	Log K 25°, 0.1	Log K 37°, 0.15	Log K 25°, 1.0	ΔH 25°, 0.2	ΔS 25°, 0.1
(Ni ²⁺)	MHL/ML.H	9.9	9.5			
	M(HL) ₂ /MHL ₂ .H	10.0 ±0.1	9.38		(-10.1)	(12)
	MHL ₂ /ML ₂ .H	10.1	10.36			
	M(HL) ₃ /MH ₂ L ₃ .H	10.0 ±0.2				
	MH ₂ L ₃ /MHL ₃ .H	10.4				
	MHL ₃ /ML ₃ .H	10.9				
Cu ²⁺	MHL/M.HL	7.63 ±0.04	7.41		-6.2	14
	M(HL) ₂ /M.(HL) ₂	14.0 ±0.1	13.6		-12.3	23
	M(HL) ₂ /MHL ₂ .H	9.9 ±0.1	9.66		-12.7	3
	MHL ₂ /ML ₂ .H	10.47 ±0.06	(10.32)		-12.9	5
Zn ²⁺	MHL/M.HL	4.06	4.07 ±0.03			
	M(HL) ₂ /M.(HL) ₂	7.53	7.86 ±0.06			
	MHL/ML.H	8.40				
	M(HL) ₂ /MHL ₂ .H	9.18	8.67			

Bibliography: H⁺ 71MB, 81ABa, 84DA, 85CFH;
 Ni²⁺ 81FGK, 85CFH; Cu²⁺ 84DA, 85CFH; Zn²⁺ 81ABa, 81FGK, 85CFH;
 Other references: 73VB, 80SSG, 81BKB, 83Sa, 83SD, 83SDB, 84PBP, 84Sb, 84SD

C₆H₉O₂N₃

L-2-Amino-3-(4-imidazolyl)propanoic acid (histidine)
 (Other values in Vol.1, p.61 and Vol.5, p.31)

HL

Metal ion	Equilibrium	Log K 25°, 0.1	Log K 25°, 1.0	Log K 25°, 0	ΔH 25°, 0.1	ΔS 25°, 0.1
H ⁺	HL/H.L	9.09 ±0.03	9.08 ±0.03	9.28	-10.5 ±0.2	6
		9.03 ^b ±0.02	8.79 ⁿ ±0.03	9.63 ^e	-10.8 ^c ±0.1	
	H ₂ L/HL.H	6.02 ±0.04	6.1 ±0.1	5.97	-7.0 ±0.1	4
		6.03 ^b ±0.08	5.84 ⁿ ±0.03	6.97 ^e	-7.4 ^c ±0.1	
	H ₃ L/H ₂ L.H	(1.7) ±0.1	(1.8)	(1.6)	-0.9 ±0.1	5
		(1.7) ^b	(1.7) ⁿ ±0.1	2.28 ^e	-1.0 ^c ±0.1	
Ca ²⁺	ML/M.L	0.95	1.0 ⁿ		(+1) ^r	(8)
	MHL/M.HL	0.29	0.4 ⁿ		(+1) ^r	(5)
Nd ³⁺	ML/M.L	2.36				
	MHL/M.HL	0.26				
Mn ²⁺	ML/M.L	3.32 ±0.02	3.24 ⁿ	3.91 ^e	-2.7 ^e	9 ^e
	ML ₂ /M.L ²	6.29 ±0.04	6.16 ⁿ	6.61 ^e	-5.2 ^e	13 ^e
Co ²⁺	ML/M.L	6.87 ±0.06	6.71 ⁿ	7.44 ^e	-5.6 ^e	15 ^e
	ML ₂ /M.L ²	12.38 ±0.04	12.06 ⁿ	(13.48) ^e	-11.8 ±0.2	17
		(12.57) ^x ±0.07			-12.3 ^e	20 ^e
	MHL/ML.H	4.62				
	MHL ₂ /ML ₂ .H	5.99				
		(5.96) ^x				

^b25°,0.5; ^c25°,1.0; ^e25°,3.0; ⁿ37°,0.15; ^r10-37°,0; ^xDL-mixture

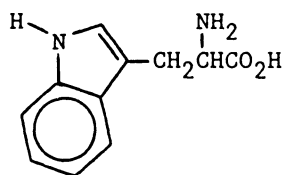
Histidine (continued)

Metal ion	Equilibrium	Log K 25°, 0.1	Log K 25°, 1.0	Log K 25°, 0	ΔH 25°, 0.1	ΔS 25°, 0.1
Ni ²⁺	ML/M.L	8.66 ±0.04	8.43 ⁿ -0.1	9.20 ^e	-8.1 ±0.1 -8.6 ^e	12
	ML ₂ /M.L ²	15.52 ±0.06 (15.77) ^x ±0.07	15.0 ⁿ ±0.1	(16.65) ^e	-16.5 ±0.3 (-18.9) ^e	16
	MHL/ML.H	3.62				
	MHL ₂ /ML ₂ .H	5.03 (5.00) ^x				
Cu ²⁺	ML/M.L	10.16 ±0.06	9.82 ⁿ ±0.07	(10.09) ^e	-11.0 ±0.6	10
	ML ₂ /M.L ²	18.07 ^y ±0.06	17.44 ⁿ ±0.06	19.03 ^e	-20.4 ±0.9	14
	MHL/ML.H	3.97 ±0.05	3.97 ⁿ ±0.03	(5.53) ^e	-3.3 -5.5 ^e	7
	ML/M(H ₁ L).H	8.0 ±0.2	7.5 ⁿ ±0.2	(6.6) ^e		
	M(HL) ₂ /MHL ₂ .H	3.4 ±0.2 (3.89) ^x	3.41 ⁿ ±0.03	(4.87) ^e	-2 (-5.3) ^e	9
	MHL ₂ /ML ₂ .H	5.74 ±0.07 (5.70) ^x	5.6 ⁿ ±0.1	(6.86) ^e	-5.8 -5.7 ^e	7
	ML ₂ /MOHL ₂ .H	11.0 ±0.3	11.1 ⁿ		-11	13
	M ₂ (OH) ₂ L ₂ .H ² /M ² .L ²	8.0 ±0.0	7.5 ⁿ -0.1		-3.6	25
	ML/M.L	6.51 ±0.06	6.34 ⁿ ±0.08	7.07 ^e	-4.8 -5.5 ^e	14
	ML ₂ /M.L ²	12.04 ±0.03 (12.18) ^x ±0.02 -11.89 ^b	11.67 ⁿ ±0.07	12.74 ^e	-11.2 ±0.3 (-11.8) ^x -11.8 ^e	18
Zn ²⁺	MHL/ML.H	4.87 ±0.06	4.61 ⁿ -0.2		-6.6	0
	M(HL) ₂ /MHL ₂ .H	5.67				
	MHL ₂ /ML ₂ .H	5.80 ±0.01 (5.54) ^x	5.5 ⁿ ±0.2			
Cd ²⁺	ML/M.L	5.74		6.48 ^e	-4.8	10
	ML ₂ /M.L ²	9.96		11.11 ^e	-9.9	12
	MHL/ML.H	5.43			-9	-5
Al ³⁺	MOH(HL).H/M.H.L	8.11 ^b				
	MOH(HL)/MHL.H	4.36 ^b				

^b25°, 0.5; ^e25°, 3.0; ⁿ37°, 0.15; ^xDL-mixture; ^yL- and DL-isomers have the same value.

Bibliography:

H⁺ 71MB, 80Dma, 81AB, 81CMW, 81JM, 85CFH, 85DD, 85DR, 85VK, 85VKb;
 Ca²⁺ 85DD; Cu²⁺ 79SH, 81CMW, 81JM, 82KB, 84AC, 85CFH;
 Nd³⁺ 73SY; Zn²⁺ 80DMY, 81AB, 81CMW, 81JM, 82HA, 82NV, 84AC,
 Mn²⁺ 80DMY; 85CFH, 85ISB;
 Co²⁺ 79VZ, 80Dma; Cd²⁺ 80DA, 81AAD;
 Ni²⁺ 80DMY, 81AAD, 81JM, 82GS, 85CFH; Al³⁺ 84CDD;
 Other references: 49HB, 61S, 64K, 65PP, 72GH, 73VB, 80DD, 80JM, 80NS, 81JJ, 81PBA, 81PU, 81VZT, 82EA,
 82TC, 83FA, 83JK, 83NR, 83TS, 84ABH, 84P, 84PBA, 85RRb, 85SGY, 85VP

 $C_{11}H_{12}O_2N_2$ L-2-Amino-3-(3-indolyl)propanoic acid (tryptophan)

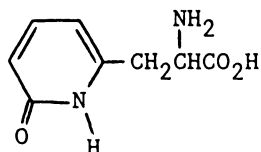
HL

(Other values in Vol.1, p.63 and Vol.5, p.33)

Metal	Equilibrium	Log K 25°, 0.1	Log K 25°, 1.0	Log K 25°, 3.0	ΔH 25°, 0.1	ΔS 25°, 0.1
H^+	HL/H.L	9.34 ± 0.03	9.30	9.92	-10.7 -0.1	7
		9.32 ^b	9.01 ⁿ ± 0.04			
	H ₂ L/HL.H	2.37 ± 0.04	2.39	2.75	-1.1	7
		2.23 ^b	2.36 ⁿ ± 0.04			
Cu^{2+}	ML/M.L	8.26 ± 0.03	8.01 ⁿ ± 0.05	8.71	-5.7 ± 0.2	19
	ML ₂ /M.L ²	15.4 ± 0.1	(15.3) ⁿ - 0.1	(16.66)	-13.0 ± 0.4	27
	MHL/ML.H		2.47 ⁿ			
Zn^{2+}	ML/M.L	4.70 -0.01	4.50 ⁿ	5.01	-2.9	12
	ML ₂ /M.L ²	8.94	8.76 ⁿ	(9.78)	-5.8	21
	ML ₃ /M.L ³			(13.5)		

^b25°, 0.5; ⁿ37°, 0.15

Bibliography: H^+ 71MB, 80JH, 83ACC, 84BPB, 85MK, 85VD; Cu^{2+} 78AM, 83ACC, 84BPB; Zn^{2+} 83ACC, 85MK;
 Other references: 73VB, 80OF, 80PB, 80RR, 80SSa, 81KV, 81SSa, 82BP, 82VD, 83TS

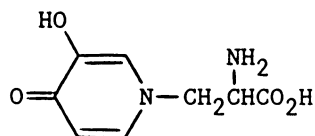
 $C_8H_{10}O_3N_2$ DL-2-Amino-3-(6-oxo-1,6-dihydro-2-pyridinyl)propanoic acid

HL

Metal	Equilibrium	Log K 37°, 0.15
H^+	L/(H ₋₁ L).H	11.7
	HL/H.L	7.80
	H ₂ L/HL.H	(1.8)
Cu^{2+}	ML/M.L	7.00
	ML ₂ /M.L ²	(12.82) ^x
	M(H ₋₁ L)/MOH(H ₋₁ L).H	8.9
	ML/M(H ₋₁ L).H	7.39
	M(H ₋₁ L)L/MOH(H ₋₁ L)L.H	(9.63) ^x
	ML ₂ /M(H ₋₁ L)L ₂ H	(8.42) ^x
	M ₂ H ₋₃ L ₂ .H ³ /M ² .L ²	(-6.2) ^x
Zn^{2+}	ML/M.L	3.85
	ML ₂ /M.L ²	(7.01) ^x
	ML ₃ /M.L ³	(9.4) ^x
	M(H ₋₁ L)/MOH(H ₋₁ L).H	8.5
	ML/M(H ₋₁ L).H	8.0
	M(H ₋₁ L)L/MOH(H ₋₁ L)L.H	(7.8) ^x
	ML ₂ /M(H ₋₁ L)L.H	(7.8) ^x

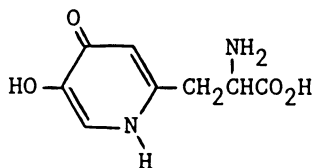
^xDL-mixture

Bibliography: 80SNP

 H_2L

Metal <u>ion</u>	<u>Equilibrium</u>	Log K <u>37°, 0.15</u>
H ⁺	HL/H.L	8.72
	H ₂ L/HL.H	6.87
	H ₃ L/H ₂ L.H	2.50
	H ₄ L/H ₃ L.H	(1.0)
Mg ²⁺	ML/M.L	4.38
	ML ₂ /M.L ²	7.31
	MHL/ML.H	6.96
	MHL ₂ /ML ₂ .H	7.57
	MH ₂ L ₂ /MHL ₂ .H	6.8
	M ₂ L/ML.M	1.2
Ca ²⁺	ML/M.L	3.24
	ML ₂ /M.L ²	5.09
	MHL/ML.H	7.13
	MHL ₂ /ML ₂ .H	7.9

Bibliography: 80SNP

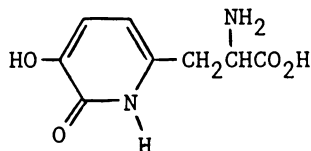
 H_2L

Metal		Log K
<u>ion</u>	<u>Equilibrium</u>	<u>37°, 0.15</u>
H ⁺	HL/H.L	9.17
	H ₂ L/HL.H	7.72
	H ₃ L/H ₂ L.H	3.01
	H ₄ L/H ₃ L.H	(1.3)
Mg ²⁺	ML/M.L	4.50
	ML ₂ /M.L ²	(7.56) ^x
	MHL/ML.H	7.85
	MHL ₂ /ML ₂ .H	(8.53) ^x
	MH ₂ L ₂ /MHL ₂ .H	(7.5) ^x
	M ₂ L/ML.M	(1.8) ^x
	M ₂ L ₂ /M ₂ L.L	(3.9) ^x
Ca ²⁺	ML/M.L	3.32
	ML ₂ /M.L ²	(5.0) ^x
	MHL/ML.H	7.95
	MHL ₂ /ML ₂ .H	(8.0) ^x

 $\overline{x_{DL-mixture}}$

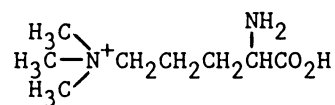
Isomimosine (continued)

Metal		Log K
<u>ion</u>	<u>Equilibrium</u>	<u>37° 0.15</u>
Zn ²⁺	MHL/M.HL	5.59
	M(HL) ₂ /M.(HL) ₂	(10.20) ^x
	ML ₃ /M.L ³	(14.9) ^x
	MHL/ML.H	7.8
	MHL ₂ /ML ₂ .H	(8.21) ^x
	MH ₂ L ₂ /MHL ₂ .H	(7.59) ^x
^x DL-mixture		
Bibliography: 80SNP		



C₈H₁₀O₄N₂ DL-2-Amino-3-(5-hydroxy-6-oxo-1,6-dihydro-2-pyridinyl)propanoic acid H₂L

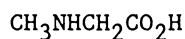
Metal		Log K
<u>ion</u>	<u>Equilibrium</u>	<u>37° 0.15</u>
H ⁺	HL/H.L	9.01
	H ₂ L/HL.H	7.85
	H ₃ L/H ₂ L.H	(1.9)
Mg ²⁺	ML/M.L	3.63
	ML ₂ /M.L ²	(6.24) ^x
	MHL/ML.H	8.21
	MHL ₂ /ML ₂ .H	(8.8) ^x
Ca ²⁺	ML/M.L	2.89
	ML ₂ /M.L ²	(4.6) ^x
	MHL/ML.H	8.26
Cu ²⁺	MHL/M.HL	7.22
	M(HL) ₂ /M.(HL) ₂	(13.4) ^x
	ML ₂ /M(H ₋₁ L)L.H	(9.3) ^x
	MHL ₂ /ML ₂ .H	(8.7) ^x
	M(HL) ₂ /MHL ₂ .H	(7.7) ^x
	M ₂ L/M ² .L	14.95
	M ₂ L ₂ /M ₂ L.L	(13.28) ^x
	M ₂ L ₂ /M ₂ (H ₋₁ L)L.H	(8.46) ^x
	M ₂ HL ₂ /M ₂ L ₂ .H	(3.0) ^x
	M ₃ (H ₋₁ L) ₃ .H ³ /M ³ .L ³	(17.28) ^x
	M ₃ (H ₋₁ L) ₂ L/M ₃ (H ₋₁ L) ₃ .H	(8.8) ^x
	M ₂ L ₂ /M ² .L	14.95
Zn ²⁺	MHL/M.HL	4.90
	M(HL) ₂ /M.(HL) ₂	(9.02) ^x
	ML ₃ /M.L ³	(13.0) ^x
	MHL/ML.H	7.9
	MHL ₂ /ML ₂ .H	(8.60) ^x
	M(HL) ₂ /MHL ₂ .H	(7.62) ^x
	MHL ₃ /ML ₃ .H	(8.9) ^x
	M ₂ L ₂ /M ² .L ²	(18.15) ^x
	M ₂ HL ₂ /M ₂ L ₂ .H	(5.56) ^x
	M ₃ (H ₋₁ L) ₂ L.H ² /M ³ .L ³	(11.3) ^x
	M ₂ L ₂ /M ² .L ²	14.95
	M ₂ L ₂ /M ₂ L.L	(13.28) ^x
^x DL-mixture		
Bibliography: 80SNP		

 $\text{C}_8\text{H}_{19}\text{O}_2\text{N}_2^+$ DL-(4-Amino-4-carboxybutyl)trimethylammonium ion
(N(5)-trimethylornithine) HL^+

Metal ion	Equilibrium	Log K 25°, 0.1
H^+	HL/H.L	8.70
	$\text{H}_2\text{L}/\text{HL.H}$	(1.8)
Cu^{2+}	ML/M.L	7.30
	$\text{ML}_2/\text{M.L}^2$	(13.59) ^x

^xDL-mixture

Bibliography: 83TST

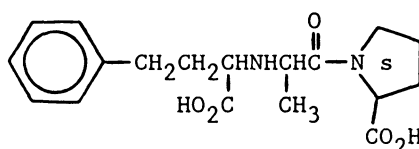
 $\text{C}_3\text{H}_7\text{O}_2\text{N}$ N-Methylglycine (sarcosine)
(Other values in Vol.1, p.66 and Vol.5, p.37)

HL

Metal ion	Equilibrium	Log K 25°, 0.1	Log K 25°, 1.0	Log K 25°, 0	ΔH 25°, 0	ΔS 25°, 0
H^+	HL/H.L	9.97 ± 0.04	10.0 ± 0.1	10.200	-9.8 ± 0.1	13.8
		10.00 ^b ± 0.01				
	$\text{H}_2\text{L}/\text{HL.H}$	2.18 ± 0.06 2.14 ^b ± 0.01	2.16 ± 0.1	2.11	(-1.7)	(4)
Cu^{2+}	ML/M.L	7.68	7.79 ± 0.01	8.14	-4.6	22
	$\text{ML}_2/\text{M.L}^2$	14.16	14.23 ± 0.01	14.97	-10.0	35
	$\text{ML}_3/\text{M.L}^3$		13.8			
	$\text{ML}_2/\text{MOHL}_2.\text{H}$		11.3			

^b25°, 0.5

Bibliography: 83DP; Other reference: 85LW

 $\text{C}_{18}\text{H}_{24}\text{O}_5\text{N}_2$

S-(1-Carboxy-3-phenylpropyl)-L-alanyl-L-proline (enalaprilat)

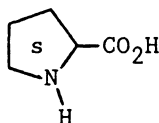
 H_2L

Metal ion	Equilibrium	Log K 37° 0.15
H^+	HL/H.L	7.54
	$\text{H}_2\text{L}/\text{HL.H}$	3.26
	$\text{H}_3\text{L}/\text{H}_2\text{L.H}$	(1.6)
Cu^{2+}	ML/M.L	7.66
	$\text{ML}_2/\text{M.L}^2$	11.36
	$\text{ML}_3/\text{M.L}^3$	14.75
	$\text{ML}_2/\text{MOHL}_2.\text{H}$	8.73
	$\text{M}_2\text{OHL}_2/\text{MOHL}_2.\text{M}$	8.53
	$\text{M}_2\text{L}_3/\text{ML}_3.\text{M}$	7.19

Enalaprilat (continued)

Metal ion	Equilibrium	Log K 37° , 0.15
Zn ²⁺	ML/M.L	4.51
	ML ₂ /M.L ²	7.70
	ML/MOHL.H	8.40
	MHL ₂ /ML ₂ .H	6.14
	MH ₂ L ₂ /MHL ₂ .H	5.01
	ML ₂ /MOHL ₂ .H	8.95

Bibliography: 85HS



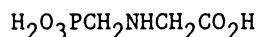
C₅H₉O₂N L-Pyrrolidine-2-carboxylic acid (proline) HL
(Other values in Vol.1, p.69 and Vol.5, p.37)

Metal ion	Equilibrium	Log K 25° , 0.1	Log K 25° , 1.0	Log K 25° , 0	ΔH 25° , 0	ΔS 25° , 0
H ⁺	HL/H.L	10.47 ±0.06	10.42 ±0.03	10.640	-10.35 ±0.04	14.0
		10.43 ^b ±0.08	10.20 ⁿ ±0.03	11.09 ^e	-10.5 ^b	
	H ₂ L/HL.H	(1.9) ±0.1	2.0 ±0.0	1.952	-0.31 ±0.03	7.9
		(1.9) ^b ±0.1	(1.9) ⁿ ±0.0	2.33 ^e	-0.3 ^b	
Ni ²⁺	ML/M.L	5.95 -0.01			-5.7 ^a	8 ^a
	ML ₂ /M.L ²	10.88 ±0.03			-11.8 ^a	10 ^a
	ML ₃ /M.L ³	13.9				

^a25°, 0.1; ^b25°, 0.5; ^e25°, 3.0; ⁿ37°, 0.15

Bibliography: H⁺ 81DA, 84AO, 84SGd, 85MK; Ni²⁺ 81DA; Cu²⁺ 84AO

Other references: 65K, 71MB, 73VB, 77GO, 80GL, 80JM, 80Sa, 81PU, 81ZLW, 82LB, 83HD, 83JK, 83RV, 84SGc



C₃H₈O₅NP N-(Phosphonomethyl)glycine (glyphosate) H₃L
(Other references in Vol.5, p.39)

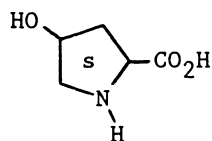
Metal ion	Equilibrium	Log K 25° , 0.1
H ⁺	HL/H.L	10.14 ±0.00
	H ₂ L/HL.H	5.46 ±0.00
	H ₃ L/H ₂ L.H	2.20 ±0.04
Mg ²⁺	ML/M.L	3.28 ±0.03
	ML ₂ /M.L ²	5.47
	MHL/ML.H	8.81
Ca ²⁺	ML/M.L	3.25 ±0.00
	ML ₂ /M.L ²	5.87
	MHL/ML.H	8.23

N-(Phosphonomethyl)glycine (continued)

Metal ion	Equilibrium	Log K 25°, 0.1
La ³⁺	ML/M.L	6.7
	ML ₂ /M.L ²	10.1
	MHL/ML.H	6.9
Mn ²⁺	ML/M.L	5.50 ±0.03
	ML ₂ /M.L ²	7.80
	MHL/ML.H	6.83
Fe ²⁺	ML/M.L	6.87
	ML ₂ /M.L ²	11.18
	MHL/ML.H	5.92
Co ²⁺	ML/M.L	7.23
	ML ₂ /M.L ²	11.12
	MHL/ML.H	5.36
Ni ²⁺	ML/M.L	8.10
	ML ₂ /M.L ²	12.25
	MHL/ML.H	5.26
Cu ²⁺	ML/M.L	11.93 -0.01
	ML ₂ /M.L ²	16.02
	MHL/ML.H	3.92
	ML/MOHL.H	9.87
Fe ³⁺	ML/M.L	16.09
	ML ₂ /M.L ²	23
	MHL/ML.H	1.54
	ML/MOHL.H	5.78
	MOHL/M(OH) ₂ L.H	8.91
Zn ²⁺	ML/M.L	8.74 -0.3
	ML ₂ /M.L ²	11.69
	ML/MOHL.H	9.73
Cd ²⁺	ML/M.L	7.29
	ML ₂ /M.L ²	10.91
	MHL/ML.H	5.35
	ML/MOHL.H	10.75
Al ³⁺	ML/M.L	13.70
	ML ₂ /M.L ²	22.05
	MHL/ML.H	2.48
	MHL ₂ /ML ₂ .H	5.71

Bibliography: 85MM;

Other references: 76W, 84BMY



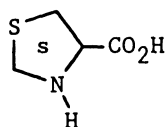
$C_5H_9O_3N$ L-4-Hydroxypyrrolidine-2-carboxylic acid (hydroxyproline) HL
(Other values in Vol.1, p.73 and other references in Vol.5, p.427)

Metal ion	Equilibrium	Log K 25°, 0.1	Log K 25°, 1.0	Log K 25°, 0	ΔH 25°, 0	ΔS 25°, 0
H^+	HL/H.L	9.47 $\pm$ 0.06	9.45	9.662	-9.4	12.7
		9.47 ^b	9.16 ⁿ	10.05 ^e		
	H ₂ L/HL.H	(1.8) $\pm$ 0.0	(1.9)	1.818	-0.9	5.3
Ni^{2+}		(1.9) ^b	(1.7) ⁿ	2.21 ^e		
	ML/M.L	5.94 $\pm$ 0.00			-5.0 ^a	10 ^a
	ML ₂ /M.L ²	10.95 $\pm$ 0.00			-10.5 ^a	15 ^a
	ML ₃ /M.L ³	14.0				

^a25°, 0.1; ^b25°, 0.5; ^e25°, 3.0; ⁿ37°, 0.15

Bibliography: 81DA;

Other references: 80Sa, 81ZLW, 83KV, 83RV



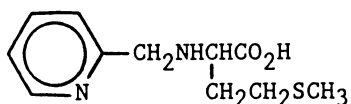
$C_4H_7O_2NS$ DL-1,3-Thiazolidene-4-carboxylic acid (thiaproline) HL
(Other values in Vol.5, p.40)

Metal ion	Equilibrium	Log K 25°, 0.15	Log K 37°, 0.15
H^+	HL/H.L	6.11	6.10
	H ₂ L/HL.H	(1.5)	(1.7)
Mg^{2+}	ML/M.L		1.68
Ca^{2+}	ML/M.L		1.66
Mn^{2+}	ML/M.L		1.90
Ni^{2+}	ML/M.L	(3.93)	(4.01)
	ML ₂ /M.L ²	(7.21) ^w	(7.26) ^w
	ML ₃ /M.L ³	(8.83) ^w	(9.24) ^w
Zn^{2+}	ML/M.L	(3.10)	(3.19)
	ML ₂ /M.L ²	(5.63) ^w	(5.75) ^w
	ML ₃ /M.L ³		(7.88) ^w

^woptical isomerism not stated

Bibliography: 81HM;

Other reference: 83RV

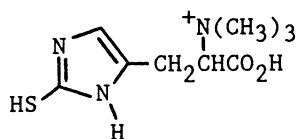
 $C_{11}H_{16}O_2N_2S$

L-2-(2-Pyridylmethylamino)-5-thiahexanoic acid
(N-(2-pyridylmethyl)-L-methionine)

HL

Metal ion	Equilibrium	Log K 25°, 0.1
H^+	HL/H.L	7.60
	H_2L /HL.H	2.10
Cu^{2+}	ML/M.L	9.3
	ML/M(H_1L).H	8.8

Bibliography: 83YS

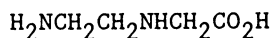


$C_9H_{16}O_2N_3S^+$ [DL-1-Carboxy-2-(2-mercapto-4-imidazolyl)ethyl](trimethyl)ammonium (chloride)
(ergothioneine) (Other references in Vol.5, p.428) H_2L^+

Metal ion	Equilibrium	Log K 25°, 0.1	ΔH 25°, 0.1 (-12) ^s	ΔS 25°, 0.1 (8)
H^+	HL/H.L	10.44		
CH_3Hg^+	ML/M.L	13.7 ^u		

^s5-35°, 0.1; ^u25°, 0.3

Bibliography: 82RR

 $C_4H_{10}O_2N_2$

N-2-Aminoethylglycine (EDMA)
(Other values in Vol.1, p.76 and Vol.5, p.42)

HL

Metal ion	Equilibrium	Log K 25°, 0.1	Log K 25°, 0.5	Log K 25°, 1.0
H^+	HL/H.L	9.84 ± 0.02	9.89	9.97
	H_2L /HL.H	6.67 ± 0.02	(6.97)	6.74
	H_3L / H_2L .H	(1.8) ± 0.3	(1.5)	2.05
Mn^{2+}	ML/M.L		3.63	
Co^{2+}	ML/M.L		8.12	7.51
	ML_2 /M.L ²		13.05	14.05
Ni^{2+}	ML/M.L	10.44	10.11	
	ML_2 /M.L ²	16.78	16.63	
Cu^{2+}	ML/M.L	13.35 ± 0.06	12.85	
	ML_2 /M.L ²	21.2 ± 0.2	20.37	
Zn^{2+}	ML/M.L	8.20	8.06	
	ML_2 /M.L ²		13.66	

Bibliography: H^+ , Cu^{2+} 69Pa, 85L; Mn^{2+} , Ni^{2+} , Zn^{2+} 85L; Co^{2+} 8000, 85L

	$\text{H}_2\text{NCH}_2\text{CH}_2\text{NHCH}_2\text{CH}_2\text{NHCH}_2\text{CO}_2\text{H}$	
$\text{C}_6\text{H}_{15}\text{O}_2\text{N}_3$	<u>Diethylenetriamine-N-acetic acid</u>	HL
	(Other values in Vol.5, p.42)	

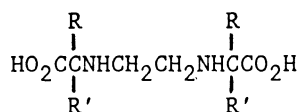
Metal		Log K
<u>ion</u>	<u>Equilibrium</u>	<u>25°, 0.1</u>
H^+	HL/H.L	9.92
	$\text{H}_2\text{L}/\text{HL.H}$	8.70
	$\text{H}_3\text{L}/\text{H}_2\text{L.H}$	4.32
	$\text{H}_4\text{L}/\text{H}_3\text{L.H}$	(1.3)
Zn^{2+}	ML/M.L	12.94
	MHL/ML.H	4.40
	ML/MOHL.H	9.70

Bibliography: 75MMH

		HO ₂ CCH ₂ NHCH ₂ CH ₂ NHCH ₂ CO ₂ H				
C ₆ H ₁₂ O ₄ N ₂		Ethylenediiminodiacetic acid (EDDA)				H ₂ L
		(Other values in Vol.1, p.86 and Vol.5, p.45)				
Metal		Log K	Log K	Log K	ΔH	ΔS
<u>ion</u>	<u>Equilibrium</u>	<u>25°, 0.1</u>	<u>25°, 1.0</u>	<u>25°, 3.0</u>	<u>25°, 0.1</u>	<u>25°, 0.1</u>
H ⁺	HL/H.L	9.60 ±0.03	9.64 ±0.05 (9.54) ⁿ	10.06	-7.7 ±0.2 -8.9 ^c	18 14 ^c
	H ₂ L/HL.H	6.55 ±0.04	6.71 ±0.02 (6.48) ⁿ	7.18	-7.5 ±0.2 -8.9 ^c	5 8 ^c
	H ₃ L/H ₂ L.H	2.36 -0.2	2.37 ±0.00 2.30 ⁿ	2.98	(0) ^s	(11) ^c
	H ₄ L/H ₃ L.H	(1.3)	(1.7) ±0.1 (1.3) ⁿ	(1.5)	(0) ^s	(8) ^c
Zn ²⁺	ML/M.L	11.1 ±0.1			-6.0 ±0.2	31
	ML/MOHL.H	10.56			-14.5	0
VO ²⁺	ML/M.L	13.40				
	ML/MOHL.H	7.29				

^c25°, 1.0; ⁿ37°, 0.15; ^s15-35°, 1.0Bibliography: H^+ 82HA; VO^{2+} 83FF; Cd^{2+} 82HA, 83YW;

Other references: 82CG, 83EH, 84BL



$\text{C}_x\text{H}_y\text{O}_4\text{N}_2$	<u>Ethylenediiminodialkanoic acid</u>				H_2L
	Metal		Log K	Log K	
<u>Ligand</u>	<u>ion</u>	<u>Equilibrium</u>	<u>25°, 0.1</u>	<u>20°, 0.1</u>	
R= CH ₃ , R'= H	H ⁺	HL/H.L	(9.58)	9.58 -0.1	
-di-2-propanoic acid		H ₂ L/HL.H	(6.74)	6.69 -0.1	
	VO ²⁺	ML/M.L	13.34		
(C ₈ H ₁₆ O ₄ N ₂)		ML/MOHL.H	7.50		
(Other values in Vol.1, p.89)					

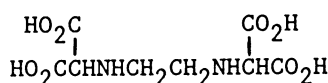
Ethylenediiminodialkanoic (continued)

<u>Ligand</u>	<u>Metal ion</u>	<u>Equilibrium</u>	<u>Log K</u> <u>25°, 0.1</u>	<u>Log K</u> <u>25°, 0.5</u>
R= CH ₂ CH ₃ , R'= H	H ⁺	HL/H.L		9.15 ⁿ
-di-2-butanoic		H ₂ L/HL.H		6.29 ⁿ
acid	Cu ²⁺	ML/M.L		13.81 ⁿ
(C ₁₀ H ₂₀ O ₄ N ₂)	Zn ²⁺	ML/M.L		9.63 ⁿ
		ML/MOHL.H		9.33 ⁿ
		MOHL/M(OH) ₂ L.H		10.9 ⁿ
R= R'= CH ₃	H ⁺	HL/H.L	9.85	
-bis(dimethyl-		H ₂ L/HL.H	7.00	
acetic acid)	VO ²⁺	ML/M.L	12.23	
(C ₁₀ H ₂₀ O ₄ N ₂)		ML/MOHL.H	7.88	

ⁿ37°, 0.15

Bibliography: 81CMW, 83FF;

Other reference: 83EH

C₈H₁₂O₈N₂

Ethylenediiminodipropanedioic acid
(ethylenediamine-N,N'-dimalonic acid, EDDM)
(other references in Vol.2, p.90 and Vol.5, p.456)

H₄L

<u>Metal ion</u>	<u>Equilibrium</u>	<u>Log K</u> <u>25°, 0.1</u>	<u>Log K</u> <u>20°, 0.1</u>
H ⁺	HL/H.L	9.5 ±0.2	9.62
	H ₂ L/HL.H	6.60 ±0.04	6.68
	H ₃ L/H ₂ L.H	2.75 ±0.04	2.75
	H ₄ L/H ₃ L.H	2.1 ±0.1	2.1
Mg ²⁺	ML/M.L	4.93 -0.4	4.86
	MHL/ML.H	6.9 ±0.3	6.8
	M ₂ L/ML.M	2.0 ±0.3	
Ca ²⁺	ML/M.L	5.1 ±0.3	5.18
	MHL/ML.H	6.26 +1	6.3
	M ₂ L/ML.M	2.3	
Sr ²⁺	ML/M.L	(3.8)	4.19
	MHL/ML.H	(7.7)	7.3
	M ₂ L/ML.M	(2.1)	
Ba ²⁺	ML/M.L	(3.5)	3.92
	MHL/ML.H	(7.9)	7.5
	M ₂ L/ML.M	(1.9)	
Y ³⁺	ML/M.L	11.6	
La ³⁺	ML/M.L		10.98
	ML ₂ /M.L ²		15.63
Ce ³⁺	ML/M.L		11.58
	ML ₂ /M.L ²		16.08

EDDM (continued)

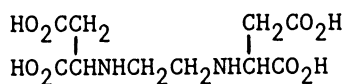
Metal ion	Equilibrium	Log K <u>25°, 0.1</u>	Log K <u>20°, 0.1</u>
Pr ³⁺	ML/M.L		12.00
	ML ₂ /M.L ²		16.23
Nd ³⁺	ML/M.L		12.27
	ML ₂ /M.L ²		16.42
Sm ³⁺	ML/M.L		12.58
	ML ₂ /M.L ²		16.79
Eu ³⁺	ML/M.L		12.69
	ML ₂ /M.L ²		17.07
Gd ³⁺	ML/M.L		12.58
	ML ₂ /M.L ²		17.16
Tb ³⁺	ML/M.L		12.53
	ML ₂ /M.L ²		17.37
Dy ³⁺	ML/M.L		12.54
	ML ₂ /M.L ²		17.66
Ho ³⁺	ML/M.L		12.53
	ML ₂ /M.L ²		17.85
Er ³⁺	ML/M.L		12.45
	ML ₂ /M.L ²		18.09
Tm ³⁺	ML/M.L		12.40
	ML ₂ /M.L ²		18.28
Yb ³⁺	ML/M.L		12.46
	ML ₂ /M.L ²		18.68
Lu ³⁺	ML/M.L		12.45
	ML ₂ /M.L ²		18.91
Mn ²⁺	ML/M.L	8.45	
Co ²⁺	ML/M.L	12.2 ±0.3	
Ni ²⁺	ML/M.L	14.5	
Cu ²⁺	ML/M.L	15.9	16.05
Zn ²⁺	ML/M.L	11.1	
Hg ²⁺	ML/M.L	18.6	
Pb ²⁺	ML/M.L	11.4	

Bibliography:

H⁺-Ba²⁺ 72BG, 73DS;
Y³⁺ 72GB;
La³⁺-Lu³⁺ 75DPM;
Mn²⁺ 74SG;
Co²⁺ 73SG;

Ni²⁺ 72SG;
Cu²⁺ 72BG, 75DPM;
Zn²⁺ 72BG;
Hg²⁺ 72GSB;
Pb²⁺ 73GSK;

Other reference: 82PT

C₁₀H₁₆O₈N₂Ethylenediiminodibutanedioic acidH₄L

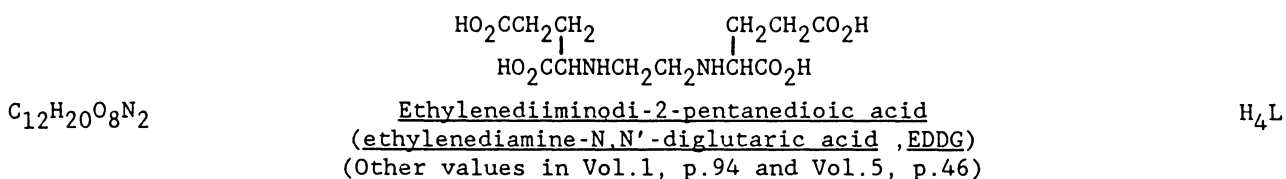
(ethylenediamine-N,N'-disuccinic acid, EDDS)

(Other values in Vol.1, p.91 and other references in Vol.5, p.427)

Metal ion	Equilibrium	Log K 25°, 0.1	Log K 20°, 0.1
H ⁺	HL/H.L	10.01 ±0.05	10.13
	H ₂ L/HL.H	6.83 ±0.2	6.93
	H ₃ L/H ₂ L.H	3.86 ±0.02	3.85
	H ₄ L/H ₃ L.H	3.0 ±0.2	3.00
Mg ²⁺	ML/M.L	5.82	6.09
	MHL/ML.H	6.55	5.82
	M ₂ L/ML.M	2.06	
Ca ²⁺	ML/M.L	4.23	4.72
	MHL/ML.H	8.44	7.06
	M ₂ L/ML.M	1.95	
Sr ²⁺	ML/M.L	2.82	3.37
	MHL/ML.H	8.84	8.18
	M ₂ L/ML.M	1.08	
Ba ²⁺	ML/M.L	2.12	3.10
	MHL/ML.H	9.15	8.06
	M ₂ L/ML.M	0.90	
La ³⁺	ML/M.L	11.98	12.07
Ce ³⁺	ML/M.L	12.67	12.81
Pr ³⁺	ML/M.L	12.96	13.23
Nd ³⁺	ML/M.L	13.03	13.41
Sm ³⁺	ML/M.L	13.46	13.77
Eu ³⁺	ML/M.L	13.54	13.83
Gd ³⁺	ML/M.L	13.45	13.67
Tb ³⁺	ML/M.L	13.51	13.72
Dy ³⁺	ML/M.L	13.59	13.75
Ho ³⁺	ML/M.L	13.60	13.75
	ML ₂ /M.L ²		18.28
Er ³⁺	ML/M.L	13.63	13.76
	ML ₂ /M.L ²		18.82
Tm ³⁺	ML/M.L	14.00	14.00
	ML ₂ /M.L ²		19.35
Yb ³⁺	ML/M.L	14.13	14.11
	ML ₂ /M.L ²		19.89
Lu ³⁺	ML/M.L	(14.32)	14.15
	ML ₂ /M.L ²		20.12
Ni ²⁺	ML/M.L	17.05	(18.02)
Hg ²⁺	ML/M.L	17.50	
	MHL/M.HL	12.49	
	MOHL/ML.OH	7.2*	

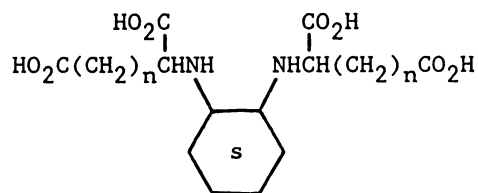
*Value used for K_w not given.Bibliography: H⁺ 83KM; La³⁺-Lu³⁺ 75DPM;

Other references: 74SG, 80MMB

H₄L

Metal ion	Equilibrium	Log K 25°, 0.1	Log K 20°, 0.1
H ⁺	HL/H.L	9.46	9.60
	H ₂ L/HL.H	6.81	6.88
	H ₃ L/H ₂ L.H	4.25	4.25
	H ₄ L/H ₃ L.H	(3.28)	3.56
Mg ²⁺	ML/M.L	3.00	3.90
	MHL/ML.H	7.71	7.1
	M ₂ L/ML.M	2.74	
Ca ²⁺	ML/M.L	2.59	2.70
	MHL/ML.H	8.44	7.9
	M ₂ L/ML.M	2.86	
Sr ²⁺	ML/M.L	(2.25)	2.00
	MHL/ML.H	8.55	
	M ₂ L/ML.M	2.72	
Ba ²⁺	ML/M.L	(2.47)	1.80
	MHL/ML.H	8.66	
	M ₂ L/ML.M	2.66	
Y ³⁺	ML/M.L	8.70	
La ³⁺	ML/M.L	6.76	6.81
Ce ³⁺	ML/M.L	7.43	7.49
Pr ³⁺	ML/M.L	(7.41)	7.71
Nd ³⁺	ML/M.L	7.90	7.94
Sm ³⁺	ML/M.L	(8.02)	8.30
Eu ³⁺	ML/M.L	(8.12)	8.48
Gd ³⁺	ML/M.L	(8.22)	8.61
Tb ³⁺	ML/M.L	8.82	8.88
Dy ³⁺	ML/M.L	9.00	9.06
Ho ³⁺	ML/M.L	(9.10)	9.24
Er ³⁺	ML/M.L	(9.19)	9.37
Tm ³⁺	ML/M.L	(9.46)	9.59
Yb ³⁺	ML/M.L	(9.60)	9.82
Lu ³⁺	ML/M.L	(9.70)	10.00
Co ²⁺	ML/M.L	10.62 ±0.03	
Ni ²⁺	ML/M.L	13.04	
Cu ²⁺	ML/M.L	15.00	15.15
Hg ²⁺	ML/M.L	16.64	
	MHL/M.HL	12.00	
	MH ₂ L/M.H ₂ L	8.2	
	MOHL/ML.OH	6.56*	

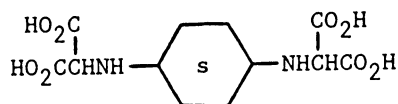
*Value used for K_w not given.Bibliography: H⁺-Ba²⁺ 73DS; La³⁺-Lu³⁺, Cu²⁺ 75DPM

 $C_xH_yO_8N_2$ trans-1,2-Cyclohexylenediiminodialkanedioic acid H_4L

Ligand	Metal ion	Equilibrium	Log K 25°, 0.1
n= 0	H^+	HL/H.L	10.49
-dipropanedioic acid		$H_2L/HL.H$	6.27
		$H_3L/H_2L.H$	2.83
		$H_4L/H_3L.H$	(1.7)
(trans-1,2-diaminocyclohexane-N,N'-dimalonic acid	Y^{3+}	ML/M.L	15.02
		$ML_2/M.L^2$	19.2
	La^{3+}	ML/M.L	13.93
		$ML_2/M.L^2$	17.9
($C_{12}H_{18}O_8N_2$)	Ce^{3+}	ML/M.L	14.16
(Other values in Vol.5, p.48)	Pr^{3+}	ML/M.L	14.59
		$ML_2/M.L^2$	18.7
	Nd^{3+}	ML/M.L	15.04
		$ML_2/M.L^2$	19.1
	Sm^{3+}	ML/M.L	15.63
		$ML_2/M.L^2$	20.2
	Eu^{3+}	ML/M.L	15.67
		$ML_2/M.L^2$	21.0
	Gd^{3+}	ML/M.L	15.65
		$ML_2/M.L^2$	21.0
	Tb^{3+}	ML/M.L	15.38
		$ML_2/M.L^2$	20.8
	Dy^{3+}	ML/M.L	15.59
	Ho^{3+}	ML/M.L	15.62
	Er^{3+}	ML/M.L	15.55
		$ML_2/M.L^2$	21.6
	Tm^{3+}	ML/M.L	15.63
	Yb^{3+}	ML/M.L	15.84
		$ML_2/M.L^2$	22.3
	Lu^{3+}	ML/M.L	15.71

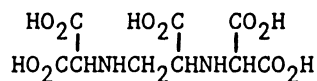
trans-1,2-Cyclohexylenediiminodialkanedioic acid (continued)

<u>Ligand</u>	<u>Metal ion</u>	<u>Equilibrium</u>	<u>Log K</u> <u>25°, 0.1</u>
n= 1	H ⁺	HL/H.L	10.67
-dibutanedioic acid		H ₂ L/HL.H	6.71
		H ₃ L/H ₂ L.H	3.81
		H ₄ L/H ₃ L.H	2.95
(trans-1,2-	Y ³⁺	ML/M.L	13.85
diaminocyclo-	La ³⁺	ML/M.L	12.10
hexane-N,N' -	Ce ³⁺	ML/M.L	12.87
disuccinic acid)	Pr ³⁺	ML/M.L	13.29
	Nd ³⁺	ML/M.L	13.33
(C ₁₄ H ₂₂ O ₈ N ₂)	Sm ³⁺	ML/M.L	13.83
	Eu ³⁺	ML/M.L	13.83
	Gd ³⁺	ML/M.L	13.34
	Tb ³⁺	ML/M.L	14.09
	Dy ³⁺	ML/M.L	14.04
	Ho ³⁺	ML/M.L	14.09
	Er ³⁺	ML/M.L	14.10
	Tm ³⁺	ML/M.L	14.22
	Yb ³⁺	ML/M.L	14.26
	Lu ³⁺	ML/M.L	14.25
	Hg ²⁺	ML/M.L	18.37

Bibliography: H⁺-Lu³⁺ 80SG,85SGP; Hg²⁺ 85SGPC₁₂H₁₈O₈N₂cis-1,4-Diaminocyclohexane-N,N'-dimalonic acidH₄L

<u>Metal ion</u>	<u>Equilibrium</u>	<u>Log K</u> <u>25°, 0.1</u>
H ⁺	HL/H.L	9.72
	H ₂ L/HL.H	8.14
	H ₃ L/H ₂ L.H	3.11
	H ₄ L/H ₃ L.H	2.36
Mg ²⁺	ML/M.L	3.82
Ca ²⁺	ML/M.L	2.69
Sr ²⁺	ML/M.L	2.62
Ba ²⁺	ML/M.L	2.54

Bibliography: 82SGY

 $\text{C}_9\text{H}_{12}\text{O}_{10}\text{N}_2$ DL-2,3-Diaminopropanoic-N,N'-dimalononic acid H_5L

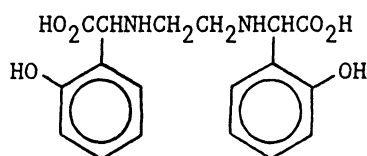
Metal ion	Equilibrium	Log K 25°, 0.1
H^+	HL/H.L	9.71
	$\text{H}_2\text{L}/\text{HL.H}$	6.55
	$\text{H}_3\text{L}/\text{H}_2\text{L.H}$	2.98
	$\text{H}_4\text{L}/\text{H}_3\text{L.H}$	2.45
	$\text{H}_5\text{L.H}_4\text{L.H}$	(1.6)
Mg^{2+}	ML/M.L	7.15
	$\text{ML}_2/\text{M.L}^2$	12.30
Ca^{2+}	ML/M.L	7.60
	$\text{ML}_2/\text{M.L}^2$	13.60
Sr^{2+}	ML/M.L	7.05
	$\text{ML}_2/\text{M.L}^2$	12.15
Ba^{2+}	ML/M.L	6.90
	$\text{ML}_2/\text{M.L}^2$	11.75
Y^{3+}	ML/M.L	11.34
La^{3+}	ML/M.L	12.05
Ce^{3+}	ML/M.L	11.74
Pr^{3+}	ML/M.L	11.95
Nd^{3+}	ML/M.L	11.85
Sm^{3+}	ML/M.L	11.79
Eu^{3+}	ML/M.L	12.15
Gd^{3+}	ML/M.L	12.22
Tb^{3+}	ML/M.L	12.52
Dy^{3+}	ML/M.L	12.25
Ho^{3+}	ML/M.L	12.08
Er^{3+}	ML/M.L	12.25
Tm^{3+}	ML/M.L	12.46
Yb^{3+}	ML/M.L	12.29
Lu^{3+}	ML/M.L	12.76
Ni^{2+}	ML/M.L	12.36
Cu^{2+}	ML/M.L	15.51
	MHL/ML.H	4.57
	$\text{MH}_2\text{L}/\text{MHL.H}$	2.80
	ML/MOHL.H	10.48
Zn^{2+}	ML/M.L	11.78
Cd^{2+}	ML/M.L	11.61
Hg^{2+}	ML/M.L	17.64
	ML/MOHL.H	7.15
Pb^{2+}	ML/M.L	12.02

Bibliography:

 H^+ , Ni^{2+} , Zn^{2+} , Cd^{2+} , Pb^{2+} 82KBa; Mg^{2+} - Ba^{2+} 82KBG; Y^{3+} - Lu^{3+} 83LBG;

Other reference: 85KTK

 Cu^{2+} 82KBb; Hg^{2+} 82KBa, 83KBG;

 $C_{18}H_{20}O_6N_2$

Ethylenediiminobis[(2-hydroxyphenyl)acetic acid] (EHPG)
 (Other references in Vol.1, p.96 and Vol.5, p.49)

 H_4L

<u>Isomer</u>	<u>Metal ion</u>	<u>Equilibrium</u>	<u>Log K</u> <u>25°, 0.1</u> <u>(12.05)^v</u>
rac-	H^+	HL/H.L	(12.05) ^v
		$H_2L/HL.H$	10.87
		$H_3L/H_2L.H$	8.79
		$H_4L/H_3L.H$	6.33
	Ni^{2+}	ML/M.L	21.33
		ML/MOHL.H	(12.4)
		MHL/ML.H	7.42
		$MH_2L/MHL.H$	5.50
	Cu^{2+}	ML/M.L	25.27
		MHL/ML.H	7.82
		$MH_2L/MHL.H$	4.44
	Fe^{3+}	ML/M.L	35.54
		ML/MOHL.H	11.78
	Zn^{2+}	ML/M.L	18.66
		ML/MOHL.H	(12.5)
		MHL/ML.H	7.14
		$MH_2L/MHL.H$	6.18
	Ga^{3+}	ML/M.L	33.89
		MHL/ML.H	2.22
	In^{3+}	ML/M.L	26.68
		ML/MOHL.H	10.57
		MHL/ML.H	4.75
		$MH_2L/MHL.H$	4.78
meso-	H^+	HL/H.L	11.90 ^v
		$H_2L/HL.H$	10.85
		$H_3L/H_2L.H$	8.76
		$H_4L/H_3L.H$	6.36
	Ni^{2+}	ML/M.L	19.42
		ML/MOHL.H	11.68
		MHL/ML.H	8.11
		$MH_2L/MHL.H$	6.41
	Cu^{2+}	ML/M.L	23.68
		MHL/ML.H	8.37
		$MH_2L/MHL.H$	5.14
	Fe^{3+}	ML/M.L	33.28
		MHL/ML.H	2.72
	Zn^{2+}	ML/M.L	16.88
		MHL/HL.H	8.28
		$MH_2L/MHL.H$	6.83

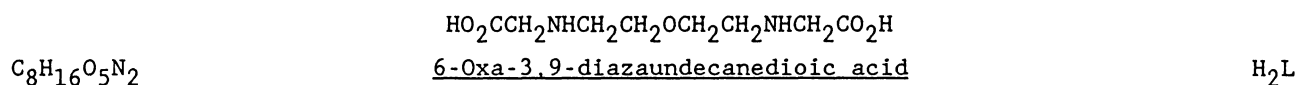
^v K^+ salt used as background electrolyte.

EHPG (continued)

<u>Isomer</u>	<u>Metal ion</u>	<u>Equilibrium</u>	<u>Log K</u> <u>25°, 0.1</u>
(meso-)	Ga ³⁺	ML/M.L	32.40
		MHL/ML.H	3.44
	In ³⁺	ML/M.L	25.26
		ML/MOHL.H	8.83
		MHL/ML.H	6.14
		MH ₂ L/MHL.H	3.42

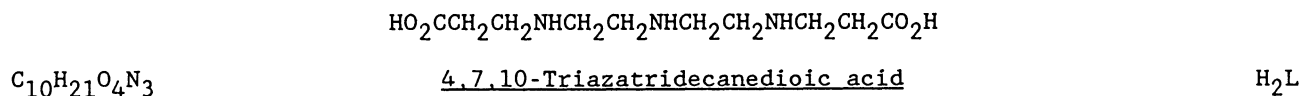
Bibliography: 88BM;

Other references: 81RMD, 84TMM

6-Oxa-3,9-diazaundecanedioic acid

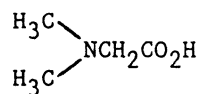
<u>Metal ion</u>	<u>Equilibrium</u>	<u>Log K</u> <u>25°, 0.1</u>
H ⁺	HL/H.L	9.61
	H ₂ L/HL.H	8.65
	H ₃ L/H ₂ L.H	2.60
	H ₄ L/H ₃ L.H	(1.9)
Co ²⁺	ML/M.L	9.46
Ni ²⁺	ML/M.L	11.83
Cu ²⁺	ML/M.L	14.54
Zn ²⁺	ML/M.L	10.15

Bibliography: 82BT

4,7,10-Triazatridecanedioic acid

<u>Metal ion</u>	<u>Equilibrium</u>	<u>Log K</u> <u>25°, 0.5</u>
H ⁺	HL/H.L	9.99
	H ₂ L/HL.H	9.31
	H ₃ L/H ₂ L.H	4.40
	H ₄ L/H ₃ L.H	3.55
	H ₅ L/H ₄ L.H	2.97
Cu ²⁺	ML/M.L	18.47
	MHL/ML.H	3.73
	MH ₂ L/MHL.H	2.37

Bibliography: 84GH

 $\text{C}_4\text{H}_9\text{O}_2\text{N}$ N,N-Dimethylglycine

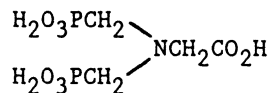
HL

(Other values in Vol.1, p.100 and Vol.5, p.54)

Metal ion	Equilibrium	Log K <u>25°, 0.1</u>	Log K <u>25°, 0.5</u>	Log K <u>25°, 0</u>	ΔH <u>25°, 0</u>	ΔS <u>25°, 0</u>
H^+	HL/H.L	9.80 ± 0.01	9.73	9.940	-7.7	19.7
	$\text{H}_2\text{L}/\text{HL.H}$	2.0 ± 0.1	2.0			
	$\text{H}_3\text{L}/\text{H}_2\text{L.H}$	(0.7)				
Ni^{2+}	ML/M.L	4.76 ± 0.06				
	$\text{ML}_2/\text{M.L}^2$	8.6 ± 0.1				
	$\text{ML}_3/\text{M.L}^3$	10.8				
Zn^{2+}	ML/M.L	3.97				
	$\text{ML}_2/\text{M.L}^2$	7.65				
	$\text{ML}_3/\text{M.L}^3$	10.35				

Bibliography: 78DA;

Other references: 84L,84La

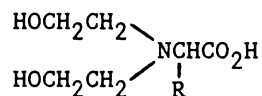
 $\text{C}_4\text{H}_{11}\text{O}_8\text{NP}_2$ N,N-Bis(phosphonomethyl)glycine H_5L

(Other values in Vol.1, p.103 and Vol.5, p.56)

Metal ion	Equilibrium	Log K <u>25°, 0.1</u>	Log K <u>25°, 0</u>	ΔH <u>25°, 0</u>	ΔS <u>25°, 0</u>
H^+	HL/H.L	10.81 ^v ± 0.01	11.9	-6.6	32
	$\text{H}_2\text{L}/\text{HL.H}$	6.39 ± 0.02	7.26	+2.3	41
	$\text{H}_3\text{L}/\text{H}_2\text{L.H}$	5.03 ± 0.03	5.68	+2.0	33
	$\text{H}_4\text{L}/\text{H}_3\text{L.H}$	2.0 ± 0.0			
	$\text{H}_5\text{L}/\text{H}_4\text{L.H}$	(1.7) ± 0.1			
	$\text{H}_5\text{L}/\text{H}_3\text{L.H}^2$	3.66 ± 0.08	4.39	+1.3	25
	ML/M.L	21.93 ^v			
Ga^{3+}	MHL/ML.H	4.09			
	$\text{MH}_2\text{L}/\text{MHL.H}$	2.51			
	ML/MOHL.H	6.6			

^v K^+ salt used as background electrolyte.Bibliography: H^+ 81VKa; Ga^{3+} 80MM;

Other references: 80MRR,80MTV,82SPS,85PM



$\text{C}_x\text{H}_y\text{O}_4\text{N}$	<u>N,N-Bis(2-hydroxyethyl)-2-aminoalkanoic acid</u>					HL
<u>Ligand</u>	<u>Metal ion</u>	<u>Equilibrium</u>	<u>Log K</u> <u>20°, 0.1</u>	<u>Log K</u> <u>25°, 0</u>	<u>ΔH</u> <u>25°, 0</u>	<u>ΔS</u> <u>25°, 0</u>
R= H	H^+	HL/H.L	8.14	8.334	-6.3	17.0
N,N-Bis-(2-hydroxyethyl)-glycine		$\text{H}_2\text{L}/\text{HL.H}$	$8.11^{\text{a}} \pm 0.05$ (1.7) (1.7) ^a	8.11^{b}		
$(\text{C}_6\text{H}_{13}\text{O}_4\text{N})$	La^{3+}	ML/M.L $\text{ML}_2/\text{M.L}^2$	4.99 8.40			
(Other values in Vol.1, p.105 and other references in Vol.5, p.456)	Ce^{3+}	ML/M.L $\text{ML}_2/\text{M.L}^2$	5.32 9.03			
	Pr^{3+}	ML/M.L $\text{ML}_2/\text{M.L}^2$	5.46 9.41			
	Nd^{3+}	ML/M.L $\text{ML}_2/\text{M.L}^2$	5.66 9.75			
	Sm^{3+}	ML/M.L $\text{ML}_2/\text{M.L}^2$	5.72 10.30			
	Eu^{3+}	ML/M.L $\text{ML}_2/\text{M.L}^2$	5.73 10.47			
	Gd^{3+}	ML/M.L $\text{ML}_2/\text{M.L}^2$	5.58 10.43			
	Tb^{3+}	ML/M.L $\text{ML}_2/\text{M.L}^2$	5.43 10.49			
	Dy^{3+}	ML/M.L $\text{ML}_2/\text{M.L}^2$	5.41 10.45			
	Ho^{3+}	ML/M.L $\text{ML}_2/\text{M.L}^2$	5.36 10.37			
	Er^{3+}	ML/M.L $\text{ML}_2/\text{M.L}^2$	5.36 10.23			
	Tm^{3+}	ML/M.L $\text{ML}_2/\text{M.L}^2$	5.35 9.90			
	Yb^{3+}	ML/M.L $\text{ML}_2/\text{M.L}^2$	5.42 9.82			
	Lu^{3+}	ML/M.L $\text{ML}_2/\text{M.L}^2$	5.46 9.76			
	Fe^{3+}	$\text{M}(\text{OH})_2\text{L}/\text{M.}(\text{OH})^2.\text{L}$ $\text{M}(\text{OH})_3\text{L}/\text{M.}(\text{OH})^3.\text{L}$ 38.0		30.1^{b}		
	Al^{3+}	MHL/M.HL $\text{MHL}/\text{M}(\text{H}_2\text{L}).\text{H}^3$	3.38 13.72			

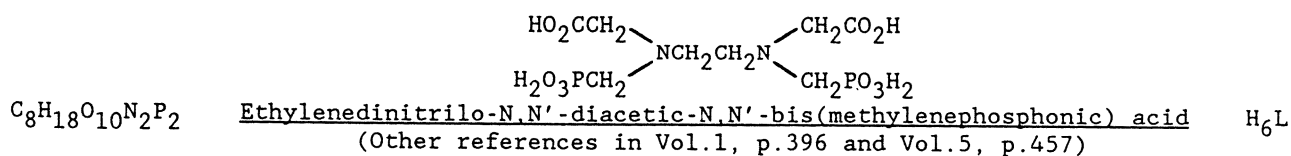
^a25°, 0.1; ^b25°, 0.5

DL-N,N-Bis(2-hydroxyethyl)-2-aminoalkanoic acid (continued)

<u>Ligand</u>	<u>Metal</u> <u>ion</u>	<u>Equilibrium</u>	<u>Log K</u> <u>20°, 0.1</u>	<u>Log K</u> <u>25°, 0</u>	<u>ΔH</u> <u>25°, 0</u>	<u>ΔS</u> <u>25°, 0</u>
R= CH ₃	H ⁺	HL/H.L	8.47			
DL-N,N-Bis-		H ₂ L/HL.H	(1.7)			
(2-hydroxyethyl)-	La ³⁺	ML/M.L	4.49			
alanine		ML ₂ /M.L ²	(7.50) ^x			
(C ₇ H ₁₅ O ₄ N)	Ce ³⁺	ML/M.L	4.91			
		ML ₂ /M.L ²	(8.52) ^x			
(Other values in	Pr ³⁺	ML/M.L	5.21			
Vol.1, p.106)		ML ₂ /M.L ²	(9.07) ^x			
	Nd ³⁺	ML/M.L	5.28			
		ML ₂ /M.L ²	(9.24) ^x			
	Sm ³⁺	ML/M.L	5.36			
		ML ₂ /M.L ²	(9.75) ^x			
	Eu ³⁺	ML/M.L	5.36			
		ML ₂ /M.L ²	(9.81) ^x			
	Gd ³⁺	ML/M.L	5.26			
		ML ₂ /M.L ²	(9.80) ^x			
	Tb ³⁺	ML/M.L	5.28			
		ML ₂ /M.L ²	(10.04) ^x			
	Dy ³⁺	ML/M.L	5.18			
		ML ₂ /M.L ²	(9.88) ^x			
	Ho ³⁺	ML/M.L	5.10			
		ML ₂ /M.L ²	(9.77) ^x			
	Er ³⁺	ML/M.L	5.13			
		ML ₂ /M.L ²	(9.71) ^x			
	Tm ³⁺	ML/M.L	5.07			
		ML ₂ /M.L ²	(9.58) ^x			
	Yb ³⁺	ML/M.L	5.19			
		ML ₂ /M.L ²	(9.62) ^x			

^xDL-mixtureBibliography: H⁺ 82RF,84MM; La³⁺-Lu³⁺ 82RF; Fe³⁺ 71KM; Al³⁺ 84MM;

Other references: 73MSM,81SG,83KN



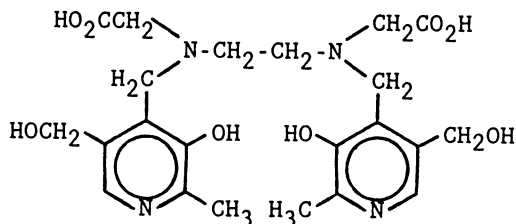
<u>Metal</u> <u>ion</u>	<u>Equilibrium</u>	<u>Log K</u> <u>25°, 0.1</u>
H ⁺	HL/H.L	10.43 ^v ±0.2
	H ₂ L/HL.H	7.81 ±0.5
	H ₃ L/H ₂ L.H	6.38 -0.3
	H ₄ L/H ₃ L.H	3.90 ±0.7
	H ₅ L/H ₄ L.H	2.49 ±0.2
	H ₆ L/H ₅ L.H	(1.7) ±0.3

^vK⁺ salt used as background electrolyte.

Ethylenedinitrilo-N,N'-diacetic-N,N'-bis(methylenephosphonic acid) (continued)

Metal ion	Equilibrium	Log K 25°, 0.1
Ga ³⁺	ML/M.L	26.82
	ML/MOHL.H	8.42
	MHL/ML.H	5.10
	MH ₂ L/MHL.H	2.24

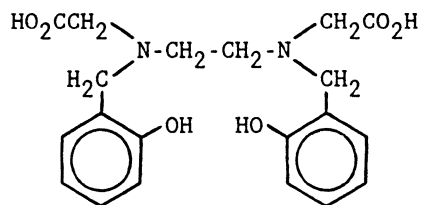
Bibliography: 80MM

C₂₂H₃₀O₈N₄ N,N'-Dipyridoxylethylenediamine-N,N'-diacetic acid (PLED)H₄L

Metal ion	Equilibrium	Log K 25°, 0.1
H ⁺	HL/H.L	10.89
	H ₂ L/HL.H	10.28
	H ₃ L/H ₂ L.H	7.20
	H ₄ L/H ₃ L.H	5.73
	H ₅ L/H ₄ L.H	3.26
	H ₆ L/H ₅ L.H	2.31
Co ²⁺	ML/M.L	17.29
	MHL/ML.H	8.85
	MH ₂ L/MHL.H	8.14
	MH ₃ L/MH ₂ L.H	1.93
Cu ²⁺	ML/M.L	21.6
	MHL/ML.H	8.65
	MH ₂ L/MHL.H	7.89
	MH ₃ L/MH ₂ L.H	2.59
Fe ³⁺	ML/M.L	30.78
	MHL/ML.H	6.93
	MH ₂ L/MHL.H	6.02
Zn ²⁺	ML/M.L	16.62
	MHL/ML.H	8.82
	MH ₂ L/MHL.H	8.11
	MH ₃ L/MH ₂ L.H	2.02
Ga ³⁺	ML/M.L	32.31
	MHL/ML.H	7.10
	MH ₂ L/MHL.H	6.2
In ³⁺	ML/M.L	26.54
	ML/MOHL.H	11.21
	MHL/ML.H	7.15
	MH ₂ L/MHL.H	6.34

Bibliography: 88MS;

Other references: 84TMM, 85TM

C₂₀H₂₄O₆N₂

N,N'-Bis(2-hydroxybenzyl)ethylenediamine-N,N'-diacetic acid (HBED)
(Other values in Vol.1, p.112 and Vol.5, p.58)

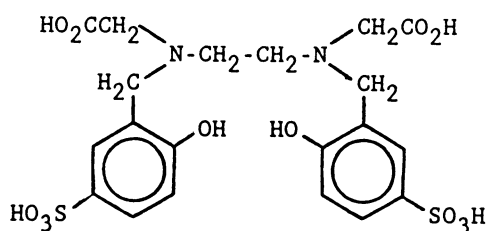
H₄L

Metal ion	Equilibrium	Log K 25°, 0.1	Log K 20°, 0.1
H ⁺	HL/H.L	(12.53) ±0.07	(12.41)
	H ₂ L/HL.H	11.00 ±0.00	11.19
	H ₃ L/H ₂ L.H	8.38 ±0.06	(8.32)
	H ₄ L/H ₃ L.H	4.68 ±0.04	(4.64)
	H ₅ L/H ₄ L.H	2.5	(2.0)
	H ₆ L/H ₅ L.H	(1.7)	(1.9)
La ³⁺	ML/M.L		16.42
	MHL/ML.H		7.1
	MH ₂ L/MHL.H		6.0
Ce ³⁺	ML/M.L		17.16
	MHL/ML.H		6.0
	MH ₂ L/MHL.H		5.4
Pr ³⁺	ML/M.L		17.85
	MHL/ML.H		5.8
	MH ₂ L/MHL.H		5.3
Nd ³⁺	ML/M.L		18.32
	MHL/ML.H		5.6
	MH ₂ L/MHL.H		5.2
Sm ³⁺	ML/M.L		19.24
	MHL/ML.H		5.5
	MH ₂ L/MHL.H		5.0
Eu ³⁺	ML/M.L		19.28
	MHL/ML.H		5.5
	MH ₂ L/MHL.H		5.0
Gd ³⁺	ML/M.L		19.16
	MHL/ML.H		5.7
	MH ₂ L/MHL.H		5.1
Tb ³⁺	ML/M.L		19.61
	MHL/ML.H		5.3
	MH ₂ L/MHL.H		4.9
Dy ³⁺	ML/M.L		19.90
	MHL/ML.H		5.2
	MH ₂ L/MHL.H		4.8
Ho ³⁺	ML/M.L		19.97
	MHL/ML.H		5.2
	MH ₂ L/MHL.H		4.8
Er ³⁺	ML/M.L		20.15
	MHL/ML.H		5.1
	MH ₂ L/MHL.H		4.7

HBED (continued)

<u>Metal ion</u>	<u>Equilibrium</u>	<u>Log K</u> <u>25°, 0.1</u>	<u>Log K</u> <u>20°, 0.1</u>
Tm ³⁺	ML/M.L		20.31
	MHL/ML.H		5.0
	MH ₂ L/MHL.H		4.6
Yb ³⁺	ML/M.L		20.50
	MHL/ML.H		5.0
	MH ₂ L/MHL.H		4.5
Lu ³⁺	ML/M.L		20.70
	MHL/ML.H		4.9
	MH ₂ L/MHL.H		4.4
Cu ²⁺	ML/M.L	23.69 -2	
	MHL/ML.H	8.49 +0.1	
	MH ₂ L/MHL.H	5.04 +0.1	
In ³⁺	ML/M.L	39.66	

Bibliography: H⁺ 84TM, 84TMM, 85SN; La³⁺-Lu³⁺ 85SND; Cu²⁺, In³⁺ 84TMM;
Other reference: 81RMD



C₂₀H₂₄O₁₂N₂S₂ N,N'-Bis(2-hydroxy-5-sulfobenzyl)ethylenediamine-N,N'-diacetic acid H₆L
(SHBED)

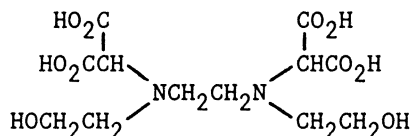
<u>Metal ion</u>	<u>Equilibrium</u>	<u>Log K</u> <u>25°, 0.1</u>
H ⁺	HL/H.L	(12.91)
	H ₂ L/HL.H	10.42
	H ₃ L/H ₂ L.H	7.90
	H ₄ L/H ₃ L.H	4.29
	H ₅ L/H ₄ L.H	1.96
	H ₆ L/H ₅ L.H	(1.2)
Gd ³⁺	ML/M.L	23.36
	MHL/ML.H	3.86
	MH ₂ L/MHL.H	5.10
	MH ₃ L/MH ₂ L.H	4.03
	MH ₄ L/MH ₃ L.H	1.96
Fe ³⁺	ML/M.L	36.87
	ML/MOHL.H	10.56
Ga ³⁺	ML/M.L	37.47
	MHL/ML.H	2.82

N,N'-Bis(2-hydroxy-5-sulfobenzyl)ethylenediamine-N,N'-diacetic acid (continued)

Metal ion	Equilibrium	Log K 25°, 0.1
In ³⁺	ML/M.L	29.37
	ML/MOHL.H	10.82
	MHL/ML.H	2.82

Bibliography: 88MS;

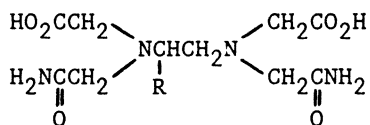
Other reference: 84TMc



C₁₂H₂₀O₁₀N₂ N,N'-Bis(2-Hydroxyethyl)ethylenediiminodipropanedioic acid H₄L
 (N,N'-bis(2-hydroxyethyl)ethylenediamine-N,N'-dimalonic acid)

Metal ion	Equilibrium	Log K 25°, 0.1
H ⁺	HL/H.L	9.29
	H ₂ L/HL.H	5.62
	H ₃ L/H ₂ L.H	4.06
	H ₄ L/H ₃ L.H	3.47
Mg ²⁺	ML/M.L	5.85
	ML ₂ /M.L ²	8.99
Ca ²⁺	ML/M.L	5.75
	ML ₂ /M.L ²	8.70
Sr ²⁺	ML/M.L	4.21
	ML ₂ /M.L ²	7.1
Ba ²⁺	ML/M.L	3.53
	ML ₂ /M.L ²	6.3

Bibliography: 85MG



C_xH_yO₆N₄ DL-1-Alkylethylenedinitrilotetraacetic acid N,N'-diamide H₂L

<u>Ligand</u>	<u>Metal ion</u>	<u>Equilibrium</u>	<u>Log K</u> <u>37°, 0.15</u>
R= CH ₃	H ⁺	HL/H.L	7.56 ±0.01
DL-1-Methyl-		H ₂ L/HL.H	3.80 ±0.00
		H ₃ L/H ₂ L.H	(1.7) ±0.0
(C ₁₁ H ₂₀ O ₆ N ₄)		H ₄ L/H ₃ L.H	(1.5)

DL-Alkylethylenedinitrilotetraacetic acid N,N'-diamide (continued)

H₂L

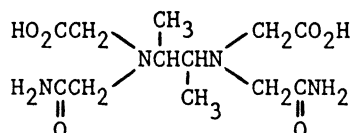
<u>Ligand</u>	<u>Metal ion</u>	<u>Equilibrium</u>	<u>Log K</u> <u>37°, 0.15</u>
	Mg ²⁺	ML/M.L	5.08
		ML ₂ /M.L ²	(6.91) ^w
		MHL/ML.H	3.82
	Ca ²⁺	ML/M.L	6.89
		ML ₂ /M.L ²	(8.18) ^w
		MHL/ML.H	2.80
	Mn ²⁺	ML/M.L	9.76
		ML ₂ /M.L ²	(11.60) ^w
		MHL/ML.H	1.22
	Fe ²⁺	ML/M.L	9.99
		MHL/ML.H	2.22
	Ni ²⁺	ML/M.L	13.53
		ML ₂ /M.L ²	(15.32) ^w
		ML/M(H ₋₁ L).H	9.66
	Cu ²⁺	ML/M.L	15.31
		MHL/ML.H	2.93
		ML/M(H ₋₁ L).H	8.43
	Zn ²⁺	ML/M.L	9.50
		MHL/ML.H	2.42
		ML/M(H ₋₁ L).H	9.33
		MHL ₂ /MHL.L	(7.14) ^w
		MH ₂ L ₂ /MHL ₂ .H	(4.05) ^w
	Cd ²⁺	ML/M.L	10.72
		ML ₂ /M.L ²	(15.08) ^w
		MH ₂ L ₂ /ML ₂ .H ²	(9.97) ^w
	Pb ²⁺	ML/M.L	16.89
		MHL/ML.H	2.34

R= CH ₂ CH ₃ DL-1-Ethyl-	H ⁺	HL/H.L	7.58 ±0.06
		H ₂ L/HL.H	3.70 ±0.02
		H ₃ L/H ₂ L.H	(1.7) ±0.0
(C ₁₂ H ₂₂ O ₆ N ₄)	Mg ²⁺	ML/M.L	4.88
	Ca ²⁺	ML/M.L	6.68
	Mn ²⁺	ML/M.L	9.38
	Fe ²⁺	ML/M.L	9.66
		MHL/ML.H	2.18
		ML/M(H ₋₁ L).H	(7.26)
	Ni ²⁺	ML/M.L	13.55
		ML ₂ /M.L ²	(15.67) ^w
		ML/M(H ₋₁ L).H	9.70
	Cu ²⁺	ML/M.L	14.96
		MHL/ML.H	1.51
		ML/M(H ₋₁ L).H	8.13

^wOptical isomerism not stated.

DL-1-Ethylethylenedinitrilotetraacetic acid N,N'-diamide (continued)

<u>Ligand</u>	<u>Metal ion</u>	<u>Equilibrium</u>	<u>Log K</u> <u>37°, 0.15</u>
	Zn ²⁺	ML/M.L	11.22
		MHL/ML.H	1.68
		MHL ₂ /MHL.L	(7.91) ^w
		MH ₂ L ₂ /MHL ₂ .H	(3.47) ^w
	Cd ²⁺	MH ₂ L/M.H ₂ L	(4.78) ^w
		MH ₂ L ₂ /M.(HL) ²	(10.51) ^w
		MH ₂ L ₂ /MHL ₂ .H	(3.62) ^w
	Pb ²⁺	ML/M.L	16.95
		MHL/ML.H	2.96

^wOptical isomerism not stated.Bibliography: H⁺ 82HM, 84MW; Mg²⁺-Fe²⁺, Cu²⁺, Zn²⁺ 82HM; Ni²⁺, Cd²⁺, Pb²⁺ 84MWC₁₂H₂₂O₆N₄ 1,2-Dimethylethylenedinitrilotetraacetic acid N,N'-diamide H₂L

<u>Isomer</u>	<u>Metal ion</u>	<u>Equilibrium</u>	<u>Log K</u> <u>37°, 0.15</u>
rac-	H ⁺	HL/H.L	8.41
		H ₂ L/HL.H	3.90
		H ₃ L/H ₂ L.H	(1.8)
	Mg ²⁺	ML/M.L	5.87
	Ca ²⁺	ML/M.L	7.26
	Mn ²⁺	ML/M.L	10.63
		MHL/ML.H	1.60
	Fe ²⁺	M(H ₋₁ L)L.H/M.L ²	(1.27) ^x
		ML/M.L	10.92
		ML/M(H ₋₁ L).H	8.54
		MH ₂ L ₂ /M.(HL) ²	(8.60) ^x
	Cu ²⁺	ML/M.L	12.63
		ML/M(H ₋₁ L).H	7.93
	Zn ²⁺	ML/M.L	11.72
		M(H ₋₁ L)L.H/M.L ²	(4.25) ^x

meso-	H ⁺	HL/H.L	6.87
		H ₂ L/HL.H	3.63
		H ₃ L/H ₂ L.H	(1.5)
	Mg ²⁺	ML/M.L	2.91
	Ca ²⁺	ML/M.L	4.04
	Mn ²⁺	ML/M.L	7.62
		MHL/ML.H	1.84

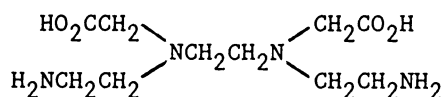
^xDL-mixture

1,2-Dimethylenedinitrilotetraacetic acid N,N'-diamide (continued)

H₂L

<u>Isomer</u>	<u>Metal ion</u>	<u>Equilibrium</u>	<u>Log K</u> <u>37°, 0.15</u>
	Fe ²⁺	ML/M.L	7.93
		ML/M(H ₋₁ L).H	8.07
		MH ₂ L ₂ /M.(HL) ²	6.49
	Cu ²⁺	ML/M.L	11.72
		ML/M(H ₋₁ L).H	8.15
	Zn ²⁺	ML/M.L	9.90
		MHL/ML.H	1.45

Bibliography: 85HC

C₁₀H₂₂O₄N₄

N,N'-Bis(2-aminoethyl)ethylenediiminodiacetic acid
(triethylenetetramine-N(2),N(3)-diacetic acid)

H₂L

<u>Metal ion</u>	<u>Equilibrium</u>	<u>Log K</u> <u>25°, 0.1</u>
H ⁺	HL/H.L	10.54
	H ₂ L/HL.H	9.86
	H ₃ L/H ₂ L.H	9.70
	H ₄ L/H ₃ L.H	3.78
	H ₅ L/H ₄ L.H	2.76
	H ₆ L/H ₅ L.H	(1.9)
Ni ²⁺	ML/M.L	20.0
	MHL/ML.H	6.16
	MH ₂ L/MHL.H	3.88
Cu ²⁺	ML/M.L	21.8
	MHL/ML.H	4.79
	MH ₂ L/MHL.H	3.45
Zn ²⁺	ML/M.L	19.1
	MHL/ML.H	5.53
	MH ₂ L/MHL.H	4.62

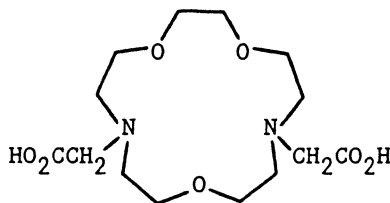
Bibliography: 81CD



$C_8H_{14}O_4N_2$ 1,4-Diazacyclohexane-1,4-diacetic acid (piperazine-1,4-diacetic acid) H_2L
 (Error in name and structure in Vol.1, p.102)

Metal <u>ion</u>	<u>Equilibrium</u>	Log K <u>20°, 0.1</u>
H^+	HL/H.L	8.70
	H_2L /HL.H	4.46
	H_3L / H_2L .H	(1.8)
Mg^{2+}	ML/M.L	1.5
Cd^{2+}	ML/M.L	2.5
Sr^{2+}	ML/M.L	2.2
Ba^{2+}	ML/M.L	1.6
Ni^{2+}	ML/M.L	3.64
	MHL/ML.H	6.35
Cu^{2+}	ML/M.L	7.37
	MHL/ML.H	5.41
Zn^{2+}	ML/M.L	3.05

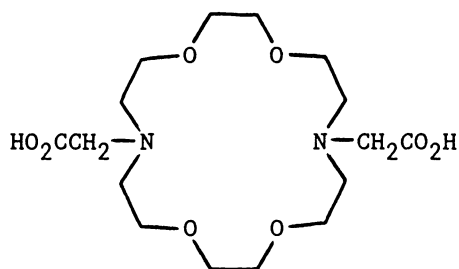
Bibliography: 63IPa



$C_{14}H_{26}O_7N_2$ 4,10,13-Trioxa-1,7-diazacyclopentadecane-1,7-diacetic acid H_2L

Metal <u>ion</u>	<u>Equilibrium</u>	Log K <u>25°, 0.1</u>
H^+	HL/H.L	8.63
	H_2L /HL.H	8.35
	H_3L / H_2L .H	2.3
Na^+	ML/M.L	2.85
Ca^{2+}	ML/M.L	8.06
Sr^{2+}	ML/M.L	7.20
Ba^{2+}	ML/M.L	6.74

Bibliography: 82TN

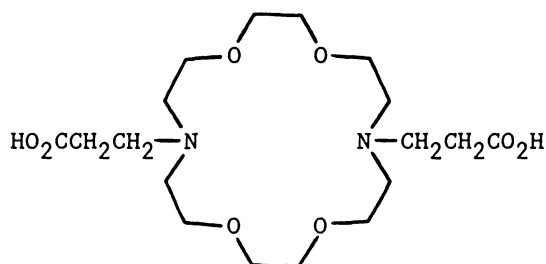


$C_{16}H_{30}O_8N_2$ 4,7,13,16-Tetraoxa-1,10-diazacyclooctadecane-1,10-diacetic acid

H_2L

Metal ion	Equilibrium	Log K 25°, 0.1
H^+	HL/H.L	8.02
	H_2L /HL.H	7.89
	H_3L / H_2L .H	2.0
Na^+	ML/M.L	1.95
Ca^{2+}	ML/M.L	7.67
Sr^{2+}	ML/M.L	7.69
Ba^{2+}	ML/M.L	7.66
Co^{2+}	ML/M.L	7.00
Ni^{2+}	ML/M.L	7.46
Zn^{2+}	ML/M.L	8.03

Bibliography: 82TN;
Other reference: 83CR

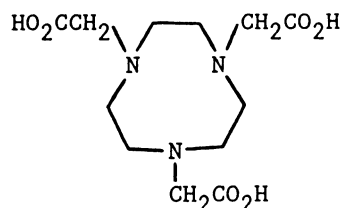


$C_{18}H_{34}O_8N_2$ 4,7,13,16-Tetraoxa-1,10-diazacyclooctadecane-1,10-dipropanoic acid

H_2L

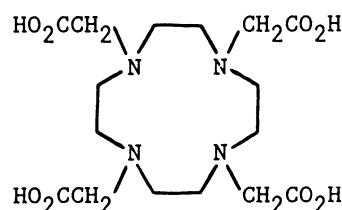
Metal ion	Equilibrium	Log K 25°, 0.1
H^+	HL/H.L	8.92
	H_2L /HL.H	8.20
	H_3L / H_2L .H	3.63
	H_4L / H_3L .H	2.61
Ca^{2+}	ML/M.L	4.0
Sr^{2+}	ML/M.L	4.4
Ba^{2+}	ML/M.L	3.8

Bibliography: 78TT

 $C_{12}H_{21}O_6N_3$ 1,4,7-Triazacyclononane-1,4,7-triacetic acid H_3L

Metal		Log K
<u>ion</u>	<u>Equilibrium</u>	<u>25°, 0.1</u>
H^+	HL/H.L	11.41 -0.01
	$H_2L/HL.H$	5.74 -0.08
	$H_3L/H_2L.H$	3.16 +0.2
	$H_4L/H_3L.H$	(1.7)
Mg^{2+}	ML/M.L	8.93
Ca^{2+}	ML/M.L	8.81
Mn^{2+}	ML/M.L	14.3
Co^{2+}	ML/M.L	17.5
Cu^{2+}	ML/M.L	19.8
Zn^{2+}	ML/M.L	18.3
Cd^{2+}	ML/M.L	16.0
Pb^{2+}	ML/M.L	16.6

Bibliography: H^+ 75HT, 85MBH; Mg^{2+}, Ca^{2+} 85MBH; $Mn^{2+}-Pb^{2+}$ 75HT; Other reference: 85GAM

 $C_{16}H_{28}O_8N_4$ 1,4,7,10-Tetraazacyclododecane-1,4,7,10-tetraacetic acid (DOTA) H_4L

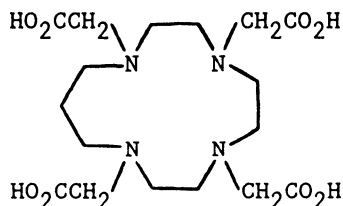
Metal		Log K	Log K	Log K	ΔH	ΔS
<u>ion</u>	<u>Equilibrium</u>	<u>25°, 0.1</u>	<u>20°, 0.1</u>	<u>25°, 1.0</u>	<u>25°, 0.1</u>	<u>25°, 0.1</u>
H^+	HL/H.L	11.22 ^V	11.36 ^V	(11.08) ^U	-8.4 ^Z	23
		12.09 ^Z				27 ^Z
	$H_2L/HL.H$	9.72 ± 0.04	9.73	9.23	-7.9	18
	$H_3L/H_2L.H$	4.46 ± 0.09	4.54	4.24		
	$H_4L/H_3L.H$	4.36 -0.1	4.41	4.18		
	$H_5L/H_4L.H$			(1.9)		
	$H_6L/H_5L.H$			(1.7)		
Li^+	ML/M.L	4.32 ^Z				
Na^+	ML/M.L	(4.38) ^Z		(2.52)		
K^+	ML/M.L	1.64 ^Z				
Be^{2+}	ML/M.L	13.64 ^Z				
	MHL/ML.H	5.26				
	MH ₂ L/MHL.H	4.33				

^UNaCl used as background electrolyte; ^VK⁺ salt used as background electrolyte;

^Z(CH₃)₄NNO₃ used as background electrolyte.

DOTA (continued)

Metal ion	Equilibrium	Log K 25°, 0.1	Log K 20°, 0.1	Log K 25°, 1.0	ΔH 25°, 0.1	ΔS 25°, 0.1
Mg^{2+}	ML/M.L	11.92			+1.9	61
	MHL/ML.H	4.09				
Ca^{2+}	ML/M.L	17.23 ^z			-11.7	40
	MHL/ML.H	3.54				
	MH ₂ L/MHL.H	(4.11)				
Sr^{2+}	ML/M.L	15.22 ^z			-10.5	34
	MHL/ML.H	4.67				
	MH ₂ L/MHL.H	4.16				
Ba^{2+}	ML/M.L	12.87 ^z			-8.5	30
	MHL/ML.H	5.63				
Co^{2+}	ML/M.L	20.17 ^z			-13.3	48
	MHL/ML.H	4.00				
	MH ₂ L/MHL.H	3.65				
Ni^{2+}	ML/M.L	(20.03) ^z			-13.2	47
	MHL/ML.H	(3.51)				
	MH ₂ L/MHL.H	(4.72)				
Cu^{2+}	ML/M.L	22.21 ^z			-14.3	54
	MHL/ML.H	4.30				
	MH ₂ L/MHL.H	3.58				
Zn^{2+}	ML/M.L	21.05 ^z			-10.6	61
	MHL/ML.H	4.19				
	MH ₂ L/MHL.H	3.55				

^z(CH₃)₄NNO₃ used as background electrolyte.Bibliography: H⁺ 76SF,81DM,82DF,84DF; Li⁺,K⁺,Be²⁺ 82DF; Na⁺ 81DM,82DF;Mg²⁺-Zn²⁺ 82DF,84DF; Other reference: 81SF

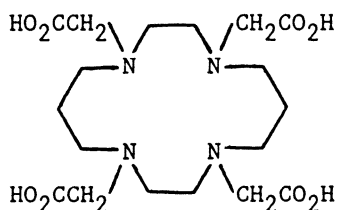
$C_{17}H_{30}O_8N_4$		1,4,7,10-Tetraazacyclotridecane-1,4,7,10-tetraacetic acid (TRITA)			H_4L	
Metal ion	Equilibrium	Log K 25°, 0.1	Log K 20°, 0.1	ΔH 25°, 0.1	ΔS 25°, 0.1	
H^+	HL/H.L	11.35 ^v	11.22 ^v	-8.0	25	
	H ₂ L/HL.H	(9.73)	9.18	-7.0	(21)	
	H ₃ L/H ₂ L.H	4.16	4.59			
	H ₄ L/H ₃ L.H	3.32	3.28			
Be^{2+}	ML/M.L	13.36				
	MHL/ML.H	5.57				
	MH ₂ L/MHL.H	4.56				
Mg^{2+}	ML/M.L	7.62				
	MHL/ML.H	6.51				

^vKNO₃ used as background electrolyte.

1,4,7,10-Tetraazacyclotridecane-1,4,7,10-tetraacetic acid (continued)

Metal ion	Equilibrium	Log K 25°, 0.1	Log K 20°, 0.1	Log K 25°, 3.0	ΔH 25°, 0.1	ΔS 25°, 0.1
Ca ²⁺	ML/M.L	12.09			-6.1	35
	MHL/ML.H	4.72				
Sr ²⁺	ML/M.L	10.00			-3.5	34
	MHL/ML.H	5.04				
Ba ²⁺	ML/M.L	8.34			-3.1	28
	MHL/ML.H	6.65				
Co ²⁺	ML/M.L	20.10			-8.2	64
	MHL/ML.H	3.98				
	MH ₂ L/MHL.H	3.17				
Ni ²⁺	ML/M.L	20.82			-9.8	62
	MHL/ML.H	4.17				
	MH ₂ L/MHL.H	3.27				
Cu ²⁺	ML/M.L	21.53			-13.6	53
	MHL/ML.H	3.85				
	MH ₂ L/MHL.H	2.91				
Zn ²⁺	ML/M.L	19.42			-8.4	61
	MHL/ML.H	4.07				
	MH ₂ L/MHL.H	3.15				

Bibliography: H⁺ 76SF,82DF,84DF; Be²⁺,Mg²⁺ 82DF; Ca²⁺-Zn²⁺ 82DF,84DF;
Other reference: 81SF



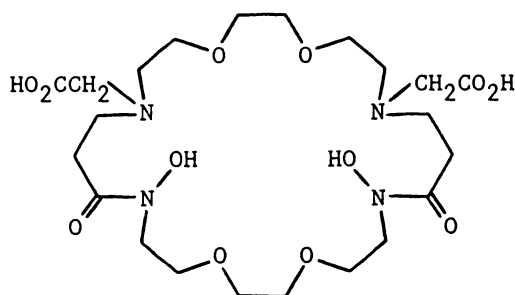
C ₁₈ H ₃₂ O ₈ N ₄ 1,4,8,11-Tetraazacyclotetradecane-1,4,8,11-tetraacetic acid (TETA)					ΔH	ΔS
Metal ion	Equilibrium	Log K 25°, 0.1	Log K 20°, 0.1	Log K 25°, 1.0	25°, 0.1	25°, 0.1
H ⁺	HL/H.L	(10.68) ^v	11.07 ^v	(11.56) ^u	-8.2	(21)
	H ₂ L/HL.H	10.14	(9.75)	10.18	-6.5	19
	H ₃ L/H ₂ L.H	4.09	4.31	4.05		
	H ₄ L/H ₃ L.H	3.35	3.46	3.38		
	H ₅ L/H ₄ L.H			2.17		
	H ₆ L/H ₅ L.H			(1.4)		
Na ⁺	ML/M.L	(0.4)		(1.64)		
Be ²⁺	ML/M.L	13.38				
	MHL/ML.H	5.12				
	MH ₂ L/MHL.H	4.79				
Mg ²⁺	ML/M.L	1.97				
	MHL/ML.H	10.46				
Ca ²⁺	ML/M.L	8.32			-2.1	31
	MHL/ML.H	7.45				

^vKNO₃ used as background electrolyte; ^uNaCl used as background electrolyte.

1,4,8,11-Tetraazacyclotetradecane-1,4,8,11-tetraacetic acid (continued)

Metal ion	Equilibrium	Log K 25°, 0.1	Log K 20°, 0.1	Log K 25°, 1.0	ΔH 25°, 0.1	ΔS 25°, 0.1
Sr ²⁺	ML/M.L	5.73			-2.1	19
	MHL/ML.H	8.94				
Ba ²⁺	ML/M.L	3.85			-2.5	9
	MHL/ML.H	9.35				
Co ²⁺	ML/M.L	16.56			-4.6	60
	MHL/ML.H	4.07				
	MH ₂ L/MHL.H	2.82				
Ni ²⁺	ML/M.L	19.91			-9.0	61
	MHL/ML.H	4.12				
	MH ₂ L/MHL.H	3.31				
	M ₂ L/ML.M	3.10				
Cu ²⁺	ML/M.L	21.60			-12.9	56
	MHL/ML.H	3.68				
	MH ₂ L/MHL.H	2.90				
Zn ²⁺	ML/M.L	16.27			-3.7	62
	MHL/ML.H	4.25				

Bibliography: H⁺ 76SF,81DM,82DF,84DF; Na⁺ 81DM,82DF; Be²⁺,Mg²⁺ 82DF;
Ca²⁺-Zn²⁺ 82DF,84DF; Other reference: 81SF

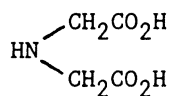
C₂₂H₄₀O₁₂N₄

5,14-Dihydroxy-4,15-dioxo-8,11,21,24-tetraoxa-1,5,14,18-tetraazacyclohexacosane-1,18-diacetic acid

H₄L

Metal ion	Equilibrium	Log K 25°, 0.1
H ⁺	HL/H.L	11.91
	H ₂ L/HL.H	9.79
	H ₃ L/H ₂ L.H	8.11
	H ₄ L/H ₃ L.H	4.25
	H ₅ L/H ₄ L.H	2.70
	H ₆ L/H ₅ L.H	2.18
Ni ²⁺	ML/M.L	13.64
	MHL/ML.H	9.50
	MH ₂ L/MHL.H	6.37
	MH ₃ L/MH ₂ L.H	3.87
Fe ³⁺	ML/M.L	24.45
	MHL/ML.H	4.73
	MH ₂ L/MHL.H	3.67
	MH ₃ L/MH ₂ L.H	2.70

Bibliography: 85SMb

 $\text{C}_4\text{H}_7\text{O}_4\text{N}$

Iminodiacetic acid (IDA)
(Other values in Vol.1, p.116 and Vol.5, p.59)

 H_2L

Metal ion	Equilibrium	Log K 25°, 0.1	Log K 25°, 1.0	Log K 25°, 0	ΔH 25°, 0.1	ΔS 25°, 0.1
H^+	HL/H.L	9.34 $\pm$ 0.06	9.26 ^u $\pm$ 0.06	9.79 -0.01	-7.9 $\pm$ 0.2	16
		9.45 ^z	9.31 ^u $\pm$ 0.07	9.68 ^{e,u}	-8.5 ^c $\pm$ 0.0	14 ^c
		9.16 ^{b,u} $\pm$ 0.02				
	$\text{H}_2\text{L}/\text{HL.H}$	2.60 $\pm$ 0.05	2.57 $\pm$ 0.06	2.84 $\pm$ 0.00	-0.8 $\pm$ 0.0	9
		2.62 ^b $\pm$ 0.06		2.77 ^e	-0.9 ^c $\pm$ 0.2	9 ^c
	$\text{H}_3\text{L}/\text{H}_2\text{L.H}$	(1.8) -0.1	(1.8) +0.1		-0.9 $\pm$ 0.0	5
		(1.8) ^b		(1.9) ^e	-1.0 ^c $\pm$ 0.0	5 ^c
Mg^{2+}	ML/M.L	2.98		3.70	+2.9 ^h	23
	$\text{ML}_2/\text{M.L}^2$	4.85				
Ca^{2+}	ML/M.L	2.59 +0.1	2.09 ^v	3.66 $\pm$ 0.04	+0.3 ^h	13
	$\text{ML}_2/\text{M.L}^2$			6.02		
Am^{3+}	ML/M.L	6.9	6.15 ^u			
	$\text{ML}_2/\text{M.L}^2$		11.0 ^u			
Th^{4+}	ML/M.L		9.69 ^u		+1.6 ^c	50 ^c
	MHL/ML.H		2.49 ^u		-8.3 ^c	-16 ^c
UO^{2+}	ML/M.L	8.96	8.75 ^u $\pm$ 0.04		-0.5 ^c	38 ^c
	MHL/ML.H		2.41 ^u		-6.9 ^c	-12 ^c
	MHL ₂ /MHL.L		8.6 ^u		-4.6 ^c	24 ^c
	$\text{M}(\text{HL})_2/\text{MHL}_2.\text{H}$		2.7 ^u		-0.5 ^c	11 ^c
Cr^{2+}	ML/M.L		5.01 ^v			
	$\text{ML}_2/\text{M.L}^2$		8.18 ^v			
Mn^{2+}	ML/M.L	4.72				
	$\text{ML}_2/\text{M.L}^2$	7.82				
Co^{2+}	ML/M.L	6.96 $\pm$ 0.02	6.54 ^v		-2.1 ^h	25
					-2.4 ^c	
	$\text{ML}_2/\text{M.L}^2$	12.30 $\pm$ 0.07	11.95 ^v		-6.0 ^h	36
					-6.6 ^c	
Ni^{2+}	ML/M.L	8.3 $\pm$ 0.2		9.24	(-5.1) ^h	20
					-4.7 ^c	
	$\text{ML}_2/\text{M.L}^2$	14.5 $\pm$ 0.4		15.7	-9.5 ^h	34
					-10.1 ^c	
Cu^{2+}	ML/M.L	10.56 $\pm$ 0.05	10.1 ^v	11.4	-4.5 ^h -0.1	33
					-5.5 ^c	
	$\text{ML}_2/\text{M.L}^2$	16.4 $\pm$ 0.2	16.0 ^v	17.2	-10.9 ^h -0.1	38
					-12.0 ^c	
	MHL/ML.H	2.3 $\pm$ 0.4			-0.5	9
	ML/MOHL.H	8.5 $\pm$ 0.9				

^b25°, 0.5; ^c25°, 1.0; ^e25°, 3.0; ^h20°, 0.1; ^u Na^+ salt used as background electrolyte;
^v K^+ salt used as background electrolyte; ^z $(\text{CH}_3)_4\text{NBr}$ used as background electrolyte.

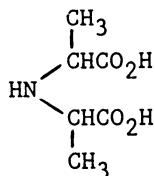
IDA (continued)

Metal ion	Equilibrium	Log K 25°, 0.1	Log K 25°, 1.0	Log K 25°, 0	ΔH 25°, 0.1	ΔS 25°, 0.1
Fe ³⁺	ML/M.L	10.72 ^{b,u}				
	ML ₂ /M.L	9.42				
VO ²⁺	ML/M.L	(9.00)				
		(9.30) ^{b,u}				
	MHL/ML.H	1.95 ^{b,u}				
	ML/MOHL.H	5.8 -0.3				
	(ML) ² /M ₂ (OH) ₂ L ₂ .H ²	(9.1)				
		(8.21) ^{b,u}				
Zn ²⁺	ML/M.L	7.15 ±0.09			-2.2 ^h -0.1	25
					-2.9 ^c	
	ML ₂ /M.L ²	12.4 ±0.1			-5.9 ^h -0.1	37
					-7.0 ^c	
Pb ²⁺	ML/M.L	7.36 ±0.05	6.86 ^v		-3.3 ^h	23
		7.31 ^{b,u}				
	ML ₂ /M.L ²	9.30	9.15 ^v			
	MHL/ML.H	3.05 ^{b,u}	3.84 ^v			
	ML/MOHL.H	9.36				
In ³⁺	ML/M.L	10.14	10.2 ^u			
	ML ₂ /M.L ²	19.7	20.3 ^u			
	ML ₃ /M.L ³		29.0 ^u			
	M ₂ L/M.L.M		3.8 ^u			

^b25°, 0.5; ^c25°, 1.0; ^h20°, 0.1; ^uNa⁺ salt used as background electrolyte;
^vK⁺ salt used as background electrolyte.

Bibliography:

H⁺ 70B, 71GK, 75MR, 80CR, 80THU, 81FM, 81MON, 81VKO, 83FF, 85Hb;
Mg²⁺ 75MR, 85MM; Co²⁺ 8000, 84VR;
Ca²⁺ 75MR; Ni²⁺ 81AC, 81FM, 84VKK;
Am³⁺ 71M; Cu²⁺ 80NW, 81FM, 82VR;
Th⁴⁺ 83DC; VO²⁺ 83FF, 84FV;
UO₂²⁺ 80DTB; Zn²⁺ 81FM, 83VR, 85BA;
Cr²⁺ 83MDN; Pb²⁺ 81MON, 85MM;
Mn²⁺, Fe³⁺ 85MM; In³⁺ 84PGa, 85MMN;
Other references: 80KT, 80SK, 81DS, 81GKN, 81PC, 81RC, 81RRS, 81RS, 82DBa, 82DBP, 82NB, 82VN, 83IT, 82SG, 83YW, 84BL, 85SA

C₆H₁₁O₄N2,2'-Iminodipropionic acid*H₂L

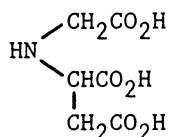
Metal ion	Equilibrium	Log K 25°, 0.1
H ⁺	HL/H.L	9.38
	H ₂ L/HL.H	2.43

*DL- or meso-isomer not stated

2,2'-Iminodipropionic acid (continued)

<u>Metal ion</u>	<u>Equilibrium</u>	<u>Log K</u> <u>25°, 0.1</u>
Ni ²⁺	ML/M.L	8.24
	ML ₂ /M.L ²	14.3
Cu ²⁺	ML/M.L	10.68
	ML ₂ /M.L ²	15.2
VO ²⁺	ML/M.L	9.54
	ML/MOHL.H	6.1
	M ₂ (OH) ₂ L ₂ .H ² /(ML) ²	9.1

Bibliography: 84FV



C₆H₉O₆N DL-2-Carboxymethyliminodiacetic acid (N-carboxymethylaspartic acid)
 (Other reference in Vol.1, p. 398 and other values in Vol.5, p.60)

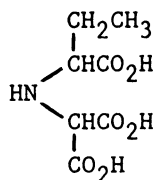
H₃L

<u>Metal ion</u>	<u>Equilibrium</u>	<u>Log K</u> <u>25°, 0.1</u>
H ⁺	HL/H.L	9.70 ±0.05
	H ₂ L/HL.H	3.79 ±0.10
	H ₃ L/H ₂ L.H	2.5 ±0.2
	H ₄ L/H ₃ L.H	2.4
Nd ³⁺	ML/M.L	8.78
	ML ₂ /M.L ²	(14.09) ^w
	MHL/ML.H	3.05
Fe ²⁺	ML/M.L	7.66
	MHL/ML.H	4.80
	MH ₂ L/MHL.H	3.86
	ML/MOHL.H	7.06
Fe ³⁺	ML/M.L	15.70
	MH ₂ L/ML.H ²	2.09
	ML/MOHL.H	5.04

^wOptical isomerism not stated.

Bibliography:

H⁺, Fe²⁺ 79MMM;Nd³⁺ 80KN;Fe³⁺ 79MM, 82MMA



$\text{C}_7\text{H}_{11}\text{O}_6\text{N}$ DL-2-Carboxy-2'-ethyliminodiacetic acid (1-carboxypropylaminomalonic acid) H_3L

Metal ion	Equilibrium	Log K 25°, 0.1
H^+	HL/H.L	9.05 ^v
	$\text{H}_2\text{L}/\text{HL.H}$	3.75
	$\text{H}_3\text{L}/\text{H}_2\text{L.H}$	(1.9)
Mg^{2+}	ML/M.L	3.10
Ca^{2+}	ML/M.L	3.43
Sr^{2+}	ML/M.L	2.14
Ba^{2+}	ML/M.L	1.90
Y^{3+}	ML/M.L	8.50
La^{3+}	ML/M.L	7.50
Ce^{3+}	ML/M.L	7.93
Pr^{3+}	ML/M.L	8.35
Nd^{3+}	ML/M.L	8.51
Sm^{3+}	ML/M.L	8.94
Eu^{3+}	ML/M.L	8.95
Gd^{3+}	ML/M.L	8.71
Tb^{3+}	ML/M.L	8.86
Dy^{3+}	ML/M.L	9.00
Ho^{3+}	ML/M.L	9.02
Er^{3+}	ML/M.L	9.17
Tm^{3+}	ML/M.L	9.16
Yb^{3+}	ML/M.L	9.43
Lu^{3+}	ML/M.L	8.44
Cu^{2+}	ML/M.L	12.08
	MHL/M.HL	5.62
	MOHL/ML.OH	3.95*
Hg^{2+}	ML/M.L	13.03
	MOHL/ML.OH	8.29*

^v KNO_3 used as background electrolyte; *value used for K_w not given.

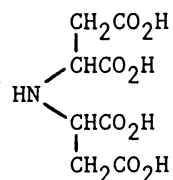
Bibliography:

$\text{H}^+ - \text{Ba}^{2+}$ 82KK;

$\text{Y}^{3+} - \text{Lu}^{3+}$ 82KKa;

Cu^{2+} 85KKa;

Hg^{2+} 85KK

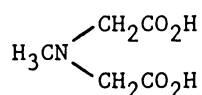


$\text{C}_8\text{H}_{11}\text{O}_8\text{N}$ 2,2'-Bis(carboxymethyl)iminodiacetic acid (iminodisuccinic acid)* H_4L
 (Other values in Vol.5, p.60)

Metal ion	Equilibrium	Log K 25°, 0.1
H^+	HL/H.L	10.12 ^v
	$\text{H}_2\text{L}/\text{HL.H}$	4.83
	$\text{H}_3\text{L}/\text{H}_2\text{L.H}$	3.84
	$\text{H}_4\text{L}/\text{H}_3\text{L.H}$	2.96
Nd^{3+}	ML/M.L	12.02
	$\text{ML}_2/\text{M.L}^2$	17.65
	MHL/ML.H	3.63
	$\text{MH}_2\text{L}/\text{MHL.H}$	2.5

^v KNO_3 used as background electrolyte; *DL- or meso-isomer not stated.

Bibliography: 80KN



$\text{C}_5\text{H}_9\text{O}_4\text{N}$ N-Methyliminodiacetic acid (MIDA) H_2L
 (Other values in Vol.1, p.124 and Vol.5, p.61)

Metal ion	Equilibrium	Log K 25°, 0.1	Log K 25°, 1.0	Log K 25°, 0	ΔH 25°, 0	ΔS 25°, 0
H^+	HL/H.L	9.59 ± 0.04	9.48 ^u	10.01 ± 0.01	-6.9 ^h ± 0.1	21 ^a
		9.42 ^{b,u}	9.50 ^{p,v}		(-8) ^r	
	$\text{H}_2\text{L}/\text{HL.H}$	2.33 - 0.2	2.36	2.59 - 0.4	+0.2	13
		2.36 ^b	2.52 ^p			
	$\text{H}_3\text{L}/\text{H}_2\text{L.H}$		(1.6)			
Ca^{2+}	ML/M.L	3.81 ± 0.03		4.45 ± 0.05	-1.4 ± 0.2	13 ^a
	$\text{ML}_2/\text{M.L}^2$	6.57		7.36	-1.9 ^a	24 ^a
VO^{2+}	ML/M.L	9.56				
		9.44 ^{b,u}				
	ML/MOHL.H	5.8				
		5.76 ^b				
	$\text{M}_2(\text{OH})_2\text{L}_2.\text{H}^2/(\text{ML})^2$	9.05 ^b				
Pb^{2+}	ML/M.L	7.97			-3.6 ^h	25 ^a
		7.60 ^{b,u}				
	$\text{ML}_2/\text{M.L}^2$	12.12 ^h				
	MHL/ML.H	3.63 ^b				
Al^{3+}	ML/M.L	7.55 ^{b,u}				

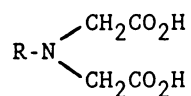
^a25°, 0.1; ^b25°, 0.5; ^h20°, 0.1; ^p35°, 2.0; ^r15-35°, 1.0;

^u NaClO_4 used as background electrolyte; ^v KNO_3 used as background electrolyte.

Bibliography: H^+ 75MR, 83FF;

Ca^{2+} 75MR; VO^{2+} 83FF; Pb^{2+} 85N; Al^{3+} 84N;

Other references: 70B, 80MGM, 82CG

 $\text{C}_x\text{H}_y\text{O}_4\text{N}$ N-Alkyliminodiacetic acid H_2L

(Other references in Vol.1, p.127 and Vol.5, p.457)

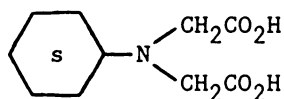
<u>Ligand</u>	<u>Metal ion</u>	<u>Equilibrium</u>	<u>Log K</u> <u>25°, 0.1</u>	<u>Log K</u> <u>25°, 0</u>
R= CH ₂ CH ₃ N-Ethyl-	H ⁺	HL/H.L H ₂ L/HL.H		10.13 2.70
(C ₆ H ₁₁ O ₄ N)	Ca ²⁺	ML/M.L		3.92
R= CH ₂ CH ₂ CH ₃ N-Propyl-	H ⁺	HL/H.L H ₂ L/HL.H H ₃ L/H ₂ L.H	10.03 +0.06 2.24 +0.2	10.43 2.49 (1.1)
(C ₇ H ₁₃ O ₄ N)	Ca ²⁺	ML/M.L ML ₂ /M.L ²	3.4 5.4	3.71
	Co ²⁺	ML/M.L ML ₂ /M.L ²	7.40 +0.1 13.81 -0.4	
	Ni ²⁺	ML/M.L ML ₂ /M.L ²	8.78 +0.02 15.65 -0.05	
	Cu ²⁺	ML/M.L ML ₂ /M.L ²	11.30 -0.2 17.4 +3	
	Ag ⁺	ML/M.L ML ₂ /M.L ²	4.29 7.5	
	Zn ²⁺	ML/M.L ML ₂ /M.L ²	8.00 14.55	
	Cd ²⁺	ML/M.L ML ₂ /M.L ²	6.97 12.54	
R= CH ₂ (CH ₃) ₂ N-2-Propyl-	H ⁺	HL/H.L H ₂ L/HL.H		10.27 2.50
(C ₇ H ₁₃ O ₄ N)	Ca ²⁺	ML/M.L		3.77
R= CH ₂ CH ₂ CH ₂ CH ₃ N-Butyl-	H ⁺	HL/H.L H ₂ L/HL.H H ₃ L/H ₂ L.H	10.07 2.28 (1.4)	10.58 2.59
(C ₈ H ₁₅ O ₄ N)	Ca ²⁺	ML/M.L ML ₂ /M.L ²		4.01 6.77
	Co ²⁺	ML/M.L ML ₂ /M.L ²	7.71 13.78	
	Ni ²⁺	ML/M.L ML ₂ /M.L ²	8.84 15.88	
	Cu ²⁺	ML/M.L ML ₂ /M.L ²	11.31 (20.04)	

N-Alkyliminodiacetic acid (continued)

Ligand	Metal ion	Equilibrium	Log K 25°, 0.1	Log K 25°, 0
	Ag ⁺	ML/M.L ML ₂ /M.L ²	4.36 7.6	
	Zn ²⁺	ML/M.L ML ₂ /M.L ²	8.12 14.88	
	Cd ²⁺	ML/M.L ML ₂ /M.L ²	6.98 12.63	
R= CH ₂ CH(CH ₃) ₂ N-2-Methylpropyl- (C ₈ H ₁₅ O ₄ N)	H ⁺	HL/H.L H ₂ L/HL.H		10.78 2.53
	Ca ²⁺	ML/M.L		3.40
R= C(CH ₃) ₃ N-1,1-Dimethyl- ethyl- (C ₈ H ₁₅ O ₄ N)	H ⁺	HL/H.L H ₂ L/HL.H		11.88 2.53
	Ca ²⁺	ML/M.L ML ₂ /M.L ²		3.71 (6.91)
R= (CH ₂) ₄ CH ₃ N-Pentyl- (C ₉ H ₁₇ O ₄ N)	H ⁺	HL/H.L H ₂ L/HL.H		11.23 2.46
	Ca ²⁺	ML/M.L		4.22
R= (CH ₂) ₅ CH ₃ N-Hexyl- (C ₁₀ H ₁₉ O ₄ N)	H ⁺	HL/H.L H ₂ L/HL.H H ₃ L/H ₂ L.H	10.24 2.33 (1.8)	10.78 2.55
	Ca ²⁺	ML/M.L ML ₂ /M.L ²		4.60 8.00
R= (CH ₂) ₇ CH ₃ N-Octyl- (C ₁₂ H ₂₃ O ₄ N)	H ⁺	HL/H.L H ₂ L/HL.H		10.57 2.74
	Ca ²⁺	ML/M.L ML ₂ /M.L ²		4.72 8.35
R= (CH ₂) ₉ CH ₃ N-Decyl- (C ₁₄ H ₂₇ O ₄ N)	H ⁺	HL/H.L H ₂ L/HL.H H ₃ L/H ₂ L.H	10.24 3.36 2.21	

Bibliography:

H⁺ 75IP, 75MR, 84CGM;Ca²⁺ 75MR;Co²⁺-Cd²⁺ 75IP

 $C_{10}H_{17}O_4N$

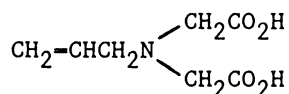
N-(Cyclohexyl)iminodiacetic acid
(Other values in Vol.1, p.129)

 H_2L

Metal ion	Equilibrium	Log K 25°, 0.1	Log K 25°, 0.5	Log K 25°, 0
H^+	HL/H.L	10.81	10.58 ^u	11.28
	$H_2L/H.L.H$	2.15	2.26	2.63
Ca^{2+}	ML/M.L	3.34		3.73
	$ML_2/M.L^2$			(6.49)

^uNaClO₄ used as background electrolyte.

Bibliography: 75MR

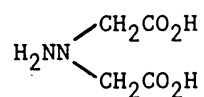
 $C_7H_{11}O_4N$

N-Allyliminodiacetic acid
(Other values in Vol.1, p.130)

 H_2L

Metal ion	Equilibrium	Log K 25°, 0.1
H^+	HL/H.L	9.14 +0.1
	$H_2L/H.L.H$	2.21 +0.2
	$H_3L/H_2L.H$	(1.6)
Co^{2+}	ML/M.L	7.52 -0.3
	$ML_2/M.L^2$	13.45 -0.7
Ni^{2+}	ML/M.L	8.58 -0.03
	$ML_2/M.L^2$	15.39 -0.09
Cu^{2+}	ML/M.L	10.31 -0.09
	$ML_2/M.L^2$	16.4 +2
Ag^+	ML/M.L	4.71
	$ML_2/M.L^2$	6.9
Zn^{2+}	ML/M.L	7.62
	$ML_2/M.L^2$	14.01
Cd^{2+}	ML/M.L	5.76
	$ML_2/M.L^2$	12.20

Bibliography: 75IP

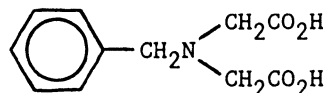
 $\text{C}_4\text{H}_8\text{O}_4\text{N}_2$ Hydrazine-N,N-diacetic acid H_2L

(Other values in Vol.1, p.131 and other references in Vol.5, p.457)

Metal ion	Equilibrium	Log K 25°, 0.1	Log K 30°, 0.1
H^+	HL/H.L	7.25	(7.03)
	$\text{H}_2\text{L}/\text{HL.H}$	2.87	2.91
Am^{3+}	ML/M.L	10.74	
	$\text{ML}_2/\text{M.L}^2$	20.20	
Cm^{3+}	ML/M.L	10.75	
	$\text{ML}_2/\text{M.L}^2$	20.25	
VO^{2+}	ML/M.L	7.61	
	ML/MOHL.H	5.2	

Bibliography:

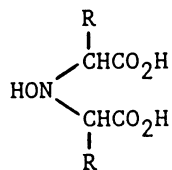
H^+ , VO^{2+} 83FF;
 Am^{3+} , Cm^{3+} 71M

 $\text{C}_{11}\text{H}_{13}\text{O}_4\text{N}$ N-Benzyliminodiacetic acid H_2L

(Other values in Vol.1, p.135)

Metal ion	Equilibrium	Log K 25°, 0.1
H^+	HL/H.L	8.90 ± 0.03
	$\text{H}_2\text{L}/\text{HL.H}$	2.21 ± 0.04
	$\text{H}_3\text{L}/\text{H}_2\text{L.H}$	(1.2) ± 0.1
Co^{2+}	ML/M.L	6.87 ± 0.1
	$\text{MH}_2/\text{M.L}^2$	12.2 ± 0.1
Ni^{2+}	ML/M.L	7.91 ± 0.1
	$\text{ML}_2/\text{M.L}^2$	14.1 ± 0.1
Cu^{2+}	ML/M.L	10.5 ± 0.2
	$\text{ML}_2/\text{M.L}^2$	15.6 ± 0.1
Ag^+	ML/M.L	4.31
	$\text{ML}_2/\text{M.L}^2$	7.1
Zn^{2+}	ML/M.L	7.01 ± 0.05
	$\text{ML}_2/\text{M.L}^2$	12.47 ± 0.04
Cd^{2+}	ML/M.L	6.16
	$\text{ML}_2/\text{M.L}^2$	11.22

Bibliography: 75IP

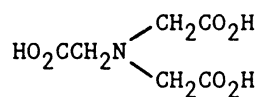
 $\text{C}_x\text{H}_y\text{O}_5\text{N}$ N-Hydroxyiminodialkanoic acid H_2L

<u>Ligand</u>	<u>Metal ion</u>	<u>Equilibrium</u>	<u>Log K</u> <u>25°, 0.1</u>
R= H	H^+	HL/H.L	5.48
N-Hydroxy-		$\text{H}_2\text{L}/\text{HL.H}$	2.82
iminodiacetic	Ni^{2+}	ML/M.L	6.43
acid		$\text{ML}_2/\text{M.L}^2$	10.97
$(\text{C}_4\text{H}_7\text{O}_5\text{N})$	Cu^{2+}	ML/M.L	8.33
		$\text{ML}_2/\text{M.L}^2$	12.2
	VO^{2+}	ML/M.L	7.16
		ML/MOHL.H	6.10
		$\text{MOHL}/\text{M}(\text{OH})_2\text{L.H}$	5.0
		$\text{M}_2(\text{OH})_2\text{L}_2.\text{H}^2/(\text{ML})^2$	6.4

R= CH_3	H^+	HL/H.L	5.77
N-Hydroxy-		$\text{H}_2\text{L}/\text{HL.H}$	2.74
2,2'-imino-	Ni^{2+}	ML/M.L	6.07
dipropionic		$\text{ML}_2/\text{M.L}^2$	11.13
acid	Cu^{2+}	ML/M.L	8.15
$(\text{C}_6\text{H}_{11}\text{O}_5\text{N})$		$\text{ML}_2/\text{M.L}^2$	12.5
	VO^{2+}	ML/M.L	7.34
		ML/MOHL.H	5.51
		$\text{MOHL}/\text{M}(\text{OH})_2\text{L.H}$	5.0
		$\text{M}_2(\text{OH})_2\text{L}_2.\text{H}^2/(\text{ML})^2$	6.6

*DL- or meso- not stated.

Bibliography: 84FV

 $\text{C}_6\text{H}_9\text{O}_6\text{N}$ Nitrilotriacetic acid (NTA) H_3L

(Other values in Vol.1, p.139 and Vol.5, p.62)

Metal ion	Equilibrium	Log K <u>25°, 0.1</u>	Log K <u>25°, 1.0</u>	Log K <u>25°, 0</u>	ΔH <u>25°, 0.1</u>	ΔS <u>25°, 0.1</u>
H^+	HL/H.L	$9.49^{\text{u}} \pm 0.04$ $9.67^{\text{v}} \pm 0.08$ $9.84^{\text{z}} \pm 0.03$ $8.93^{\text{b,u}} \pm 0.05$ $9.35^{\text{b,v}}$ $9.73^{\text{b,z}} \pm 0.1$	$8.87^{\text{u}} \pm 0.05$ $9.31^{\text{v}} \pm 0.04$ $9.7^{\text{z}} \pm 0.1$	10.334 $9.17^{\text{e,u}}$	$-4.7^{\text{h}} \pm 0.2$	27^{u} 28^{v} 29^{z}
	$\text{H}_2\text{L}/\text{HL.H}$	2.52 ± 0.09 $2.35^{\text{b}} \pm 0.08$	2.36 ± 0.10	2.940 2.63^{e}	$+0.3 \pm 0.1$	13
	$\text{H}_3\text{L}/\text{H}_2\text{L.H}$	$(1.9) \pm 0.1$ $(1.8)^{\text{b}} \pm 0.1$	$(1.9) \pm 0.1$	(1.650) 2.1^{e}	$+0.4 \pm 0.1$	10
	$\text{H}_4\text{L}/\text{H}_3\text{L.H}$	$(1.0) \pm 0.2$	$(1.2) \pm 0.2$	$(1.3)^{\text{e}}$	$(0)^{\text{s}}$	$(5)^{\text{c}}$
Li^+	ML/M.L	2.45 ± 0.1 2.36^{b}	2.44		$(+2)^{\text{t}}$	(18)
Na^+	ML/M.L	1.2 ± 0.1 1.1^{b}	1.2		$(+2)^{\text{t}}$	(12)
K^+	ML/M.L	0.6 ± 0.2 0.5^{b}	0.6		$(+4)^{\text{t}}$	(16)
Rb^+	ML/M.L	0.4				
Cs^+	ML/M.L	0.2				
Be^{2+}	ML/M.L	7.79 ± 0.07			$(+6)^{\text{r}}$	(56)
Mg^{2+}	ML/M.L	5.50 ± 0.03		6.500	$+4.3^{\text{h}} \pm 0.2$	40
Ca^{2+}	ML/M.L $\text{ML}_2/\text{M.L}^2$	6.44 ± 0.05 8.81		7.608	$-1.36^{\text{h}} \pm 0.00$ -7.8^{h}	25
Sr^{2+}	ML/M.L	4.99 ± 0.02			$-0.54^{\text{h}} \pm 0.01$	21
Ba^{2+}	ML/M.L	4.81 ± 0.02		5.875	-1.44^{h}	17
Th^{4+}	ML/M.L ML/MOHL.H	$(16.9)^{\text{h}}$ $15.2^{\text{b,u}}$ 8.6				
Cr^{2+}	ML/M.L $\text{ML}_2/\text{M.L}^2$ $\text{M}_2\text{L}/\text{ML.M}$		6.52^{v} 9.66^{v} 2.02^{v}			
Zr^{4+}	ML/M.L	20.8 ± 0.1	$19.5^{\text{j}} \pm 0.6$	24.1	$+6.0$	130
Hf^{4+}	ML/M.L	20.4		23.6	$+4.9$	124
VO^{2+}	ML/M.L ML/MOHL.H	(11.47) $(12.30)^{\text{b,u}}$ 7.2 ± 0.2 7.15^{b}				

$^{\text{b}}25^\circ, 0.5$; $^{\text{c}}25^\circ, 1.0$; $^{\text{e}}25^\circ, 3.0$; $^{\text{h}}20^\circ, 0.1$; $^{\text{j}}20^\circ, 1.0$; $^{\text{r}}20-40^\circ, 0.1$; $^{\text{s}}15-35^\circ, 1.0$; $^{\text{t}}10-45^\circ, 0.25$;
 $^{\text{u}}\text{Na}^+$ salt used as background electrolyte; $^{\text{v}}\text{K}^+$ salt used as background electrolyte;
 $^{\text{z}}\text{R}_4\text{N}^+$ salt used as background electrolyte.

NTA (continued)

Metal ion	Equilibrium	Log K 25°, 0.1	Log K 25°, 1.0	Log K 20°, 0	ΔH 25°, 0.1	ΔS 25°, 0.1
Pb ²⁺	ML/M.L	11.4 ± 0.1 10.0 ^{b,u}			-3.8 ^h	40
	MHL/ML.H	2.3 ^b				
Al ³⁺	ML/M.L	11.4 11.6 ^{p,v} 10.8 ^{b,u}				
	MHL/ML.H	1.90				
	ML/MOHL.H	5.09 5.16 ^p				
Ge(IV)	M(OH) ₂ L/M(OH) ₄ .H ₂ L	4.42 ^h				

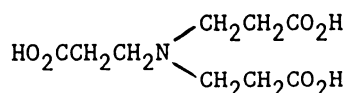
^b25°, 0.5; ^h20°, 0.1; ^p35°, 0.1; ^uNaClO₄ used as background electrolyte;

^vKNO₃ used as background electrolyte.

Bibliography:

H⁺ 65MP, 71GK, 81FM, 81VL, 82Ab, 82HA, 83DN, 83DR, 83FF, 83JKa, 85DRa, 85Hb;
 Li⁺-Cs⁺ 67A, 85DRa, 85Hc;
 Be²⁺ 75IP;
 Mg²⁺ 64DS;
 Ca²⁺ 72MR, 77A;
 Y³⁺-Lu³⁺ 51SF, 56SG, 80NSc;
 Am³⁺, Cm³⁺ 71M;
 Th⁴⁺ 67BA;
 Cr²⁺ 83MDN;
 Cu²⁺ 80NW, 81FM, 81WN, 82BC, 83DN;
 Zr⁴⁺, Hf⁴⁺ 81VB;
 VO²⁺ 83FF;
 Zn²⁺ 49AS, 81FM, 82BC;
 Pb²⁺ 80NW, 85BA, 85N;
 Al³⁺ 80TH, 84N;
 Ge(IV) 81MMB;

Other references: 50KK, 56WJ, 57BV, 63R, 67KF, 67S, 68RL, 69MP, 70GK, 70MP, 72MR, 72RMG, 74RM, 78SW, 80KV, 80SK, 81DS, 81FK, 81GD, 81GM, 81Kka, 81PC, 81RC, 81RRS, 82Ab, 82GLa, 83IT, 83VKD, 83YM, 84BL, 84GSW, 84LM, 84PBP, 84SY, 85IW, 85SGY, 85SRV



C₉H₁₅O₆N

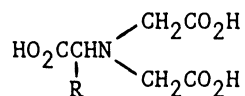
Nitrilotri-3-propanoic acid
 (Other values in Vol.1, p.148)

H₃L

Metal ion	Equilibrium	Log K 20°, 0.1	Log K 30°, 0.1
H ⁺	HL/H.L	9.49 ^v	9.30 ^v
	H ₂ L/HL.H	4.22	4.24
	H ₃ L/H ₂ L.H	3.68	3.67
Be ²⁺	ML/M.L	7.90	

^vK⁺ salt used as background electrolyte.

Bibliography: 75VB

 $\text{C}_x\text{H}_y\text{O}_6\text{N}$ DL-2-Alkylnitritotriacetic acid H_3L

<u>Ligand</u>	<u>Metal ion</u>	<u>Equilibrium</u>	<u>Log K</u> <u>25°, 0.1</u>	<u>Log K</u> <u>20°, 0.1</u>
R = CH_3	H^+	HL/H.L	(9.85) ^v	(10.43) ^v ± 0.04
DL-2-Methyl-		$\text{H}_2\text{L}/\text{HL.H}$	(2.58)	2.45 ± 0.01
		$\text{H}_3\text{L}/\text{H}_2\text{L.H}$		(1.5) ± 0.1
(alanine-N,N-diacetic acid)	Mg^{2+}	ML/M.L		5.84 - 0.01
	Ca^{2+}	ML/M.L		6.97 ± 0.00
($\text{C}_7\text{H}_{11}\text{O}_6\text{N}$)	Sr^{2+}	ML/M.L		5.16 ± 0.03
(Other reference in Vol.1, p.149)	Ba^{2+}	ML/M.L		4.83 ± 0.04
	La^{3+}	ML/M.L		11.02
		$\text{ML}_2/\text{M.L}^2$		(18.24) ^x
	Ce^{3+}	ML/M.L		11.50
		$\text{ML}_2/\text{M.L}^2$		(19.41) ^x
	Pr^{3+}	ML/M.L		11.73
		$\text{ML}_2/\text{M.L}^2$		(19.87) ^x
	Nd^{3+}	ML/M.L		11.93
		$\text{ML}_2/\text{M.L}^2$		(20.34) ^x
	Sm^{3+}	ML/M.L		12.18
		$\text{ML}_2/\text{M.L}^2$		(21.43) ^x
	Gd^{3+}	ML/M.L		12.24
		$\text{ML}_2/\text{M.L}^2$		(21.84) ^x
	Tb^{3+}	ML/M.L		12.26
		$\text{ML}_2/\text{M.L}^2$		(21.89) ^x
	Dy^{3+}	ML/M.L		12.45
		$\text{ML}_2/\text{M.L}^2$		(22.09) ^x
	Ho^{3+}	ML/M.L		12.60
		$\text{ML}_2/\text{M.L}^2$		(22.18) ^x
	Er^{3+}	ML/M.L		12.70
		$\text{ML}_2/\text{M.L}^2$		(22.19) ^x
	Tm^{3+}	ML/M.L		13.01
		$\text{ML}_2/\text{M.L}^2$		(22.70) ^x
	Yb^{3+}	ML/M.L		13.23
		$\text{ML}_2/\text{M.L}^2$		(23.05) ^x
	Co^{2+}	ML/M.L		11.05
	Ni^{2+}	ML/M.L		11.99

^v K^+ salt used as background electrolyte; ^xDL-mixture

DL-2-Methylnitrilotriacetic acid (continued)

<u>Ligand</u>	<u>Metal ion</u>	<u>Equilibrium</u>	<u>Log K</u> <u>25°, 0.1</u>	<u>Log K</u> <u>20°, 0.1</u>
	Cu ²⁺	ML/M.L		13.88
	VO ²⁺	ML/M.L	11.77	
		ML/MOHL.H	7.06	
	Zn ²⁺	ML/M.L		10.98 ±0.09
	Cd ²⁺	ML/M.L		10.61
	Pb ²⁺	ML/M.L		12.07
R= CH ₂ CH ₃	H ⁺	HL/H.L	9.81 ^v	9.88 ^v
DL-2-Ethyl-		H ₂ L/HL.H	2.76	2.48
		H ₃ L/H ₂ L.H	(1.9)	(1.6)
(C ₈ H ₁₃ O ₆ N)	Mg ²⁺	ML/M.L		5.36
	Ca ²⁺	ML/M.L		6.46
	Sr ²⁺	ML/M.L		4.52
	Ba ²⁺	ML/M.L		4.48
	La ³⁺	ML/M.L		9.98
		ML ₂ /M.L ²		(16.33) ^x
	Ce ³⁺	ML/M.L		10.48
		ML ₂ /M.L ²		(17.63) ^x
	Pr ³⁺	ML/M.L		10.67
		ML ₂ /M.L ²		(18.11) ^x
	Nd ³⁺	ML/M.L		10.82
		ML ₂ /M.L ²		(18.50) ^x
	Sm ³⁺	ML/M.L		11.13
		ML ₂ /M.L ²		(19.57) ^x
	Gd ³⁺	ML/M.L		11.25
		ML ₂ /M.L ²		(19.89) ^x
	Tb ³⁺	ML/M.L		11.29
		ML ₂ /M.L ²		(19.95) ^x
	Dy ³⁺	ML/M.L		11.45
		ML ₂ /M.L ²		(20.12) ^x
	Ho ³⁺	ML/M.L		11.58
		ML ₂ /M.L ²		(20.10) ^x
	Er ³⁺	ML/M.L		11.77
		ML ₂ /M.L ²		(20.37) ^x
	Tm ³⁺	ML/M.L		12.07
		ML ₂ /M.L ²		(20.81) ^x
	Yb ³⁺	ML/M.L		12.19
		ML ₂ /M.L ²		(21.01) ^x

^vK⁺ salt used as background electrolyte; ^xDL-mixture

DL-2-Ethyl-nitrilotriacetic acid (continued)

<u>Ligand</u>	<u>Metal ion</u>	<u>Equilibrium</u>	<u>Log K</u> <u>25°, 0.1</u>	<u>Log K</u> <u>20°, 0.1</u>
	Co ²⁺	ML/M.L		10.42
	Ni ²⁺	ML/M.L		11.24
	Cu ²⁺	ML/M.L	13.10	13.11
		MHL/M.HL	6.28	
		MOHL/ML.OH	3.37*	
	Zn ²⁺	ML/M.L		10.35
	Cd ²⁺	ML/M.L		9.96
	Pb ²⁺	ML/M.L		11.55
R= CH ₂ CH ₂ CH ₃	H ⁺	HL/H.L		9.94 ^v
DL-2-Propyl-		H ₂ L/HL.H		2.46
		H ₃ L/H ₂ L.H		(1.6)
(C ₉ H ₁₅ O ₆ N)	Mg ²⁺	ML/M.L		5.36
	Ca ²⁺	ML/M.L		6.40
	Sr ²⁺	ML/M.L		4.60
	Ba ²⁺	ML/M.L		4.41
	La ³⁺	ML/M.L		9.75
		ML ₂ /M.L ²		(16.26) ^x
	Ce ³⁺	ML/M.L		10.15
		ML ₂ /M.L ²		(17.27) ^x
	Pr ³⁺	ML/M.L		10.36
		ML ₂ /M.L ²		(17.73) ^x
	Nd ³⁺	ML/M.L		10.58
		ML ₂ /M.L ²		(18.01) ^x
	Sm ³⁺	ML/M.L		10.87
		ML ₂ /M.L ²		(19.07) ^x
	Gd ³⁺	ML/M.L		10.99
		ML ₂ /M.L ²		(19.46) ^x
	Tb ³⁺	ML/M.L		11.05
		ML ₂ /M.L ²		(19.54) ^x
	Yb ³⁺	ML/M.L		11.99
		ML ₂ /M.L ²		(20.57) ^x
	Co ²⁺	ML/M.L		10.33
	Ni ²⁺	ML/M.L		11.11
	Cu ²⁺	ML/M.L		12.92
	Zn ²⁺	ML/M.L		10.17
	Cd ²⁺	ML/M.L		9.78
	Pb ²⁺	ML/M.L		11.49

^vK⁺ salt used as background electrolyte; ^xDL-mixture; *value used for Kw not given.

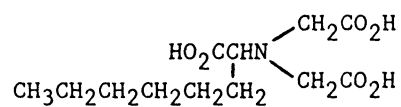
DL-2-Alkylnitritotriacetic acid (continued)

<u>Ligand</u>	<u>Metal ion</u>	<u>Equilibrium</u>	<u>Log K</u>	<u>Log K</u>
			<u>25°, 0.1</u>	<u>20°, 0.1</u>
R= CH(CH ₃) ₂ DL-2-(2-Propyl)-	H ⁺	HL/H.L		9.68 ^v
		H ₂ L/HL.H		2.40
		H ₃ L/H ₂ L.H		(1.7)
(valine-N,N- diacetic acid) (C ₉ H ₁₅ O ₆ N)	Mg ²⁺	ML/M.L		4.24
	Ca ²⁺	ML/M.L		5.19
	Sr ²⁺	ML/M.L		3.37
	Ba ²⁺	ML/M.L		3.19
	La ³⁺	ML/M.L		8.30
		ML ₂ /M.L ²		(13.77) ^x
	Ce ³⁺	ML/M.L		8.77
		ML ₂ /M.L ²		(14.93) ^x
	Pr ³⁺	ML/M.L		9.00
		ML ₂ /M.L ²		(15.28) ^x
	Nd ³⁺	ML/M.L		9.27
		ML ₂ /M.L ²		(15.84) ^x
	Sm ³⁺	ML/M.L		9.42
		ML ₂ /M.L ²		(16.51) ^x
	Gd ³⁺	ML/M.L		9.53
		ML ₂ /M.L ²		(16.95) ^x
	Tb ³⁺	ML/M.L		9.62
		ML ₂ /M.L ²		(17.02) ^x
	Dy ³⁺	ML/M.L		9.81
		ML ₂ /M.L ²		(17.21) ^x
	Ho ³⁺	ML/M.L		10.05
		ML ₂ /M.L ²		(17.42) ^x
	Er ³⁺	ML/M.L		10.28
		ML ₂ /M.L ²		(17.69) ^x
	Tm ³⁺	ML/M.L		10.42
		ML ₂ /M.L ²		(17.77) ^x
	Yb ³⁺	ML/M.L		10.49
		ML ₂ /M.L ²		(17.80) ^x
	Co ²⁺	ML/M.L		9.03
	Ni ²⁺	ML/M.L		9.81
	Cu ²⁺	ML/M.L		11.96
	Zn ²⁺	ML/M.L		8.89
	Cd ²⁺	ML/M.L		8.42
	Pb ²⁺	ML/M.L		10.03

^vK⁺ salt as background electrolyte; ^xDL-mixtureBibliography: H⁺ 74RMa, 83FF, 85KKa;Mg²⁺-Ba²⁺, Co²⁺, Ni²⁺, Zn²⁺-Pb²⁺ 74RMa;La³⁺-Yb³⁺ 74Rmb;

Other references: 78CG, 85KK

Cu²⁺ 74RMa, 85KKa;VO²⁺ 83FF;



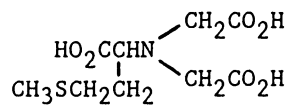
$\text{C}_{12}\text{H}_{21}\text{O}_6\text{N}$ DL-2-Hexylnitrilotriacetic acid (2-aminohexanoic-N,N-diacetic acid)

H_3L

Metal ion	Equilibrium	Log K 20°, 0.1
H^+	HL/H.L	10.08 ^v
	$\text{H}_2\text{L}/\text{HL.H}$	2.51
	$\text{H}_3\text{L}/\text{H}_2\text{L.H}$	(1.9)
Mg^{2+}	ML/M.L	5.44
Ca^{2+}	ML/M.L	6.47
Sr^{2+}	ML/M.L	4.62
Ba^{2+}	ML/M.L	4.40
La^{3+}	ML/M.L	9.84
Ce^{3+}	ML/M.L	10.18
Pr^{3+}	ML/M.L	10.40
Nd^{3+}	ML/M.L	10.68
Sm^{3+}	ML/M.L	10.93
Eu^{3+}	ML/M.L	11.06
Gd^{3+}	ML/M.L	11.08
Tb^{3+}	ML/M.L	11.19
Dy^{3+}	ML/M.L	11.34
Ho^{3+}	ML/M.L	11.53
Er^{3+}	ML/M.L	11.65
Tm^{3+}	ML/M.L	11.80
Yb^{3+}	ML/M.L	11.99
Lu^{3+}	ML/M.L	12.17
Ni^{2+}	ML/M.L	11.23
Cu^{2+}	ML/M.L	13.01
Cd^{2+}	ML/M.L	9.84
Pb^{2+}	ML/M.L	11.29

^v KNO_3 used as background electrolyte.

Bibliography: 85LBF

 $\text{C}_9\text{H}_{15}\text{O}_6\text{NS}$

DL-2-(2-Methylthioethyl)nitrilotriacetic acid
 (methionine-N,N-diacetic acid)

 H_3L

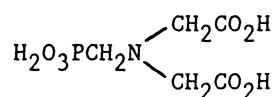
Metal ion	Equilibrium	Log K 25°, 0.1	Log K 25°, 0.5
H^+	HL/H.L	(10.68) ^v	(12.0) ^u
	$\text{H}_2\text{L}/\text{HL.H}$	7.60	7.53
	$\text{H}_3\text{L}/\text{H}_2\text{L.H}$	2.47	2.49
	$\text{H}_4\text{L}/\text{H}_3\text{L.H}$	2.11	
Mg^{2+}	MHL/M.HL		1.48
Ca^{2+}	MHL/M.HL		1.35
Sr^{2+}	MHL/M.HL		0.58
Ba^{2+}	MHL/M.HL		0.55
Mn^{2+}	MHL/M.HL		3.16
Fe^{2+}	MHL/M.HL	4.68	
	$\text{M}(\text{HL})_2/\text{M.}(\text{HL})^2$	(8.01) ^w	
	MHL/ML.H	9.02	
	$\text{M}(\text{HL})_2/\text{ML}_2.\text{H}^2$	(18.17) ^w	
Co^{2+}	MHL/M.HL		5.35
	$\text{M}(\text{HL})_2/\text{M.}(\text{HL})^2$		(9.51) ^w
Ni^{2+}	MHL/M.HL		7.15
	$\text{M}(\text{HL})_2/\text{M.}(\text{HL})^2$		(12.87) ^w
	$\text{M}(\text{HL})_3/\text{M.}(\text{HL})^3$		(15.62) ^w
	$\text{MH}_2\text{L}/\text{MHL.H}$		5.13
Cu^{2+}	MHL/M.HL		9.23
	$\text{M}(\text{HL})_2/\text{M.}(\text{HL})^2$		(13.33) ^w
	$\text{MH}_2\text{L}/\text{MHL.H}$		6.10
Fe^{3+}	MHL/M.HL	10.98	
	MHL/ML.H	3.18	
	ML/MOHL.H	6.48	
Zn^{2+}	MHL/M.HL		5.54
	$\text{M}(\text{HL})_2/\text{M.}(\text{HL})^2$		(9.47) ^w
Cd^{2+}	MHL/M.HL		3.98
	$\text{M}(\text{HL})_2/\text{M.}(\text{HL})^2$		(7.38) ^w

^uNaCl used as background electrolyte; ^vKCl used as background electrolyte;
^woptical isomerism not stated.

Bibliography:

H^+ 79MFM;
 Mg^{2+} - Mn^{2+} , Co^{2+} , Ni^{2+} , Zn^{2+} , Cd^{2+} 80MFA;

Fe^{2+} 79MMM;
 Fe^{3+} 80MMM

 $\text{C}_5\text{H}_{10}\text{O}_7\text{NP}$

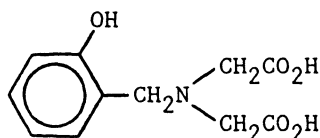
N-(Phosphonomethyl)iminodiacetic acid
(Other values in Vol.1, p.157)

 H_4L

Metal ion	Equilibrium	Log K 25°, 0.1	Log K 20°, 0.1	Log K 25°, 0	ΔH 25°, 0	ΔS 25°, 0
H^+	HL/H.L	(10.29) ^v	(10.76) ^v	(11.32)	-6.0	32
	$\text{H}_2\text{L}/\text{HL.H}$	5.57	5.57	(5.99)	+1.6	33
					+1.1 ^c	
	$\text{H}_3\text{L}/\text{H}_2\text{L.H}$	2.44	2.25			
Be^{2+}	$\text{H}_4\text{L}/\text{H}_3\text{L.H}$	(1.2)	2.0			
	ML/M.L	9.14 ^v				
	MHL/M.HL	4.6				
Mn^{2+}	MHL/M.HL		3.5			
Co^{2+}	MHL/M.HL		5.7			
Zn^{2+}	MHL/M.HL		5.9			
Al^{3+}	ML/M.L	14.7 ^v				
	MHL/M.HL	7.4				
Ga^{3+}	ML/M.L	19.50 ^v				
	MHL/ML.H	3.10				
	ML/MOHL.H	5.95				

^c25°, 1.0; ^v K^+ salt used as background electrolyte.Bibliography: H^+ 80MM, 81VK; Be^{2+} , Al^{3+} 76VG; Mn^{2+} - Zn^{2+} 80MTV; Ga^{3+} 80MM;

Other references: 81KKa, 83KK, 85PM

 $\text{C}_{11}\text{H}_{13}\text{O}_5\text{N}$

N-(2-Hydroxybenzyl)iminodiacetic acid
(Other values in Vol.1, p.161 and Vol.5, p.65)

 H_3L

Metal ion	Equilibrium	Log K 25°, 0.1	Log K 20°, 0.1	Log K 25°, 1.0
H^+	HL/H.L	11.8 ^v ± 0.1	11.79 ^v ± 0.5	
	$\text{H}_2\text{L}/\text{HL.H}$	8.06 ± 0.02	8.17 - 0.1	8.05 ^v
	$\text{H}_3\text{L}/\text{H}_2\text{L.H}$	2.36 ± 0.02	2.28 - 0.1	2.36
Y^{3+}	ML/M.L		14.2	
	$\text{ML}_2/\text{M.L}^2$		24.3	
La^{3+}	ML/M.L		11.57*	
	$\text{ML}_2/\text{M.L}^2$		18.67*	
	MHL/M.HL		(5.30)	
Ce^{3+}	ML/M.L		12.11*	
	$\text{ML}_2/\text{M.L}^2$		19.91*	
	MHL/M.HL		(5.14)	

^v K^+ salt used as background electrolyte. *Log K (ML/M.L) and log K ($\text{ML}_2/\text{M.L}^2$) adjusted by -0.57 to be compatible with log protonation constants listed.

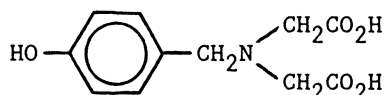
N-(2-Hydroxybenzyl)iminodiacetic acid (continued)

Metal ion	Equilibrium	Log K 25°, 0.1	Log K 20°, 0.1	Log K 25°, 1.0
Pr ³⁺	ML/M.L		12.35*	
	ML ₂ /M.L ²		20.57*	
	MHL/M.HL		(5.16)	
Nd ³⁺	ML/M.L		12.70*	
	ML ₂ /M.L ²		21.44*	
	MHL/M.HL		(5.16)	
Sm ³⁺	ML/M.L		13.05*	
	ML ₂ /M.L ²		22.54*	
	MHL/M.HL		(4.62)	
Eu ³⁺	ML/M.L		13.18*	
	ML ₂ /M.L ²		22.95*	
	MHL/M.HL		(4.24)	
Gd ³⁺	ML/M.L		13.25*	
	ML ₂ /M.L ²		23.22*	
	MHL/M.HL		(4.30)	
Tb ³⁺	ML/M.L		13.47*	
	ML ₂ /M.L ²		23.56*	
	MHL/M.HL		(3.88)	
Dy ³⁺	ML/M.L		13.68*	
	ML ₂ /M.L ²		23.94*	
	MHL/M.HL		(3.88)	
Ho ³⁺	ML/M.L		13.67*	
	ML ₂ /M.L ²		24.06*	
	MHL/M.HL		(3.82)	
Er ³⁺	ML/M.L		13.75*	
	ML ₂ /M.L ²		24.22*	
	MHL/M.HL		(3.82)	
Tm ³⁺	ML/M.L		13.96*	
	ML ₂ /M.L ²		24.63*	
	MHL/M.HL		(3.82)	
Yb ³⁺	ML/M.L		14.00*	
	ML ₂ /M.L ²		24.69*	
	MHL/M.HL		(3.85)	
Lu ³⁺	ML/M.L		14.05*	
	ML ₂ /M.L ²		24.74*	
	MHL/M.HL		(3.80)	
Co ²⁺	ML/M.L	13.0 ±0.1		
	ML ₂ /M.L ²	24.4		
	MHL/ML.H	5.80 ±0.01		
Ni ²⁺	ML/M.L	14.0 ±0.2		
	MHL/ML.H	6.13 -0.01		

*Log K (ML/M.L) and log K (ML₂/ML.L) adjusted by -0.57 to be compatible with log protonation constants listed.

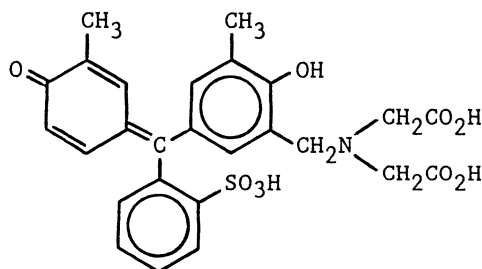
N-(2-Hydroxybenzyl)iminodiacetic acid (continued)

Metal ion	Equilibrium	Log K 25°, 0.1	Log K 20°, 0.1	Log K 25°, 1.0
Cu ²⁺	ML/M.L	16.3 ±0.2		
	MHL/ML.H	6.49 ±0.03		
Zn ²⁺	ML/M.L	13.2 ±0.1		
	ML ₂ /M.L ²	24.5		
	MHL/ML.H	5.75 ±0.04		

Bibliography: H⁺ 80THU, 83MSV; Y³⁺-Lu³⁺ 83MSV; Co²⁺-Zn²⁺ 80THUC₁₁H₁₃O₅NN-(4-Hydroxybenzyl)iminodiacetic acidH₃L

Metal ion	Equilibrium	Log K 25°, 0.1
H ⁺	HL/H.L	10.38
	H ₂ L/HL.H	8.86
	H ₃ L/H ₂ L.H	(2.0)
Co ²⁺	ML/M.L	7.66
	MHL/ML.H	9.35
Ni ²⁺	ML/M.L	9.02
	MHL/ML.H	9.20
Cu ²⁺	ML/M.L	12.48
	MHL/ML.H	8.55
Zn ²⁺	ML/M.L	8.81
	MHL/ML.H	8.42

Bibliography: 80THU

C₂₆H₂₄O₉NS

5'-Bis(carboxymethyl)aminomethyl-3,3'-dimethyl-4'-hydroxyfuchson-2''-sulfonic acid (Semi-Xylenol Orange)
 (Other references in Vol.1, p.399 and other values in Vol.5, p.67)

H₄L

Metal ion	Equilibrium	Log K 25°, 0.1
H ⁺	HL/H.L	10.9
	H ₂ L/HL.H	7.44
	H ₃ L/H ₂ L.H	2.60
	H ₄ L/H ₃ L.H	(1.5)

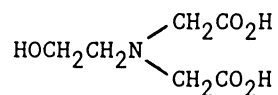
Semi-Xylenol Orange (continued)

Metal ion	Equilibrium	Log K 25°, 0.1
Mn ²⁺	ML/M.L	9.4
Co ²⁺	ML/M.L	(12.4)
	MHL/ML.H	6.0
Ni ²⁺	ML/M.L	(11.2)
	MHL/ML.H	6.7
Cu ²⁺	ML/M.L	(10.8)
	MHL/ML.H	6.4
	MOHL/ML.OH	3.4*
Zn ²⁺	ML/M.L	11.8
	MHL/ML.H	6.2
Cd ²⁺	ML/M.L	9.8
Hg ²⁺	MHL/M.HL	6.8
Pb ²⁺	ML/M.L	13.4
	MHL/ML.H	5.6

*Value used for K_w not stated.

Bibliography: 81M;

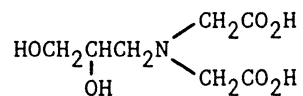
Other references: 83Kb, 85HK



C ₆ H ₁₁ O ₅ N		N-(2-Hydroxyethyl)iminodiacetic acid (HIDA)				H ₂ L
Metal ion	Equilibrium	Log K 25°, 0.1	Log K 25°, 1.0	Log K 25°, 0	ΔH 25°, 0.1	ΔS 25°, 0.1
H ⁺	HL/H.L	8.68 ± 0.04 8.52 ^{b,u}	8.69 ^v ± 0.03		-5.3	22
	H ₂ L/HL.H	2.20 ± 0.05 2.28 ^b	2.22		-0.6	8
Cu ²⁺	ML/M.L	11.72 ± 0.07 11.29 ^{b,v}	11.15 ^v	12.56	-5.6 -0.1 -6.4 ^c	35
	ML ₂ /M.L ²	15.68 ± 0.06 15.23 ^{b,v}	15.06 ^v	16.52	-10.6 ± 0.1 -11.5 ^c	36
VO ²⁺	ML/M.L	9.60				
	ML/MOHL.H	5.3				
Pb ²⁺	ML/M.L	9.41 ^h 8.75 ^{b,u}				
	MHL/ML.H	2.8 ^b				
	ML/MOHL.H	8.25 ^h				
Al ³⁺	ML/M.L	7.74 7.49 ^{b,u}			+6.2	56

^b25°, 0.5; ^c25°, 1.0; ^h20°, 0.1; ^uNaClO₄ used as background electrolyte;^vKNO₃ used as background electrolyte.Bibliography: H⁺ 80TH;Cu²⁺ 85VRL; VO²⁺ 83FF; Pb²⁺ 85N; Al³⁺ 84N;

Other references: 71EVa, 75MRa

 $\text{C}_7\text{H}_{13}\text{O}_6\text{N}$ DL-N-(2,3-Dihydroxypropyl)iminodiacetic acid H_2L

Metal ion	Equilibrium	Log K <u>20°, 0.1</u>	Log K <u>25°, 0</u>
H^+	HL/H.L H ₂ L/HL.H	8.29 2.01	8.67 (2.60)
Mg^{2+}	ML/M.L	3.02	
Ca^{2+}	ML/M.L	4.41	
La^{3+}	ML/M.L ML ₂ /M.L ²	7.52 (13.25) ^x	
Ce^{3+}	ML/M.L ML ₂ /M.L ²	7.84 (14.16) ^x	
Pr^{3+}	ML/M.L ML ₂ /M.L ²	8.33 (15.18) ^x	
Nd^{3+}	ML/M.L ML ₂ /M.L ²	8.45 (15.55) ^x	
Sm^{3+}	ML/M.L ML ₂ /M.L ²	8.50 (16.02) ^x	
Eu^{3+}	ML/M.L ML ₂ /M.L ²	8.51 (16.12) ^x	
Gd^{3+}	ML/M.L ML ₂ /M.L ²	8.50 (16.20) ^x	
Tb^{3+}	ML/M.L ML ₂ /M.L ²	8.70 (16.63) ^x	
Dy^{3+}	ML/M.L ML ₂ /M.L ²	8.82 (16.81) ^x	
Ho^{3+}	ML/M.L ML ₂ /M.L ²	8.84 (16.80) ^x	
Er^{3+}	ML/M.L ML ₂ /M.L ²	8.88 (16.82) ^x	
Tm^{3+}	ML/M.L ML ₂ /M.L ²	8.95 (16.77) ^x	
Yb^{3+}	ML/M.L ML ₂ /M.L ²	9.06 (16.78) ^x	
Co^{2+}	ML/M.L ML ₂ /M.L ²	7.70 (11.41) ^x	
Ni^{2+}	ML/M.L ML ₂ /M.L ²	9.09 (13.56) ^x	
Cu^{2+}	ML/M.L	11.31	

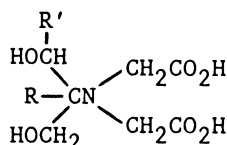
^xDL-mixture

DL-N-(2,3-Dihydroxypropyl)iminodiacetic acid (continued)

Metal ion	Equilibrium	Log K 20°, 0.1	Log K 25°, 0
Zn ²⁺	ML/M.L ML ₂ /M.L ²	8.11 (11.53) ^x	
Cd ²⁺	ML/M.L ML ₂ /M.L ²	7.26 (12.17) ^x	
Hg ²⁺	ML ₂ /M.L ²	(12.57) ^x	
Pb ²⁺	ML/M.L ML ₂ /M.L ²	9.02 (12.94) ^x	

^xDL-mixture

Bibliography:

H⁺ 75MRb, 80MRP;Mg²⁺, Ca²⁺, Co²⁺-Pb²⁺ 80MRP;La³⁺-Yb³⁺ 80RPC_xH_yO₆NN-(Dihydroxyalkyl)iminodiacetic acidH₂L

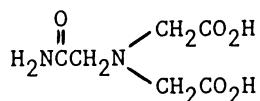
Ligand	Metal ion	Equilibrium	Log K 25°, 1.0
R= CH ₃ , R'= H	H ⁺	HL/H.L	8.45 ^u
N-[1,1-Bis-(hydroxymethyl)-ethyl]-	Mg ²⁺	H ₂ L/HL.H	2.80
		H ₃ L/H ₂ L.H	(1.0)
(C ₈ H ₁₅ O ₆ N)	Ca ²⁺	ML/M.L	1.96
		ML/M.L	4.85
		ML/M.L	7.5
		ML ₂ /M.L ²	9.91
	Co ²⁺	ML/MOHL.H	8.11
		ML/M.L	9.07
		ML/M.L	10.22
		ML/MOHL.H	7.19
	Zn ²⁺	ML/M.L	7.96
		ML ₂ /M.L ²	10.3
		MHL/ML.H	3.23
		ML/MOHL.H	8.26
	Cd ²⁺	ML/M.L	7.29
		ML ₂ /M.L ²	10.1
	Pb ²⁺	ML/M.L	10.12
		ML/MOHL.H	8.44

^uNaClO₄ used as background electrolyte.

N-(Dihydroxyalkyl)iminodiacetic acid (continued)

<u>Ligand</u>	<u>Metal</u> <u>ion</u>	<u>Equilibrium</u>	<u>Log K</u> <u>25°, 1.0</u>
R= CH ₂ CH ₃ , R' = H	H ⁺	HL/H.L	8.67 ^u
N-[1,1-Bis-(hydroxymethyl)-propyl]-	Mg ²⁺	H ₂ L/HL.H	3.02
		H ₃ L/H ₂ L.H	(1.0)
(C ₉ H ₁₇ O ₆ N)	Ca ²⁺	ML/M.L	2.58
	Co ²⁺	ML/M.L	4.84
		ML ₂ /M.L ²	7.84
		MHL/ML.H	10.3
		ML/MOHL.H	3.66
			8.42
	Ni ²⁺	ML/M.L	9.42
	Cu ²⁺	ML/M.L	11.04
		ML/MOHL.H	7.07
	Zn ²⁺	ML/M.L	9.67
		ML ₂ /M.L ²	13.6
		MHL/ML.H	3.94
		ML/MOHL.H	8.29
	Cd ²⁺	ML/M.L	7.75
		ML ₂ /M.L ²	10.7
		MHL/ML.H	3.12
	Pb ²⁺	ML/M.L	10.38
		ML/MOHL.H	8.61
R= H, R' = C ₆ H ₅	H ⁺	HL/H.L	7.19 ^u
DL-N-(1-Hydroxy-methyl-2-hydroxy-2-phenylethyl)-	Mg ²⁺	H ₂ L/HL.H	2.35
		H ₃ L/H ₂ L.H	(1.4)
(C ₁₃ H ₁₇ O ₆ N)	Ca ²⁺	ML/M.L	2.35
	Co ²⁺	ML/M.L	3.18
		ML ₂ /M.L ²	6.76
		ML/MOHL.H	(9.5) ^w
			8.26
	Ni ²⁺	ML/M.L	8.54
		ML ₂ /M.L ²	(11.6) ^w
	Cu ²⁺	ML/M.L	9.90
		ML ₂ /M.L ²	(12.26) ^w
		ML/MOHL.H	2.4
	Zn ²⁺	ML/M.L	7.93
		ML ₂ /M.L ²	(13.2) ^w
		MHL/ML.H	2.58
		ML/MOHL.H	8.22
	Cd ²⁺	ML/M.L	5.84
		ML ₂ /M.L ²	(8.0) ^w
	Pb ²⁺	ML/M.L	7.8
		ML ₂ /M.L ²	(13.0) ^w
		ML/MOHL.H	7.99

^uNaClO₄ used as background electrolyte; ^woptical isomerism not stated.
Bibliography: 81ASa



$\text{C}_6\text{H}_{10}\text{O}_5\text{N}_2$ N-(Carbamylmethyl)iminodiacetic acid (N-2-acetamidoiminodiacetic acid) H_2L
(Other values in Vol.1, p.178 and note in Vol.5, p.457)

Metal ion	Equilibrium	Log K 25°, 0.1	Log K 20°, 0.1	Log K 25°, 0	ΔH 25°, 0	ΔS 25°, 0
H^+	HL/H.L	6.67 -0.01	6.71 -0.1	6.844	-2.9	22
	$\text{H}_2\text{L}/\text{HL}.\text{H}$	2.31 -0.2	2.30 -0.1			
Mg^{2+}	ML/M.L	2.54 ± 0.03	2.47 +0.1		(+5) ^t	(28) ^a
Ca^{2+}	ML/M.L	4.01 +0.01	4.01 ± 0.05		(-2) ^t	(12) ^a
Sr^{2+}	ML/M.L	2.94	2.99 ± 0.04		(-1) ^t	(10) ^a
Ba^{2+}	ML/M.L	2.81	2.86 ± 0.02		(-1) ^t	(10) ^a
Mn^{2+}	ML/M.L	4.72	4.93			
	$\text{ML}_2/\text{M.L}^2$	6.93	7.23			
Co^{2+}	ML/M.L	6.72	6.91			
	$\text{ML}_2/\text{M.L}^2$	9.34	10.21			
	$\text{ML}_2/\text{M}(\text{H}_{-1}\text{L})\text{L}.\text{H}$	10.03				
	$\text{M}(\text{H}_{-1}\text{L})\text{L}/\text{M}(\text{H}_{-1}\text{L})_2.\text{H}$	11.34				
Ni^{2+}	ML/M.L	7.86	8.02			
	$\text{ML}_2/\text{M.L}^2$	11.61	11.90			
Cu^{2+}	ML/M.L	(9.7)	9.68			
	$\text{ML}_2/\text{M.L}^2$	12.8	12.94			
	$\text{ML}/\text{M}(\text{H}_{-1}\text{L}).\text{H}$	7.96				
	$\text{M}(\text{H}_{-1}\text{L})/\text{MOH}(\text{H}_{-1}\text{L}).\text{H}$	10.08				
Zn^{2+}	ML/M.L	7.10	7.30			
	$\text{ML}_2/\text{M.L}^2$	9.22	9.54			
	$\text{ML}_2/\text{M}(\text{H}_{-1}\text{L})\text{L}.\text{H}$	9.49				
	$\text{M}(\text{H}_{-1}\text{L})\text{L}/\text{M}(\text{H}_{-1}\text{L})_2.\text{H}$	10.56				

^a25°, 0.1; ^t15-35°, 0.1

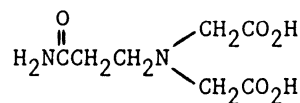
Bibliography:

H^+ 79N, 80BBN, 81RG;

Mg^{2+} - Ba^{2+} 79N, 80BBN;

Mn^{2+} , Ni^{2+} , Cu^{2+} 79N, 83LRN;

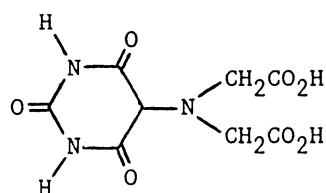
Co^{2+} , Zn^{2+} 79N, 81LN

 $\text{C}_7\text{H}_{12}\text{O}_5\text{N}_2$ N-(2-Carbamylethyl)iminodiacetic acid H_2L

Metal ion	Equilibrium	Log K <u>25°, 0.1</u>	Log K <u>20°, 0.1</u>	ΔH <u>25°, 0.1</u>	ΔS <u>25°, 0.1</u>
H^+	HL/H.L	8.46	8.52	(-5) ^t	(22)
	$\text{H}_2\text{L}/\text{HL.H}$	2.41	2.47		
Mg^{2+}	ML/M.L	3.79	3.78	(+1) ^t	(21)
Ca^{2+}	ML/M.L	3.91	3.93	(-2) ^t	(11)
Sr^{2+}	ML/M.L	2.93	2.94	(-1) ^t	(10)
Ba^{2+}	ML/M.L	2.89	2.90	(-1) ^t	(10)
Co^{2+}	ML/M.L		8.13		
	$\text{ML}_2/\text{M.L}^2$		12.18		
Ni^{2+}	ML/M.L		9.34		
	$\text{ML}_2/\text{M.L}^2$		14.05		
Cu^{2+}	ML/M.L		10.47		
	$\text{ML}_2/\text{M.L}^2$		14.71		
Zn^{2+}	ML/M.L		8.12		
	$\text{ML}_2/\text{M.L}^2$		11.94		
Cd^{2+}	ML/M.L		6.52		
	$\text{ML}_2/\text{M.L}^2$		11.12		
Pb^{2+}	ML/M.L		8.09		
	$\text{ML}_2/\text{M.L}^2$		10.03		

^t15-35°, 0.1

Bibliography:

 H^+ , Ba^{2+} 80BBN; Co^{2+} , Pb^{2+} 80BBM $\text{C}_8\text{H}_9\text{O}_7\text{N}$ Uramil-N,N-diacetic acid H_2L

(Other values in Vol.1, p.183 and Vol.5, p.70)

Metal ion	Equilibrium	Log K <u>25°, 0.1</u>	Log K <u>20°, 0.1</u>	Log K <u>20°, 0</u>	ΔH <u>25°, 0.1</u>	ΔS <u>25°, 0.1</u>
H^+	HL/H.L	9.55 ± 0.03	9.63	10.33		
		9.65 ^z ± 0.07			-3.7 ^{h,z}	32 ^z
	$\text{H}_2\text{L}/\text{HL.H}$	2.72 ± 0.05	2.67	3.1		
	$\text{H}_3\text{L}/\text{H}_2\text{L.H}$	(1.9) ± 0.2	(1.7)	(1.9)		

^h20°, 0.1; ^z(CH_3)₄N⁺ salt used as background electrolyte.

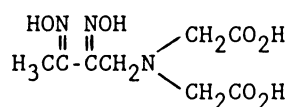
Uramil-N,N-diacetic acid (continued)

Metal ion	Equilibrium	Log K 25°, 0.1	Log K 20°, 0.1	Log K 20°, 0	ΔH 25°, 0.1	ΔS 25°, 0.1
Mn ²⁺	ML/M.L	9.95			(-3) ^s	(35)
		10.28 ^z				
	ML ₂ /M.L ²	14.04 ^z				
	MHL/ML.H	3.05				
Co ²⁺	ML/M.L	11.84			-4.2	40
Ni ²⁺	ML/M.L	13.12			-6.4	39
		14.19 ^z				
	ML ₂ /M.L ²	17.3 ^z				
Cu ²⁺	ML/M.L	14.10			-6.2	44
		15.54 ^z				
	ML ₂ /M.L ²	19.4 ^z				
	MHL/ML.H	2.46				
VO ²⁺	ML/MOHL.H	7.18				
Zn ²⁺	ML/M.L	12.21			-4.7	40
		13.39 ^z				
	ML ₂ /M.L ²	16.7 ^z				

^s20-40°, 0.1; ^z(CH₃)₄N⁺ salt used as background electrolyte.

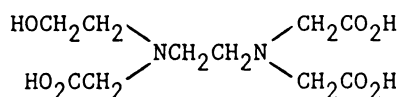
Bibliography:

H⁺ 81AF, 83FF;
Mn²⁺-Cu²⁺, Zn²⁺ 81AF;
VO²⁺ 83FF

C₈H₁₃O₆N₃1-[Bis(carboxymethyl)amino]butan-2,3-dione dioximeH₄L

Metal ion	Equilibrium	Log K 25°, 0.1
H ⁺	HL/H.L	(12.2)
	H ₂ L/HL.H	10.47
	H ₃ L/H ₂ L.H	8.23
	H ₄ L/H ₃ L.H	2.03
Co ²⁺	MH ₂ L/M.H ₂ L	8.00
Ni ²⁺	MH ₂ L/M.H ₂ L	9.87
	MH ₂ L/MHL.H	7.38
	M(HL) ₂ /M.(HL) ₂	18.4
	M ₂ (HL) ₂ /(MHL) ₂	3.2
Cu ²⁺	MH ₂ L/M.H ₂ L	11.6
	MH ₂ L/MHL.H	6.0

Bibliography: 81UM

 $\text{C}_{10}\text{H}_{18}\text{O}_7\text{N}_2$

N-(2-Hydroxyethyl)ethylenedinitrilotriacetic acid (HEDTA)
(Other values in Vol.1, p.199 and Vol.5, p.74)

 H_3L

Metal ion	Equilibrium	Log K 25°, 0.1	Log K 25°, 0.5	Log K 25°, 1.0	ΔH 25°, 0.1	ΔS 25°, 0.1
H^+	$\text{HL}/\text{H}_3\text{L}$	$9.84^{\text{v}} \pm 0.09$	$9.77^{\text{u}} \pm 0.03$	9.73^{v} 9.20^{u}	-6.7 -7.0 ^b	23
	$\text{H}_2\text{L}/\text{HL.H}$	5.39 ± 0.03	5.39 ± 0.01	5.49 ± 0.04	-3.1 -5.4 ^b	14
	$\text{H}_3\text{L}/\text{H}_2\text{L.H}$ $\text{H}_4\text{L}/\text{H}_3\text{L.H}$	2.67 ± 0.05	2.68	2.33 ± 0.03 (1.5)	+1.1	16
Am^{3+}	$\text{ML}/\text{M.L}$ $\text{ML}_2/\text{M.L}^2$	15.7 27.4		14.8^{u} 22.2^{u}		
V^{2+}	$\text{MHL}/\text{ML.H}$ $\text{ML}/\text{MOHL.H}$			3.87 10.18		
Mn^{2+}	$\text{ML}/\text{M.L}$	11.4 -0.6			-5.2	35
Co^{2+}	$\text{ML}/\text{M.L}$ $\text{MHL}/\text{ML.H}$	14.5 ± 0.0 2.24			-6.5	45
Cu^{2+}	$\text{ML}/\text{M.L}$ $\text{MHL}/\text{ML.H}$	17.4 ± 0.1 2.45 ± 0.03			-9.4	48
V^{3+}	$\text{MHL}/\text{ML.H}$ $\text{ML}/\text{MOHL.H}$ $(\text{MOHL})_2/(\text{MOHL})^2$			3.04 6.47 4.13		
Fe^{3+}	$(\text{MOHL})_2/(\text{MOHL})^2$			2.38	(-7) ^s	(-13) ^c
Co^{3+}	$\text{ML}/\text{M.L}$	37.2				
VO^{2+}	$\text{ML}/\text{M.L}$	17.1				
Zn^{2+}	$\text{ML}/\text{M.L}$	14.6 -0.1			-8.4	39
Cd^{2+}	$\text{ML}/\text{M.L}$ $\text{MHL}/\text{ML.H}$	14.2 ± 0.1		13.2^{u} 2.30	-10.3	30
Pb^{2+}	$\text{ML}/\text{M.L}$ $\text{MHL}/\text{ML.H}$	$15.6 -0.1$		14.8^{u} 2.14	-12.6	29

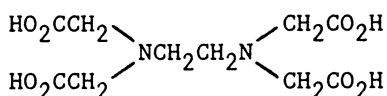
^b25°, 0.5; ^c25°, 1.0; ^s20-50°, 1.0; ^u NaClO_4 used as background electrolyte
^v K^+ salt used as background electrolyte.

Bibliography:

 H^+ 80MF, 81MM, 83FF; Am^{3+} 71M; V^{2+} V^{3+} 83KNT; Mn^{2+} - Cu^{2+} , Zn^{2+} - Pb^{2+} 83YW, 85KLL, 85YW;

Other references: 67ZA, 69JP, 77KS, 77MPb, 80TH, 81YO, 82TR

 Fe^{3+} 67SWJ; Co^{3+} 8300; VO^{2+} 83FF;

 $\text{C}_{10}\text{H}_{16}\text{O}_8\text{N}_2$

Ethylenedinitrilotetraacetic acid (EDTA)
(Other values in Vol.1, p.204 and Vol.5, p.75)

 H_4L

Metal ion	Equilibrium	Log K 25°, 0.1	Log K 25°, 1.0	Log K 25°, 0	ΔH 25°, 0.1	ΔS 25°, 0.1
H^+	HL/H.L	10.19 ^v ±0.04 10.37 ^z ±0.02 10.23 ^{b,z} ±0.08	8.77 ^u -0.09 9.86 ^v ±0.08 10.2 ^z ±0.1	11.014 9.05 ^{e,u} ±0.01	-5.6±0.2 -5.7 ^h ±0.2 -6.3 ^c ±0.2	28 ^v 29 ^z 26 ^c
	$\text{H}_2\text{L}/\text{HL.H}$	6.13±0.03 6.14 ^b ±0.02	6.21±0.04 5.98 ⁿ ±0.03	6.320 7.02 ^e ±0.02	-4.2±0.2 -4.4 ^h ±0.2 -5.6 ^c ±0.1	14 10 ^c
	$\text{H}_3\text{L}/\text{H}_2\text{L.H}$	2.69±0.05	2.52±0.07 2.71 ⁿ ±0.08	2.54 ^e ±0.04	+1.3 +1.4 ^h	17
	$\text{H}_4\text{L}/\text{H}_3\text{L.H}$	2.00±0.1	2.00±0.05 2.05 ⁿ ±0.05	2.20 ^e ±0.07	+0.3 +0.2 ^h	10
	$\text{H}_5\text{L}/\text{H}_4\text{L.H}$	(1.5)±0.1	(1.5)-0.1 (1.6) ⁿ	(1.7) ^e	+0.5 ^h	9
	$\text{H}_6\text{L}/\text{H}_5\text{L.H}$		(0.0)±0.1	(0.4) ^e	+0.2	5 ^{c*}
Li^+	ML/M.L	2.90±0.07			+0.1 +0.2 ^h	14
Na^+	ML/M.L	1.84±0.1			-1.4 -1.3 ^h	4
K^+	ML/M.L	0.8±0.2			0	4
Be^{2+}	ML/M.L	9.7±0.1			(+10) ^r	(78)
Mg^{2+}	ML/M.L	8.85±0.08 9.13 ^z 8.67 ^{b,z} 4.0 ^z 3.85 ^h			+3.3 ^h ±0.2	52 53 ^z
	MHL/ML.H					
Ca^{2+}	ML/M.L	10.65±0.08 10.97 ^z 10.47 ^{b,z} 3.1 ^z 3.18 ^h	9.68 ^v	(12.42)	-6.5 ^h ±0.1 -7.2 ^c	27 28 ^z 20 ^{c,v}
	MHL/ML.H					
Sr^{2+}	ML/M.L	8.74±0.08			-4.1 ^h ±0.1	26
	MHL/ML.H	3.93 ^h				
Ba^{2+}	ML/M.L	7.86±0.08	(6.93)		-4.9 ^h ±0.4 -6.0 ^c	20 (12) ^c
	MHL/ML.H	4.57 ^h				
Y^{3+}	ML/M.L	18.08±0.1 16.58 ^{b,u}			-0.6±0.3	81
La^{3+}	ML/M.L	15.46±0.1 14.48 ^{b,u}			-2.9±0.1 -4.9 ^c	61
	MHL/ML.H	2.24 2.0 ^h				
Ce^{3+}	ML/M.L	15.94±0.05 15.04 ^{b,u}			-2.9±0.1	63

^b25°,0.5; ^c25°,1.0; ^e25°,3.0; ^h20°,0.1; ⁿ37°,0.15; ^r20-40°,0.1; ^u Na^+ salt used as background electrolyte; ^v K^+ salt used as background electrolyte; ^z R_4N^+ salt used as background electrolyte; *assuming ΔH for 0.1 = ΔH for 1.0.

EDTA (continued)

Metal ion	Equilibrium	Log K 25°, 0.1	Log K 25°, 1.0	Log K 25°, 0	ΔH 25°, 0.1	ΔS 25°, 0.1
Pr ³⁺	ML/M.L	16.36 $\pm$ 0.04 15.44 ^{b,u}			-3.2 -5.2 ^c	64
Nd ³⁺	ML/M.L	16.60 $\pm$ 0.05 15.75 ^{b,u}			-3.6 $\pm$ 0.1 -5.5 ^c	64
	MHL/ML.H	2.0 ^h				
Sm ³⁺	ML/M.L	17.09 $\pm$ 0.05 16.20 ^{b,u}			-3.4 -5.6 ^c	67
Eu ³⁺	ML/M.L	17.29 $\pm$ 0.03 16.23 ^{b,u}			-2.6 -5.1 ^c -5.5 ^d	70
Gd ³⁺	ML/M.L	17.32 $\pm$ 0.03 16.28 ^{b,u}			-1.7 $\pm$ 0.1 -4.5 ^c	74
Tb ³⁺	ML/M.L	17.88 $\pm$ 0.04 16.59 ^{b,u}			-1.1 -3.9 ^c	78
Dy ³⁺	ML/M.L	18.26 $\pm$ 0.03 16.79 ^{b,u}			-1.2	80
Ho ³⁺	ML/M.L	18.53 $\pm$ 0.05 17.13 ^{b,u}			-1.4 -4.1 ^c	80
Er ³⁺	ML/M.L	18.85 $\pm$ 0.04 17.45 ^{b,u}			-1.7	81
Tm ³⁺	ML/M.L	19.28 $\pm$ 0.04 17.80 ^{b,u}			-1.9	82
Yb ³⁺	ML/M.L	19.51 $\pm$ 0.05 18.04 ^{b,u}			-2.3 -4.8 ^c	82
Lu ³⁺	ML/M.L	19.82 $\pm$ 0.03 18.19 ^{b,u}			-2.5	82
Am ³⁺	ML/M.L	17.8 $\pm$ 0.4 16.4 ^{b,u}			-4.7	66
Cm ³⁺	ML/M.L	18.1 $\pm$ 0.7 16.7 ^{b,u}	16.9 ^{d,u}		-6.9 ^d	54 ^d
Th ⁴⁺	ML/M.L	23.2 $\pm$ 0.0 22.3 ^{b,u}			-3.1	96
	MHL/ML.H	1.98			+0.1	9
	ML/MOHL.H	7.04				
	(ML) ² /M ₂ (OH) ₂ L ₂ .H ²	9.82				
		10.03 ^h				
UO ₂ ²⁺	MHL/M ₂ HL	7.40 $\pm$ 0.04	6.35 ^v		(+3) ^r	(45)
	M ₂ L/M ² .L	17.87	16.14 ^v			
	M ₂ L/M ₂ OHL.H		4.81 ^v			
	M ₂ L ₂ /M ₂ L.L		8.90 ^v			
	M ₄ (OH) ₄ L ₂ .H ⁴ /M ⁴ .L ²		15.34 ^v			
	M ₆ (OH) ₄ L ₃ .H ⁴ /M ⁶ .L ³		34.3 ^v			

^b25°, 0.5; ^c25°, 1.0; ^d25°, 2.0; ^h20°, 0.1; ^r20-40°, 0.1;

^uNa⁺ salt used as background electrolyte; ^vK⁺ used as background electrolyte.

EDTA (continued)

Metal ion	Equilibrium	Log K 25°, 0.1	Log K 25°, 1.0	Log K 25°, 0	ΔH 25°, 0.1	ΔS 25°, 0.1
V ²⁺	ML/M.L	12.7 ^h				
	MHL/ML.H	3.5 ^h	3.4			
	ML/MOHL.H		12.6			
Cr ²⁺	ML/M.L	13.6 ^h	12.7 ^v			
	MHL/ML.H	(3.0) ^h	(3.5)			
Mn ²⁺	ML/M.L	13.88 ±0.08			-4.6 ^h -0.6	48
	MHL/ML.H	3.1			-1.2	10
Fe ²⁺	ML/M.L	14.30 ±0.10			-4.0	52
	MHL/ML.H	2.8 ±0.1			(-2) ^s	(6)
	ML/MOHL.H	9.07 ^h				
	MOHL/M(OH) ₂ L.H	(9.84) ^h				
Co ²⁺	ML/M.L	16.45 ±0.05			-4.1 ±0.1	62
	MHL/ML.H	3.0	3.0 ±0.1		-5.4 ^c	
	MH ₂ L/MHL.H		1.7		-1.9	7
Ni ²⁺	ML/M.L	18.4 ±0.1			-7.4 ±0.2	59
	MHL/ML.H	3.1 ±0.1	3.0 ±0.1		-8.2 ^c	
	MH ₂ L/MHL.H		0.9		-1.8	8
	ML/MOHL.H	11.9	12.92		(-17) ^h	(-3)
Cu ²⁺					-11.1 ^c	22 ^c
	ML/M.L	18.78 ±0.08			-8.2 ±0.1	58
	MHL/ML.H	3.1 ±0.1	2.9 ±0.0		-9.6 ^c	
	MH ₂ L/MHL.H	2.0	1.9		-2.0	7
	ML/MOHL.H	11.4 ±0.1	11.5 ±0.0		(-11) ^h	(15)
V ³⁺					-7.4 ^c	28 ^c
	ML/M.L	25.9 ^h				
	MHL/ML.H		2.54			
Fe ³⁺						
	ML/M.L	25.1 ±0.0	23.9 ^u ±0.0		-2.7	105
	MHL/ML.H	1.3 ±0.1			-0.1	6
	ML/MOHL.H	7.37 ±0.01	7.53 ±0.05		(-10) ^t	(1) ^c
	(ML) ₂ /M ₂ (OH) ₂ L ₂ .H ₂		12.21		(-5) ^t	(40) ^c
Co ³⁺					(-15) ^t	(-38) ^c
	M ₂ (OH) ₂ L ₂ /(MOHL) ₂		2.8 ±0.2			
VO ²⁺	ML/M.L	41.4 ±0.1				
	MHL/ML.H	2.98 ^h				
Pd ²⁺	ML/M.L	15.55 ^h		15.5 ^{e,u}		
	MHL/ML.H	4.32 ^h	3.91	4.3 ^e	(0) ^x	(18) ^c
	MH ₂ L/MHL.H	3.49 ^h	3.45	3.7 ^e	(0) ^x	(16) ^c
Pd ²⁺						
	ML/M.L	25.6 ^{h,u}	24.5 ^{j,u}			
			25.5 ^{j,v}			
	MHL/ML.H		3.01 ^j			
	MH ₂ L/MHL.H		2.31 ^j			
	MH ₃ L/MH ₂ L.H		0.9 ^j			

^c25°, 1.0; ^h20°, 0.1; ^r20-40°, 0.1; ^s10-40°, 0.2; ^t0-42°, 1.0;

^uNa⁺ salt used as electrolyte. ^vK⁺ used as background electrolyte.

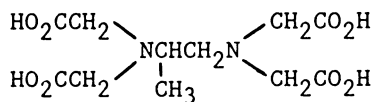
EDTA (continued)

Metal ion	Equilibrium	Log K 25°, 0.1	Log K 25°, 1.0	Log K 25°, 0	ΔH 25°, 0.1	ΔS 25°, 0.1
Zn^{2+}	ML/M.L	16.5 ± 0.1 15.7 ^{b,v}	15.7 ^v	18.0	-4.7 ± 0.2	60
	MHL/ML.H	3.0 ± 0.1	2.8 -0.4	3.1 ^e	-2.2	6
	MH ₂ L/MHL.H		1.2			
	ML/MOHL.H	11.6	11.97		(-14) ^h -8.5 ^c	(6) 26 ^c
Cd^{2+}	ML/M.L	16.5 ± 0.1			-9.1 ± 0.1	45
	MHL/ML.H	2.9	2.6 ± 0.0	2.8 ^e	-0.4	12
	MH ₂ L/MHL.H		1.6 ± 0.1		-12.1 ^c	20 ^c
	ML/MOHL.H		13.2			
Hg^{2+}	ML/M.L	21.5 ± 0.1			-18.9 ^h -0.4	35
	MHL/ML.H	3.2 ± 0.1	3.1		-0.7	12
	MH ₂ L/MHL.H		2.1			
Pb^{2+}	ML/M.L	18.0 ± 0.1			-13.1 ± 0.1	38
	MHL/ML.H	2.8 ^h -0.1	2.4	2.8 ^e		
	MH ₂ L/MHL.H		1.7 ± 0.1			
	MH ₃ L/MH ₂ L.H		1.2 ± 0.0			
Ga^{3+}	ML/M.L	21.0 ± 0.7				
	MHL/ML.H	1.8 ± 0.1				
	ML/MOHL.H	5.58 ± 0.06				
In^{3+}	ML/M.L	24.9 ± 0.3			-7.2 ^h	90
	MHL/ML.H	1.5 ^h				
	ML/MOHL.H	8.49 8.63 ^h				
Ge(IV)	ML/M(OH) ₄ .H ₄ L	4.80				
	MOHL/M(OH) ₄ .H ₃ L	4.52 4.57 ^h				
		2.40				
	ML/MOHL.H	2.64 ^h				

^b25°, 0.5; ^c25°, 1.0; ^e25°, 3.0; ^h20°, 0.1; ^j20°, 1.0; ^uNa⁺ used as background electrolyte;
^vK⁺ used as background electrolyte; ^x20-30°, 1.0

Bibliography:

H⁺ 75VB, 78AMP, 80MCC, 82HA, 82OL, 83DR, 83KDC, 83WW, 84SA, 85DRa, 85SM;
 Li⁺-K⁺ 71RMS, 85DRa; Cr²⁺ 83MDN;
 Be²⁺ 75VB; Mn²⁺-Cu²⁺, Zn²⁺, Cd²⁺, Pb²⁺ 49AS, 63R, 71GBG,
 Mg²⁺-Ba²⁺ 54SG, 75APB, 83AMP, 83VB, 85YM; 75APB, 80Jd, 82BSC, 85VG, 85VKK, 85YW;
 Y³⁺-Lu³⁺ 80SY, 85CL; Fe³⁺, Ga³⁺, In³⁺ 84TMB;
 Am³⁺ 71M; Co³⁺ 8300;
 Cm³⁺ 71M, 85CL; VO²⁺ 80FMT;
 Th⁴⁺ 67S, 85LCF; Ag⁺ 79SP, 81SKD;
 NpO₂²⁺ 70P; Pd²⁺ 83KD;
 UO₂²⁺ 84SA; Hg²⁺ 72SNM;
 V²⁺, V³⁺ 83KNT; Ge(IV) 81MMB;
 Other references: 51C, 53H, 53RL, 56TB, 59PH, 59SS, 60FM, 61BB, 61S, 61TS, 67KF, 67MVK, 67PP, 68RL, 69BH,
 69Ma, 70B, 71SF, 71TS, 72M, 74KI, 75VD, 77KS, 78BKG, 78KN, 78RL, 80AY, 80CJ, 80KKK, 80MBA, 80TH, 81RMD,
 81TP, 81YO, 82HA, 82TR, 82TRA, 83AH, 83IT, 83KDB, 83NV, 83PMP, 84AH, 84BKK, 84BL, 84DM, 84GC, 84KKA, 84LS,
 84VG, 85KLL, 85MFD, 85SA

C₁₁H₁₈O₈N₂DL-(Methylethylene)dinitrilotetraacetic acid (PDTA)
(Other values in Vol.1, p.212 and Vol.5, p.78)H₄L

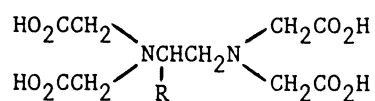
Metal ion	Equilibrium	Log K 25°, 0.1	Log K 25°, 0.5	Log K 20°, 0	ΔH 25°, 0.2	ΔS 25°, 0.1
H ⁺	HL/H.L	10.85 ^v ±0.05	11.01 ^z	11.17	-5.6 ^t ±0.5	31
	H ₂ L/HL.H	6.23 ±0.02		6.40	-2.6 ^h	20
	H ₃ L/H ₂ L.H	2.78 ^h ±0.01				
	H ₄ L/H ₃ L.H	(1.8) ^h ±0.0				
Mg ²⁺	ML/M.L	10.10 ±0.1			+1.0 ^j	50*
Ca ²⁺	ML/M.L	11.54 ±0.1			-3.0 ^j	43*
Sr ²⁺	ML/M.L	9.62 ±0.1			(-0.6) ^j	(42)*
Ba ²⁺	ML/M.L	8.54 ±0.1			-1.9 ^j	33*
La ³⁺	ML/M.L	16.37 ^h ±0.05				
Ce ³⁺	ML/M.L	16.84 ^h ±0.06				
Pr ³⁺	ML/M.L	17.22 ^h ±0.05				
Nd ³⁺	ML/M.L	17.54 ^h ±0.04				
Sm ³⁺	ML/M.L	17.99 ^h ±0.03				
Eu ³⁺	ML/M.L	18.23 ^h ±0.04				
Gd ³⁺	ML/M.L	18.20 ^h ±0.09				
Tb ³⁺	ML/M.L	18.66 ^h ±0.04				
Dy ³⁺	ML/M.L	19.01 ^h ±0.04				
Ho ³⁺	ML/M.L	19.32 ^h ±0.03				
Er ³⁺	ML/M.L	19.68 ^h ±0.07				
Tm ³⁺	ML/M.L	20.03 ^h ±0.05				
Yb ³⁺	ML/M.L	20.27 ^h ±0.09				
Lu ³⁺	ML/M.L	20.53 ^h ±0.07				
Am ³⁺	ML/M.L	17.5				
Cm ³⁺	ML/M.L	17.6				
Mn ²⁺	ML/M.L	15.0 ±0.2			-5.3	51
Co ²⁺	ML/M.L	17.4 ±0.1			-4.9	63
Cu ²⁺	ML/M.L	19.82 ±0.07			-9.3	60
Co ³⁺	ML/M.L	42.3				
Ag ⁺	ML/M.L	7.86 ±0.2				
	MHL/ML.H	5.80				
Zn ²⁺	ML/M.L	17.5 ±0.1			-6.2	59
Cd ²⁺	ML/M.L	17.83 ^h ±0.05				
Hg ²⁺	ML/M.L	22.8 ^h ±0.3				
Pb ²⁺	ML/M.L	18.92 ^h ±0.06				

^h20°,0.1; ^j20°,1.0; ^taverage of values at 20°,0.1 and 20°,1.0;^vK⁺ salt used as background electrolyte; ^z(CH₃)₄NCl used as background electrolyte;

* assuming ΔH for 1.0 = ΔH for 0.1.

Bibliography; H⁺ 71CS;Mg²⁺-Cu²⁺, Zn²⁺-Pb²⁺ 78NL;Am³⁺, Cm³⁺ 71M;Co³⁺ 8300;Ag⁺ 81SKD;

Other references: 79SP, 82HR, 85HB

 $\text{C}_x\text{H}_y\text{O}_8\text{N}_2$ DL-(Alkylethylene)dinitrilotetraacetic acid H_4L

Ligand	Metal ion	Equilibrium	Log K 20°, 0.1
R= CH_2CH_3 (Ethyl- (DL-1,2-butylene- dinitrilotetra- acetic acid) ($\text{C}_{12}\text{H}_{20}\text{O}_8\text{N}_2$) (Other values in Vol.1, p.214)	H^+	HL/H.L $\text{H}_2\text{L}/\text{HL.H}$ $\text{H}_3\text{L}/\text{H}_2\text{L.H}$ $\text{H}_4\text{L}/\text{H}_3\text{L.H}$	10.98 ^v 6.05 3.04 2.1
	Ag^+	ML/M.L MHL/ML.H	7.93 5.92
R= $\text{CH}_2\text{CH}_2\text{CH}_3$ (Propyl- ($\text{C}_{13}\text{H}_{22}\text{O}_6\text{N}_2$) (Other values in Vol.1, p.215)	H^+	HL/H.L $\text{H}_2\text{L}/\text{HL.H}$ $\text{H}_3\text{L}/\text{H}_2\text{L.H}$ $\text{H}_4\text{L}/\text{H}_3\text{L.H}$	10.97 ^v 6.05 3.05 2.1
	La^{3+}	ML/M.L	16.6
	Ce^{3+}	ML/M.L	17.1
	Pr^{3+}	ML/M.L	17.5
	Nd^{3+}	ML/M.L	17.8
	Sm^{3+}	ML/M.L	18.3
	Eu^{3+}	ML/M.L	18.4
	Gd^{3+}	ML/M.L	18.5
	Tb^{3+}	ML/M.L	19.0
	Dy^{3+}	ML/M.L	19.5
	Ho^{3+}	ML/M.L	19.8
	Er^{3+}	ML/M.L	20.1
	Tm^{3+}	ML/M.L	20.5
	Yb^{3+}	ML/M.L	20.8
	Lu^{3+}	ML/M.L	21.0
	Mn^{2+}	ML/M.L	15.60
	Co^{2+}	ML/M.L	17.99
	Cu^{2+}	ML/M.L	20.5
	Ag^+	ML/M.L MHL/ML.H	8.05 5.80
	Zn^{2+}	ML/M.L	18.17
	Pb^{2+}	ML/M.L	19.26
R= $\text{CH}(\text{CH}_3)_2$ (2-Propyl- ($\text{C}_{13}\text{H}_{22}\text{O}_8\text{N}_2$) (Other values in Vol.1, p.216)	H^+	HL/H.L $\text{H}_2\text{L}/\text{HL.H}$ $\text{H}_3\text{L}/\text{H}_2\text{L.H}$ $\text{H}_4\text{L}/\text{H}_3\text{L.H}$	11.25 ^v 5.64 3.33 2.4
	Ag^+	ML/M.L MHL/ML.H	8.13 5.84

^v KNO_3 used as background electrolyte.

DL-(Alkylethylene)dinitrilotetraacetic acid (continued)

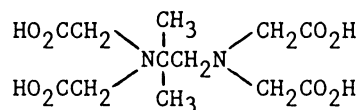
<u>Ligand</u>	<u>Metal ion</u>	<u>Equilibrium</u>	<u>Log K</u> <u>20°, 0.1</u>
R= (CH ₂) ₃ CH ₃ (Butyl-)	H ⁺	HL/H.L H ₂ L/HL.H H ₃ L/H ₂ L.H H ₄ L/H ₃ L.H	11.00 ^v 6.06 3.06 2.1
(C ₁₄ H ₂₄ O ₆ N ₂) (Other reference in Vol.1, p.400)	La ³⁺ Ce ³⁺ Pr ³⁺ Nd ³⁺ Sm ³⁺ Eu ³⁺ Gd ³⁺ Tb ³⁺ Dy ³⁺ Ho ³⁺ Er ³⁺ Tm ³⁺ Yb ³⁺ Lu ³⁺ Mn ²⁺ Co ²⁺ Cu ²⁺ Zn ²⁺ Pb ²⁺	ML/M.L ML/M.L ML/M.L ML/M.L ML/M.L ML/M.L ML/M.L ML/M.L ML/M.L ML/M.L ML/M.L ML/M.L ML/M.L ML/M.L ML/M.L ML/M.L ML/M.L ML/M.L ML/M.L	16.5 17.1 17.4 17.7 18.2 18.3 18.5 19.0 19.4 19.7 19.9 20.4 20.6 20.8 15.59 18.03 20.5 18.18 19.27
R= CH ₂ CH(CH ₃) ₂ (2-Methylpropyl-)	H ⁺	HL/H.L H ₂ L/HL.H H ₃ L/H ₂ L.H H ₄ L/H ₃ L.H	11.00 ^v 5.91 3.05 2.1
(C ₁₄ H ₂₄ O ₈ N ₂) (Other values in Vol.1, p.218)	Ag ⁺	ML/M.L MHL/ML.H	8.10 5.85
R=(CH ₂) ₅ CH ₃ (Hexyl-)	H ⁺	HL/H.L H ₂ L/HL.H H ₃ L/H ₂ L.H H ₄ L/H ₃ L.H	10.95 ^v 6.05 2.98 2.28
(C ₁₆ H ₂₈ O ₈ N ₂)	Mg ²⁺ Ca ²⁺ Sr ²⁺ Ba ²⁺ La ³⁺ Ce ³⁺ Pr ³⁺ Nd ³⁺ Sm ³⁺ Eu ³⁺ Gd ³⁺ Tb ³⁺ Dy ³⁺ Ho ³⁺	ML/M.L ML/M.L ML/M.L ML/M.L ML/M.L ML/M.L ML/M.L ML/M.L ML/M.L ML/M.L ML/M.L ML/M.L ML/M.L ML/M.L	10.16 11.70 9.80 8.65 16.5 17.1 17.3 17.7 18.2 18.3 18.4 19.0 19.6 19.7

^vKNO₃ used as background electrolyte.

DL-(Hexylethylene)dinitrilotetraacetic acid (continued)

<u>Ligand</u>	Metal <u>ion</u>	<u>Equilibrium</u>	<u>Log K</u> <u>20°, 0.1</u>
	Er ³⁺	ML/M.L	19.8
	Tm ³⁺	ML/M.L	20.4
	Yb ³⁺	ML/M.L	20.6
	Lu ³⁺	ML/M.L	20.8
	Mn ²⁺	ML/M.L	15.51
	Co ²⁺	ML/M.L	17.90
	Cu ²⁺	ML/M.L	20.4
	Zn ²⁺	ML/M.L	18.12
	Cd ²⁺	ML/M.L	18.02
	Hg ²⁺	ML/M.L	22.77
	Pb ²⁺	ML/M.L	19.20

Bibliography; H⁺ 74NL, 79MBN, 81SKD; Mg²⁺-Ba²⁺, Mn²⁺, Cd²⁺, Hg²⁺ 79MBN;
La³⁺-Lu³⁺, Cu²⁺, Zn²⁺, Pb²⁺ 74NL, 79MBN; Ag⁺ 81SKD

C₁₂H₂₀O₈N₂1,1-Dimethylethylenedinitrilotetraacetic acidH₄L

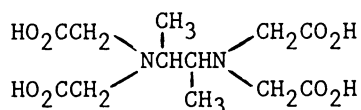
Metal <u>ion</u>	<u>Equilibrium</u>	<u>Log K</u> <u>20°, 0.1</u>
H ⁺	HL/H.L	11.46 ^v
	H ₂ L/HL.H	5.38
	H ₃ L/H ₂ L.H	3.25
	H ₄ L/H ₃ L.H	2.45
Mg ²⁺	ML/M.L	9.65
Ca ²⁺	ML/M.L	10.37
Sr ²⁺	ML/M.L	8.40
Ba ²⁺	ML/M.L	6.98
La ³⁺	ML/M.L	15.43
Ce ³⁺	ML/M.L	16.05
Pr ³⁺	ML/M.L	16.49
Nd ³⁺	ML/M.L	16.60
Sm ³⁺	ML/M.L	17.04
Eu ³⁺	ML/M.L	17.14
Gd ³⁺	ML/M.L	17.09
Tb ³⁺	ML/M.L	17.18
Dy ³⁺	ML/M.L	17.28
Ho ³⁺	ML/M.L	17.40
Er ³⁺	ML/M.L	17.56
Tm ³⁺	ML/M.L	17.79
Yb ³⁺	ML/M.L	18.04
Lu ³⁺	ML/M.L	18.18
Mn ²⁺	ML/M.L	15.31
Co ²⁺	ML/M.L	17.20

^vKNO₃ used as background electrolyte.

1,1-Dimethylethylenedinitrilotetraacetic acid (continued)

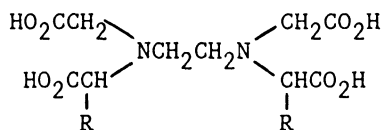
Metal ion	Equilibrium	Log K 20°, 0.1
Cu ²⁺	ML/M.L	20.33
Zn ²⁺	ML/M.L	17.02
Cd ²⁺	ML/M.L	17.92
Hg ²⁺	ML/M.L	22.51
Pb ²⁺	ML/M.L	17.42

Bibliography: 78NL

C₁₂H₂₀O₈N₂(1,2-Dimethylethylene)dinitrilotetraacetic acid
(2,3-butylenedinitrilotetraacetic acid)H₄L

Isomer	Metal ion	Equilibrium	Log K 25°, 0.1	Log K 20°, 0.1	ΔH 20°, 1.0	ΔS 25°, 0.1
rac- (Other values in Vol.1, p.220)	H ⁺	HL/H.L	11.53 ^v	11.61 ^v ±0.1	-5.6	34 [*]
		H ₂ L/HL.H	6.07	6.09 ±0.04		
		H ₃ L/H ₂ L.H		3.49 ±0.05		
		H ₄ L/H ₃ L.H		2.40 ±0.02		
	Fe ²⁺	ML/M.L	17.08	17.18 ±0.10		
		MHL/ML.H	2.13	(2.51)		
		ML/MOHL.H	6.0			
	Fe ³⁺	ML/M.L	28.05	(28.22)		
				(28.4) ¹		
		ML/MOHL.H	6.45	(4.31)		
		MOHL/M(OH) ₂ L.H		(2.5)		
	Ag ⁺	ML/M.L		8.07		
		MHL/ML.H		6.49		
meso- (Other values in Vol.1, p.222)	H ⁺	HL/H.L		11.23 ^v ±0.02		
		H ₂ L/HL.H		6.28 ±0.01		
		H ₃ L/H ₂ L.H		2.6 ±0.1		
		H ₄ L/H ₃ L.H		(1.8) ±0.0		
	Fe ²⁺	ML/M.L	15.33	(15.11)		
				2.32		
		MHL/ML.H	2.3			
		ML/MOHL.H	6.1			
	Fe ³⁺	ML/M.L	25.65	(25.42)		
				(25.0) ¹		
		ML/MOHL.H	6.17	(6.33)		
		MOHL/M(OH) ₂ L.H		(2.78)		
	Co ³⁺	ML/M.L	42.5			
	Ag ⁺	ML/M.L		6.70		
		MHL/ML.H		6.75		

ⁱ20°,0.5; ^vK⁺ salt used as background electrolyte; *assuming ΔH for 1.0 = ΔH for 0.1.Bibliography: Co³⁺ 8300; Ag⁺ 81SKD

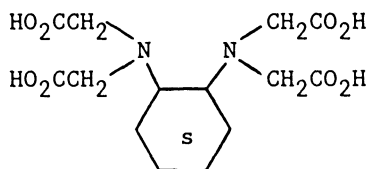


$C_xH_yO_8N_2$ DL-Ethylenedinitrilo-N,N'-di(2-alkylacetic)-N,N'-diacetic acid H_4L
(Other values in Vol.1, p.226,228,230,232)

<u>Ligand</u>	<u>Metal ion</u>	<u>Equilibrium</u>	<u>Log K</u> <u>20°, 0.1</u>
R= CH ₃ (2-methyl- (C ₁₂ H ₂₀ O ₈ N ₂))	Hg ²⁺	ML/M.L	21.33 ^v
R= CH ₂ CH ₃ (2-ethyl- (C ₁₃ H ₂₂ O ₈ N ₂))	Hg ²⁺	ML/M.L	20.53 ^v
R= (CH ₂) ₂ CH ₃ (2-propyl- (C ₁₄ H ₂₄ O ₈ N ₂))	Hg ²⁺	ML/M.L	20.54 ^v
R= CH(CH ₃) ₂ (2-2-propyl- (C ₁₄ H ₂₄ O ₈ N ₂))	Hg ²⁺	ML/M.L	18.03 ^v

^vKNO₃ used as background electrolyte.

Bibliography: 72SNM



$C_{14}H_{22}O_8N$ trans-1,2-Cyclohexylenedinitrilotetraacetic acid (CDTA)* H_4L
(Other values in Vol.1, p.236 and Vol.5, p.79)

<u>Metal ion</u>	<u>Equilibrium</u>	<u>Log K</u> <u>25°, 0.1</u>	<u>Log K</u> <u>25°, 1.0</u>	<u>Log K</u> <u>25°, 3.0</u>	<u>ΔH</u> <u>20°, 0.1</u>	<u>ΔS</u> <u>25°, 0.1</u>
H ⁺	HL/H.L	(12.3) ^v -0.1	9.22 ^u (12.1) ^v ±0.0 (12.7) ^z	9.90 ^u	-6.7 ±0.1	34
	H ₂ L/HL.H	6.12 ±0.03 (5.83) ^{n,u}	5.84 ^u 6.00 ^v ±0.02 6.12 ^z	6.72 ^u	-2.1 -0.4	21
	H ₃ L/H ₂ L.H	(3.49) 3.53 ^h ±0.02 (3.57) ⁿ	(3.21)±0.04 3.54 ^j ±0.04	3.65		
	H ₄ L/H ₃ L.H	2.40 2.42 ^h ±0.02 2.48 ⁿ	2.42 -0.01 2.38 ^j ±0.08	3.21		
	H ₅ L/H ₄ L.H	(1.7) ⁿ	(1.6) -0.1 (1.7) ^j ±0.1			

^h20°,0.1; ^j20°,1.0; ⁿ37°,0.15; ^uNa⁺ salt used as background electrolyte;

^vK⁺ salt used as background electrolyte; ^z(CH₃)₄NCl used as background electrolyte or corrected for background electrolyte; * metal constants listed have been adjusted by the difference between the utilized first protonation constant and the listed one.

CDTA (continued)

Metal ion	Equilibrium	Log K 25°, 0.1	Log K 25°, 1.0	Log K 25°, 3.0	ΔH 25°, 0.1	ΔS 25°, 0.1
K ⁺	ML/M.L		0.2			
Y ³⁺	ML/M.L	20.49 ±0.04	18.53 ^{b,u}		+1.8 ^b	100*
La ³⁺	ML/M.L	17.10 ±0.09	15.24 ^{b,u}		+1.6 ^b +1.5 ^b	84
Ce ³⁺	ML/M.L	17.67 ±0.1	16.59 ^{b,u}		(+1.5) ^b	86*
Pr ³⁺	ML/M.L	18.07 ±0.03	17.23 ^{b,u}		+1.2 ^b	87*
Nd ³⁺	ML/M.L	18.40 ±0.06	(17.86) ^{b,u}		+1.0 ^b	88*
Sm ³⁺	ML/M.L	19.20 ±0.08	(18.61) ^{b,u}		+2.1 ^b	95*
Eu ³⁺	ML/M.L	19.49 ±0.10	18.80 ^{b,u}		+1.8 ^b	95*
Gd ³⁺	ML/M.L	19.66 ±0.06	18.82 ^{b,u}		(+1.8) ^b	(96)*
Tb ³⁺	ML/M.L	20.32 ±0.03	19.22 ^{b,u}		+1.8 ^b	99*
Dy ³⁺	ML/M.L	20.74 ±0.01	19.40 ^{b,u}		(+1.1) ^b	(99)*
Ho ³⁺	ML/M.L	20.92 ±0.07	19.80 ^{b,u}		+1.2 ^b	100*
Er ³⁺	ML/M.L	21.37 ±0.06	20.08 ^{b,u}		+1.0 ^b	101*
Tm ³⁺	ML/M.L	21.68 ±0.1	(20.28) ^{b,u}		+0.6 ^b	101*
Yb ³⁺	ML/M.L	21.98 ±0.05	(20.46) ^{b,u}		+0.2 ^b	101*
Lu ³⁺	ML/M.L	22.15 ±0.10	(20.60) ^{b,u}		+0.5 ^b	103*
Am ³⁺	ML/M.L	19.40 ±0.09				
Cm ³⁺	ML/M.L	19.58 ±0.07				
Bk ³⁺	ML/M.L	20.1 ±0.3				
Cf ³⁺	ML/M.L	20.4 ±0.3				
Th ⁴⁺	ML/M.L	25.6 ^h	24.5 ^{b,u}			
Co ³⁺	ML/M.L	44.8				
Sn ²⁺	ML/M.L		18.7 ^{j,u}			
	MHL/ML.H		2.7 ^{j,u}			
	MH ₂ L/MHL.H		1.8 ^{j,u}			
As(III)	M(OH) ₂ HL/M(OH) ₂ .HL	20.7				

^b25°, 0.5; ^h20°, 0.1; ^j20°, 1.0; ^uNa⁺ salt used as background electrolyte.

* assuming ΔH for 0.5 = ΔH for 0.1

Bibliography:

H⁺ 80M, 83KDc, 84DM, 84MF;

K⁺ 84MF;

Ca²⁺ 69RH;

Y³⁺-Lu³⁺ 61K, 71Sf;

Am³⁺-Cf³⁺ 71Sf;

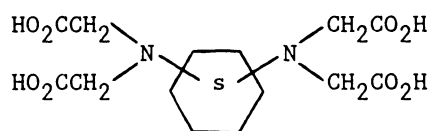
Th⁴⁺ 85LCF;

Co³⁺ 8300;

Sn²⁺ 68BR;

As(III) 80ET;

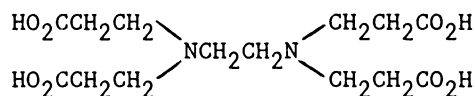
Other references: 61JS, 62S, 67S, 72MSS, 80TH, 81SKD, 83AH, 85KLL

 $C_{14}H_{22}O_8N_2$ Cyclohexylenedinitrilotetraacetic acid H_4L

Isomer	Metal ion	Equilibrium	Log K 20°, 0.1	Log K 25°, 1.0
cis-1,2- (Other values in Vol.1, p.235)	H^+	HL/H.L	10.70 ^v	9.67 ^z
		$H_2L/HL.H$	5.21	5.56
		$H_3L/H_2L.H$	3.50	2.99
		$H_4L/H_3L.H$	2.44	(1.5)
	K^+	ML/M.L		0.4
cis-1,3-	H^+	ML/M.L		10.68 ^z
		$H_2L/HL.H$		8.34
		$H_3L/H_2L.H$		2.57
		$H_4L/H_3L.H$		(1.9)
		$H_5L/H_4L.H$		(1.4)
	K^+	ML/M.L		-0.1
trans-1,3-	H^+	HL/H.L		11.09 ^z
		$H_2L/HL.H$		7.67
		$H_3L/H_2L.H$		2.48
		$H_4L/H_3L.H$		2.02
		$H_5L/H_4L.H$		(1.4)
	K^+	ML/M.L		-0.5
cis-1,4-	H^+	HL/H.L		11.15 ^z
		$H_2L/HL.H$		8.24
		$H_3L/H_2L.H$		2.44
		$H_4L/H_3L.H$		(1.9)
		$H_5L/H_4L.H$		(1.5)
	K^+	ML/M.L		0.2
trans-1,4-	H^+	HL/H.L		11.15 ^z
		$H_2L/HL.H$		8.42
		$H_3L/H_2L.H$		2.47
		$H_4L/H_3L.H$		2.0
		$H_5L/H_4L.H$		(1.7)
	K^+	ML/M.L		0.0

^vKCl used as background electrolyte; ^zCorrected for background electrolyte.

Bibliography: 84MFa, 85MF

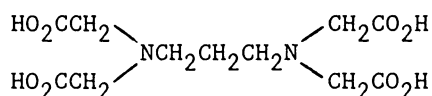
 $\text{C}_{14}\text{H}_{24}\text{O}_8\text{N}_2$

Ethylenedinitrilotetra(3-propanoic acid)
(Other values in Vol.1, p.243)

 H_4L

Metal ion	Equilibrium	Log K 30°, 0.1	Log K 25°, 1.0
H^+	HL/H.L	9.60 ^v	
	$\text{H}_2\text{L}/\text{HL.H}$	6.77	
	$\text{H}_3\text{L}/\text{H}_2\text{L.H}$	3.43	
	$\text{H}_4\text{L}/\text{H}_3\text{L.H}$	3.00	
Am^{3+}	ML/M.L		18.8 ^u

^u NaClO_4 used as background electrolyte; ^v KCl used as background electrolyte.
Bibliography: 71M

 $\text{C}_{11}\text{H}_{18}\text{O}_8\text{N}_2$

Trimethylenedinitrilotetraacetic acid (TMDTA)
(Other values in Vol.1, p.244 and Vol.5, p.80)

 H_4L

Metal ion	Equilibrium	Log K 25°, 0.1	Log K 20°, 0.1	Log K 25°, 1.0	ΔH 20°, 0.1	ΔS 25°, 0.1
H^+	HL/H.L	10.30 ^v -0.05	10.37 $\pm$ 0.10 10.56 ^z	9.80 ^{j,u} 10.03 ^v 10.23 ^{j,z}	-5.2	30
	$\text{H}_2\text{L}/\text{HL.H}$	7.88 -0.08	7.96 $\pm$ 0.06	7.80 7.81 ^j $\pm$ 0.01	-4.4	21
	$\text{H}_3\text{L}/\text{H}_2\text{L.H}$	2.63	2.63 $\pm$ 0.04	2.53 ^v 2.53 ^j $\pm$ 0.03		
	$\text{H}_4\text{L}/\text{H}_3\text{L.H}$	2.1	2.0 $\pm$ 0.1	(1.9) (1.9) ^j $\pm$ 0.4		
K^+	ML/M.L		0.4			
Y^{3+}	ML/M.L		14.33 $\pm$ 0.07			
La^{3+}	ML/M.L	11.27	11.22 $\pm$ 0.02		+3.8	64
	MHL/ML.H		4.67			
Ce^{3+}	ML/M.L	11.74	11.71 $\pm$ 0.04		+3.6	66
	MHL/ML.H		4.55			
Pr^{3+}	ML/M.L	12.06	12.03 $\pm$ 0.04		+3.9	68
Nd^{3+}	ML/M.L	12.39	12.36 $\pm$ 0.04		+4.2	71
	MHL/ML.H		4.03			
Sm^{3+}	ML/M.L	13.17	13.18 $\pm$ 0.03		+5.7	79
Eu^{3+}	ML/M.L	13.62 -0.08	13.57 $\pm$ 0.01		+6.0	83

^j_{20°, 1.0}; ^u Na^+ salt used as background electrolyte;

^v K^+ salt used as background electrolyte; ^z $(\text{CH}_3)_4\text{NCl}$ used as background electrolyte.

TMDTA (continued)

Metal ion	Equilibrium	Log K 25°, 0.1	Log K 25°, 0.1	Log K 25°, 1.0	ΔH 25°, 0.1	ΔS 25°, 0.1
Gd ³⁺	ML/M.L	13.83	13.76 ±0.05		+5.0	80
Tb ³⁺	ML/M.L		14.17			
Dy ³⁺	ML/M.L	14.78	14.69 ±0.05		+4.6	83
Ho ³⁺	ML/M.L		15.03			
Er ³⁺	ML/M.L	15.18	15.20 ±0.05		+4.2	84
Tm ³⁺	ML/M.L		15.69			
Yb ³⁺	ML/M.L	15.95	15.90 ±0.04		+3.7	85
Lu ³⁺	ML/M.L	16.03	16.00 ±0.02		+3.5	85
Am ³⁺	ML/M.L	13.45				
Cm ³⁺	ML/M.L	13.79				
Bk ³⁺	ML/M.L	14.36				
Cf ³⁺	ML/M.L	14.66				
UO ₂ ²⁺	MHL/M ₂ HL	8.55		8.08 ^v		
	M ₂ L/M ₂ .L	18.66		17.37 ^v		
	M ₂ L/M ₂ OHL.H	4.61		4.89 ^v		
	M ₂ L ₂ /M ₂ L.L	11.5		11.04 ^v		
	M ₄ (OH) ₄ L ₂ .H ⁴ /M ⁴ .L ²	20.64		18.01 ^v		
	M ₆ (OH) ₄ L ₃ .H ⁴ /M ⁶ .L ³			35.8 ^v		
Mn ²⁺	ML/M.L	10.06	10.03 ±0.04		+2.1	53
	MHL/ML.H		5.29			
Cu ²⁺	ML/M.L	18.80	18.90 ±0.03		-7.7	60
	MHL/ML.H		2.2			
Co ³⁺	ML/M.L	41.7				
Ag ⁺	ML/M.L		5.45			
	MHL/ML.H		8.62			
Cd ²⁺	ML/M.L	13.86	13.93 ±0.03		-5.4	45
	MHL/ML.H		3.06			

^vK⁺ salt used as background electrolyte.

Bibliography:

H⁺ 81NSD, 84SA;

K⁺ 67A;

Y³⁺ 64LA;

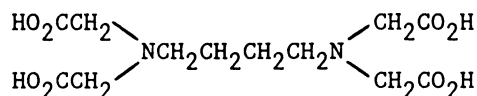
La³⁺-Sm³⁺, Gd³⁺-Lu³⁺, Mn²⁺, Cu²⁺, Cd²⁺ 81NSD;

Eu³⁺ 81NSD, 85CM;

Am³⁺-Cf³⁺ 85CM;

Co³⁺ 8300;

Ag⁺ 81SKD;

 $\text{C}_{12}\text{H}_{20}\text{O}_8\text{N}_2$

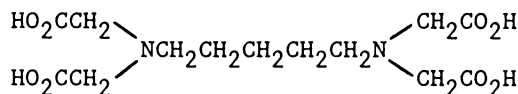
Tetramethylenedinitrilotetraacetic acid
(Other values in Vol.1, p.247 and Vol.5, p.81)

 H_4L

Metal ion	Equilibrium	Log K 25°, 0.1	Log K 20°, 0.1	Log K 25°, 1.0	ΔH 20°, 0.1	ΔS 25°, 0.1
H^+	HL/H.L	10.45 ^v 10.24 ^{b,u}	10.55 ± 0.1	10.24 ^v 10.35 ^{j,u} 10.09 ^{j,u}	-6.7 -7.0 ^b	26
	$\text{H}_2\text{L}/\text{HL.H}$	8.98	9.06 ± 0.01	8.89 8.96 ^j - 0.07	-5.8	22
	$\text{H}_3\text{L}/\text{H}_2\text{L.H}$	2.71	2.66 - 0.2	2.5 ^j ± 0.1		
	$\text{H}_4\text{L}/\text{H}_3\text{L.H}$	(1.8)	(1.9) ± 0.0	2.3 ^j ± 0.1		
UO_2^{2+}	MHL/M.HL	9.16		8.91 ^v		
	$\text{M}_2\text{L}/\text{M}_2\text{.L}$	19.06		18.37 ^v		
	$\text{M}_2\text{L}/\text{M}_2\text{OHL.H}$	5.23		4.93 ^v		
	$\text{M}_2\text{L}_2/\text{M}_2\text{L.L}$	11.98				
	$\text{M}_4(\text{OH})_2\text{L}_2.\text{H}^2/\text{M}_4\text{.L}^2$			29.72 ^v		
	$\text{M}_4(\text{OH})_4\text{L}_2.\text{H}^4/\text{M}_4\text{.L}^2$	19.76		20.10 ^v		
Co^{3+}	ML/M.L	37.6				

^b25°, 0.5; ^j20°, 1.0; ^u Na^+ salt used as background electrolyte;^v K^+ salt used as background electrolyte.Bibliography: H^+ 84SA, 85CB; UO_2^{2+} 84SA; Co^{3+} 8300;

Other reference: 79SP

 $\text{C}_{13}\text{H}_{22}\text{O}_8\text{N}_2$

Pentamethylenedinitrilotetraacetic acid
(Other values in Vol.1, p.249 and Vol.5, p.81)

 H_4L

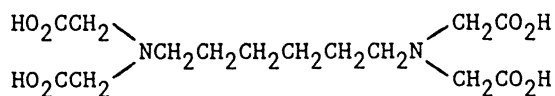
Metal ion	Equilibrium	Log K 25°, 0.1	Log K 20°, 0.1	Log K 20°, 1.0	ΔH 20°, 0.1	ΔS 25°, 0.1
H^+	HL/H.L	10.60 ^v - 0.4	10.70 ^v - 0.1 10.75 ^z	10.27 ^u 10.50 ^v (10.49) ^z	-7.5	23
	$\text{H}_2\text{L}/\text{HL.H}$	9.43 - 0.08	9.54 ± 0.04	9.33 ± 0.05	-6.3	22
	$\text{H}_3\text{L}/\text{H}_2\text{L.H}$	2.7	2.7 ± 0.0	2.6 ± 0.0		
	$\text{H}_4\text{L}/\text{H}_3\text{L.H}$	2.2	2.2 + 0.1	2.2 ± 0.2		
Y^{3+}	ML/M.L	10.36				
	MHL/M.HL	6.82				
La^{3+}	ML/M.L	8.96				
	MHL/M.HL	6.09				
Ce^{3+}	ML/M.L	9.51				
	MHL/M.HL	6.34				

^u Na^+ salt used as background electrolyte; ^v K^+ salt used as background electrolyte;^z $(\text{CH}_3)_4\text{NCl}$ used as background electrolyte.

Pentamethylenedinitrilotetraacetic acid (continued)

Metal ion	Equilibrium	Log K 25°, 0.1	Log K 20°, 0.1	Log K 20°, 1.0	ΔH 20°, 0.1	ΔS 25°, 0.1
Pr ³⁺	ML/M.L	9.71				
	MHL/M.HL	6.45				
Nd ³⁺	ML/M.L	9.77				
	MHL/M.HL	6.52				
Sm ³⁺	ML/M.L	10.17				
	MHL/M.HL	6.66				
Eu ³⁺	ML/M.L	10.22				
	MHL/M.HL	6.70				
Gd ³⁺	ML/M.L	10.37				
	MHL/M.HL	6.79				
Tb ³⁺	ML/M.L	10.53				
	MHL/M.HL	6.89				
Dy ³⁺	ML/M.L	10.75				
	MHL/M.HL	6.98				
Ho ³⁺	ML/M.L	10.83				
	MHL/M.HL	7.06				
Er ³⁺	ML/M.L	11.03				
	MHL/M.HL	7.14				
Tm ³⁺	ML/M.L	11.19				
	MHL/M.HL	7.24				
Yb ³⁺	ML/M.L	11.33				
	MHL/M.HL	7.32				
Lu ³⁺	ML/M.L	11.36				
	MHL/M.HL	7.33				

Bibliography: 82PPB

C₁₄H₂₄O₈N₂

Hexamethylenedinitrilotetraacetic acid
(Other values in Vol.1, p.251 and Vol.5, p.82)

H₄L

Metal ion	Equilibrium	Log K 25°, 0.1	Log K 20°, 0.1	Log K 25°, 1.0	ΔH 20°, 0.1	ΔS 25°, 0.1
H ⁺	HL/H.L	10.64 ^v ±0.08	10.73 ^v ±0.08	10.35 ^v -0.05 10.39 ^{j,u} 10.56 ^{j,v}	-7.9	23
	H ₂ L/HL.H	9.70 ±0.05	9.77 ±0.02	9.57±0.02 9.65 ^j ±0.04	-6.2	24
	H ₃ L/H ₂ L.H	2.76 +0.1	2.70 +0.2	2.56 2.5 ^j ±0.1		
	H ₄ L/H ₃ L.H	(2.4)	2.3 ±0.1	2.2 ^j +0.1		

^j20°, 1.0; ^uNa⁺ salt as background electrolyte; ^vK⁺ salt used as background electrolyte.

Hexamethylenedinitrilotetraacetic acid (continued)

Metal ion	Equilibrium	Log K 25°, 0.1	Log K 20°, 0.1	Log K 25°, 1.0	ΔH 20°, 0.1	ΔS 25°, 0.1
Y ³⁺	ML/M.L			9.18 ^v		
	MHL/M.HL	6.87		5.84		
La ³⁺	ML/M.L			7.88 ^v		
	MHL/M.HL	6.28		5.16		
Ce ³⁺	ML/M.L			8.18 ^v		
	MHL/M.HL			5.30		
Pr ³⁺	ML/M.L			8.41 ^v		
	MHL/M.HL	6.40		5.44		
Nd ³⁺	ML/M.L			8.63 ^v		
	MHL/M.HL	6.43		5.57		
Sm ³⁺	ML/M.L			8.94 ^v		
	MHL/M.HL	6.64		5.71		
Eu ³⁺	ML/M.L			9.16 ^v		
	MHL/M.HL	6.71		5.82		
Gd ³⁺	ML/M.L			9.16 ^v		
	MHL/M.HL	6.66		5.82		
Tb ³⁺	ML/M.L			9.45 ^v		
	MHL/M.HL			5.95		
Dy ³⁺	ML/M.L			9.52 ^v		
	MHL/M.HL	6.93		6.00		
Ho ³⁺	ML/M.L			9.66 ^v		
	MHL/M.HL	6.96		6.06		
Er ³⁺	ML/M.L			9.97 ^v		
	MHL/M.HL	7.07		6.23		
Tm ³⁺	ML/M.L			10.04 ^v		
	MHL/M.HL	7.18		6.26		
Yb ³⁺	ML/M.L			10.13 ^v		
	MHL/M.HL	7.30		6.34		
Lu ³⁺	ML/M.L			10.46 ^v		
	MHL/M.HL	7.46		6.46		
UO ₂ ²⁺	MHL/M.HL	9.50		9.13 ^v		
	M ₂ L/M ₂ .L	19.43		18.77 ^v		
	M ₂ L/M ₂ OHL.H	5.20		5.7 ^v		
	M ₂ L ₂ /M ₂ L.L	12.46		12.2 ^v		
	M ₄ (OH) ₂ L ₂ .H ² /M ⁴ .L ²			30.9 ^v		
	M ₄ (OH) ₄ L ₂ .H ⁴ /M ⁴ .L ²	20.18		19.8 ^v		

^vK⁺ salt used as background electrolyte.

Bibliography:

H⁺ 75BK, 84SA;

Y³⁺-Lu³⁺ 75BK;

UO₂²⁺ 84SA;

Other references: 80KMB, 80KVV

$$\begin{array}{c}
 \text{HO}_2\text{CCH}_2 \diagdown \quad \text{N}(\text{CH}_2)_n \quad \diagup \text{CH}_2\text{CO}_2\text{H} \\
 \text{HO}_2\text{CCH}_2 \diagup \quad \quad \quad \diagdown \text{CH}_2\text{CO}_2\text{H}
 \end{array}$$

$\text{C}_x\text{H}_y\text{O}_8\text{N}_2$		<u>Polymethylenedinitrilotetraacetic acid</u>			H_4L	
<u>Ligand</u>	<u>Metal ion</u>	<u>Equilibrium</u>	<u>Log K</u> <u>20°, 0.1</u>	<u>Log K</u> <u>25°, 1.0</u>	<u>ΔH</u> <u>20°, 0.1</u>	<u>ΔS</u> <u>20°, 0.1</u>
n= 8	H^+	HL/H.L	10.76 ^v ±0.01	10.76 ^z	-8.1	22
Octamethylene- ($\text{C}_{16}\text{H}_{28}\text{O}_8\text{N}_2$)		$\text{H}_2\text{L}/\text{HL.H}$	9.93 ±0.02	(9.79)	-5.8	26
(Other values in Vol.1, p.253)		$\text{H}_3\text{L}/\text{H}_2\text{L.H}$	2.75 ±0.00	(2.46)		
		$\text{H}_4\text{L}/\text{H}_3\text{L.H}$	2.0 ±0.0	(2.03)		
		$\text{H}_5\text{L}/\text{H}_4\text{L.H}$		(1.9)		
	K^+	ML/M.L		-0.2		
n= 12	H^+	HL/H.L	(10.55) ^v	10.65 ^z		
Dodecamethylene- ($\text{C}_{20}\text{H}_{32}\text{O}_8\text{N}_2$)		$\text{H}_2\text{L}/\text{HL.H}$	9.96	10.62 ^{j,v}		
(Other reference in Vol.1, p.400)		$\text{H}_3\text{L}/\text{H}_2\text{L.H}$	2.6	(9.79)		
		$\text{H}_4\text{L}/\text{H}_3\text{L.H}$	(2.6)	9.95 ^j		
		$\text{H}_5\text{L}/\text{H}_4\text{L.H}$		2.65		
				2.03		
				(1.8)		
	K^+	ML/M.L		-0.8		

^v K^+ salt used as background electrolyte; ^zCorrected for background electrolyte.
Bibliography: 85CMF

$$\begin{array}{c}
 \text{HO}_2\text{CCH}_2 \diagdown \quad \text{NCHCH}_2\text{CHN} \quad \diagup \text{CH}_2\text{CO}_2\text{H} \\
 \text{HO}_2\text{CCH}_2 \diagup \quad \quad \quad \diagdown \text{CH}_2\text{CO}_2\text{H} \\
 \quad \quad \quad \text{CH}_3 \quad \quad \quad \text{CH}_3
 \end{array}$$

$\text{C}_{13}\text{H}_{22}\text{O}_8\text{N}_2$

DL-(1,3-Dimethyltrimethylene)dinitrilotetraacetic acid
(DL-2,4-diaminopentane-N,N,N',N'-tetraacetic acid)

H_4L

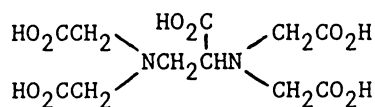
<u>Metal ion</u>	<u>Equilibrium</u>	<u>Log K</u> <u>20°, 0.1</u>
H^+	HL/H.L	10.84 ^v
	$\text{H}_2\text{L}/\text{HL.H}$	8.54
	$\text{H}_3\text{L}/\text{H}_2\text{L.H}$	2.42
	$\text{H}_4\text{L}/\text{H}_3\text{L.H}$	2.09
Mg^{2+}	ML/M.L	8.27
	MHL/ML.H	5.49
Ca^{2+}	ML/M.L	6.33
	MHL/ML.H	7.37
Sr^{2+}	ML/M.L	4.40
	MHL/ML.H	8.64
Ba^{2+}	ML/M.L	3.81
	MHL/ML.H	9.09
La^{3+}	ML/M.L	10.21
Ce^{3+}	ML/M.L	10.65
Pr^{3+}	ML/M.L	11.15
Nd^{3+}	ML/M.L	11.30
Sm^{3+}	ML/M.L	11.82
Eu^{3+}	ML/M.L	12.03

^v KNO_3 used as background electrolyte.

DL-(1,3-Dimethyltrimethylene)dinitrilotetraacetic acid (continued)

Metal ion	Equilibrium	Log K 20°, 0.1
Gd ³⁺	ML/M.L	12.15
Tb ³⁺	ML/M.L	12.50
Dy ³⁺	ML/M.L	12.88
Ho ³⁺	ML/M.L	13.20
Er ³⁺	ML/M.L	13.48
Tm ³⁺	ML/M.L	13.63
Yb ³⁺	ML/M.L	13.83
Lu ³⁺	ML/M.L	14.01
Mn ²⁺	ML/M.L	10.97
Co ²⁺	ML/M.L	17.40
Cu ²⁺	ML/M.L	20.51
Zn ²⁺	ML/M.L	16.96
Cd ²⁺	ML/M.L	13.98
Hg ²⁺	ML/M.L	20.68
Pb ²⁺	ML/M.L	12.65

Bibliography: 81NSD

C₁₁H₁₆O₁₀N₂DL-2,3-Diaminopropanoic-N,N,N',N'-tetraacetic acidH₅L

Metal ion	Equilibrium	Log K 25°, 0.1
H ⁺	HL/H.L	9.52 ^v
	H ₂ L/HL.H	6.32
	H ₃ L/H ₂ L.H	3.40
	H ₄ L/H ₃ L.H	2.75
	H ₅ L/H ₄ L.H	2.20
Mg ²⁺	ML/M.L	9.20
Ca ²⁺	ML/M.L	10.40
Sr ²⁺	ML/M.L	8.70
Ba ²⁺	ML/M.L	7.90
La ³⁺	ML/M.L	14.30
Ce ³⁺	ML/M.L	14.74
Pr ³⁺	ML/M.L	15.29
Nd ³⁺	ML/M.L	15.49
Sm ³⁺	ML/M.L	15.83
Eu ³⁺	ML/M.L	15.93
Gd ³⁺	ML/M.L	15.93
Tb ³⁺	ML/M.L	16.20
Dy ³⁺	ML/M.L	16.27
Ho ³⁺	ML/M.L	16.37
Er ³⁺	ML/M.L	16.40

^vKNO₃ used as background electrolyte.

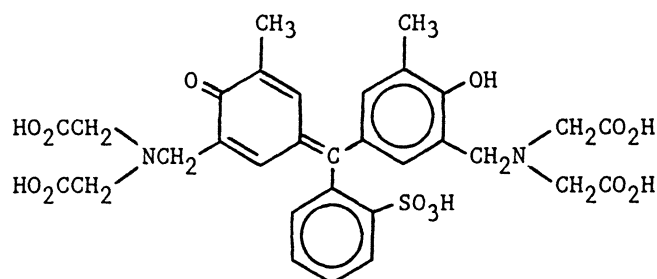
DL-2,3-Diaminopropanoic-N,N,N',N'-tetraacetic acid (continued)

Metal ion	Equilibrium	Log K 25°, 0.1
Tm ³⁺	ML/M.L	16.47
Yb ³⁺	ML/M.L	16.57
Lu ³⁺	ML/M.L	16.60
Ni ²⁺	ML/M.L	15.08
Cu ²⁺	ML/M.L	16.50
	MHL/ML.H	4.32
Zn ²⁺	ML/M.L	15.32
Cd ²⁺	ML/M.L	15.05
	ML/M.L	20.33
	MHL/ML.H	4.74
Hg ²⁺	MHL/ML.H	6.97*
	MOHL/ML.OH	
Pb ²⁺	ML/M.L	16.16

*DL-mixture; *Value used for K_w not stated.

Bibliography: H⁺-Ba²⁺ 80KBb; La³⁺-Lu³⁺ 80Mba; Ni²⁺, Zn²⁺-Pb²⁺ 80KBc; Cu²⁺ 81KBa;

Other reference: 82GSM



C₃₁H₃₂O₁₃N₂S

5,5'-Bis[bis(carboxymethyl)aminomethyl]-3,3'-dimethyl-4'-hydroxyfuchson-2"-sulfonic acid (Xylenol Orange)
(Other values in Vol.1, p.259 and Vol.5, p.85)

H₆L

Metal ion	Equilibrium	Log K 25°, 0.1	ΔH 25°, 0.1	ΔS 25°, 0.1
H ⁺	HL/H.L	(12.12) ^v		
	H ₂ L/HL.H	10.45		
	H ₃ L/H ₂ L.H	6.62 ± 0.05	(-3) ^s	(20)
	H ₄ L/H ₃ L.H	2.85		
	H ₅ L/H ₄ L.H	2.3		
Co ²⁺	ML/M.L	(12.63) ^u		
	MHL/ML.H	10.07		
	MH ₂ L/MHL.H	4.51		
	M ₂ L/ML.M	11.61		
	M ₂ HL/M ₂ L.H	4.55		
Ni ²⁺	ML/M.L	12.37 ^u		
	MHL/ML.H	10.27		
	MH ₂ L/MHL.H	4.77		
	M ₂ L/ML.M	11.36		
	M ₂ HL/M ₂ L.H	4.38		

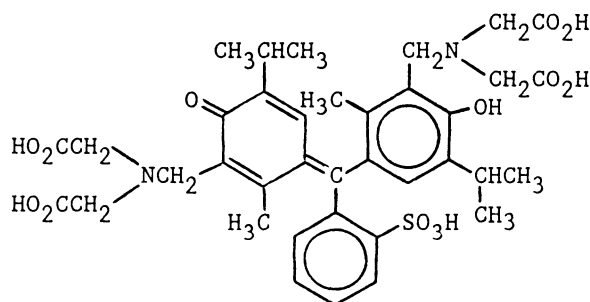
^s15-70°, 0.1; ^uNaClO₄ used as background electrolyte; ^vKNO₃ used as background electrolyte.

Xylenol Orange (continued)

Metal ion	Equilibrium	Log K 25°, 0.1	ΔH 25°, 0.1	ΔS 25°, 0.1
Cu ²⁺	ML/M.L	12.52 ^u		
	MHL/ML.H	8.04		
	MH ₂ L/MHL.H	4.90		
	M ₂ L/ML.M	11.43		
	M ₂ HL/M ₂ L.H	4.57		
Zn ²⁺	ML/M.L	13.41 ^u		
	MHL/ML.H	9.16		
	MH ₂ L/MHL.H	4.45		
	M ₂ L/ML.M	11.63		
	M ₂ HL/M ₂ L.H	4.80		
Cd ²⁺	ML/M.L	(9.67) ^u		
	MHL/ML.H	7.92		
	M ₂ L/ML.M	8.54		
Pb ²⁺	ML/M.L	13.68 ^u		
	MHL/ML.H	9.97		
	MH ₂ L/MHL.H	4.21		
	M ₂ L/ML.M	12.45		
	M ₂ HL/M ₂ L.H	4.11		
Al ³⁺	MHL/M.HL	16.3 ^u		
	MHL/MQH(HL).H	5.7		
	M ₂ L/M ² .L	27.0		
	M ₂ L/M ₂ OHL.H	13.3		

^uNaClO₄ used as background electrolyte;Bibliography: H⁺ 79NY; Co²⁺-Pb²⁺ 80MO; Al³⁺ 81MY;

Other references: 76NDa, 77NDa, 77NDb, 80KMY, 80OSM, 81Nc, 82Nb, 84MSC



C₃₇H₄₄O₁₃N₂S 5,5'-Bis[bis(carboxymethyl)aminomethyl]-3,3'-di-(2-propyl)-
6,6'-dimethyl-4'-hydroxyfuchson-2"-sulfonic acid (Methylthymol Blue)
 (Other values in Vol.5, p.86)

H₆L

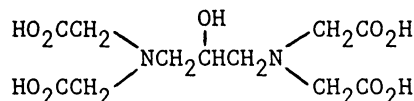
Metal ion	Equilibrium	Log K 25°, 0.1	ΔH 25°, 0.1	ΔS 25°, 0.1
H ⁺	HL/H.L	(12.94) ^v		
	H ₂ L/HL.H	11.14		
	H ₃ L/H ₂ L.H	6.86 ± 0.01		
	H ₄ L/H ₃ L.H	3.04		
	H ₅ L/H ₄ L.H	2.0		
	H ₆ L/H ₅ L.H	(1.8)		

^s15-70°, 0.1; ^vKNO₃ used as background electrolyte.

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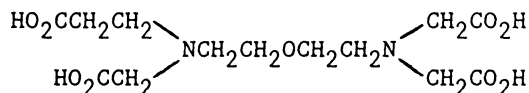
Metal <u>ion</u>	<u>Equilibrium</u>	Log K 25°, 0.1	ΔH 25°, 0.1	ΔS 25°, 0.1
Al ³⁺	ML/M.L	16.2 ^u		
	ML/MOHL.H	6.7		
	M ₂ L/ML.M	10.6		
	M ₂ L/M ₂ (OH) ₂ L.H ²	13.8		

Other references: 63R, 72SB, 77RS, 80Nc, 81ZLA

 H_4L

Metal		Log K	Log K
<u>ion</u>	<u>Equilibrium</u>	<u>25°, 0.1</u>	<u>20°, 0.1</u>
H ⁺	HL/H.L	9.49 ^v -0.01	9.59 ^v +0.01
	H ₂ L/HL.H	6.96 ±0.00	6.92 -0.01
	H ₃ L/H ₂ L.H	2.56 ±0.04	2.52 ±0.06
	H ₄ L/H ₃ L.H	(1.6) ±0.0	(1.7) ±0.1
Co ³⁺	ML/M.L	39.3	

Bibliography: 8300

 H_4L

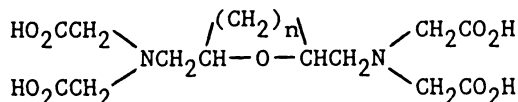
Metal		Log K
<u>ion</u>	<u>Equilibrium</u>	<u>25°, 0.1</u>
H ⁺	HL/H.L	9.55 ^v
	H ₂ L/HL.H	8.98
	H ₃ L/H ₂ L.H	3.86
	H ₄ L/H ₃ L.H	2.63
Y ³⁺	ML/M.L	14.28
	MHL/M.HL	8.77
La ³⁺	ML/M.L	13.31
	MHL/M.HL	8.36
Ce ³⁺	ML/M.L	14.26
	MHL/M.HL	8.89
Pr ³⁺	ML/M.L	14.61
	MHL/M.HL	9.21
Nd ³⁺	ML/M.L	14.80
	MHL/M.HL	9.40
Sm ³⁺	ML/M.L	15.29
	MHL/M.HL	9.59

$\sqrt{\text{KNO}_3}$ used as background electrolyte.

N-(2-Carboxyethyl)oxybis(ethyleneamine)-N,N',N'-triacetic acid (continued)

<u>Metal ion</u>	<u>Equilibrium</u>	<u>Log K</u> <u>25°, 0.1</u>
Eu ³⁺	ML/M.L	15.28
	MHL/M.HL	9.50
Gd ³⁺	ML/M.L	15.21
	MHL/M.HL	9.32
Tb ³⁺	ML/M.L	15.16
	MHL/M.HL	9.43
Dy ³⁺	ML/M.L	15.11
	MHL/M.HL	9.31
Ho ³⁺	ML/M.L	15.01
	MHL/M.HL	(9.06)
Er ³⁺	ML/M.L	14.90
	MHL/M.HL	9.24
Tm ³⁺	ML/M.L	14.97
	MHL/M.HL	9.29
Yb ³⁺	ML/M.L	15.17
	MHL/M.HL	9.38
Lu ³⁺	ML/M.L	15.14
	MHL/M.HL	9.40

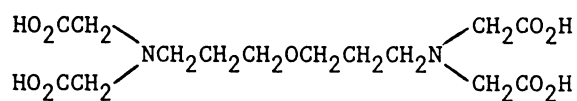
Bibliography: 85PL

C_xH_yO₉N₂Bis[bis(carboxymethyl)aminomethyl]oxacycloalkaneH₄L

<u>Ligand</u>	<u>Metal ion</u>	<u>Equilibrium</u>	<u>Log K</u> <u>25°, 0.1</u>
n= 2	H ⁺	HL/H.L	8.95 ^u
2,5-...-oxalane		H ₂ L/HL.H	8.67
(2,5-bis(amino-		H ₃ L/H ₂ L.H	2.73
methyl)-tetrahydro-		H ₄ L/H ₃ L.H	2.42
furan-N,N,N',N' -	Pb ²⁺	ML/M.L	14.30
tetraacetic acid)			
(C ₁₄ H ₂₂ O ₉ N ₂)			
n= 3	H ⁺	H ₂ L/H ² .L	17.2 ^u
2,6-...-oxane		H ₃ L/H ₂ L.H	2.98
(2,6-bis(amino-		H ₄ L/H ₃ L.H	2.71
methyl)tetrahydro-	Pb ²⁺	ML/M.L	14.9
pyrane-N,N,N',N' -		MHL/ML.H	3.79
tetraacetic acid)			
(C ₁₅ H ₂₄ O ₉ N ₂)			

^uNaNO₃ used as background electrolyte.

Bibliography: 77PI

C₁₄H₂₄O₉N₂

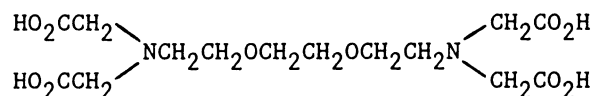
Oxybis(trimethylenenitrilo)tetraacetic acid
 (bis(3-aminopropyl)ether-N,N,N',N'-tetraacetic acid)
 (Other values in Vol.1, p.267)

H₄L

Metal ion	Equilibrium	Log K 25°, 0.1	Log K 20°, 0.1
H ⁺	HL/H.L	10.03	10.15 ^v ±0.02
	H ₂ L/HL.H	(9.88)	9.65 ±0.02
	H ₃ L/H ₂ L.H	(2.65)	2.72 ±0.02
	H ₄ L/H ₃ L.H	(2.32)	2.0 ±0.1
La ³⁺	ML/M.L	10.68	
	MHL/ML.H	5.94	
Ce ³⁺	ML/M.L	11.27	
	MHL/ML.H	5.59	
Pr ³⁺	ML/M.L	11.54	
	MHL/ML.H	5.48	
Nd ³⁺	ML/M.L	11.66	
	MHL/ML.H	5.40	
Sm ³⁺	ML/M.L	11.87	
	MHL/ML.H	5.36	
Eu ³⁺	ML/M.L	11.82	
	MHL/ML.H	5.51	
Gd ³⁺	ML/M.L	11.74	
	MHL/ML.H	5.59	
Tb ³⁺	ML/M.L	11.70	
	MHL/ML.H	5.89	
Dy ³⁺	ML/M.L	11.72	
	MHL/ML.H	6.02	
Ho ³⁺	ML/M.L	11.75	
	MHL/ML.H	6.08	
Er ³⁺	ML/M.L	11.87	
	MHL/ML.H	6.01	
Tm ³⁺	ML/M.L	11.99	
	MHL/ML.H	5.97	
Yb ³⁺	ML/M.L	12.08	
	MHL/ML.H	6.04	
Lu ³⁺	ML/M.L	12.14	
	MHL/ML.H	6.02	

^vK⁺ salt used as background electrolyte.

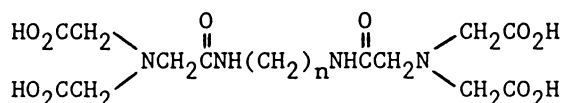
Bibliography: 84TP

 $\text{C}_{14}\text{H}_{24}\text{O}_{10}\text{N}_2$ Ethylenebis(oxyethylenenitrilo)tetraacetic acid (EGTA)
(Other values in Vol.1, p.269 and Vol.5, p.88) H_4L

Metal ion	Equilibrium	Log K 25°, 0.1	Log K 20°, 1.0	Log K 25°, 3.0	ΔH 20°, 0.1	ΔS 25°, 0.1
H^+	HL/H.L	9.40 ^v ±0.02 8.89 ^{b,u}	9.22 ^v	9.36 ^u	-5.8	24
	$\text{H}_2\text{L}/\text{HL.H}$	8.78 -0.01 8.40 ^b	8.67	8.61	-5.8	21
	$\text{H}_3\text{L}/\text{H}_2\text{L.H}$	2.66 ^h ±0.02 2.50 ^b	2.5	3.00		
	$\text{H}_4\text{L}/\text{H}_3\text{L.H}$	2.0 ^h ±0.0 2.1 ^b	(2.4)	2.73		
	$\text{H}_5\text{L}/\text{H}_4\text{L.H}$	(0.9) ^b				
Am^{3+}	ML/M.L	18.1				
Cm^{3+}	ML/M.L	18.0				
Cf^{3+}	ML/M.L	17.8				
Th^{4+}	ML/M.L	20.5			(+3) ^s	(104)
	ML/MOHL.H	7.3				
Zr^{4+}	ML/M.L	23.0			(-8) ^s	(78)
Sn^{2+}	ML/M.L		17.8 ^u			
	MHL/ML.H		3.1			
	MH ₂ L/MHL.H		2.5			

^b25°,0.5; ^h20°,0.1; ^s0-40°,0.1; ^uNaClO₄ used as background electrolyte;^vK⁺ salt used as background electrolyte.Bibliography: Am³⁺-Cf³⁺ 70B; Th⁴⁺, Zr⁴⁺ 81HJ; Sn²⁺ 68BR

Other references: 63R, 65FS, 71RMS, 80DC, 80OSK, 82AO, 82NB, 83FF, 83YW

 $\text{C}_x\text{H}_y\text{O}_{10}\text{N}_4$ N,N'-Diglycyl-1,n-diaminoalkane-N'',N'',N''',N'''-tetraacetic acid H_4L

Ligand	Metal ion	Equilibrium	Log K 25°, 0.1
n= 2	H^+	HL/H.L	7.28 ^v ±0.04
-1,2-diaminoethane-		$\text{H}_2\text{L}/\text{HL.H}$	6.15 ±0.04
(DGENTA)		$\text{H}_3\text{L}/\text{H}_2\text{L.H}$	2.65 ±0.05
($\text{C}_{14}\text{H}_{22}\text{O}_{10}\text{N}_4$)		$\text{H}_4\text{L}/\text{H}_3\text{L.H}$	(1.9) -0.7
(Other values in	Co^{2+}	ML/M.L	8.85 -0.3
Vol.1, p.273 and		MHL/ML.H	5.23 +0.5
Vol.5, p.89)		M ₂ L/ML.M	5.26 +0.5
	Ni^{2+}	ML/M.L	9.95 -0.4
		MHL/ML.H	5.00 -0.02
		M ₂ L/ML.M	5.80 +0.7

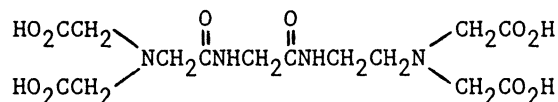
^vK⁺ salt used as background electrolyte.

DGENTA (continued)

<u>Ligand</u>	<u>Metal ion</u>	<u>Equilibrium</u>	<u>Log K</u> <u>25°, 0.1</u>
	Cu ²⁺	ML/M.L	11.22 -0.06
		MHL/ML.H	4.64 +0.3
		ML/M(H ₋₁ L).H	9.63 -0.6
		M(H ₋₁ L)/M(H ₋₂ L).H	9.84 -0.2
		M ₂ L/ML.M	6.08 +2
		M ₂ L/M ₂ (H ₋₁ L).H	7.32 +0.08
		M ₂ (H ₋₁ L)/M ₂ (H ₋₂ L).H	7.56 +0.02
		M ₂ (H ₋₂ L)/M ₂ OH(H ₋₂ L).H	8.28 +0.3
n= 4	H ⁺	HL/H.L	7.06 ^v
-1,4-diaminobutane-		H ₂ L/HL.H	6.14
(C ₁₆ H ₂₆ O ₁₀ N ₄)		H ₃ L/H ₂ L.H	2.55
		H ₄ L/H ₃ L.H	(2.0)
	Co ²⁺	ML/M.L	8.58
		MHL/ML.H	5.42
		M ₂ L/ML.M	5.17
	Ni ²⁺	ML/M.L	10.00
		MHL/ML.H	4.59
		M ₂ L/ML.M	5.81
	Cu ²⁺	ML/M.L	10.4
		MHL/ML.H	5.07
		ML/M(H ₋₁ L).H	9.90
		M ₂ L/ML.M	7.40
		M ₂ L/M ₂ OHL.H	7.19
		M ₂ OHL/M ₂ OH(H ₋₁ L).H	9.00
		M ₂ OH(H ₋₁ L)/M ₂ OH(H ₋₂ L).H	9.59
		M ₂ OH(H ₋₂ L)/M ₂ (OH) ₂ (H ₋₂ L).H	10.77

^vKNO₃ used as background electrolyte.

Bibliography: 85SM

C₁₄H₂₂O₁₀N₄ N-(Glycylglycyl)-1,2-diaminoethane-N',N',N'',N''-tetraacetic acidH₄L

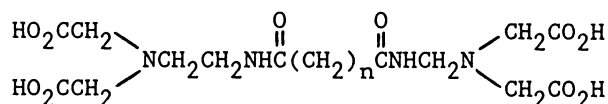
<u>Metal ion</u>	<u>Equilibrium</u>	<u>Log K</u> <u>25°, 0.1</u>
H ⁺	HL/H.L	8.7 ^v
	H ₂ L/HL.H	6.2
	H ₃ L/H ₂ L.H	2.9
	H ₄ L/H ₃ L.H	2.1
Co ²⁺	ML/M.L	11.0
	MHL/ML.H	4.6
	M ₂ L/ML.M	2.9
Ni ²⁺	ML/M.L	11.3
	MHL/ML.H	5.2
	M ₂ L/ML.M	4.2
Cu ²⁺	ML/M.L	11.7
	MHL/ML.H	4.8

^vKNO₃ used as background electrolyte.

N-(Glycylglycyl)-1,2-diaminoethane-N'',N'',N''',N'''-tetraacetic acid (continued)

Metal		Log K
<u>ion</u>	<u>Equilibrium</u>	<u>25°, 0.1</u>
(Cu ²⁺)	ML/M(H ₁ L).H	7.2
	M ₂ L/ML.M	5.7
	M ₂ L/M ₂ (H ₁ L).H	6.0
	M ₂ (H ₁ L)/M ₂ (H ₂ L).H	13.3

Bibliography: 85SM

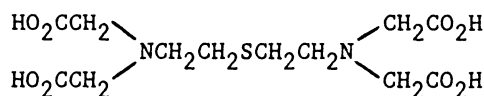


C_xH_yO₁₀N₄ N,N'-Bis(2-aminoethyl)alkylenediamide-N'',N'',N''',N'''-tetraacetic acid H₄L

Ligand	Metal	<u>ion</u>	<u>Equilibrium</u>	Log K
				<u>25°, 0.1</u>
n= 0		H ⁺	HL/H.L	8.60 ^v
-oxalamide-			H ₂ L/HL.H	7.87
			H ₃ L/H ₂ L.H	2.61
(C ₁₄ H ₂₂ O ₁₀ N ₄)			H ₄ L/H ₃ L.H	2.01
	Co ²⁺		ML/M.L	10.63
			MHL/ML.H	4.90
			M ₂ L/ML.M	2.84
			M ₂ L/M(H ₂ L).H ²	14.92
	Ni ²⁺		ML/M.L	11.36
			MHL/ML.H	5.10
			M ₂ L/ML.M	4.30
			M ₂ L/M(H ₂ L).H ²	15.48
	Cu ²⁺		ML/M.L	12.06
			MHL/ML.H	6.42
			M ₂ L/ML.M	6.92
			M ₂ L/M(H ₂ L).H ²	11.37
n= 1		H ⁺	HL/H.L	8.67 ^v
-malonamide-			H ₂ L/HL.H	7.97
			H ₃ L/H ₂ L.H	2.70
(C ₁₅ H ₂₄ O ₁₀ N ₄)			H ₄ L/H ₃ L.H	2.03
	Co ²⁺		ML/M.L	10.05
			MHL/ML.H	5.46
			M ₂ L/ML.H	3.41
	Ni ²⁺		ML/M.L	11.59
			MHL/ML.H	5.14
			M ₂ L/ML.H	4.16
	Cu ²⁺		ML/M.L	12.48
			MHL/ML.H	5.60
			ML/M(H ₁ L).H	9.41
			M(H ₁ L)/M(H ₂ L).H	10.79
			M ₂ L/ML.M	6.48
			M ₂ L/M ₂ (H ₁ L).H	6.40
			M ₂ (H ₁ L)/M ₂ (H ₂ L).H	8.03

^vKNO₃ used as background electrolyte.

Bibliography: 85SM

 $\text{C}_{12}\text{H}_{20}\text{O}_8\text{N}_2\text{S}$

Thiobis(ethylenenitrilo)tetraacetic acid (TEDTA)
(Other values in Vol.1, p.274)

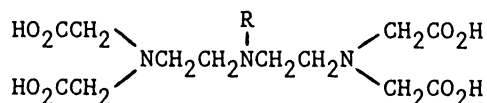
 H_4L

Metal	Equilibrium	Log K 25°, 0.1	Log K 20°, 1.0	ΔH 20°, 0.1	ΔS 25°, 0.1
ion	HL/H.L				
H^+		9.31 ^v ±0.02	9.05 ^u 9.29 ^z	-6.7	20
	$\text{H}_2\text{L}/\text{HL.H}$	8.35 ±0.05	8.24	-6.6	16
	$\text{H}_3\text{L}/\text{H}_2\text{L.H}$	2.60 ±0.08	2.5		
	$\text{H}_4\text{L}/\text{H}_3\text{L.H}$	(1.9) ±0.1	2.1		
La^{3+}	$\text{ML}/\text{M.L}$	12.7 ±0.1		-0.2	57
Ce^{3+}	$\text{ML}/\text{M.L}$	13.47			
Pr^{3+}	$\text{ML}/\text{M.L}$	13.97			
Nd^{3+}	$\text{ML}/\text{M.L}$	14.22			
Sm^{3+}	$\text{ML}/\text{M.L}$	14.76			
Eu^{3+}	$\text{ML}/\text{M.L}$	14.82			
Gd^{3+}	$\text{ML}/\text{M.L}$	14.76			
Tb^{3+}	$\text{ML}/\text{M.L}$	14.83			
Dy^{3+}	$\text{ML}/\text{M.L}$	14.83			
Ho^{3+}	$\text{ML}/\text{M.L}$	14.67			
Er^{3+}	$\text{ML}/\text{M.L}$	14.51			
Tm^{3+}	$\text{ML}/\text{M.L}$	14.41			
Yb^{3+}	$\text{ML}/\text{M.L}$	14.32			
Lu^{3+}	$\text{ML}/\text{M.L}$	14.10			

^u NaClO_4 used as background electrolyte; ^v KNO_3 used as background electrolyte;

^z $(\text{CH}_3)_4\text{N}^+$ salt used as background electrolyte.

Bibliography: H^+ 67A,85TP; La^{3+} - Lu^{3+} 85TP

 $\text{C}_x\text{H}_{25}\text{O}_8\text{N}_3$

N-Alkyliminobis(ethylenenitrilo)tetraacetic acid

 H_4L

Ligand	Metal	Equilibrium	Log K 25°, 0.1
ion			
$\text{R} = \text{CH}_2\text{CH}_3$	H^+	$\text{HL}/\text{H.L}$	10.44 ^v
N-Ethyl-		$\text{H}_2\text{L}/\text{HL.H}$	7.42
		$\text{H}_3\text{L}/\text{H}_2\text{L.H}$	4.00
		$\text{H}_4\text{L}/\text{H}_3\text{L.H}$	2.80
$(\text{C}_{14}\text{H}_{25}\text{O}_8\text{N}_3)$	Y^{3+}	$\text{ML}/\text{M.L}$	17.13
	La^{3+}	$\text{ML}/\text{M.L}$	15.86
	Ce^{3+}	$\text{ML}/\text{M.L}$	16.73
	Pr^{3+}	$\text{ML}/\text{M.L}$	17.20
	Nd^{3+}	$\text{ML}/\text{M.L}$	17.44
	Sm^{3+}	$\text{ML}/\text{M.L}$	17.79
	Eu^{3+}	$\text{ML}/\text{M.L}$	17.82
	Gd^{3+}	$\text{ML}/\text{M.L}$	17.79
	Tb^{3+}	$\text{ML}/\text{M.L}$	17.92
	Dy^{3+}	$\text{ML}/\text{M.L}$	17.84
	Ho^{3+}	$\text{ML}/\text{M.L}$	17.72
	Er^{3+}	$\text{ML}/\text{M.L}$	17.70
	Tm^{3+}	$\text{ML}/\text{M.L}$	17.60

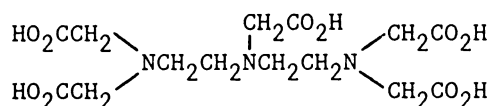
^v KNO_3 used as background electrolyte.

N-Alkyliminobis(ethylenenitrilo)tetraacetic acid (continued)

Ligand	Metal ion	Equilibrium	Log K 25°, 0.1
	Yb ³⁺	ML/M.L	17.70
	Lu ³⁺	ML/M.L	17.68
R= C ₆ H ₅	H ⁺	HL/H.L	10.15 ^v
N-Phenyl-		H ₂ L/HL.H	9.18
		H ₃ L/H ₂ L.H	3.46
(C ₁₈ H ₂₅ O ₈ N ₃)		H ₄ L/H ₃ L.H	(1.9)
	La ³⁺	ML/M.L	13.10
	Ce ³⁺	ML/M.L	13.91
	Pr ³⁺	ML/M.L	14.82
	Nd ³⁺	ML/M.L	15.10
	Sm ³⁺	ML/M.L	15.66
	Eu ³⁺	ML/M.L	15.71
	Gd ³⁺	ML/M.L	15.42
	Tb ³⁺	ML/M.L	15.48
	Dy ³⁺	ML/M.L	15.35
	Ho ³⁺	ML/M.L	15.02
	Er ³⁺	ML/M.L	14.81
	Tm ³⁺	ML/M.L	14.79
	Yb ³⁺	ML/M.L	14.88
	Lu ³⁺	ML/M.L	14.74

^vKNO₃ used as background electrolyte.

Bibliography: 85TP

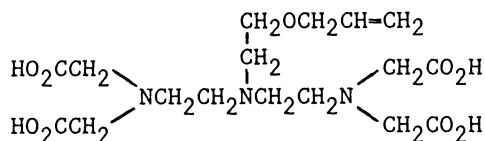
C₁₄H₂₃O₁₀N₃Diethylenetrinitrilopentaacetic acid (DTPA)
(Other values in Vol.1, p.281 and Vol.5, p.89)H₅L

Metal ion	Equilibrium	Log K 25°, 0.1	Log K 25°, 0.5	Log K 25°, 1.0	ΔH 25°, 0.1	ΔS 25°, 0.1
H ⁺	HL/H.L	10.48 ^v ±0.08 10.71 ^z	9.42 ^u 9.9 ^v	9.38 ^u ±0.00 9.98 ^v ±0.08	-8.0 ±0.1	21
	H ₂ L/HL.H	8.60 ±0.05 8.64 ^z	(8.09) ^u 8.32 ^v	8.18 ^u ±0.02 8.25 ^v ±0.04 8.33 ^z	-4.3 -0.1	25
	H ₃ L/H ₂ L.H	4.28 ±0.04	4.10 ±0.02	4.15 ±0.03	-1.5 ±0.1	15
	H ₄ L/H ₃ L.H	2.6 ±0.1	2.7 ±0.1	2.6 ±0.1	-0.8 ±0.2	11
	H ₅ L/H ₄ L.H	2.0 ±0.2	2.1 ±0.1	2.2 ±0.2	+0.5 ±0.2	11
	H ₆ L/H ₅ L.H	(1.6) ±0.1		(1.5) ±0.3		
	H ₇ L/H ₆ L.H	(0.7)		(0.8) ±0.1		
	H ₈ L/H ₇ L.H	(-0.1)				
K ⁺	ML/M.L	0.9 ^{h,z}				
Ce ³⁺	ML/M.L	20.33 ±0.01			-5.8	74
Am ³⁺	ML/M.L	23.1 ±0.2				
	MHL/M.HL	14.06				

^h20°, 0.1; ^uNa⁺ used as background electrolyte; ^vKNO₃ used as background electrolyte.^z(CH₃)₄NCl used as background electrolyte.

DTPA (continued)

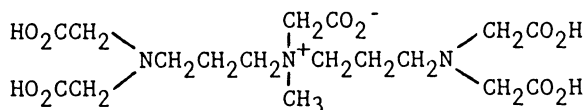
Metal ion	Equilibrium	Log K 25°, 0.1	Log K 25°, 0.5	Log K 25°, 1.0	ΔH 25°, 0.1	ΔS 25°, 0.1
Cm ³⁺	ML/M.L MHL/M.HL	23.5 ±0.5 14.43				
Th ⁴⁺	ML/M.L	(26.4)	(27.1) ^u		(-10) ^s	(87)

^s10-40°, 0.1; ^uNa⁺ salt used as background electrolyte;Bibliography: H⁺ 80M, 81MPa, 82OL, 83KDC; K⁺ 67A; Am³⁺, Cm³⁺ 70B; Ce³⁺ 83HP; Th⁴⁺ 83HP, 85LCF
Other references: 63JK, 70P, 80KJ, 80KKK, 80KTS, 80Sb, 80TH, 82CP, 83MA, 83YW, 84DM, 84Sc, 84ZG, 85KLLC₁₇H₂₉O₉N₃N'-(Allyloxyethyl)diethylenetriaminetetraacetic acidH₄L

Metal ion	Equilibrium	Log K 20°, 0.1
H ⁺	HL/H.L H ₂ L/HL.H H ₃ L/H ₂ L.H H ₄ L/H ₃ L.H	9.55 ^v 8.28 4.34 2.89
Y ³⁺	ML/M.L	18.81
Eu ³⁺	ML/M.L	19.05
Cu ²⁺	ML/M.L	18.61
Zn ²⁺	ML/M.L	15.77

^vKCl used as background electrolyte.

Bibliography: 82T

C₁₇H₂₉O₁₀N₃(Bis[3-(bis(carboxymethyl)amino)propyl]methylammonio)acetateH₄L

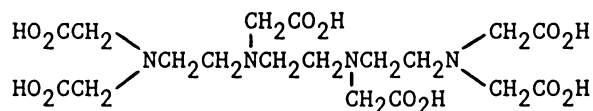
Metal ion	Equilibrium	Log K 25°, 0.1
H ⁺	HL/H.L H ₂ L/HL.H H ₃ L/H ₂ L.H H ₄ L/H ₃ L.H	8.84 ^v 7.95 2.82 2.14
La ³⁺	ML/M.L MHL/ML.H	7.58 6.37
Ce ³⁺	ML/M.L MHL/ML.H	8.08 6.09
Pr ³⁺	ML/M.L MHL/ML.H	8.37 5.91
Nd ³⁺	ML/M.L MHL/ML.H	8.43 5.91

^vKNO₃ used as background electrolyte.

(Bis[3-(carboxymethyl)amino]propyl)methylammonio}acetate (continued)

Metal ion	Equilibrium	Log K 25°, 0.1
Sm ³⁺	ML/M.L	8.71
	MHL/ML.H	5.80
Eu ³⁺	ML/M.L	8.90
	MHL/ML.H	5.58
Gd ³⁺	ML/M.L	8.79
	MHL/ML.H	5.72
Tb ³⁺	ML/M.L	8.87
	MHL/ML.H	5.75
Dy ³⁺	ML/M.L	9.00
	MHL/ML.H	5.86
Ho ³⁺	ML/M.L	9.35
	MHL/ML.H	5.61
Er ³⁺	ML/M.L	9.54
	MHL/ML.H	5.54
Tm ³⁺	ML/M.L	9.69
	MHL/ML.H	5.49
Yb ³⁺	ML/M.L	9.85
	MHL/ML.H	5.40
Lu ³⁺	ML/M.L	9.83
	MHL/ML.H	5.44

Bibliography: 84TP

C₁₈H₃₀O₁₂N₄Triethylenetetranitrilo-hexa-acetic acid (TTHA)
(Other values in Vol.1, p.286 and Vol.5, p.90)H₆L

Metal ion	Equilibrium	Log K 25°, 0.1	Log K 20°, 0.1	Log K 25°, 0.5
H ⁺	HL/H.L	10.55 ^v ±0.1	10.65 ^v	9.73 ^u
	H ₂ L/HL.H	9.5 ±0.1	9.54	8.76
	H ₃ L/H ₂ L.H	6.12 ±0.06	6.10	5.92
	H ₄ L/H ₃ L.H	4.09 ±0.07	4.03	3.94
	H ₅ L/H ₄ L.H	2.75 ±0.03	2.7	2.75
	H ₆ L/H ₅ L.H	2.3 ±0.1	2.3	2.3
	H ₇ L/H ₆ L.H	(1.8)		
	H ₈ L/H ₇ L.H	(1.5)		
Ce ³⁺	MHL/M.HL	15.76		
	MH ₂ L/MHL.H	4.13		
Am ³⁺	ML/M.L	26.6 +1		
	MHL/M.HL	18.13		
	MH ₂ L/MHL.H	3.91		
Cm ³⁺	MHL/M.HL	18.19		
	M ₂ L/MHL.H	3.77		

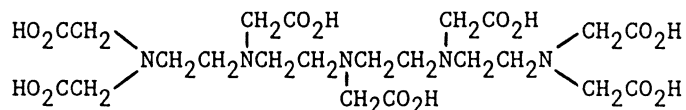
^uNaClO₄ used as background electrolyte; ^vK⁺ salt used as background electrolyte.

Metal ion	Equilibrium	Log K 25°, 0.1	Log K 25°, 1.0	Log K 25°, 0.5
UO ₂ ²⁺	ML/M.L			12.55 ^u
	MHL/ML.H			6.40
	MH ₂ L/MHL.H			5.69
VO ²⁺	MHL/ML.H			8.95
	MH ₂ L/MHL.H			4.36
	MH ₃ L/MH ₂ L.H			2.32
Tl ⁺	ML/M.L			4.91
	MHL/MHL.H			9.73
Ga ³⁺	ML/M.L	28.21		
	ML/MOHL.H	9.64		
	MHL/ML.H	5.30 ±0.0		
	MH ₂ L/MHL.H	3.96 -0.3		
	MH ₃ L/MH ₂ L.H	2.57 ±0.01		
In ³⁺	ML/M.L	(26.75)		
Bi ³⁺	MHL/ML.H	4.16		3.60
	MH ₃ L/MHL.H ²	4.95		4.68
	MH ₄ L/MH ₃ L.H			(1.2)
	M.H ₉ L/MH ₄ L.H ⁵			5.73 ^e

Bibliography: H^+ 76N, 82OL;

Ce³⁺-Cm³⁺ 70B; UO₂²⁺ 82N; VO²⁺ 76N; Tl⁺ 77CN; Ga³⁺ 80MM; In³⁺ 84TMM; Bi³⁺ 79NPa;

Other references: ²80TH, 81GMb, 84Na


$$\text{C}_{22}\text{H}_{37}\text{O}_{14}\text{N}_5$$

Tetraethylenepentanitriloheptaacetic acid (TPHA)

(Other references in Vol.1, p.400 and Vol.5, p.428)

H₇L

Metal		Log K
<u>ion</u>	<u>Equilibrium</u>	<u>25°</u> , <u>0.1</u>
H ⁺	HL/H.L	10.76 ^v -0.4
	H ₂ L/HL.H	9.78 ±0.10
	H ₃ L/H ₂ L.H	8.19 ±0.06
	H ₄ L/H ₃ L.H	4.69 ±0.07
	H ₅ L/H ₄ L.H	3.78 -0.01
	H ₆ L/H ₅ L.H	2.67 ±0.02
	H ₇ L/H ₆ L.H	2.07 ±0.07
	H ₈ L/H ₇ L.H	(1.7) ±0.0
	H ₉ L/H ₈ L.H	(1.4)
Ga ³⁺	ML/M.L	28.16
	ML/MOHL.H	9.77
	MHL/ML.H	7.87
	MH ₂ L/MHL.H	4.90
	MH ₃ L/MH ₂ L.H	3.70
	MH ₄ L/MH ₃ L.H	2.50

$\overline{v_{K^+}}$ salt used as background electrolyte.

Bibliography: 80MM; Other references: 81GMB,84MS

		O H₂NCH₂CNHCH₂CO₂H				
C ₄ H ₈ O ₃ N ₂		Glycylglycine (diglycine)			HL	
		(Other values in Vol.1, p.294 and Vol.5, p.91)				
Metal ion	Equilibrium	Log K 25°, 0.1	Log K 25°, 1.0	Log K 25°, 0	ΔH 25°, 0	ΔS 25°, 0
H ⁺	HL/H.L	8.10 ±0.05	8.10 ±0.05	8.259 ±0.007	-10.5 ±0.1	2.5
		8.05 ^b ±0.04	7.74 ⁿ ±0.00	8.56 ^e	-10.6 ^a ±0.1	1 ^a
					-11.7 ^e	
	H ₂ L/HL.H	3.13 ±0.05	3.14 ±0.03	3.144 ±0.004	-0.2 ±0.2	13.7
		3.12 ^b -0.01	3.11 ⁿ -0.01	3.51 ^e	-0.3 ^a	13 ^a
					-1.3 ^e	
Gd ³⁺	ML/M.L	0.58				
Mn ²⁺	ML/M.L	1.8 ^h		2.15		
Ni ²⁺	ML/M.L	4.05 ±0.06	4.03	4.49	-5.2 ^a ±0.3	1 ^a
	ML ₂ /M.L ²	7.25 ±0.07	7.24	7.91	-9.2 ^a ±0.4	2 ^a
	ML ₃ /M.L ³	9.4 ±0.1	9.4		-14.3 ^a	5 ^a
	ML ₂ /M(H ₋₁ L).L.H	9.0 ±0.2	9.2		-8.7 ^a	12 ^a
	M(H ₋₁ L)L/M(H ₋₁ L) ₂ .H	9.7 ±0.2	9.9		-8.9 ^a	15 ^a
Cu ²⁺	ML/M.L	5.55 ±0.05	5.45 ±0.05	6.04	-6.5 ^a ±0.4	4 ^a
		5.46 ^b	5.34 ⁿ		-7.1 ^b	
	ML/M(H ₋₁ L).H	4.15 ±0.09	4.30 ±0.08		-7.2 ^a ±0.4	-5 ^a
			(3.98) ⁿ		-7.5 ^b	
	M(H ₋₁ L)/MOH(H ₋₁ L).H	9.31 ±0.09	9.51 ±0.01		-10.0 ^a ±0.3	9 ^a
			(8.85) ⁿ			
	M(H ₋₁ L)L/M(H ₋₁ L).L	3.1 ±0.2	3.1 ±0.2		-7.0 ^a ±0.4	-9 ^a
	3.0 ^b	3.1 ⁿ				
	M ₂ OH(H ₋₁ L) ₂ /M(H ₋₁ L).MOH(H ₋₁ L)	2.1 ±0.2	2.1 ±0.1		-2.6 ^a	1 ^a
			(1.9) ⁿ			
a _{25°} ,0.1; b _{25°} ,0.5; e _{25°} ,3.0; h _{20°} ,0.1; n _{37°} ,0.15						
Bibliography: H ⁺ 74ER,81KR,81NMK,81NMP,82NP,84ME,85AJO,85KSR,85VP;						
Gd ³⁺ 81KB; Mn ²⁺ 82KR; Ni ²⁺ 57Lc,82KR; Cu ²⁺ 81NMK,82ND,83KR,84YMD,85AJO;						
Other references: 59KG,67SB,80NSa,80SBa,80SBb,81PMa,82RRa,82RRb,82VS,83NR,84WR,85PO						

^a25°, 0.1; ^b25°, 0.5; ^e25°, 3.0; ^h20°, 0.1; ⁿ37°, 0.15

Bibliography: H^+ 74ER, 81KR, 81NMK, 81NMP, 82NP, 84ME, 85AJO, 85KSR, 85VP;

Gd^{3+} 81KB; Mn^{2+} 82KR; Ni^{2+} 57Lc, 82KRa; Cu^{2+} 81NMK, 82ND, 83KR, 84YMD, 85AJO;

Other references: 59KG, 67SB, 80NSa, 80SBa, 80SBb, 81PMA, 82RRa, 82RRb, 82VS, 83NR, 84WR, 85PO

$$\begin{array}{c} \text{O} \\ \parallel \\ \text{H}_2\text{NCH}_2\text{CNHCH}_2\text{CH}_2\text{CO}_2\text{H} \end{array}$$

Glycyl-β-alanine

(Other references in Vol.1, p.296 and other values in Vol.5, p.92)

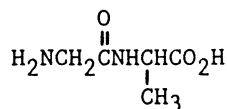
HL

$\text{C}_5\text{H}_{10}\text{O}_3\text{N}_2$

Metal		Log K
<u>ion</u>	<u>Equilibrium</u>	<u>25°, 0.1</u>
H^+	HL/H.L	8.07 ±0.02
	$\text{H}_2\text{L}/\text{HL.H}$	3.94 ±0.03
Cu^{2+}	ML/M.L	5.71 ±0.03
	ML/M(H ₋₁ L).H	4.60 ±0.04
	M(H ₋₁ L)/MOH(H ₋₁ L).H	10.13
	M(H ₋₁ L)L/M(H ₋₁ L).L	2.87
	$\text{M}_2\text{OH}(\text{H}_{-1}\text{L})_2/\text{M}(\text{H}_{-1}\text{L}).\text{MOH}(\text{H}_{-1}\text{L})$	2.46

Bibliography: 81SP

Bibliography: 81SP

 $\text{C}_5\text{H}_{10}\text{O}_3\text{N}_2$ Glycyl-L-alanine

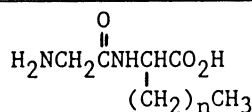
HL

(Other values in Vol.1, p.297 and other references in Vol.5, p.93)

Metal		Log K	Log K	ΔH	ΔS
<u>ion</u>	<u>Equilibrium</u>	<u>25°, 0.1</u>	<u>25°, 0</u>	<u>25°, 0.1</u>	<u>25°, 0.1</u>
H^+	HL/H.L	8.15 ± 0.05 8.09 ^b	8.331	-10.5 ± 0.5	2
	$\text{H}_2\text{L}/\text{HL.H}$	3.12 ± 0.06 3.16 ^b	3.153	-0.2 ± 0.2	14
Mn^{2+}	ML/M.L		1.8 ^h		
Ni^{2+}	ML/M.L	4.23 -0.01	4.35 ^h		
	$\text{ML}_2/\text{M.L}^2$	7.60 ^y +0.1	7.74 ^h		
	$\text{ML}_3/\text{M.L}^3$	9.7	10.4 ^h		
	$\text{ML}_2/\text{M}(\text{H}_{-1}\text{L}).\text{H}$	8.8	9.3 ^h		
	$\text{M}(\text{H}_{-1}\text{L})\text{L}/\text{M}(\text{H}_{-1}\text{L})_2.\text{H}$	11.0	10.2 ^h		
Cu^{2+}	ML/M.L	5.78 ± 0.04 5.65 ^b		-6.5 -0.1 -7.0 ^b	5
	$\text{ML}/\text{M}(\text{H}_{-1}\text{L}).\text{H}$	4.14 ± 0.10		-6.7 ± 0.4 (-8.4) ^b	-4
	$\text{M}(\text{H}_{-1}\text{L})/\text{MOH}(\text{H}_{-1}\text{L}).\text{H}$	9.4 ± 0.2 9.5 ^b		-10.5 (-9.1) ^b	8
	$\text{M}(\text{H}_{-1}\text{L})\text{L}/\text{M}(\text{H}_{-1}\text{L}).\text{L}$	3.15 ± 0.07 3.16 ^b		-6.5 -6.7 ^b	-7
	$\text{M}_2\text{OH}(\text{H}_{-1}\text{L})_2/\text{MOH}(\text{H}_{-1}\text{L}).\text{M}(\text{H}_{-1}\text{L})$	2.1 ± 0.2		-3.3	-1

^b25°, 0.5; ^h20°, 0.1; ^yL- and DL-isomers have about the same value.Bibliography: H^+ 81KR, 85AJ0; Mn^{2+} 82KR; Ni^{2+} 82KR; Cu^{2+} 83KR, 84YMD, 85AJ0;

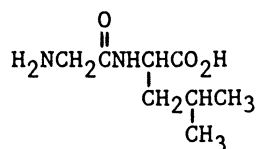
Other references: 80NSa, 82GF, 82RRa, 82RRb, 85PO

 $\text{C}_x\text{H}_y\text{O}_3\text{N}_2$ Glycyl-DL-2-aminoalkanoic acid

HL

Ligand	Metal		Log K
<u>ion</u>	<u>Equilibrium</u>		<u>25°, 0.1</u>
n= 2	H^+	HL/H.L	8.21 ± 0.00
Glycyl-		$\text{H}_2\text{L}/\text{HL.H}$	3.13
DL-norvaline	Cu^{2+}	ML/M.L	5.85 ± 0.03
($\text{C}_7\text{H}_{14}\text{O}_3\text{N}_2$)		$\text{ML}/\text{M}(\text{H}_{-1}\text{L}).\text{H}$	4.66 ± 0.06
		$\text{M}(\text{H}_{-1}\text{L})/\text{MOH}(\text{H}_{-1}\text{L}).\text{H}$	9.66
		$\text{M}(\text{H}_{-1}\text{L})\text{L}/\text{M}(\text{H}_{-1}\text{L}).\text{L}$	(3.56) ^x ± 0.04
n= 3	H^+	HL/H.L	8.23 ± 0.08
Glycyl-		$\text{H}_2\text{L}/\text{HL.H}$	3.10
DL-norleucine	Cu^{2+}	ML/M.L	5.95 ± 0.03
($\text{C}_8\text{H}_{16}\text{O}_3\text{N}_2$)		$\text{ML}/\text{M}(\text{H}_{-1}\text{L}).\text{H}$	4.68 ± 0.06
		$\text{M}(\text{H}_{-1}\text{L})/\text{MOH}(\text{H}_{-1}\text{L}).\text{H}$	10.08
		$\text{M}(\text{H}_{-1}\text{L})\text{L}/\text{M}(\text{H}_{-1}\text{L}).\text{L}$	(3.69) ^x ± 0.04

^xDL-mixtureBibliography: H^+ 67SBG, 70PBS, 85OP, 85PO; Cu^{2+} 67SBG, 84YMD

 $\text{C}_8\text{H}_{16}\text{O}_3\text{N}_2$ Glycyl-L-leucine

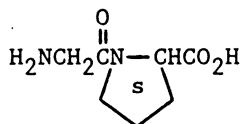
HL

(Other values in Vol.1, p.299 and other references in Vol.5, p.429)

Metal ion	Equilibrium	Log K 25°, 0.1	Log K 25°, 0	ΔH 25°, 0	ΔS 25°, 0
H^+	HL/H.L	8.15 $\pm$ 0.04	8.327	-10.6	3
	$\text{H}_2\text{L}/\text{HL.H}$	3.10 $\pm$ 0.08	3.180	-0.8	17
Mn^{2+}	ML/M.L		1.9 ^h		
Ni^{2+}	ML/M.L	4.27 $\pm$ 0.02	4.28 ^h		
	$\text{ML}_2/\text{M.L}^2$	7.70 ^y $\pm$ 0.3	7.77 ^h		
	$\text{ML}_3/\text{M.L}^3$		10.5 ^h		
	$\text{ML}_2/\text{M}(\text{H}_{-1}\text{L})\text{L.H}$		9.9 ^h		
Cu^{2+}	ML/M.L	5.93 $\pm$ 0.04	5.98 ^h $\pm$ 0.05		
	$\text{ML}/\text{M}(\text{H}_{-1}\text{L})\text{.H}$	4.70 $\pm$ 0.06	4.84 ^h $\pm$ 0.2		
	$\text{M}(\text{H}_{-1}\text{L})/\text{MOH}(\text{H}_{-1}\text{L})\text{.H}$	9.50	9.46 ^h $\pm$ 0.06		
	$\text{M}(\text{H}_{-1}\text{L})\text{L}/\text{M}(\text{H}_{-1}\text{L})\text{.L}$	3.56	3.40 ^h $\pm$ 0.08		
	$\text{M}_2\text{OH}(\text{H}_{-1}\text{L})_2/\text{M}(\text{H}_{-1}\text{L})\text{.MOH}(\text{H}_{-1}\text{L})$		2.27 ^h		

^h20°, 0.2; ^yL- and DL-isomers have about the same value.Bibliography: H^+ 81KR, 85PO; Mn^{2+} 82KR; Ni^{2+} 57Lc, 82KR; Cu^{2+} 81KR, 83KR, 84YMD;

Other references: 80NSa, 82RRa, 82RRb

 $\text{C}_7\text{H}_{12}\text{O}_3\text{N}_2$ Glycyl-L-proline

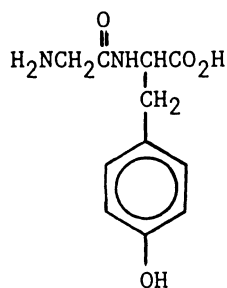
HL

(Other references in Vol.1, p.302 and Vol.5, p.95)

Metal ion	Equilibrium	Log K 25°, 0.1	Log K 20°, 0.1	ΔH 25°, 0.1	ΔS 25°, 0.1
H^+	HL/H.L	8.45 $\pm$ 0.07	8.52	-10.6	3
	$\text{H}_2\text{L}/\text{HL.H}$	2.80 $\pm$ 0.06	2.85		
Mn^{2+}	ML/M.L		2.3		
Ni^{2+}	ML/M.L	4.69 $\pm$ 0.07	4.86		
	$\text{ML}_2/\text{M.L}^2$	8.5 $\pm$ 0.1	8.8		
	$\text{ML}_3/\text{M.L}^3$	11.3 $\pm$ 0.3	11.9		
Cu^{2+}	ML/M.L	6.44 $\pm$ 0.06	6.6 $\pm$ 0.1	-6.2	8
	$\text{ML}_2/\text{M.L}^2$	11.5 $\pm$ 0.1	11.67 $\pm$ 0.05	-13.2	8

Bibliography: H^+ 81KR, 83SK, 84WR; Mn^{2+} 82KR; Ni^{2+} 82KR; Cu^{2+} 81KR, 83KR;

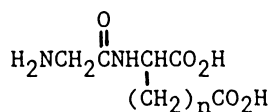
Other references: 74ER, 82RRa, 82RRb

 $\text{C}_{11}\text{H}_{14}\text{O}_4\text{N}_2$ Glycyl-L-tyrosine H_2L

(Other references in Vol.1, p.401 and other values in Vol.5, p.96)

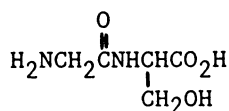
Metal		Log K
<u>ion</u>	<u>Equilibrium</u>	<u>25° 0.1</u>
H^+	HL/H.L	10.09 $\pm$ 0.04
	$\text{H}_2\text{L}/\text{HL.H}$	8.17 $\pm$ 0.04
	$\text{H}_3\text{L}/\text{H}_2\text{L.H}$	2.98 $\pm$ 0.08
Cu^{2+}	MHL/M.HL	6.00
	MHL/MH(H_{-1}L).H	3.84
	MH(H_{-1}L)/M(H_{-1}L).H	9.07
	M(H_{-1}L)/MOH(H_{-1}L).H	10.72
	MHL ₂ /MHL.L	9.40
	M ₂ OH(H_{-1}L) ₂ /M(H_{-1}L).MOH(H_{-1}L)	2.82

Bibliography: 81HP; Other references: 83IS

 $\text{C}_x\text{H}_y\text{O}_5\text{N}_2$ Glycyl-L-2-aminoalkanedioic acid H_2L

	Metal		Log K	ΔH	ΔS
<u>Ligand</u>	<u>ion</u>	<u>Equilibrium</u>	<u>25°, 0.1</u>	<u>25°, 0.2</u>	<u>25°, 0.2</u>
n= 1	H^+	HL/H.L	8.35 $\pm$ 0.00	-10.8	2
Glycyl-L-aspartic acid		$\text{H}_2\text{L}/\text{HL.H}$	4.30 $\pm$ 0.01	-1.4	15
		$\text{H}_3\text{L}/\text{H}_2\text{L.H}$	2.80 $\pm$ 0.01	-1.1	9
($\text{C}_6\text{H}_{10}\text{O}_5\text{N}_2$)	Cu^{2+}	ML/M.L	6.61	-5.3	12
		$\text{ML}_2/\text{M.L}^2$	11.5		
(Other reference		MHL/ML.H	3.80	(-15.0)	(-33)
in Vol.1, p.410		$\text{ML}/\text{M}(\text{H}_{-1}\text{L}).\text{H}$	4.76	-4.3	7
and other values		$\text{M}(\text{H}_{-1}\text{L})/\text{MOH}(\text{H}_{-1}\text{L}).\text{H}$	9.82	-16.1	-9
in Vol.5, p.96)		$\text{M}(\text{H}_{-1}\text{L})\text{L}/\text{M}(\text{H}_{-1}\text{L}).\text{L}$	2.69	-5.5	-6
		$\text{M}_2\text{OH}(\text{H}_{-1}\text{L})_2/\text{M}(\text{H}_{-1}\text{L}).\text{MOH}(\text{H}_{-1}\text{L})$	1.92	-4.1	-5
n= 2	H^+	HL/H.L	8.27	-10.8	2
Glycyl-L-glutamic acid		$\text{H}_2\text{L}/\text{HL.H}$	4.36	-2.2	13
		$\text{H}_3\text{L}/\text{H}_2\text{L.H}$	2.86	-2.3	5
($\text{C}_7\text{H}_{12}\text{O}_5\text{N}_2$)	Cu^{2+}	ML/M.L	6.31	-4.1	15
		MHL/ML.H	3.64		
		$\text{ML}/\text{M}(\text{H}_{-1}\text{L}).\text{H}$	4.85	-4	9
		$\text{M}(\text{H}_{-1}\text{L})/\text{MOH}(\text{H}_{-1}\text{L}).\text{H}$	9.33	-15.3	-9
		$\text{M}(\text{H}_{-1}\text{L})\text{L}/\text{M}(\text{H}_{-1}\text{L}).\text{L}$	2.87	-6.2	-8
		$\text{M}_2\text{OH}(\text{H}_{-1}\text{L})_2/\text{M}(\text{H}_{-1}\text{L}).\text{MOH}(\text{H}_{-1}\text{L})$	1.61	-5.0	-9

Bibliography: 82GF

 $\text{C}_5\text{H}_{10}\text{O}_4\text{N}_2$ Glycyl-L-serine

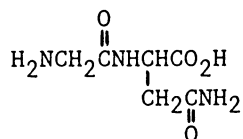
HL

(Other references in Vol.1, p.401 and other values in Vol.5, p.97)

Metal		Log K	Log K	ΔH	ΔS
<u>ion</u>	<u>Equilibrium</u>	<u>25°, 0.1</u>	<u>25°, 0</u>	<u>25°, 0</u>	<u>25°, 0</u>
H^+	HL/H.L	8.13 $\pm$ 0.04		-10.8 ^a	1 ^a
	$\text{H}_2\text{L}/\text{HL.H}$	2.97 $\pm$ 0.05	2.981	-0.2	13
Cu^{2+}	ML/M.L	5.66 $\pm$ 0.00		-6.9 ^a	3 ^a
	ML/M(H_{-1}L).H	3.98 -0.2		-5.8 ^a	-1 ^a
	M(H_{-1}L)/MOH(H_{-2}L).H	9.35		(-21.2) ^a	(-28) ^a
	M(H_{-1}L)L/M(H_{-1}L).L	2.96		-5.8 ^a	-6 ^a
	$\text{M}_2\text{OH}(\text{H}_{-1}\text{L})_2/\text{M}(\text{H}_{-1}\text{L}).\text{MOH}(\text{H}_{-1}\text{L})$	2.19		(-7.6) ^a	(-16) ^a

^a25°, 0.1

Bibliography: 82GF; Other reference: 83S

 $\text{C}_6\text{H}_{11}\text{O}_4\text{N}_3$ Glycyl-L-asparagine

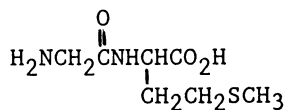
HL

(Other references in Vol.1, p.401 and Vol.5, p.458)

Metal		Log K	Log K	ΔH	ΔS
<u>ion</u>	<u>Equilibrium</u>	<u>25°, 0.2</u>	<u>25°, 0</u>	<u>25°, 0</u>	<u>25°, 0</u>
H^+	HL/H.L	8.12		-10.5 ^a	2 ^a
	$\text{H}_2\text{L}/\text{H.L}^2$	3.11	2.942	-0.1	13
				-0.2 ^a	14 ^a
Cu^{2+}	ML/M.L	5.99		-6.6 ^a	5 ^a
	ML/M(H_{-1}L).H	4.32		-6.4 ^a	-2 ^a
	M(H_{-1}L)/M(H_{-2}L).H	8.78		(15.5) ^a	(-12) ^a
	M(H_{-2}L)/MOH(H_{-1}L).H	10.80			
	M(H_{-1}L)L/M(H_{-1}L).L	3.05		-6.7 ^a	-9 ^a
	$\text{M}_2(\text{H}_{-1}\text{L})(\text{H}_{-1}\text{L})/\text{M}(\text{H}_{-1}\text{L}).\text{M}(\text{H}_{-2}\text{L})$	2.64		-5.1 ^a	-5 ^a

^a25°, 0.2

Bibliography: 82GF; Other references: 83Ab

 $\text{C}_7\text{H}_{14}\text{O}_3\text{N}_2\text{S}$ Glycyl-L-methionine

HL

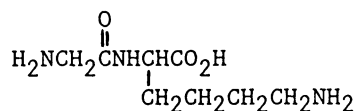
(Other references in Vol.1, p.304 and other values in Vol.5, p.98)

Metal		Log K
<u>ion</u>	<u>Equilibrium</u>	<u>25°, 0.1</u>
H^+	HL/H.L	8.17 $\pm$ 0.05
	$\text{H}_2\text{L}/\text{HL.H}$	3.01 $\pm$ 0.10
Co^{2+}	ML/M.L	3.08 $\pm$ 0.05
	$\text{ML}_2/\text{M.L}^2$	(5.76) ^x $\pm$ 0.07

^xDL-mixture

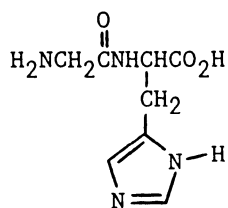
Glycyl-L-methionine (continued)

Metal ion	Equilibrium	Log K 25°, 0.1
Ag ⁺	ML/M.L	4.70
	ML ₂ /M.L ²	8.03
	MHL/ML.H	7.21
	MH ₂ L/MHL.H	5.5
	M ₂ L ₂ /M ² .L ²	12.34
	M ₂ HL ₂ /M ₂ L ₂ .H	7.15
	M ₂ H ₂ L ₂ /M ₂ HL ₂ .H	7.21

Bibliography: H⁺, Ag⁺ 84LR; Co²⁺ 81AEC₈H₁₇O₃N₃Glycyl-L-lysine

HL

Metal ion	Equilibrium	Log K 37°, 0.1
H ⁺	HL/H.L	10.01
	H ₂ L/HL.H	7.77
	H ₃ L/H ₂ L.H	2.76
Cu ²⁺	ML/M.L	11.60
	ML ₂ /M.L ²	15.72
	MHL/M.HL	5.57
	ML/M(H ₋₁ L).H	8.84
	M(H ₋₁ L)MOH(H ₋₁ L).H	10.09
	MHL ₂ /ML ₂ .H	9.29
	ML ₂ /M(H ₋₁ L)L.H	9.69
Zn ²⁺	MHL/M.HL	3.15
	M(HL) ₂ /M.(HL) ²	6.1

Bibliography: H⁺, Zn²⁺ 84RRa; Cu²⁺ 85RRC₈H₁₂O₃N₄Glycyl-L-histidine

HL

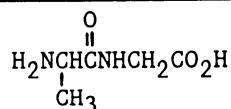
(Other values in Vol.1, p.305 and Vol.5, p.99)

Metal ion	Equilibrium	Log K 25°, 0.1	Log K 37°, 0.15
H ⁺	HL/H.L	8.11 ±0.05	7.85
	H ₂ L/HL.L	6.68 ±0.05	6.49
	H ₃ L/H ₂ L.H	2.54 ±0.00	2.54

Glycyl-L-histidine (continued)

Metal ion	Equilibrium	Log K	Log K
		25°, 0.1	37°, 0.15
Co ²⁺	ML/M.L	3.38 ±0.06	3.37
	ML ₂ /M.L ²	6.57	6.26
	MHL/ML.H	7.17	6.71
	ML/M(H ₋₁ L).H	7.31 ±0.08	7.07
	M(H ₋₁ L)L/M(H ₋₁ L).L		2.47
Ni ²⁺	ML/M.L	4.68	
	ML ₂ /M.L ²	9.62 ±0.03	
	MHL/ML.H	6.66	
	ML/M(H ₋₁ L).H	6.06 ±0.04	
	M(H ₋₁ L)L/M(H ₋₁ L).L	3.42	
Cu ²⁺	ML/M.L	8.98 ±0.08	8.68
	ML ₂ /M.L ²	16.0 ±0.2	15.4
	MHL/ML.H	3.5 ±0.2	3.45
	ML/M(H ₋₁ L).H	4.89 ±0.02	(4.02)
	M(H ₋₁ L)L/M(H ₋₁ L).L	3.2 ±0.2	(0.23)
Zn ²⁺	ML/M.L	3.98	3.65
	ML ₂ /M.L ²	7.9 ±0.2	(6.89)
	MHL/ML.H	6.89	
	ML/M(H ₋₁ L).H	6.73	
	M(H ₋₁ L)MOH(H ₋₁ L).H	9.91	
	M ₂ L ₂ /M ² .L ²	11.11	10.60
	M ₂ L ₂ /M ₂ (H ₋₁ L)L.H	(7.03)	(7.39)
	M ₂ (H ₋₁ L)L/M ₂ (H ₋₁ L) ₂ .H	(6.70)	(6.19)
Cd ²⁺	ML/M.L	3.32	
	ML ₂ /M.L ²	5.6	
	MHL/ML.H	7.18	
	M ₂ L ₂ /M ² .L ²	8.99	
	M ₂ (H ₋₁ L)L/M ₂ (H ₋₁ L) ₂ .H	8.6	

Bibliography: H⁺ 77RGE,82SF,84ACM,85RDI; Co²⁺,Ni²⁺ 83FSG; Cu²⁺ 82SF,84AC;
Zn²⁺ 83FSG,84ACM; Cd²⁺ 84ACM; Other references: 85VP

C₅H₁₀O₃N₂L-Alanylglycine

HL

(Other values in Vol.1, p.306 and other references in Vol.5, p.100)

Metal ion	Equilibrium	Log K	Log K	ΔH	ΔS
		25°, 0.1	20°, 0.1	25°, 0.1	25°, 0.1
H ⁺	HL/H.L	8.13 ±0.06	8.21	-10.6 ±0.4	2
	H ₂ L/HL.H	3.14 ±0.06	3.10	-0.7 ±0.3	12
Mn ²⁺	ML/M.L		1.9		
Ni ²⁺	ML/M.L		3.60		
	ML ₂ /M.L ²		(6.41) ^x		
	ML ₃ /M.L ³		(8.7) ^x		
	ML ₂ /M(H ₋₁ L)L.H		(8.62) ^x		
	M(H ₋₁ L)L/M(H ₋₁ L) ₂ .H		(9.87) ^x		

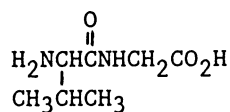
^xDL-mixture

L-Alanylglycine (continued)

Metal ion	Equilibrium	Log K	Log K	ΔH	ΔS
		25°, 0.1	20°, 0.1	25°, 0.1	25°, 0.1
Cu ²⁺	ML/M.L	5.27 ±0.07	5.28 -0.2	-6.4 ±0.4	3
	ML/M(H ₋₁ L).H	3.80 ±0.10	3.9 ±0.2	-6.6 ±0.1	-5
	M(H ₋₁ L)/MOH(H ₋₁ L).H	9.54 ±0.03	9.61 +0.01	-10.5	8
	M(H ₋₁ L)L/M(H ₋₁ L).L	(2.62) ^x ±0.08	(2.61) ^x +0.01	(-5.7) ^x	-7
	M ₂ OH(H ₋₁ L) ₂ /M(H ₋₁ L).MOH(H ₋₁ L)	(2.07) ^x ±0.09	(2.01) ^x	(-2.6) ^x	1

^xDL-mixtureBibliography: Bibliography: H⁺ 81KR; Mn²⁺ 82KR; Ni²⁺ 82KR_a; Cu²⁺ 81KR,83KR,84YMD

Other references: 8ONSA,82RRa,82RRb

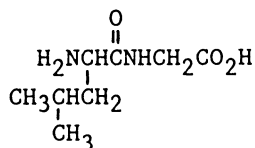
C₇H₁₄O₃N₂

L-Valylglycine
(Other values in Vol.1, p.307)

HL

Metal ion	Equilibrium	Log K
		25°, 0.1
H ⁺	HL/H.L	7.89 ±0.01
	H ₂ L/HL.H	3.11
Cu ²⁺	ML/M.L	4.87 -0.01
	ML/M(H ₋₁ L).H	3.67 ±0.07
	M(H ₋₁ L)/MOH(H ₋₁ L).H	9.01
	MOH(H ₋₁ L)/M(OH) ₂ (H ₋₁ L).H	11.7
	M(H ₋₁ L)L/M(H ₋₁ L).L	2.20 -0.01
	M ₂ OH(H ₋₁ L) ₂ /M(H ₋₁ L).MOH(H ₋₁ L)	2.24

Bibliography: 84YMD

C₈H₁₆O₃N₂

L-Leucylglycine
(Other values in Vol.1, p.308 and other reference in Vol.5, p.429)

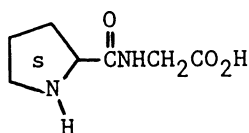
HL

Metal ion	Equilibrium	Log K	Log K
		25°, 0.1	20°, 0.2
H ⁺	HL/H.L	8.00 ±0.10	8.12
	H ₂ L/HL.H	3.11 ±0.06	3.08
Mn ²⁺	ML/M.L		1.9
Ni ²⁺	ML/M.L	(3.44)	(3.39)
	ML ₂ /M.L ₂	(6.4)	(6.21) ^x
	ML ₃ /M.L ₃		(8.5) ^x
	ML ₂ /M(H ₋₁ L)L.H		(8.62) ^x
	M(H ₋₁ L)L/M(H ₋₁ L) ₂ .H		(9.90) ^x

^xDL-mixture

L-Leucylglycine (continued)

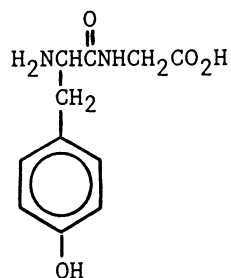
Metal ion	Equilibrium	Log K 25°, 0.1	Log K 20°, 0.2
Cu ²⁺	ML/M.L	(4.79)+0.0	(5.15)±0.04
	ML/M(H ₋₁ L).H	(3.31)-0.1	(3.85)±0.02
	M(H ₋₁ L)/MOH(H ₋₁ L).H		9.70 ±0.09
	M(H ₋₁ L)L/M(H ₋₁ L).L	(2.05) ^x	(2.5) ^x ±0.2
	M ₂ OH(H ₋₁ L) ₂ /M(H ₋₁ L).MOH(H ₋₁ L)		(1.98) ^x

^xDL-mixtureBibliography: H⁺ 81KR; Mn²⁺ 82KR; Ni²⁺ 82KR_a; Cu²⁺ 81KR, 83KR, 84YMD;Other references: 80NS_a, 82RR_a, 82RR_bC₇H₁₂O₃N₂L-Prolylglycine

HL

(Other references in Vol.1, p.311 and Vol.5, p.101)

Metal ion	Equilibrium	Log K 25°, 0.1	Log K 20°, 0.2
H ⁺	HL/H.L	8.91 ±0.08	9.03
	H ₂ L/HL.H	3.11 ±0.04	(2.93)
Mn ²⁺	ML/M.L		2.3
Ni ²⁺	ML/M.L		4.36
	ML ₂ /M.L ₂		8.10
	ML ₃ /M.L ₃		10.2
	ML ₂ /M(H ₋₁ L)L.H		9.05
	M(H ₋₁ L)L/M(H ₋₁ L) ₂ .H		9.53
Cu ²⁺	ML/M.L	6.40 ±0.02	(6.08)-0.1
	ML/M(H ₋₁ L).H	3.80 ±0.04	(3.5) ±0.2
	M(H ₋₁ L)/MOH(H ₋₁ L).H	(9.22)	9.46 ±0.03
	M(H ₋₁ L)L/M(H ₋₁ L).L	(2.66)	(2.59)+0.8
	M ₂ OH(H ₋₁ L) ₂ /M(H ₋₁ L).MOH(H ₋₁ L)	(1.88)	(0.86)

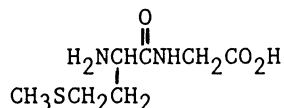
Bibliography: H⁺ 81KR; Mn²⁺ 82KR; Ni²⁺ 82KR_a; Cu²⁺ 81KR, 83KR;Other references: 82RR_a, 82RR_bC₁₁H₁₄O₄N₂L-TyrosylglycineH₂L

Metal ion	Equilibrium	Log K 25°, 0.1
H ⁺	HL/H.L	9.93
	H ₂ L/HL.H	7.69
	H ₃ L/H ₂ L.H	3.15

L-Tyrosylglycine (continued)

Metal ion	Equilibrium	Log K 25°, 0.1
Cu ²⁺	MHL/M.HL	5.25
	M(H ₋₁ LH).H	3.77
	M(H ₋₁ LH)/M(H ₋₁ L).H	9.09
	M(H ₋₁ L)/MOH(H ₋₁ L).H	10.21
	MHL ₂ /MHL.L	8.90
	M ₂ (H ₋₁ L) ₂ /(M(H ₋₁ L)) ²	2.62

Bibliography: 81HP; Other reference: 83IS

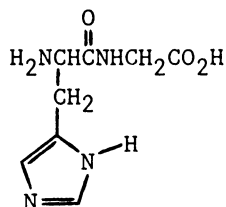
C₇H₁₄O₃N₂S

L-Methionylglycine
(Other values in Vol.5, p.103)

HL

Metal ion	Equilibrium	Log K 25°, 0.1
H ⁺	HL/H.L	(7.56)±0.00
	H ₂ L/HL.H	3.17 ±0.05
Ag ⁺	ML/M.L	4.63
	ML ₂ /M.L ²	8.29
	MHL/ML.H	6.09
	MH ₂ L/MHL.H	4.75
	M ₂ L ₂ /M ² .L ²	12.45
	M ₂ HL ₂ /M ₂ L ₂ .H	6.25
	M ₂ H ₂ L ₂ /M ₂ HL ₂ .H	5.83

Bibliography: 84LP

C₈H₁₂O₃N₄

L-Histidylglycine
(Other references in Vol.1, p.313 and Vol.5, p.104)

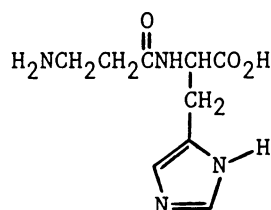
HL

Metal ion	Equilibrium	Log K 25°, 0.1	Log K 37°, 0.15
H ⁺	HL/H.L	7.53 ±0.07	(7.03)
	H ₂ L/HL.H	5.81 ±0.02	(5.27)
	H ₃ L/H ₂ L.H	2.78 ±0.07	(2.20)
Co ²⁺	ML/M.L	5.20 ±0.02	(4.54)
	ML ₂ /M.L ²	9.28	(8.16)
	MHL/ML.H		(4.66)
	ML/M(H ₋₁ L).H	7.15	
Ni ²⁺	ML/M.L	6.83 ±0.02	
	ML ₂ /M.L ²	12.35 ±0.05	

L-Histidylglycine (continued)

Metal ion	Equilibrium	Log K 25°, 0.1	Log K 37°, 0.15
Cu ²⁺	ML/M.L	8.84 ± 0.01	(8.02)
	ML ₂ /M.L ²	15.1	(14.2)
	MHL/ML.H	(3.16)	
	ML/M(H ₋₁ L).H	(8.07)	(6.30)
	M(H ₋₁ L)/MOH(H ₋₁ L).H	(9.49)	
	M(H ₋₁ L)L/M(H ₋₁ L).L	(5.10)	
	M ₂ (H ₋₂ L)L.H ² /M ² .L ²	8.20	
Zn ²⁺	ML/M.L	5.07	(4.25)
	ML ₂ /M.L ²	9.54	(8.46)
	MHL/ML.H		(5.15)

Bibliography: H⁺ 82SF, 83FSG; Co²⁺, Ni²⁺, Zn²⁺ 83FSG; Cu²⁺ 75BM, 82SF;
Other reference: 85VP

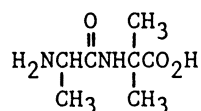


C ₉ H ₁₄ O ₃ N ₄		<u>β-Alanyl-L-histidine (L-carnosine)</u>		HL	
		(Other values in Vol.1, p.314 and Vol.5, p.105)			
Metal ion	Equilibrium	Log K 25°, 0.1	Log K 37°, 0.15	ΔH 25°, 0.2	ΔS 25°, 0.1
H ⁺	HL/H.L	9.35 ± 0.05	8.92 ± 0.00		
	H ₂ L/HL.H	6.76 ± 0.03	6.46 ± 0.01		
	H ₃ L/H ₂ L.H	2.51 ± 0.03	2.52 ± 0.00		
Co ²⁺	ML/M.L	2.85 ± 0.8	(3.22)		
	ML/M(H ₋₁ L).H	8.95			
	MHL/M.HL	2.09			
	M(HL) ₂ /M.(HL) ²	3.13			
Ni ²⁺	ML/M.L	4.61 - 0.3			
	MHL/ML.H	7.48 ± 0.03			
	ML/M(H ₋₁ L).H	7.83 - 0.4			
	M(H ₋₁ L)L/M(H ₋₁ L).L	2.14 ± 0.03			
Cu ²⁺	ML/M.L	8.33 ± 0.08	8.13 ± 0.01		
	ML ₂ /M.L ²		14.2 ± 0.2		
	MHL/ML.H	5.01	4.6 ± 0.1		
	ML/M(H ₋₁ L).H		6.2 ± 0.0		
	ML/MOH(H ₋₁ L).H ²	17.2	16.37		
	MHL ₂ /ML ₂ .H		6.23		
	ML ₂ /M(H ₋₁ L)L.H		8.82		
	M ₂ (H ₋₁ L) ₂ /M ₂ .L ²	8.18	7.93	-12	-3
	M ₂ (H ₋₁ L) ₂ /M ₂ OH(H ₋₁ L) ₂ .H		5.51		
	M ₂ (H ₋₁ L) ₂ /M(H ₋₁ L).M		3.44		

L-Carnosine (continued)

Metal ion	Equilibrium	Log K 25°, 0.1	Log K 37°, 0.15	ΔH 25°, 0.2	ΔS 25°, 0.1
Zn^{2+}	ML/M.L	4.00	3.86 +0.2		
	MHL/ML.H	7.62	7.36 -0.1		
Cd^{2+}	ML/M.L	3.19	3.03		
	$ML_2/M.L^2$		5.13		
	MHL/ML.H	8.38	8.29		

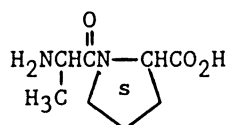
Bibliography: H^+ 82DA, 82SF, 83FSG;
 Co^{2+}, Ni^{2+} 83FSG; Cu^{2+} 82DA, 82SF; Zn^{2+} 82DA, 83FSG; Cd^{2+} 82DA

 $C_7H_{14}O_3N_2$ DL-Alanyl-2-methylalanine

HL

Metal ion	Equilibrium	Log K 25°, 0.1
H^+	HL/H.L	8.22
	$H_2L/HL.H$	3.49
Cu^{2+}	ML/M.L	5.6
	$ML/M(H_{-1}L).H$	3.4
	$M(H_{-1}L)/MOH(H_{-1}L).H$	8.86

Bibliography: 83HNa

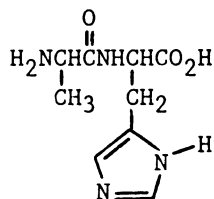
 $C_8H_{14}O_3N_2$

L-Alanyl-L-proline
 (Other reference in Vol.5, p.458)

HL

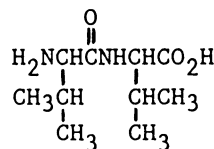
Metal ion	Equilibrium	Log K 20°, 0.2
H^+	HL/H.L	8.40
	$H_2L/HL.H$	2.90
Mn^{2+}	ML/M.L	2.0
Ni^{2+}	ML/M.L	3.93
	$ML_2/M.L^2$	7.12
	$ML_3/M.L^3$	9.57
Cu^{2+}	ML/M.L	5.86 +0.2
	$ML_2/M.L^2$	10.39 $\pm$ 0.03

Bibliography: H^+ 81KR; Mn^{2+} 82KR; Ni^{2+} 82KR; Cu^{2+} 81KR, 83KR;
 Other reference: 74ER

 $\text{C}_9\text{H}_{14}\text{O}_3\text{N}_4$ L-Alanyl-L-histidine

HL

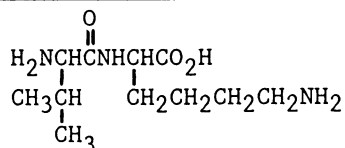
Metal		Log K	
<u>ion</u>	<u>Equilibrium</u>	<u>25°, 0.3</u>	<u>37°, 0.1</u>
H^+	HL/H.L	8.08	7.79
	$\text{H}_2\text{L}/\text{HL.H}$	6.63	6.50
	$\text{H}_3\text{L}/\text{H}_2\text{L.H}$	(2.60)	2.52
Cu^{2+}	ML/M.L		8.93
	$\text{ML}_2/\text{M.L}^2$		14.66
	$\text{ML}/\text{M}(\text{H}_{-1}\text{L}).\text{H}$		4.35
	$\text{M}(\text{H}_{-1}\text{L})/\text{MOH}(\text{H}_{-1}\text{L}).\text{H}$		9.43
Zn^{2+}	ML/M.L	3.5	
	$\text{ML}_2/\text{M.L}^2$	7.8	
	$\text{MHL}/\text{M.HL}$	2.2	2.08
	$\text{MHL}/\text{M}(\text{H}_{-1}\text{L}).\text{H}^2$	(13.9)	(13.10)
	$\text{ML}/\text{M}(\text{H}_{-1}\text{L}).\text{H}$	7.1	

Bibliography: $\text{H}^+, \text{Zn}^{2+}$ 84RRa, 85RDI; Cu^{2+} 85RR $\text{C}_{10}\text{H}_{20}\text{O}_3\text{N}_2$ Valylvaline

HL

Metal		Log K	
<u>Isomer</u>	<u>ion</u>	<u>Equilibrium</u>	<u>25°, 0.1</u>
L-, L-	H^+	HL/H.L	7.91 ± 0.06
		$\text{H}_2\text{L}/\text{HL.L}$	3.34 ± 0.07
(Other values in Vol.5, p.108)	Ag^+	ML/M.L	3.03
		$\text{ML}_2/\text{M.L}^2$	6.93
L-, D-	H^+	HL/H.L	8.17 ± 0.06
		$\text{H}_2\text{L}/\text{HL.H}$	2.99 ± 0.06
	Ag^+	ML/M.L	3.24
		$\text{ML}_2/\text{M.L}^2$	7.23

Bibliography: 84LP

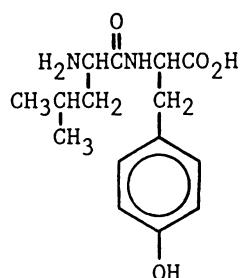
 $\text{C}_{11}\text{H}_{23}\text{O}_3\text{N}_3$ L-Valyl-L-lysine

HL

Metal		Log K	
<u>ion</u>	<u>Equilibrium</u>	<u>37°, 0.1</u>	
H^+	HL/H.L	10.00	
	$\text{H}_2\text{L}/\text{HL.H}$	7.47	
	$\text{H}_3\text{L}/\text{H}_2\text{L.H}$	3.09	

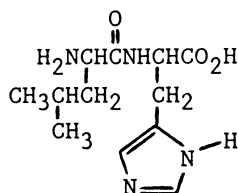
L-Valyl-L-lysine (continued)

Metal ion	Equilibrium	Log K 37°, 0.1
Cu ²⁺	ML/M.L	11.68
	ML ₂ /M.L ²	15.35
	MHL/M.HL	4.83
	ML/M(H ₋₁ L).H	8.92
	M(H ₋₁ L)/MOH(H ₋₁ L).H	10.00
	MHL ₂ /ML ₂ .H	8.75
	ML ₂ /M(H ₋₁ L)L.H	9.58
Zn ²⁺	MHL/M.HL	2.0
	M(HL) ₂ /M.(HL) ²	4.9

Bibliography: H⁺, Zn²⁺ 84RRA; Cu²⁺ 85RRC₁₅H₂₂O₄N₂L-Leucyl-L-tyrosineH₂L

(Other values in Vol.1, p.318 and Vol.5, p.110)

Metal ion	Equilibrium	Log K 25°, 0.1	ΔH 25°, 0.1	ΔS 25°, 0.1
H ⁺	HL/H.L	10.08 ± 0.10		
	H ₂ L/HL.H	7.78 ± 0.06	-10.4	1
	H ₃ L/H ₂ L.H	3.18 ± 0.08	0.0	15
Cu ²⁺	MHL/M.HL	5.24 ± 0.09		
	MHL/M(H ₋₁ LH).H	3.32 ± 0.06		
	M(H ₋₁ LH)/M(H ₋₁ L).H	9.10 ± 0.06		
	M(H ₋₁ L)/MOH(H ₋₁ L).H	10.39 ± 0.09		
	MHL ₂ /MHL.L	9.54		
	M ₂ OH(H ₋₁ L) ₂ /M(H ₋₁ L).MOH(H ₋₁ L)	2.2 ± 0.2		

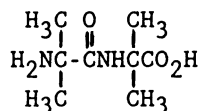
Bibliography: H⁺ 81HP, 84IB; Cu²⁺ 81HPC₁₂H₂₁O₃N₅L-Leucyl-L-histidine

HL

Metal ion	Equilibrium	Log K 37°, 0.1
H ⁺	HL/H.L	7.72
	H ₂ L/HL.H	6.44
	H ₃ L/H ₂ L.H	2.36

L-Leucyl-L-histidine (continued)

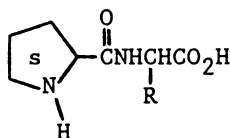
Metal ion	Equilibrium	Log K 37°, 0.1
Cu ²⁺	ML/M.L	8.98
	ML ₂ /M.L ²	14.32
	ML/M(H ₋₁ L).H	4.35
	M(H ₋₁ L)/MOH(H ₋₁ L).H	9.42
	ML ₂ /M(H ₋₁ L)L.H	7.14
Zn ²⁺	MHL/M.HL	2.29
	MHL/M(H ₋₁ L).H ²	13.29
	MHL ₂ /MHL.L	3.6

Bibliography: H⁺, Zn²⁺ 84RRA; Cu²⁺ 85RRC₈H₁₆O₃N₂2-Methylalanyl-2-methylalanine

HL

Metal ion	Equilibrium	Log K 25°, 0.1
H ⁺	HL/H.L	8.26
	H ₂ L/HL.H	3.67
Cu ²⁺	ML/M.L	6.03
	ML/M(H ₋₁ L).H	4.49
	M(H ₋₁ L)/MOH(H ₋₁ L).H	9.49

Bibliography: 83HNa

C_xH_yO₃N₂L-Prolyl-L-2-aminoalkanoic acid

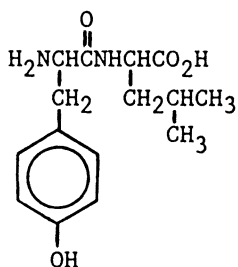
HL

Ligand	Metal ion	Equilibrium	Log K 20°, 0.2
R= CH ₃	H ⁺	HL/H.L	9.07
L-Prolyl-L-alanine		H ₂ L/HL.H	3.08
(C ₈ H ₁₄ O ₃ N ₂)	Mn ²⁺	ML/M.L	2.5
		ML ₂ /M.L ²	8.21
	Ni ²⁺	ML ₃ /M.L ³	10.6
		ML ₂ /M(H ₋₁ L)L.H	9.18
		M(H ₋₁ L)L/M(H ₋₁ L) ₂ .H	10.12
	Cu ²⁺	ML/M.L	(6.09)±0.2
		ML/M(H ₋₁ L).H	(3.42)-0.5
		M(H ₋₁ L)/MOH(H ₋₁ L).H	9.71 ±0.05
		M(H ₋₁ L)L/M(H ₋₁ L).L	(2.64)+0.8
		M ₂ OH(H ₋₁ L) ₂ /M(H ₋₁ L).MOH(H ₋₁ L)	(0.35)

1-Prolyl-L-2-aminoalkanoic acid (continued)

<u>Ligand</u>	<u>Metal ion</u>	<u>Equilibrium</u>	<u>Log K</u> <u>20°, 0.2</u>
R- CH ₂ CHCH ₃ CH ₃	H ⁺	HL/H.L	9.04
		H ₂ L/HL.H	3.09
L-Prolyl-L-leucine (C ₁₁ H ₂₀ O ₃ N ₂)	Mn ²⁺	ML/M.L	2.4
	Ni ²⁺	ML/M.L	4.38
		ML ₂ /M.L ²	8.60
		ML ₃ /M.L ³	11.3
		ML ₂ /M(H ₋₁ L)L.H	(10.5)
		M(H ₋₁ L)L/M(H ₋₁ L) ₂ .H	10.1
	Cu ²⁺	ML/M.L	(5.83)-0.4
		ML/M(H ₋₁ L).H	(3.56)-0.3
		M(H ₋₁ L)/MOH(H ₋₁ L).H	9.7 ±0.2
		M(H ₋₁ L)L/M(H ₋₁ L).L	(2.82)+0.7

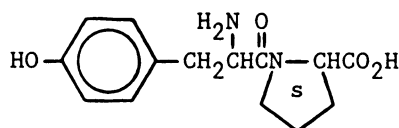
Bibliography: H⁺ 81KR; Mn²⁺ 82KR; Ni²⁺ 82KR_a; Cu²⁺ 81KR, 83KR;
Other references: 82RR_a, 82RR_b

C₁₅H₂₂O₄N₂TyrosylleucineH₂L

<u>Isomer</u>	<u>Metal ion</u>	<u>Equilibrium</u>	<u>Log K</u> <u>25°, 0.1</u>
L-, L-	H ⁺	HL/H.L	10.11
		H ₂ L/HL.H	7.41
		H ₃ L/H ₂ L.H	3.39
	Cu ²⁺	MHL/M.HL	4.93
		MHL/M(H ₋₁ LH).H	3.86
		M(H ₋₁ LH)/M(H ₋₁ L).H	9.45
		M(H ₋₁ L)/MOH(H ₋₁ L).H	10.24
		MHL ₂ /MHL.L	8.68
		M ₂ (H ₋₁ L) ₂ /M(H ₋₁ L) ²	3.42

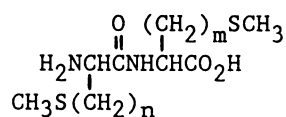
L-, D-	H ⁺	HL/H.L	10.38
		H ₂ L/HL.H	7.86
		H ₃ L/H ₂ L.H	3.02
	Cu ²⁺	MHL/M.HL	4.88
		MHL/M(H ₋₁ LH).H	4.41
		M(H ₋₁ LH)/M(H ₋₁ L).H	9.15
		M(H ₋₁ L)/MOH(H ₋₁ L).H	10.42
		MHL ₂ /MHL.L	8.65
		M ₂ (H ₋₁ L) ₂ /M(H ₋₁ L) ²	2.70

Bibliography: 81HP

 $C_{14}H_{18}O_4N_2$ L-Tyrosyl-L-proline H_2L

Metal	Equilibrium	Log K 25°, 0.1
<u>ion</u>		
H^+	HL/H.L	9.91
	$H_2L/HL.H$	7.81
	$H_3L/H_2L.H$	3.19
Cu^{2+}	MHL/M.HL	5.15
	$M(HL)_2/M.(HL)_2$	9.41
	$M_2L_2/M^2.L^2$	18.37

Bibliography: 84FP

 $C_xH_yO_3N_2S_2$ Bis(methylthio)diptides

HL

<u>Ligand</u>	Metal	<u>Equilibrium</u>	Log K 25°, 0.1
<u>ion</u>			
$n=m=1$	H^+	HL/H.L	7.03
		$H_2L/HL.H$	2.92
L-S-Methyl-	Ag^+	ML/M.L	6.19
cysteinyl-		$ML_2/M.L^2$	9.59
L-S-methyl-		MHL/ML.H	5.34
cysteine		$MH_2L/MHL.H$	3.22
		$M_2L_2/M^2.L^2$	15.13
$(C_8H_{16}O_3N_2S_2)$		$M_2HL_2/M_2L_2.H$	5.66
		$M_2H_2L_2/M_2HL_2.H$	5.03
$n=1, m=2$	H^+	HL/H.L	7.03
		$H_2L/HL.H$	3.18
L-S-Methyl-	Ag^+	ML/M.L	6.01
cysteinyl-		$ML_2/M.L^2$	9.66
L-methionine		MHL/ML.H	5.01
		$MH_2L/MHL.H$	3.53
$(C_9H_{18}O_3N_2S)$		$M_2L_2/M^2.L^2$	14.81
		$M_2HL_2/M_2L_2.H$	5.38
		$M_2H_2L_2/M_2HL_2.H$	4.62
$n=1, m=2$	H^+	HL/H.L	7.23
		$H_2L/HL.H$	2.94
L-S-Methyl-	Ag^+	ML/M.L	5.86
cysteinyl-		$ML_2/M.L^2$	9.40
D-methionine		MHL/ML.H	5.90
		$MH_2L/MHL.H$	3.75
$(C_9H_{18}O_3N_2S_2)$		$M_2L_2/M^2.L^2$	14.74
		$M_2HL_2/M_2L_2.H$	5.92
		$M_2H_2L_2/M_2HL_2.H$	5.79

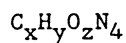
Bis(methylthio)dipeptides (continued)

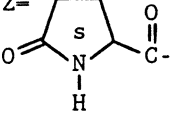
<u>Ligand</u>	<u>Metal ion</u>	<u>Equilibrium</u>	<u>Log K</u> <u>25°, 0.1</u>
n= 2, m= 1	H ⁺	HL/H.L	7.40
		H ₂ L/HL.H	2.98
L-Methionyl- L-S-methyl- cysteine (C ₉ H ₁₈ O ₃ N ₂ S ₂)	Ag ⁺	ML/M.L	5.72
		ML ₂ /M.L ²	8.1
		MHL/ML.H	6.33
		MH ₂ L/MHL.H	4.56
		M ₂ L ₂ /M ² .L ²	14.19
		M ₂ HL ₂ /M ₂ L ₂ .H	6.65
		M ₂ H ₂ L ₂ /M ₂ HL ₂ .H	5.99
n= 2, m=1	H ⁺	HL/H.L	7.62
		H ₂ L/HL.H	2.72
D-Methionyl- L-S-methyl- cysteine (C ₉ H ₁₈ O ₃ N ₂ S ₂)	Ag ⁺	ML/M.L	5.77
		ML ₂ /M.L ²	8.6
		MHL/ML.H	6.63
		MH ₂ L/MHL.H	4.7
		M ₂ L ₂ /M ² .L ²	14.45
		M ₂ HL ₂ /M ₂ L ₂ .H	6.62
		M ₂ H ₂ L ₂ /M ₂ HL ₂ .H	(6.67)
n= m= 2	H ⁺	HL/H.L	7.43
		H ₂ L/HL.H	3.22
L-Methionyl- L-methionine (C ₁₀ H ₂₀ O ₃ N ₂ S ₂)	Ag ⁺	ML/M.L	5.81
		ML ₂ /M.L ²	8.7
		MHL/ML.H	6.05
		MH ₂ L/MHL.H	4.45
		M ₂ L ₂ /M ² .L ²	14.44
		M ₂ HL ₂ /M ₂ L ₂ .H	6.44
		M ₂ H ₂ L ₂ /M ₂ HL ₂ .H	5.90
n= m= 2	H ⁺	HL/H.L	7.63
		H ₂ L/HL.H	3.04
L-Methionyl- D-methionine (C ₁₀ H ₂₀ O ₃ N ₂ S ₂)	Ag ⁺	ML/M.L	5.71
		MHL/ML.H	6.69
		MH ₂ L/MHL.H	4.9
		M ₂ L ₂ /M ² .L ²	14.51
		M ₂ HL ₂ /M ₂ L ₂ .H	6.66
		M ₂ H ₂ L ₂ /M ₂ HL ₂ .H	6.59

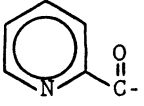
Bibliography: 84LP

Acyl-L-histidine

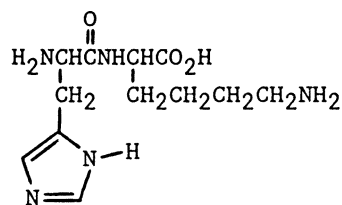
HL



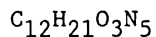
<u>Ligand</u>	<u>Metal ion</u>	<u>Equilibrium</u>	<u>Log K</u> <u>22°, 0.1</u>
 L-Pyroglutamyl-L-histidine (C ₁₁ H ₁₄ O ₄ N ₄)	H ⁺	HL/H.L H ₂ L/HL.H	7.18 2.70
	Ni ²⁺	ML/M.L ML/M(H ₋₂ L).H ²	3.33 18.55
	Cu ²⁺	ML/M.L	4.23
		ML/M(H ₋₁ L).H ₂	6.2
		ML/M(H ₋₂ L).H ²	12.52

 Picolyl-L-histidine (C ₁₂ H ₁₂ O ₃ N ₄)	H ⁺	HL/H.L H ₂ L/HL.H	7.72 3.05
	Ni ²⁺	ML/M.L ML/M(H ₋₁ L).H	7.61 5.4
	Cu ²⁺	ML/M.L	9.43
		ML/M(H ₋₁ L).H	4.0
		M(H ₋₁ L)/MOH(H ₋₁ L).H	9.7
		M ₂ (H ₋₁ L) ₂ .H ² /M ² .L ² M ₂ (H ₋₁ L)L/M ₂ (H ₋₁ L) ₂ .H	14.01 3.7

Bibliography: 83FB

L-Histidyl-L-lysine

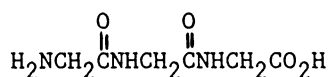
HL



<u>Metal ion</u>	<u>Equilibrium</u>	<u>Log K</u> <u>37°, 0.1</u>
H ⁺	HL/H.L H ₂ L/HL.H H ₃ L/H ₂ L.H H ₄ L/H ₃ L.H	10.09 7.29 5.65 2.0

L-Histidyl-L-lysine (continued)

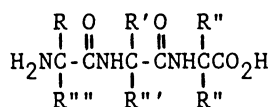
Metal ion	Equilibrium	Log K 37°, 0.1
Cu ²⁺	MHL/M.HL	8.51
	M(HL) ₂ /M.(HL) ₂	14.7
	MHL/M(H ₋₁ L).H	15.5
	M(H ₋₁ L)/MOH(H ₋₁ L).H	10.5
	M(HL) ₂ /MHL ₂ .H	8.6
	MHL ₂ /M(H ₋₁ L)L.H ²	19.4
	M ₂ L ₂ /M ² .L ²	27.8
Zn ²⁺	MHL/M.HL	4.69
	M(HL) ₂ /M.(HL) ₂	8.42

Bibliography: H⁺, Zn²⁺ 84RRA; Cu²⁺ 85RRC₆H₁₁O₄N₃

Glycylglycylglycine (triglycine)
(Other values in Vol.1, p.322 and Vol.5, p.112)

HL

Metal ion	Equilibrium	Log K 25°, 0.1	Log K 25°, 1.0	Log K 25°, 0	ΔH 25°, 0.1	ΔS 25°, 0.1
H ⁺	HL/H.L	7.89 ±0.02	7.99 ±0.07	8.09	-10.1	2
			7.58 ⁿ ±0.01	8.57 ^e ±0.03	-12.0 ^e	
	H ₂ L/HL.H	3.21 ±0.04	3.20 ±0.07	3.22	-0.2	14
			3.19 ⁿ -0.08	3.6 ^e ±0.2	-1.0 ^e	
Gd ³⁺	ML/M.L	0.43				
Cu ²⁺ *	M(H ₋₁ L) ₂ /M(H ₋₂ L).L	2.20		2.05 ^e		
Ni(III)	M(H ₋₂ L)L/M(H ₋₂ L).L		2.64			
	M(H ₋₂ L)L/M(H ₋₂ L)(H ₋₁ L).H		5.1			
	M(H ₋₂ L)(H ₋₁ L)/M(H ₋₂ L) ₂ .H		11.0			

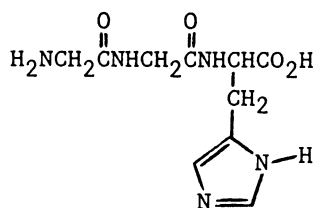
e_{25°}, 3.0; n_{37°}, 0.15; *see Vol.5 for other Cu²⁺ equilibria.Bibliography: H⁺ 83VP; Gd³⁺ 81KB; Cu²⁺ 72DM; Ni(III) 85KMbC_xH_yO₄N₃Methylsubstituted-triglycine

HL

Ligand	Metal ion	Equilibrium	Log K 25°, 0.1	Log K 25°, 1.0	ΔH 25°, 0.1	ΔS 25°, 0.1
R=R''=R'''=R''''=H	H ⁺	HL/H.L	7.96			
R'=CH ₃		H ₂ L/HL.H	3.34			
Glycyl-L-alanyl-glycine (C ₇ H ₁₃ O ₄ N ₃) (Other values in Vol.1, p.326 and Vol.5, p.114)	Ni(III)	M(H ₋₂ L)L/M(H ₋₂ L).L		2.20		

Methylsubstituted-triglycine (continued)

Ligand	Metal ion	Equilibrium	Log K 25°, 0.1	Log K 25°, 1.0	ΔH 25°, 0.1	ΔS 25°, 0.1
R'=R''=R'''=R''''= H R= CH ₃	H ⁺	HL/H.L H ₂ L/HL.H	7.93 3.24			
L-Alanylglycyl-glycine (C ₇ H ₁₃ O ₄ N ₃) (Other values in Vol.1, p.326)	Ni(III)	M(H ₋₂ L)L/M(H ₋₂ L).L MH(H ₋₂ L)(H ₋₁ L)/M(H ₋₂ L)(H ₋₁ L).H		1.43 4.7		
R=R''=R'''=R''''= H R'=R''=R'''=R''''= CH ₃	H ⁺	HL/H.L H ₂ L/HL.H	8.20 3.33			
Glycyl-2-methylalanylglycine (C ₈ H ₁₅ O ₄ N ₃)	Cu ²⁺	ML/M.L ML/M(H ₋₁ L).H M(H ₋₁ L)/M(H ₋₂ L).H	5.55 5.33 5.87			
R= H R'=R''=R'''=R''''= CH ₃	H ⁺	HL/H.L H ₂ L/HL.H	8.29 3.95			
DL-Alanyl-2-methylalanyl-2-methylalanine (C ₁₁ H ₂₁ O ₄ N ₃)	Cu ²⁺	ML/M.L ML/M(H ₋₁ L).H M(H ₋₁ L)/M(H ₋₂ L).H	5.8 4.87 5.84			
R=R'=R''=R'''=R''''= CH ₃	H ⁺	HL/H.L H ₂ L/HL.H	8.11 -0.1 3.82 -0.2			
2-Methylalanyl-2-methylalanyl-2-methylalanine (C ₁₂ H ₂₃ O ₄ N ₃)	Ni ²⁺ Cu ²⁺	M(H ₋₂ L).H ² /M.L MH(H ₋₂ L)/M(H ₋₂ L).H ML/M.L ML/M(H ₋₁ L).H M(H ₋₁ L)/M(H ₋₂ L).H	-9.65 2.1 5.41 4.23 6.13 -0.08			
^s 10-40°, 0.1 Bibliography: H ⁺ , Cu ²⁺ 81KMa, 83HNa; Ni ²⁺ 85KMa; Ni(III) 85KMb					(-1) ^s (-9) ^s	(14) (-2)

C₁₀H₁₅O₄N₅

Glycylglycyl-L-histidine

HL

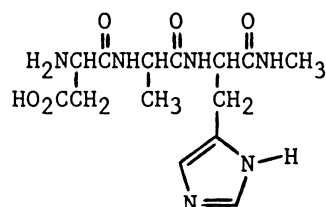
(Other values in Vol.1, p.330 and Vol.5, p.115)

Metal ion	Equilibrium	Log K 25°, 0.1	Log K 20°, 0.1	Log K 37°, 0.15
H ⁺	HL/H.L H ₂ L/HL.H H ₃ L/H ₂ L.H	8.02 ±0.08 6.72 ±0.08 2.82 ±0.10	8.22 6.87 2.84	(7.39) 6.40 (2.31)
Ni ²⁺	MH(H ₋₂ L)/M(H ₋₂ L).H M(H ₋₂ LH ₂)/M(H ₋₂ LH).H		4.3 ^c 1.3 ^c	

^c25°, 1.0

Glycylglycyl-L-histidine (continued)

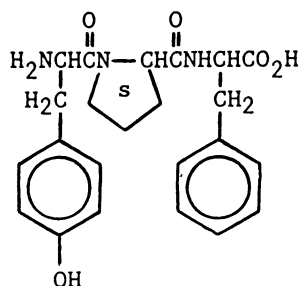
Metal ion	Equilibrium	Log K 25°, 0.1	Log K 20°, 0.1	Log K 37°, 0.15
Cu ²⁺	ML/M.L	7.59 ±0.02		(7.04)
	ML ₂ /M.L ²	16.68		
	MHL/ML.H	4.4 ±0.2		4.54
	ML/M(H ₋₁ L).H	4.97 ±0.10		
	ML/M(H ₋₂ L).H ²	9.56 ±0.09		(9.15)
	M(H ₋₁ L)L.H/M.L ²	(9.73)		(8.70)
	M(H ₋₁ L)L/M(H ₋₁ L) ₂ .H	(8.30)		(7.40)
	MHL ₂ /ML ₂ .H	3.96		
	MH ₂ L ₂ /MHL ₂ .H	5.17		
	M(H ₋₂ LH)/M(H ₋₂ L).H		4.2 ^c	
	M(H ₋₂ LH ₂)/M(H ₋₂ LH).H		2.3 ^c	

^c25°, 1.0Bibliography: H⁺ 81LS,84FS; Ni²⁺ 82BRM; Cu²⁺ 76WC,80SN,81LS; Other reference: 83DELC₁₄H₂₂O₅N₆L-Aspartyl-L-alanyl-L-histidine methylamide
(Other values in Vol.5, p.118)

HL

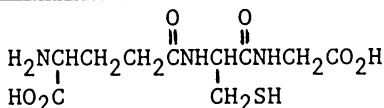
Metal ion	Equilibrium	Log K 25°, 0.1	ΔH 25°, 0.15	ΔS 25°, 0.1
H ⁺	HL/H.L	7.70 ±0.03	-8.8	6
	H ₂ L/HL.H	6.38 ±0.01	-6.6	7
	H ₃ L/H ₂ L.H	3.00 ±0.08	-0.4	12
Ni ²⁺	ML/M.L	8.57		
	ML ₂ /M.L ²	15.57		
Cu ²⁺	ML/M.L	7.4 ±1.0	(-8.9)	(4)
	MOHL.H/M.L	3.99		
	M(OH) ₂ L.H ² /M.L	-1.21 ±0.7	-1.2	-10
	MHL/M.HL	4.90		
	M(H ₋₁ L)L.H/M ₂ L ²	11.02 ±1.0		
	M ₂ (H ₋₁ L).H/M ² .L	5.86		
Zn ²⁺	M ₂ (H ₋₁ L)/M ₂ (H ₋₂ L).H	5.16		
	ML/M.L	4.17 ±0.6		
	ML ₂ /M.L ²	6.43 ±1.7		
	ML/MOHL.H	8.26 ±0.8		
Cd ²⁺	MHL/ML.H	5.85 ±0.6		
	ML/M.L	3.66		
	MHL/ML.H	6.37		

Bibliography: H⁺, Cu²⁺ 78IL,83DA; Ni²⁺ 82GS; Zn²⁺, Cd²⁺ 83DA

C₂₃H₂₇O₅N₃L-Tyrosyl-L-prolyl-L-phenylalanineH₂L

Metal	Equilibrium	Log K 25°, 0.1
H ⁺	HL/H.L	9.79
	H ₂ L/HL.H	7.47
	H ₃ L/H ₂ L.H	3.14
Cu ²⁺	MHL/M.HL	4.53
	M(HL) ₂ /M.(HL) ₂	8.73
	M ₂ L ₂ /M ² .L ²	18.78
	M ₂ L ₂ /M ₂ (H ₂ L) ₂ .H ²	17.61

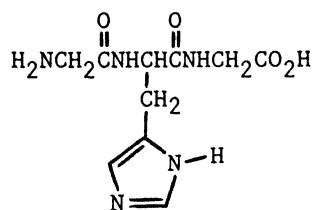
Bibliography: 84FP

C₁₀H₁₇O₆N₃SL-5-Glutamyl-L-cysteinylglycine (glutathione)H₃L

(Other references in Vol.1, p.403 and other values in Vol.5, p.117)

Metal	Equilibrium	Log K 25°, 0.15	Log K 37°, 0.15	Log K 25°, 3.0	ΔH 25°, 3.0	ΔS 25°, 3.0
H ⁺	HL/H.L	9.53 ± 0.03	9.27 ± 0.03	9.88	(-9) ^s	(15)
		9.37 ^b ± 0.07				
	H ₂ L/HL.H	8.64 ± 0.03	8.39 ± 0.02	9.16	(-8) ^s	(15)
		8.58 ^b ± 0.05				
H ₃ L/H ₂ L.H		3.48 ± 0.02	3.46 ± 0.02	3.82	(-1) ^s	(14)
		3.48 ^b				
	H ₄ L/H ₃ L.H	2.08 ± 0.03	2.06 ± 0.03	2.59	(-1) ^s	(9)
Co ²⁺		(2.34) ^b				
	ML ₂ /M.L ²	9.55				
	MHL/M.HL	3.74				
	MHL ₂ /ML ² .H	8.97				
	M ₂ L ₂ /M ² .L ²	14.05				
	M ₂ L ₃ /M ² .L ³	18.93				
Ni ²⁺	M ₂ HL ₃ /M ₃ L ₃ .H	8.04				
	ML/M.L		7.37			
	ML ₂ /M.L ²		10.44			
	MHL/ML.H		6.54			
CH ₃ Hg ⁺	MHL ₂ /ML ₂ .H		8.90			
	ML/M.L	15.9 ± 0.1				
	MHL/ML.H	9.25 ± 0.00				
(CH ₃) ₃ Pb ⁺	MH ₂ L/MHL.H	3.53 ± 0.10				
	MH ₂ L/M.H ₂ L	1.04 ^u				
	MH ₃ L/MH ₂ L.H	2.41 ^u				

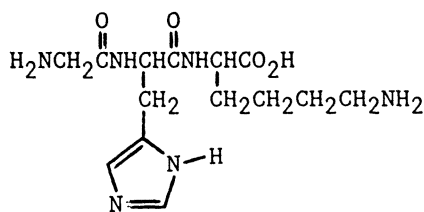
^b25°, 0.5; ^c25°, 1.0; ^r12-30°, 1.0; ^s10-40°, 3.0; ^u25°, 0.3Bibliography: H⁺ 66WS, 80FMW, 83HS, 84TC; Co²⁺ 83HS; Ni²⁺ 80FMW; CH₃Hg⁺ 82RR, 83AC; (CH₃)₃Pb⁺ 81RB; Other references 61S, 77MO, 81AE

 $C_{10}H_{15}O_4N_5$ Glycyl-L-histidylglycine

HL

(Other references in Vol.1, p.331 and Vol.5, p.116)

Metal	Equilibrium	Log K 25°, 0.15	Log K 25°, 1.0	Log K 25°, 3.0
<u>ion</u>	<u>HL/H.L</u>			
H^+	HL/H.L	8.00 ±0.03	7.96	8.62
			7.56 ⁿ	
	$H_2L/HL.H$	6.42 ±0.08	(6.92)	(7.54)
			6.24 ⁿ	
	$H_3L/H_2L.H$	2.72	(3.26)	(3.57)
			2.91 ⁿ	
Co^{2+}	ML/M.L		3.17 ⁿ	
	ML/M($H_{-1}L$).H		5.97 ⁿ	
	M($H_{-1}L$)/M($H_{-1}L$).L		2.54 ⁿ	
Cu^{2+}	ML/M.L	9.05	8.52 ⁿ	
	$ML_2/M.L^2$	(15.72)	(15.78) ⁿ	(19.95)
	ML/M($H_{-1}L$).H	3.59	3.20 ⁿ	
	M($H_{-1}L$)/M($H_{-2}L$).H		9.01 ⁿ	
	M($H_{-1}L$)/M($H_{-1}L$).L	2.90		
	$ML_2/M(H_{-1}L)L.H$	7.36	7.37 ⁿ	
	$M_3L_4/M^3.L^4$			(53.7)
Zn^{2+}	ML/M.L		2.9 ⁿ	
	ML/M($H_{-1}L$).H		2.55 ⁿ	
	M($H_{-1}L$)/MOH($H_{-1}L$).H		9.69 ⁿ	

ⁿ37°, 0.15Bibliography: H^+ 77RGE, 84FS; Co^{2+}, Zn^{2+} 75APa; Cu^{2+} 84FS; Other reference: 83DEL $C_{14}H_{24}O_3N_6$ Glycyl-L-histidyl-L-lysine

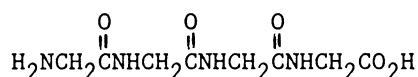
HL

Metal	Equilibrium	Log K 25°, 0.15	Log K 37°, 0.15
<u>ion</u>	<u>HL/H.L</u>		
H^+	HL/H.L	10.51 ±0.08	10.05 ±0.04
	$H_2L/HL.H$	7.91 ±0.03	7.65 -0.2
	$H_3L/H_2L.H$	6.51 ±0.02	6.33 -0.5
	$H_4L/H_3L.H$	2.91 ±0.00	2.80 -0.3
Cu^{2+}	ML/M.L	16.44	16.12 -1
	$ML_2/M.L^2$	21.43	
	M(HL) ₂ /M.(HL) ²		14.58
	ML/M($H_{-1}L$).H	8.96	8.96 +0.1
	M($H_{-1}L$)/M($H_{-2}L$).H	(11.22)	(10.37) -0.4

Glycyl-L-histidyl-L-lysine (continued)

Metal ion	Equilibrium	Log K 25°, 0.15	Log K 37°, 0.15
(Cu ²⁺)	MHL ₂ /ML ₂ .H	9.40	
	M(HL) ₂ /MHL ₂ .H	7.35	7.38
	M ₂ (H ₋₁ L)/M(H ₋₁ L).M		8.08
Zn ²⁺	ML/M.L	8.2	7.50 -0.3
	MHL/M.HL	3.1	
	M(HL) ₂ /M.(HL) ²	8.0	
	MH ₂ L/MHL.H	6.2	
	ML/M(H ₋₁ L).H	9.5	9.22
	M(H ₋₁ L)/MOH(H ₋₁ L).H		9.97
	M(HL) ₂ /MHL ₂ .H	7.5	

Bibliography: H⁺ 77RGE, 81LSa, 83MWW, 84RR, 85DAI; Cu²⁺ 81LSa, 83MWW, 84RR;
Zn²⁺ 83MWW, 84RRA, 85DAI

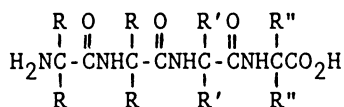
C₈H₁₄O₅N₄

Glycylglycylglycylglycine (tetraglycine)
(Other values in Vol.1, p.332 and Vol.5, p.119)

HL

Metal ion	Equilibrium	Log K 25°, 0.1	Log K 25°, 1.0
Ni ²⁺	M(H ₋₃ LH)/M(H ₋₃ L).H	4.1	
Cu(III)	M(H ₋₃ LH)/M(H ₋₃ L).H		4.3
	M(H ₋₂ LH)/M(H ₋₃ LH).H		1.6

Bibliography: Ni²⁺ 72PM; Cu(III) 80RK

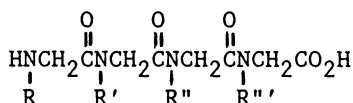
C_xH_yO₅N₄Tetrapeptides containing 2-methylalanine

HL

Ligand	Metal ion	Equilibrium	Log K 25°, 0.1
R= R''= H	H ⁺	HL/H.L	7.98
R'= CH ₃		H ₂ L/HL.H	3.55
Glycylglycyl- 2-methylalanyl- glycine (C ₁₀ H ₁₈ O ₅ N ₄)	Cu ²⁺	ML/M.L	5.18
		ML/M(H ₋₁ L).H	5.21
		M(H ₋₁ L)/M(H ₋₂ L).H	7.71
		M(H ₋₂ L)/M(H ₋₃ L).H	8.11
R''= H	H ⁺	HL/H.L	8.33
R= R'= CH ₃		H ₂ L/HL.H	3.46
2-Methylalanyl- 2-methylalanyl- 2-methylalanyl- glycine (C ₁₄ H ₂₆ O ₅ N ₄)	Cu ²⁺	ML/M.L	5.27
		ML/M(H ₋₁ L).H	4.70
		M(H ₋₁ L)/M(H ₋₂ L).H	7.31
		M(H ₋₂ L)/M(H ₋₃ L).H	7.94

Tetrapeptides containing 2-methylalanine (continued)

<u>Ligand</u>	<u>Metal ion</u>	<u>Equilibrium</u>	<u>Log K</u> <u>25°, 0.1</u>
R= R'= R''= CH ₃	H ⁺	HL/H.L	7.78
2-Methylalanyl-		H ₂ L/HL.H	3.80
2-methylalanyl-	Cu ²⁺	ML/M.L	4.59
2-methylalanyl-		ML/M(H ₋₁ L).H	4.44
2-methylalanine		M(H ₋₁ L)/M(H ₋₂ L).H	7.13
(C ₁₆ H ₃₀ O ₅ N ₄)		M(H ₋₂ L)/MOH(H ₋₂ L).H	10.5
Bibliography: 83HNa			

C₉H₁₆O₅N₄Tetrapeptides containing three glycines and sarcosine

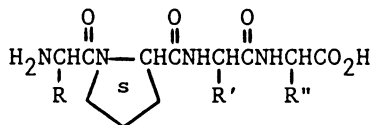
HL

<u>Ligand</u>	<u>Metal ion</u>	<u>Equilibrium</u>	<u>Log K</u> <u>25°, 0.1</u>
R= R'= R''= H	H ⁺	HL/H.L	7.92
R'''= CH ₃		H ₂ L/HL.H	3.04
Glycylglycyl-	Cu ²⁺	ML/M.L	5.28
glycylsarcosine		ML/M(H ₋₁ L).H	5.50
		M(H ₋₁ L)/M(H ₋₂ L).H	7.12
		M(H ₋₂ L)/MOH(H ₋₂ L).H	10.40
R= R'= R''= H	H ⁺	HL/H.L	7.97
R'''= CH ₃		H ₂ L/HL.H	3.34
Glycylglycyl-	Cu ²⁺	ML/M.L	5.13
sarcosylglycine		ML/M(H ₋₁ L).H	4.93
		M(H ₋₁ L)/M(H ₋₂ L).H	9.26
		M(H ₋₂ L)/MOH(H ₋₂ L).H	11.33
R= R''= R'''= H	H ⁺	HL/H.L	8.28
R'= CH ₃		H ₂ L/HL.H	3.35
Glycylsarcosyl-	Cu ²⁺	ML/M.L	5.18
glycylglycine		ML ₂ /M.L ²	9.92
		ML/M(H ₋₁ L).H	6.96
		M(H ₋₁ L)/M(H ₋₂ L).H	9.24
		M(H ₋₂ L)/MOH(H ₋₂ L).H	10.9
R'= R''= R'''= H	H ⁺	HL/H.L	8.39
R= CH ₃		H ₂ L/HL.H	3.34
Sarcocylglycyl-	Cu ²⁺	ML/M.L	5.00
glycylglycine		ML/M(H ₋₁ L).H	5.54
		M(H ₋₁ L)/M(H ₋₂ L).H	6.89
		M(H ₋₂ L)/M(H ₋₃ L).H	9.43
Bibliography: 85PSF			

HL

<u>Ligand</u>	<u>Metal ion</u>	<u>Equilibrium</u>	<u>Log K</u> <u>25°, 0.1</u>
Glycylglycyl-glycyl-L-proline	H^+	HL/H.L	8.04
		H_2L /HL.H	2.91
	Cu^{2+}	ML/M.L	5.16
		ML/M($H_{-1}L$).H	5.64
		M($H_{-1}L$)/M($H_{-2}L$).H	7.02
		M($H_{-2}L$)/MOH($H_{-2}L$).H	10.08
Glycylglycyl-L-prolylglycine	H^+	HL/H.L	8.06
		H_2L /HL.H	3.17
	Cu^{2+}	ML/M.L	4.95
		ML/M($H_{-1}L$).H	5.01
		M($H_{-1}L$)/M($H_{-2}L$).H	9.40
		M($H_{-2}L$)/MOH($H_{-2}L$).H	10.01
Glycyl-L-prolyl-glycylglycine	H^+	HL/H.L	8.25
		H_2L /HL.H	3.11
	Cu^{2+}	ML/M.L	5.46
		ML_2 /M.L ²	9.61
		ML/M($H_{-1}L$).H	7.92
		M($H_{-1}L$)/M($H_{-2}L$).H	9.40
		M($H_{-2}L$)/MOH($H_{-2}L$).H	(9.48)
L-Prolylglycyl-glycylglycine	H^+	HL/H.L	8.67
		H_2L /HL.H	3.27
	Cu^{2+}	ML/M.L	5.59
		ML/M($H_{-1}L$).H	5.42
		M($H_{-1}L$)/M($H_{-2}L$).H	6.95
		M($H_{-2}L$)/M($H_{-3}L$).H	9.32

Bibliography: 85PSF

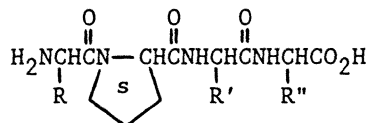


HL

<u>Ligand</u>	<u>Metal ion</u>	<u>Equilibrium</u>	<u>Log K</u> <u>22°, 0.1</u>
R= R'= H	H ⁺	HL/H.L	8.33
R''= CH ₂ -C ₆ H ₅	Cu ²⁺	ML/M.L	5.15
Glycyl-L-prolyl- glycyl-L-phenyl- alanine		ML/M(H ₋₁ L).H	6.86
R= R''= H	H ⁺	HL/H.L	8.29
R'= CH ₂ -C ₆ H ₅	Cu ²⁺	ML/M.L	5.22
Glycyl-L-prolyl- L-phenylalanyl- glycine		ML/M(H ₋₁ L).H	6.77
		M(H ₋₁ L)/M(H ₋₂ L).H	7.6

Tetrapeptides containing two glycines, phenylalanine, and L-proline (continued)

<u>Ligand</u>	<u>Metal ion</u>	<u>Equilibrium</u>	<u>Log K</u> <u>22°, 0.1</u>
R= R''= H	H ⁺	HL/H.L	8.64
R' = CH ₂ -C ₆ H ₅	Cu ²⁺	ML/M.L	4.96
Glycyl-L-prolyl-D-phenylalanyl-glycine		ML/M(H ₋₁ L).H	6.95
R' = R'' = H	H ⁺	HL/H.L	7.75
R = CH ₂ -C ₆ H ₅	Cu ²⁺	H ₂ L/HL.H	3.11
L-Phenylalanyl-L-prolylglycyl-glycine		ML/M.L	5.24
		ML ₂ /M.L ²	9.21
		ML/M(H ₋₁ L).H	6.78
Bibliography: 84BPS		M(H ₋₁ L)/M(H ₋₂ L).H	8.56

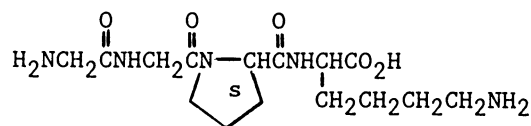
C₁₈H₂₄O₆N₄ Tetrapeptides containing two glycines, L-proline, and L-tyrosine H₂L

<u>Ligand</u>	<u>Metal ion</u>	<u>Equilibrium</u>	<u>Log K</u> <u>22°, 0.1</u>
R= R' = H	H ⁺	HL/H.L	9.98
R'' = CH ₂ -C ₆ H ₅ -OH	Cu ²⁺	H ₂ L/HL.H	8.43
Glycyl-L-prolyl-glycyl-L-tyrosine		MHL/M.HL	5.70
		MHL/ML.H	7.95
		ML/M(H ₋₁ L).H	10.15
		M ₂ HL/MHL.M	2.1
R = R'' = H	H ⁺	HL/H.L	10.27
R' = CH ₂ -C ₆ H ₅ -OH	Cu ²⁺	H ₂ L/HL.H	8.51
		H ₃ L/H ₂ L.H	3.43
Glycyl-L-prolyl-L-tyrosyl-glycine		MHL/M.HL	5.60
		MHL/M(H ₋₁ L).H ²	17.19
		M(H ₋₁ L)/M(H ₋₂ L).H	10.51
		M ₂ (H ₋₁ L)/M(H ₋₁ L).M	6.49
		M ₂ (H ₋₁ L)/M ₂ (H ₋₂ L).H	8.98
		M ₂ L ₂ /M ² .L ²	19.32
R' = R = H	H ⁺	HL/H.L	9.76
R = CH ₂ -C ₆ H ₅ -OH	Cu ²⁺	H ₂ L/HL.H	7.59
		H ₃ L/H ₂ L.H	3.29
L-Tyrosyl-L-prolyl-glycyl-glycine		MHL/M.HL	4.95
		MHL/ML.H	6.80
		ML/M(H ₋₁ L).H	9.08
		M(H ₋₁ L)/M(H ₋₂ L).H	10.15
		M ₂ (H ₋₂ L)/M(H ₋₂ L).M	6.4
Bibliography: 83KB		M ₂ L ₂ /M ² .L ²	17.5

H_3L

<u>Isomer</u>	<u>Metal ion</u>	<u>Equilibrium</u>	<u>Log K</u> <u>25°, 0.1</u>
L-Tyrosyl-	H ⁺	HL/H.L	10.16
glycyl-		H ₂ L/HL.H	9.80
L-prolyl-		H ₃ L/H ₂ L.H	7.54
L-tyrosine		H ₄ L/H ₃ L.H	3.02
	Cu ²⁺	MH ₂ L/M.H ₂ L	4.40
		MH ₂ L/M(H ₋₁ LH ₂).H	4.66
		M(H ₋₁ LH ₂)/M(H ₋₁ LH).H	9.44
		M ₂ (H ₋₁ LH) ₂ /M(H ₋₁ LH) ²	3.48
		M ₂ (H ₋₁ LH) ₂ /M ₂ (H ₋₁ L) ₂ .H ²	20.34
L-Tyrosyl-	H ⁺	HL/H.L	10.12
L-prolyl-		H ₂ L/HL.H	9.75
glycyl-		H ₃ L/H ₂ L.H	7.61
L-tyrosine		H ₄ L/H ₃ L.H	2.74
	Cu ²⁺	MH ₂ L/M.H ₂ L	4.99
		M(H ₂ L)/M.(H ₂ L) ²	8.96
		MH ₂ L/MHL.H	7.13
		MHL/ML.H	9.31

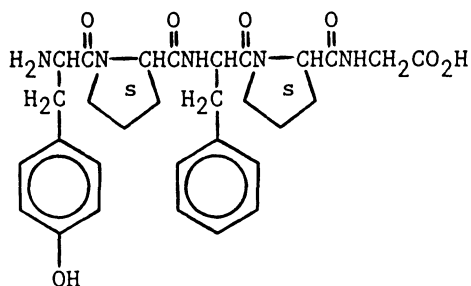
Bibliography: 85PSa



HL

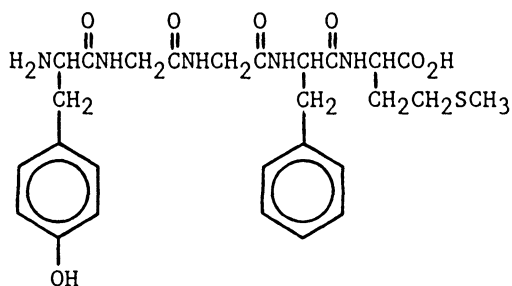
Metal		Log K
<u>ion</u>	<u>Equilibrium</u>	<u>25°, 0.1</u>
H ⁺	HL/H.L	9.88
	H ₂ L/HL.H	8.03
	H ₃ L/H ₂ L.H	3.19
Cu ²⁺	MHL/M.HL	4.78
	MHL/M(H ₋₁ LH).H	5.10
	M(H ₋₁ LH)/M(H ₋₁ L).H	6.41
	M(H ₋₁ L)/MOH(H ₋₁ L).H	10.20

Bibliography: 85BPS

C₃₀H₃₇O₇N₅L-Tyrosyl-L-prolyl-L-phenylalanyl-L-prolylglycineH₂L

Metal		Log K
<u>ion</u>	<u>Equilibrium</u>	<u>25°, 0.1</u>
H ⁺	HL/H.L	9.81
	H ₂ L/HL.H	7.42
	H ₃ L/H ₂ L.H	3.36
Cu ²⁺	MHL/M.HL	4.40
	M(HL) ₂ /M.(HL) ₂	9.10
	M ₂ L ₂ /M ² .L ²	19.02
	M ₂ L ₂ /M ₂ (H ₋₁ L) ₂ .H ²	18.79

Bibliography: 84FP

C₂₇H₃₅O₇N₅SL-Tyrosylglycylglycyl-L-phenylalanyl-L-methionine
(methionine enkephalin)H₂L

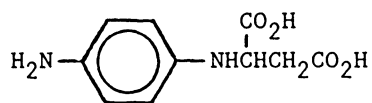
Metal		Log K
<u>ion</u>	<u>Equilibrium</u>	<u>25°, 0.1</u>
H ⁺	HL/H.L	9.82
	H ₂ L/HL.H	7.44
	H ₃ L/H ₂ L.H	3.46
Cu ²⁺	MHL/M.HL	4.6
	MHL/M(H ₋₁ LH).H	5.1
	M(H ₋₁ LH)/M(H ₋₂ LH).H	7.12
	M(H ₋₂ LH)/M(H ₋₃ LH).H	8.49
	M(H ₋₃ LH)/M(H ₋₃ L).H	9.71

Bibliography: 85FP; Other reference: 83IS

Glutathione disulfide (continued)

Metal ion	Equilibrium	Log K 25°, 0.15	Log K 37°, 0.15	Log K 25°, 0.4
Co ²⁺	ML/M.L	7.21		
	ML ₂ /M.L ²	10.17		
	M ₂ L/ML.M	2.82		
Cu ²⁺	ML/M.L	13.74	13.37 +0.3	
	ML ₂ /M.L ²		15.44 +2	
	MHL/ML.H	4.46	4.36 -0.4	
	MH ₂ L/MHL.H	3.35	2.93 +0.9	
	MH ₃ L/MH ₂ L.H	2.96	(3.85)	
	M(HL) ₂ /M.(HL) ²	14.55		
	ML/MOHL.H		10.00	
	M ₂ L/ML.M	2.52	2.64 -0.3	
	M ₂ HL/M ₂ L.H	3.83	4.19	

Bibliography:

H⁺ 80AEJ, 82BB, 84TC;Co²⁺ 81AE;Cu²⁺ 80AEJ, 82BBC₁₀H₁₂O₄N₂

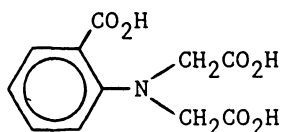
(4-Aminophenylamino)butanedioic acid
(N-(4-aminophenyl)aspartic acid, PDMS)

H₂L

Metal ion	Equilibrium	Log K 25°, 0.5
H ⁺	HL/H.L	6.36 ^u
	H ₂ L/HL.H	4.03
	H ₃ L/H ₂ L.H	3.08
	H ₄ L/H ₃ L.H	2.39
Mn ²⁺	ML/M.L	1.22
	MHL/ML.H	5.98
Co ²⁺	ML/M.L	2.21
	MHL/ML.H	5.94
Ni ²⁺	ML/M.L	(1.44)
	MHL/ML.H	5.98
Cu ²⁺	ML/M.L	4.57
	MHL/ML.H	4.01
Zn ²⁺	ML/M.L	2.03
	MHL/ML.H	5.83
Cd ²⁺	ML/M.L	2.20
	MHL/ML.H	5.96

^uNaCl used as background electrolyte.

Bibliography: 84RFb

 $C_{11}H_{11}O_6N$

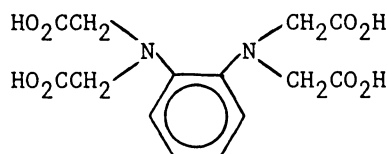
N-(2-Carboxyphenyl)iminodiacetic acid
(Other values in Vol.1, p.353 and Vol.5, p.127)

 H_3L

Metal ion	Equilibrium	Log K 25°, 0.1	Log K 20°, 0.1	ΔH 25°, 0.1	ΔS 25°, 0.1
H^+	HL/H.L	7.73 ^v - 0.01	7.75 ^v ± 0.04	-1.7	30
	H ₂ L/HL.H	2.98 - 0.01	2.98 ± 0.00		
	H ₃ L/H ₂ L.H	2.33	2.34 - 0.01		
VO^{2+}	ML/M.L	9.49			
	ML/MOHL.H	6.97			

^vK⁺ salt used as background electrolyte.

Bibliography: 83FF; Other reference: 82NB

 $C_{14}H_{16}O_8N_2$

1,2-Phenylenedinitrilotetraacetic acid
(Other values in Vol.1, p.361 and other reference in Vol.5, p.459)

 H_4L

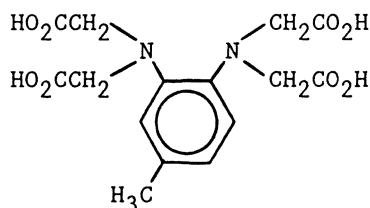
Metal ion	Equilibrium	Log K 25°, 0.1	Log K 30°, 0.1	Log K 25°, 1.0
H^+	HL/H.L	6.62 ^v 6.71 ^z	6.7 ^v	6.41 ^u
	H ₂ L/HL.H	4.87 ± 0.07	4.8	4.61
	H ₃ L/H ₂ L.H	3.64 ± 0.06	3.7	3.53
	H ₄ L/H ₃ L.H	2.89 ± 0.02	2.9	3.00
	H ₅ L/H ₄ L.H			(0.4)
	H ₆ L/H ₅ L.H			(0.3)
Li^+	ML/M.L	2.39		
Na^+	ML/M.L	1.52		
K^+	ML/M.L	0.28		
Ca^{2+}	ML/M.L		9	8.27
Mn^{2+}	ML/M.L			11.37
	MHL/ML.H			2.29
	MH ₂ L/MHL.H			(1.7)
Fe^{2+}	ML/M.L			12.2
	MHL/ML.H			2.41
Co^{2+}	ML/M.L			13.18
	MHL/ML.H			2.52
	MH ₂ L/MHL.H			(1.2)
Ni^{2+}	ML/M.L			13.48
	MHL/ML.H			3.32
	MH ₂ L/MHL.H			(0.9)

^uNaClO₄ used as background electrolyte; ^vKCl used as background electrolyte;^z(CH₃)₄NCl used as background electrolyte.

1,2-Phenylenedinitrilotetraacetic acid (continued)

Metal ion	Equilibrium	Log K 25°, 0.1	Log K 30°, 0.1	Log K 25°, 1.0
Cu ²⁺	ML/M.L			15.21
	MHL/ML.H			3.04
	MH ₂ L/MHL.H			(1.8)
Zn ²⁺	MH ₂ L/MHL.H			12.89
	MHL/ML.H			2.96
	MH ₂ L/MHL.H			(1.3)
Hg ²⁺	ML/M.L			17.38

Bibliography: H⁺ 84MH, 85MHF, 85NKM; Li⁺-K⁺ 85MHF, Ca²⁺-Hg²⁺ 85MKM

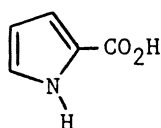


C₁₅H₁₈O₈N₂ 4-Methyl-1,2-phenylenedinitrilotetraacetic acid H₄L

Metal ion	Equilibrium	Log K 25°, 0.1
H ⁺	HL/H.L	6.99 ^v
		7.04 ^z
	H ₂ L/HL.H	4.83 ± 0.09
	H ₃ L/H ₂ L.H	3.56 ± 0.00
	H ₄ L/H ₃ L.H	2.86 ± 0.00
Li ⁺	ML/M.L	2.33
Na ⁺	ML/M.L	1.37

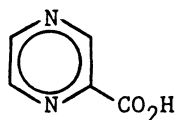
^vKCl used as background electrolyte; ^z(CH₃)₄NCl used as background electrolyte.

Bibliography: H⁺ 84MH, 85MHF; Li⁺, Na⁺ 85MHF



C ₅ H ₅ O ₂ N		<u>Pyrrole-2-carboxylic acid</u>		HL	
Metal ion	Equilibrium	Log K 25°, 1.0	Log K 25°, 0	ΔH 25°, 1.0	ΔS 25°, 1.0
H ⁺	HL/H.L	4.29	4.45	(-2.9)	(10)
Ca ²⁺	ML/M.L	1.56		-0.1	7
Co ²⁺	ML/M.L	1.63		0.0	7
Ni ²⁺	ML/M.L	(1.40)		+0.1	(7)
Cu ²⁺	ML/M.L	1.79		+1.3	13
	ML ₂ /M.L ²	2.91		+2	20

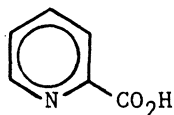
Bibliography: H⁺ 60Lb, 72L, 81Aa; Ca²⁺-Cu²⁺ 72L, 81Aa

 $C_5H_4O_2N_2$ 1,4-Diazine-2-carboxylic acid (pyrazinecarboxylic acid)

HL

Metal ion	Equilibrium	Log K <u>25°, 0.1</u>	Log K <u>25°, 1.0</u>	Log K <u>25°, 3.0</u>
H^+	HL/H.L $H_2L/HL.H$	2.82	2.73 ± 0.03	(0.5)
La^{3+}	ML/M.L $ML_2/M.L^2$ $ML_3/M.L^3$		2.30 4.1 5.3	
Nd^{3+}	ML/M.L $ML_2/M.L^2$ $ML_3/M.L^3$		2.77 4.8 6.3	
Sm^{3+}	ML/M.L $ML_2/M.L^2$ $ML_3/M.L^3$		2.85 5.2 7.1	
Eu^{3+}	ML/M.L $ML_2/M.L^2$ $ML_3/M.L^3$		2.82 5.1 6.9	
Gd^{3+}	ML/M.L $ML_2/M.L^2$ $ML_3/M.L^3$		2.50 4.6 6.1	
Tb^{3+}	ML/M.L $ML_2/M.L^2$ $ML_3/M.L^3$		2.77 4.8 6.8	
Ho^{3+}	ML/M.L $ML_2/M.L^2$ $ML_3/M.L^3$		2.91 4.9 6.8	
Er^{3+}	ML/M.L $ML_2/M.L^2$ $ML_3/M.L^3$		2.84 5.0 6.7	
Lu^{3+}	ML/M.L $ML_2/M.L^2$ $ML_3/M.L^3$		2.98 5.1 7.1	
Fe^{2+}	ML/M.L $ML_2/M.L^2$ $ML_3/M.L^3$		4.10 7.71 10.51	
Ni^{2+}	ML/M.L $ML_2/M.L^2$ $ML_3/M.L^3$		5.69 10.35 14.10	
Fe^{3+}	ML/M.L $ML_2/M.L^2$		7.5 10.4	

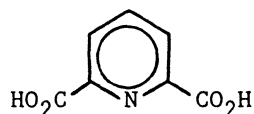
Bibliography: H^+ 78MBC, 81TBa, 83KKY; La^{3+} - Lu^{3+} 83KKY; Fe^{2+} , Ni^{2+} 79MMB; Fe^{3+} 85FM

 $C_6H_5O_2N$

Pyridine-2-carboxylic acid (picolinic acid)
(Other values in Vol.1, p.367 and Vol.5, p.129)

HL

Metal ion	Equilibrium	Log K <u>25°, 0.1</u>	Log K <u>25°, 1.0</u>	Log K <u>25°, 0</u>	ΔH <u>25°, 0.1</u>	ΔS <u>25°, 0.1</u>
H^+	HL/H.L	5.21 ± 0.01	5.32 ± 0.01	5.39 ± 0.01	-2.5 ± 0.0	15
	$H_2L/HL.H$	$5.17^b \pm 0.01$ (1.0) (0.9) ^b ± 0.0	5.34^d (0.9)	$5.87^e \pm 0.01$ (1.0) ± 0.02 (1.7) ^e ± 0.3	-0.5 ± 0.0	3
Mg^{2+}	ML/M.L	2.21		2.58	+0.4	11
	$M_2/M.L^2$			3.95		
Ca^{2+}	ML/M.L	1.80		2.22	-1.0	5
	$ML_2/M.L^2$			3.79		
Sr^{2+}	ML/M.L	1.69		(1.79)	-0.4	6
	$ML_2/M.L^2$			(2.98)		
Ba^{2+}	ML/M.L	1.65		(1.63)	-0.1	7
Hg^{2+}	ML/M.L	7.70^h	8.16^j			
	$ML_2/M.L^2$	(15.55) ^h	15.34^j			
	ML/MOHL.H		3.79^j			
In^{3+}	ML/M.L	5.81				
	$ML_2/M.L^2$	11.56				
	$ML_3/M.L^3$	15.77				
	ML/MOHL.H	3.7				

^b25°, 0.5; ^d25°, 2.0; ^e25°, 3.0; ^h20°, 0.1; ^j20°, 1.0Bibliography: H^+ 68PG, 70Ba, 70P, 82MOa, 84CPa, 84RBc; Mg^{2+} -Ba²⁺ 83A; Hg^{2+} 84CPa; In^{3+} 84PGa; Other references: 77CC, 79SP, 80EE, 81RRa, 82BPM, 83IT $C_7H_5O_4N$

Pyridine-2,6-dicarboxylic acid (dipicolinic acid)
(Other values in Vol.1, p.377 and Vol.5, p.130)

 H_2L

Metal ion	Equilibrium	Log K <u>25°, 0.1</u>	Log K <u>25°, 1.0</u>	Log K <u>25°, 0</u>	ΔH <u>25°, 0.1</u>	ΔS <u>25°, 0.1</u>
H^+	HL/H.L	4.66 ± 0.03	4.52 ± 0.10	5.07 ± 0.00	+1.0	25
		$4.51^b \pm 0.05$			+0.2 ^b	
	$H_2L/HL.H$	2.09 ± 0.1	2.11 ± 0.07	2.27 ± 0.03	-0.7	7
		$2.05^b \pm 0.05$			-1.1 ^b	
Mg^{2+}	ML/M.L	2.34 ± 0.02			+3.9	24
	$ML_2/M.L^2$	3.0				
Ca^{2+}	ML/M.L	4.36 ± 0.2			-2.9	10
	$ML_2/M.L^2$	7.4 ± 0.2				

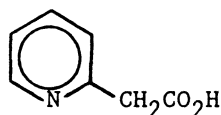
^b25°, 0.5

Dipicolinic acid (continued)

Metal ion	Equilibrium	Log K <u>25°, 0.1</u>	Log K <u>25°, 1.0</u>	Log K <u>25°, 0</u>	ΔH <u>25°, 0.1</u>	ΔS <u>25°, 0.1</u>
Sr ²⁺	ML/M.L	3.83 ±0.03			-1.9	11
	ML ₂ /M.L ²	5.6 ±0.2				
Ba ²⁺	ML/M.L	3.44 -0.01			-1.9	9
	ML ₂ /M.L ²	4.9				
VO ²⁺	ML/M.L		6.8			
VO ₂ ⁺	ML/M.L		8.65			
	ML/MOHL.H		5.87			
Zn ²⁺	ML/M.L	6.32	6.43		-2.1 ^c	22 ^c
	ML ₂ /M.L ²	11.81	12.46		-5.4 ^c	39 ^c

^c25°, 1.0Bibliography: H⁺ 77FH, 80CR, 82BPM, 84SMA; Mg²⁺-Ba²⁺ 83A; VO²⁺ 82FF; VO₂⁺ 77FH; Zn²⁺ 84SMA;

Other references: 76CM, 77CDD, 80KD, 83IT, 83PB, 84PR, 85RA

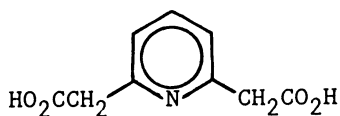
C₇H₇O₂NPyridine-2-acetic acid

HL

(Other values in Vol.1, p.387 and other reference in Vol.5, p.430)

Metal ion	Equilibrium	Log K <u>25°, 0.5</u>	Log K <u>25°, 1.0</u>	ΔH <u>25°, 1.0</u>	ΔS <u>25°, 1.0</u>
H ⁺	HL/H.L	5.77 ±0.04	5.78 ±0.06	-4.3	12
	H ₂ L/HL.H	2.67 ±0.07	2.73 ±0.03	-1.2	8
Co ²⁺	ML/M.L	2.74	2.77	-2.3	5
	ML ₂ /M.L ²	5.17	5.21	-3.7	11
Ni ²⁺	ML/M.L	3.55	3.58	-3.7	4
	ML ₂ /M.L ²	6.77	6.81	-7.1	7
Cu ²⁺	ML/M.L	5.41 ±0.1	5.44	-3.7	12
	ML ₂ /M.L ²	9.76 ±0.3	9.80	-9.5	13
Zn ²⁺	ML/M.L	2.16	2.19	-0.9	7
	ML ₂ /M.L ²	(5.35)	(5.29)	-3.1	(14)
Cd ²⁺	ML/M.L	2.10 ⁱ			
	ML ₂ /M.L ²	3.76 ⁱ			
Hg ²⁺	ML/M.L		6.68 ^j		
	ML ₂ /M.L ²		10.60 ^j		
	ML/MOHL.H		3.89 ^j		
	MOHL/M(OH) ₂ L.H		7.82 ^j		
	ML ₂ /MOHL ₂ .H		4.60 ^j		

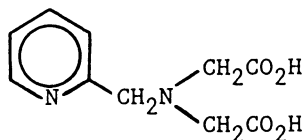
ⁱ20°, 0.5; ^j20°, 1.0Bibliography: H⁺ 70Ba, 80C; Co²⁺-Zn²⁺ 80Ab; Cd²⁺ 80C; Hg²⁺ 84CP

Pyridine-2,6-diacetic acidH₂LC₉H₉O₄N

Metal ion	Equilibrium	Log K 20°, 1.0
H ⁺	HL/H.L	6.02 ^u
	H ₂ L/HL.H	3.10
	H ₃ L/H ₂ L.H	2.35
Cu ²⁺	ML/M.L	8.34
Zn ²⁺	ML/M.L	3.68
	ML ₂ /M.L ²	6.36
Cd ²⁺	ML/M.L	2.82
	ML ₂ /M.L ²	5.07

^uNaNO₃ used as background electrolyte.

Bibliography: 79CP

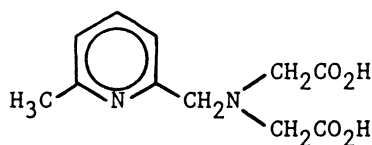
N-(2-Pyridylmethyl)iminodiacetic acid
(Other values in Vol.1, p.390)H₂LC₁₀H₁₂O₄N₂

Metal ion	Equilibrium	Log K 25°, 0.1	Log K 20°, 0.1	ΔH 20°, 0.1	ΔS 25°, 0.1
H ⁺	HL/H.L	8.20 ±0.04	8.24 ±0.02	-3.7	25
	H ₂ L/HL.H	2.72 ±0.1	2.72	-0.2	12
	H ₃ L/H ₂ L.H	2.68 ±0.03	2.70		
Mg ²⁺	ML/M.L	3.99 ±0.04	3.94	+3.8	31
Ca ²⁺	ML/M.L	4.89 ±0.01	4.91	-1.5	17
Sr ²⁺	ML/M.L	3.67 ±0.03	3.68	-1.0	13
Ba ²⁺	ML/M.L	3.38 ±0.00	3.40	-1.7	10
Am ³⁺	ML/M.L	8.7			
	ML ₂ /M.L ²	17.48			
Mn ²⁺	ML/M.L	7.05 ±0.09	7.06	-0.4	31
	ML ₂ /M.L ²		10.6 ±0.0		
Fe ²⁺	ML/M.L		8.97 ±0.03		
	MHL/ML.H		3.15		
Co ²⁺	ML/M.L	10.56	10.60 -0.4	-3.5	37
	ML ₂ /M.L ²		13.5 -0.2		
	MHL/ML.H		3.00		
Ni ²⁺	ML/M.L	12.56	12.56	-6.7	35
	ML ₂ /M.L ²	16.3	16.4	-10.8	38
	MHL/ML.H		1.4		
Cu ²⁺	ML/M.L	14.11	14.20	-6.8	42
	ML/MOHL.H		9.0		

N-(2-Pyridylmethyl)iminodiacetic acid (continued)

Metal ion	Equilibrium	Log K 25°, 0.1	Log K 20°, 0.1	ΔH 20°, 0.1	ΔS 25°, 0.1
VO ²⁺	ML/M.L	11.30			
	ML/MOHL.H	6.61			
Ag ⁺	ML/M.L	5.64			
	MHL/ML.H	4.09			
	M ₂ L/ML.M	1.6			
	M ₂ L ₂ /M ² .L ²	14.56	14.83	-21.5	-6
Zn ²⁺	ML/M.L	10.61	10.65 +0.2	-3.2	38
Cd ²⁺	ML/M.L	9.92	10.00 -0.5	-6.6	23
	ML ₂ /M.L ²	15.1	15.3 -0.6	-12.4	27
Hg ²⁺	ML/M.L	14.75	14.90	-12.0	27
	ML ₂ /M.L ²	23.8	24.1	-23.6	30
Pb ²⁺	ML/M.L	10.53	10.60 -0.3	-5.6	29

Bibliography: H⁺ 75IP,81A,83FF; Mg²⁺-Ba²⁺,Mn²⁺-Cu²⁺,Am³⁺ 82BM; Ag⁺-Pb²⁺ 81A; VO²⁺ 83FF
Other reference: 70Ba

C₁₁H₁₄O₄N₂

N-(6-Methyl-2-pyridylmethyl)iminodiacetic acid
(Other values in Vol.1, p.393)

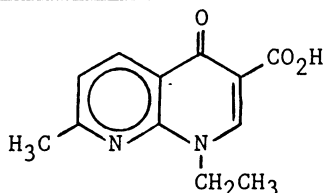
H₂L

Metal ion	Equilibrium	Log K 25°, 0.1	Log K 20°, 0.1	ΔH 20°, 0.1	ΔS 25°, 0.1
H ⁺	HL/H.L	8.31 ±0.03	8.36	-3.8	25
	H ₂ L/HL.H	3.45 ±0.01	3.46	-1.1	12
	H ₃ L/H ₂ L.H	2.62	2.60		
Mg ²⁺	ML/M.L	3.1	3.0	+4.8	31
Ca ²⁺	ML/M.L		3.55		
Ba ²⁺	ML/M.L		2.55		
Mn ²⁺	ML/M.L		6.60		
	ML ₂ /M.L ²		10.1		
Fe ²⁺	ML/M.L		8.55		
Co ²⁺	ML/M.L	9.77	9.80	-2.2	37
Ni ²⁺	ML/M.L		11.45	-4.7	37
Cu ²⁺	ML/M.L		12.70	-3.8	45
Ag ⁺	ML/M.L	6.1			
	MHL/ML.H	4.2			
	M ₂ L ₂ /M ² .L ²	15.85	16.1	-22.0	-2
Zn ²⁺	ML/M.L	9.77	9.80	-2.2	37
Cd ²⁺	ML/M.L	8.72	8.75	-2.0	33
	ML ₂ /M.L ²	13.8	13.9	-10.2	28

N-(6-Methyl-2-pyridylmethyl)iminodiacetic acid (continued)

Metal ion	Equilibrium	Log K 25°, 0.1	Log K 20°, 0.1	ΔH 20°, 0.1	ΔS 25°, 0.1
Hg ²⁺	ML/M.L	14.75	14.90	-11.6	28
	ML ₂ /M.L ²	23.8	24.0	-23.5	30
Pb ²⁺	ML/M.L	10.02	10.15	-4.4	31

Bibliography: 81A; Other references: 70B,70Ba

C₁₂H₁₂N₂O₃ 1-Ethyl-1,4-dihydro-7-methyl-4-oxo-1,8-naphthyridine-3-carboxylic acid HL
(nalidixic acid) (Other reference in Vol.5, p.456)

Metal ion	Equilibrium	Log K 37°, 0.15
H ⁺	HL/H.L	5.94
Mg ²⁺	ML/M.L	3.05
	ML ₂ /M.L ²	5.95
	ML/MOHL.H	7.70
Cu ²⁺	ML/M.L	6.00
	ML ₂ /M.L ²	11.54

Bibliography: H⁺ 82HA; Mg²⁺ 84CGW; Cu²⁺ 82HA,84CGWCH₃NH₂CH₅N Methylamine L
(Other values in Vol.2, p.1 and Vol.5, p.132)

Metal ion	Equilibrium	Log K 25°, 0.1	Log K 25°, 0.5	Log K 25°, 0	ΔH 25°, 0	ΔS 25°, 0
H ⁺	HL/H.L	10.63 ±0.04	10.69 ±0.03 10.76 ^c	10.64 ±0.02	-13.2 ±0.1	4
Ni ²⁺	ML/M.L		2.23 ^c			
Ag ⁺	ML/M.L	3.06	3.15	3.07	(-3)	(4)
	ML ₂ /M.L ²	6.78 ±0.04	6.68	6.89 -0.1	-11.7 ±0.2	-8

^c25°,1.0Bibliography: H⁺ 71RM,80H,84KM; Ni²⁺ 71RM; Ag⁺ 80H;
Other references: 80AI,83DNCH₃CH₂NH₂C₂H₇N Ethylamine L
(Other values in Vol.2, p.2 and Vol.5, p.132)

Metal ion	Equilibrium	Log K 25°, 0.1	Log K 25°, 0.5	Log K 25°, 0	ΔH 25°, 0	ΔS 25°, 0
H ⁺	HL/H.L	10.64 ±0.05	10.66 ±0.01 10.78 ^c	10.636 ±0.000	-13.65 ±0.07	2.8

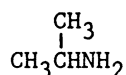
^c25°,1.0

Ethylamine (continued)

Metal ion	Equilibrium	Log K <u>25°, 0.1</u>	Log K <u>25°, 0.5</u>	Log K <u>25°, 0</u>	ΔH <u>25°, 0</u>	ΔS <u>25°, 0</u>
Ni ²⁺	ML/M.L		1.81 ^c			
Ag ⁺	ML/M.L	3.44	3.38 ±0.02	3.46	-5	-1
	ML ₂ /M.L ²	7.34 ±0.06	7.30 ±0.10	7.35 -0.03	-12.5 -0.5	-9
Hg ²⁺	ML/M.L		8.90			
	ML ₂ /M.L ²		18.44			

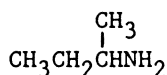
^c25°,1.0Bibliography: H⁺ 71RM,80H,80JH; Ni²⁺ 71RM; Ag⁺ 80H; Hg²⁺ 83HN;

Other references: 81NMK,84KM



C₃H₉N 2-Propylamine (isopropylamine) L
 (Other references in Vol.2, p.331 and other value in Vol.5, p.132)

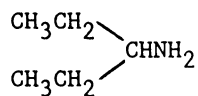
Metal ion	Equilibrium	Log K <u>25°, 0.1</u>	Log K <u>25°, 0.5</u>	Log K <u>25°, 0</u>	ΔH <u>25°, 0</u>	ΔS <u>25°, 0</u>
H ⁺	HL/H.L	10.61 ±0.01	10.63 ±0.02	10.67	-13.95 ±0.03	2.0
Ni ²⁺	ML/M.L		10.72 ^c 1.56 ^c			
Ag ⁺	ML/M.L	3.67			-5.7 ^a	-2 ^a
	ML ₂ /M.L ²	7.77			-14.3 ^a	-12 ^a
Hg ²⁺	ML/M.L		8.75			
	ML ₂ /M.L ²		18.27			

^a25°,0.1; ^c25°,1.0Bibliography: H⁺ 71RM,80H,83HN; Ni²⁺ 71RM; Ag⁺ 80H,83HN; Hg²⁺ 83HN

C₄H₁₁N DL-2-Butylamine (s-butylamine) L
 (Other reference in Vol.2, p.331)

Metal ion	Equilibrium	Log K <u>25°, 0.1</u>	Log K <u>25°, 0</u>	ΔH <u>25°, 0</u>	ΔS <u>25°, 0</u>
H ⁺	HL/H.L	10.56	10.57 ±0.01	-14.03	1.3
Ag ⁺	ML/M.L	3.65			
	ML ₂ /M.L ²	(7.77) ^w			

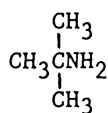
^woptical isomerism not stated.Bibliography: H⁺ 80H,81TB; Ag⁺ 80H

 $\text{C}_5\text{H}_{13}\text{N}$ 3-Pentylamine

L

Metal ion	Equilibrium	Log K 25°, 0.1	Log K 25°, 0.5
H^+	HL/H.L	10.41	10.52
Ag^+	ML/M.L	3.53	
	$\text{ML}_2/\text{M.L}^2$	7.73	
Hg^{2+}	ML/M.L		8.67
	$\text{ML}_2/\text{M.L}^2$		18.08

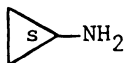
Bibliography: 83HN

 $\text{C}_4\text{H}_{11}\text{N}$ 2-Methyl-2-propylamine (t-butylamine)

L

(Other references in Vol.2, p.331 and other value in Vol.5, p.133)

Metal ion	Equilibrium	Log K 25°, 0.1	Log K 25°, 0.5	Log K 25°, 0	ΔH 25°, 0	ΔS 25°, 0
H^+	HL/H.L	10.65 $\pm$ 0.02	10.67 $\pm$ 0.01 10.72 ^c	10.685 $\pm$ 0.00	-14.39 $\pm$ 0.04	0.6
Ag^+	ML/M.L	3.69			-5.5 ^a	-2 ^a
	$\text{ML}_2/\text{M.L}^2$	7.87			-13.7 ^a	-10 ^a
Hg^{2+}	ML/M.L		8.77			
	$\text{ML}_2/\text{M.L}^2$		18.00			

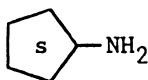
^a25°, 0.1; ^c25°, 1.0Bibliography: H^+ 71RM, 80H, 81TB, 83HN; Ag^+ 80H, 83HN; Hg^{2+} 83HN $\text{C}_3\text{H}_7\text{N}$ Cyclopropylamine

L

(Other reference in Vol.2, p.331)

Metal ion	Equilibrium	Log K 25°, 0.1	Log K 25°, 0	ΔH 25°, 0	ΔS 25°, 0
H^+	HL/H.L	9.06	9.10	-11.7	2
Ag^+	ML/M.L	3.10			
	$\text{ML}_2/\text{M.L}^2$	6.43			

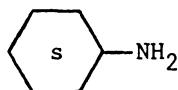
Bibliography: 80H

 $C_5H_{11}N$ Cyclopentylamine

L

(Other references in Vol.2, p.5)

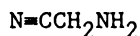
Metal ion	Equilibrium	Log K 25°, 0.1	Log K 25, 0.5	Log K 25°, 0	ΔH 25°, 0.1	ΔS 25°, 0.1
H^+	HL/H.L	10.63 (10.03) ⁿ	10.65	10.65	-14.30 $\pm$ 0.0	0.6
Ag^+	ML/M.L	3.61			-6.4	-5
	$ML_2/M.L^2$	7.83			-15.7	-17
Hg^{2+}	ML/M.L		8.89			
	$ML_2/M.L^2$		18.51			

ⁿ37°, 0.15Bibliography: H^+ , Ag^+ 80H, 83HN; Hg^{2+} 83HN $C_6H_{13}N$ Cyclohexylamine

L

(Other reference in Vol.2, p.6 and Vol.5, p.430)

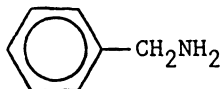
Metal ion	Equilibrium	Log K 25°, 0.1	Log K 37°, 0.15	Log K 25°, 0	ΔH 25°, 0.1	ΔS 25°, 0.1
H^+	HL/H.L	10.62	(9.93)	10.567	-14.26 -0.1	0.7
Ni^{2+}	ML/M.L	2.0	(5.9)			
Ag^{2+}	ML/M.L	3.72			-7.2	-7
	$ML_2/M.L^2$	8.02			-14.9	-13

Bibliography: H^+ , Ag^+ 80H, 83FR, 83HN; Ni^{2+} 80H $C_2H_4N_2$ Cyanomethylamine

L

Metal ion	Equilibrium	Log K 25°, 0.1	Log K 25°, 0.5
H^+	HL/H.L	5.15	5.17
Ag^+	ML/M.L	1.90	
	$ML_2/M.L^2$	3.21	
Hg^{2+}	ML/M.L		5.69
	$ML_2/M.L^2$		10.56

Bibliography: 83HN

 C_7H_9N Benzylamine

L

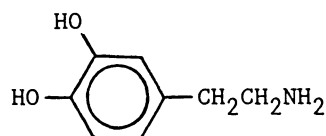
(Other references in Vol.2, p.7)

Metal ion	Equilibrium	Log K 25°, 0.1	Log K 25°, 1.0	Log K 25°, 0	ΔH 25°, 0	ΔS 25°, 0
H^+	HL/H.L	9.40 $\pm$ 0.08 9.44 ^b $\pm$ 0.04	9.49	9.35	-13.04 $\pm$ 0.06	-1.0

^b25°, 0.5

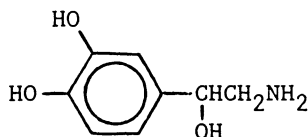
Benzylamine (continued)

Metal ion	Equilibrium	Log K 25°, 0.1	Log K 25°, 1.0	Log K 25°, 0	ΔH 25°, 0	ΔS 25°, 0
Ag ⁺	ML/M.L	3.02 (3.29) ^b	3.02 ^P			
	ML ₂ /M.L ²	7.04 (7.14) ^b	6.80 ^P			
Hg ²⁺	ML/M.L	7.51				
	ML ₂ /M.L ²	16.52				

^b25°, 0.5; ^P30°, 1.0Bibliography: H⁺ 82MT, 83HN, 84KM; Ag⁺, Hg²⁺ 83HN

C₈H₁₁O₂N 2-(3,4-Dihydroxyphenyl)ethylamine (dopamine) H₂L
 (Other references in Vol.2, p.332 and other values in Vol.5, p.134)

Metal ion	Equilibrium	Log K 25°, 0.1	Log K 25°, 0.5	Log K 20°, 0.37	ΔH 25°, 0.1	ΔS 25°, 0.1
H ⁺	HL/H.L	(13.1)	(13.3)	13.4 ^d	(-11) ^s	(23)
	H ₂ L/HL.H	10.36 ± 0.05	10.33	10.45 10.50 ^c	(-9) ^s	(17)
	H ₃ L/H ₂ L.H	8.88 ± 0.06	8.84	8.91 8.96 ^c	(-7) ^s	(17)
Co ²⁺	MHL/M.HL		5.98			
Ni ²⁺	MHL/M.HL	6.27	6.15	6.32		
	M(HL) ₂ /M.(HL) ²	9.46		9.95		
	MHL/ML.H	9.96				
	M(HL) ₂ /MHL ₂ .H	10.05				
	M(HL) ₂ /ML ₂ .H ²	20.86		19.89		
Cu ²⁺	MHL/M.HL	11.12	11.15	11.24		
	M(HL) ₂ /M.(HL) ²	19.6	19.9	20.2		
	MHL/ML.H	7.6		7.13		
	M(HL) ₂ /MHL ₂ .H	10.17	10.43			
	M(HL) ₂ /ML ₂ .H ²	20.79	20.88	20.49		

^c25°, 1.0; ^d25°, 2.0; ^s15-35°, 0.1Bibliography: H⁺ 71RD, 77BP; Co²⁺-Cu²⁺ 77BP; Other references: 74RD, 80VC, 83CL

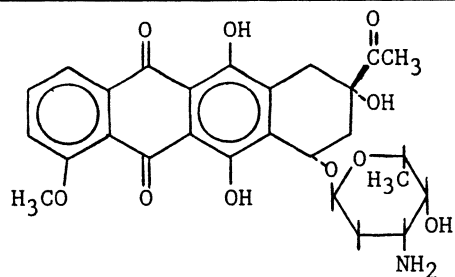
C₈H₁₁O₃N L-2-Amino-1-(3,4-dihydroxyphenyl)ethanol (noradrenaline) H₂L
 (Other references in Vol.2, p.332 and Vol.5, p.460)

Metal ion	Equilibrium	Log K 25°, 0.1	Log K 20°, 0.5	Log K 25°, 1.0
H ⁺	HL/H.L	(12.9)		
	H ₂ L/HL.H	9.62 ± 0.09	9.59	9.73
	H ₃ L/H ₂ L.H	8.61 ± 0.03	8.73	8.57

Noradrenaline (continued)

Metal ion	Equilibrium	Log K 25°, 0.1	Log K 20°, 0.5	Log K 25°, 1.0
Mn ²⁺	ML ₂ /M.L ²	12.07		
	MHL/M.HL	4.03		
	MHL/ML.H	9.49		
	MHL ₂ /ML ₂ .H	9.9		
Co ²⁺	MHL/M.HL	5.08		
	M(HL) ₂ /M.(HL) ²	8.21		
	MHL/ML.H	9.29		
	M(HL) ₂ /MHL ₂ .H	9.40		
	MHL ₂ /ML ₂ .H	9.85		
Ni ²⁺	ML ₂ /M.L ²	14.53		
	MHL/M.HL	5.36	5.32	
	M(HL) ₂ /M.(HL) ²		8.71	
	MHL/ML.H	9.19	9.3	
	M(HL) ₂ /ML ₂ .H ²		19.8	
Cu ²⁺	MHL/M.HL	10.20 ± 0.10	10.06	10.25
	M(HL) ₂ /M.(HL) ²	17.9 ± 0.3	17.9	
	MHL/ML.H	7.31 ± 0.3	7.38	(6.98)
	M(HL) ₂ /MHL ₂ .H	9.20 ± 0.1		
	M(HL) ₂ /ML ₂ .H ²	19.0	20.1	
	M ₂ L.H/M ² .HL	6.2		
Zn ²⁺	MHL/M.HL	6.22	6.09	
	M(HL) ₂ /M.(HL) ²	10.98		
	M(HL) ₂ /MHL ₂ .H	9.30		
	MHL ₂ /ML ₂ .H	9.66		
	ML ₂ /M(H ₋₁ L).H	11.14		
Cd ²⁺	MHL/M.HL		4.75	
Pb ²⁺	MHL/M.HL		8.91	

Bibliography: H⁺ 54L, 71RD, 74GS, 81GKD, 84DA; Mn²⁺, Co²⁺ 81GKD; Ni²⁺, Zn²⁺ 74GS, 81GKD; Cu²⁺ 74GS, 74RD, 81GKD, 84DA; Cd²⁺, Pb²⁺ 74GS

C₂₆H₂₉O₁₀N

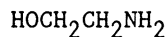
Daunorubicin

H₂L

Metal ion	Equilibrium	Log K 20°, 0.15
H ⁺	HL/H.L	(13.6)
	H ₂ L/HL.H	9.9
	H ₃ L/H ₂ L.H	8.49
Mg ²⁺	MHL/M.HL	3.7
Ca ²⁺	MHL/M.HL	3.3
Tb ³⁺	MHL/M.HL	7.2

Daunorubicin (continued)

Metal ion	Equilibrium	Log K 20°, 0.15
Th ⁴⁺	MHL/M.HL	10.3
Fe ³⁺	MHL/M.HL	11.0
Zn ²⁺	MHL/M.HL	4.5
Bibliography: 82KMa		

C₂H₇ON2-Aminoethanol (ethanolamine)

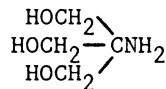
L

(Other values in Vol.2, p.15 and other references in Vol.5, p.460)

Metal ion	Equilibrium	Log K 25°, 0.1	Log K 25°, 0.5	Log K 25°, 0	ΔH 25°, 0	ΔS 25°, 0
H ⁺	HL/H.L	9.50 ±0.05	9.62 ±0.03	9.498 ±0.001 9.80 ^d	-12.06 ±0.02	3.1
Mn ²⁺	ML/M.L	0.81				
Co ²⁺	ML/M.L	2.20	2.23	2.43 ^d		
	ML ₂ /M.L ²	3.53	3.79	4.23 ^d		
Ni ²⁺	ML/M.L	3.02 ±0.04	3.09 ±0.03	3.32 ^d	-3.4 ^b	3 ^b
	ML ₂ /M.L ²	5.32 ±0.02	5.60 ±0.08	6.10 ^d	-7.3 ^b	1 ^b
	ML ₂ /M.L ³	7.2 ±0.1	7.5 -0.5	8.1 ^d	-9.9 ^b	0 ^b
Cu ²⁺	ML/M.L	4.50	4.60	4.90 ^d		
	ML ₂ /M.L ²	8.55	8.25	8.85 ^d		
	ML ₃ /M.L ³	11.9	10.50	10.70 ^d		
	ML ₄ /M.L ⁴		11.25	12.73 ^d		
Zn ²⁺	ML/M.L	2.41	2.50	2.70 ^d		
	ML ₂ /M.L ²		4.78	5.18 ^d		
Cd ²⁺	ML/M.L			2.65 ^d		
	ML ₂ /M.L ²			4.82 ^d		
	ML ₃ /M.L ³			6.22 ^d		
Pb ²⁺	ML/M.L	4.10				

^b25°, 0.4; ^d25°, 2.0Bibliography: H⁺ 80JH, 81H, 81NMK, 82BD;Mn²⁺, Pb²⁺ 81H; Co²⁺, Cu²⁺, Cd²⁺ 81H, 83DB; Ni²⁺ 81H, 82BD; Pb²⁺ 84HN;

Other references: 80AAa, 82SSb, 82SZ, 84KM

C₄H₁₁O₃N2-Amino-2-hydroxymethyl-1,3-propanediol

L

(tris(hydroxymethyl)aminomethane, THAM, TRIS)

(Other references in Vol.2, p.20 and Vol.5, p.135)

Metal ion	Equilibrium	Log K 25°, 0.1	Log K 25°, 1.0	Log K 25°, 0	ΔH 25°, 0	ΔS 25°, 0
H ⁺	HL/H.L	8.11 ±0.02 8.22 ^b ±0.02	8.32 ±0.01 8.198 ^q	8.073 ±0.004 8.65 ^e	-11.36 ±0.03 -11.46 ^q	-1.2 -0.9 ^q

^b25°, 0.5; ^e25°, 3.0; ^q25°, 0.67 synthetic seawater.

TRIS (continued)

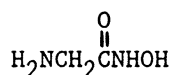
Metal ion	Equilibrium	Log K 25°, 0.1	Log K 25°, 1.0	Log K 25°, 0	ΔH 25°, 0	ΔS 25°, 0
Li ⁺	ML/M.L		-0.23			
Na ⁺	ML/M.L		-0.72			
Mg ²⁺	ML/M.L		0.30			
Ca ²⁺	ML/M.L		0.25			
Sr ²⁺	ML/M.L		0.11			
Ba ²⁺	ML/M.L		0.02			
Co ²⁺	ML/M.L	1.73				
Ni ²⁺	ML/M.L	2.63 ±0.1	2.67	3.20 ^e		
	ML ₂ /M.L ²	4.6 ±0.1		5.7 ^e		
Cu ²⁺	ML/M.L	4.05 ±0.1	4.2			
	ML ₂ /M.L ²	7.6				
	ML ₃ /M.L ³	11.1 -0.1				
	ML ₄ /M.L ⁴	14.1				
Ag ⁺	ML/M.L	3.14 ^a	3.05	3.41 ^e	(-7) ^s	(-9) ^a
	ML ₂ /M.L ²	6.57 ^a	6.53	7.20 ^e	(-15) ^s	(-20) ^a
	ML/MOHL.H			9.81 ^e		
Zn ²⁺	ML/M.L	2.27				
Cd ²⁺	ML/M.L		1.88			

^a25°, 0.05; ^e25°, 3.0; ^s0-60°, 0.05

Bibliography: H⁺ 56B, 72SI, 75BMA, 79FH, 81VSB, 82GFS, 82SSP, 83BSV, 83FR, 84EA, 84GD;

Li⁺-Ba²⁺ 82SSP; Co²⁺, Cd²⁺ 79FH; Ni²⁺-Zn²⁺ 79FH, 83BSV; Ag⁺ 82GFS;

Other references: 56PM, 67RL, 77KR, 82RM

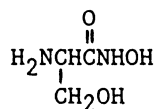


C₂H₆O₂N₂ Aminoacetohydroxamic acid (glycinehydroxamic acid) HL
(Other references in Vol.2, p.347)

Metal ion	Equilibrium	Log K 25°, 0.1
H ⁺	HL/H.L	9.12 -0.06
	H ₂ L/HL.H	7.37 +0.03
Ni ²⁺	ML/M.L	6.48
	ML ₂ /M.L ²	12.86
Cu ²⁺	ML/M.L	10.83
	ML ₂ /M.L ²	19.89
	ML ₂ /MOHL ₂ .H	9.94
	M ₂ OHL ₂ /MOHL ₂ .M	(10.96)

Bibliography: H⁺ 80BC, 84PC; Ni²⁺ 83BR; Cu²⁺ 84PC;

Other references: 82BRP, 84BKP, 85EHa

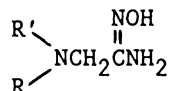
 $\text{C}_3\text{H}_8\text{O}_3\text{N}_2$

1-Amino-2-hydroxypropanohydroxamic acid
(serinehydroxamic acid)

HL

Metal ion	Equilibrium	Log K 25°, 0.15
H^+	HL/H.L	8.83
	$\text{H}_2\text{L}/\text{HL.H}$	6.67
Ni^{2+}	ML/M.L	7.08
	$\text{ML}_2/\text{M.L}_2$	13.39

Bibliography: 83BR

 $\text{C}_x\text{H}_y\text{ON}_3$ N,N-Dialkyl-2-aminoacetamidoxime

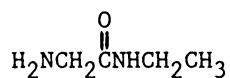
L

Ligand	Metal ion	Equilibrium	Log K 25°, 1.0
R= R'= H 2-Amino- acetamidoxime	H^+	$\text{L}/(\text{H}_{-1}\text{L}).\text{H}$	12.5
		HL/H.L	7.94
		$\text{H}_2\text{L}/\text{HL.H}$	2.47
(C ₂ H ₇ ON ₃)	Ni^{2+}	ML/M.L	5.72
		$\text{ML}_2/\text{M.L}^2$	10.84
		$\text{ML}_3/\text{M.L}^3$	14.74
		$\text{M}_2(\text{H}_{-1}\text{L}).\text{H}/\text{M}^2.\text{L}$	4.27

R= CH ₃ , R'= H N-Methyl-	H^+	$\text{L}/(\text{H}_{-1}\text{L}).\text{H}$	12.4
		HL/H.L	8.26
		$\text{H}_2\text{L}/\text{HL.H}$	2.11
(C ₃ H ₉ ON ₃)	Ni^{2+}	ML/M.L	5.25
		$\text{ML}_2/\text{M.L}^2$	9.51
		$\text{ML}_3/\text{M.L}^3$	11.88
		$\text{M}_2(\text{H}_{-1}\text{L}).\text{H}/\text{M}^2.\text{L}$	2.41

R= R'= CH ₃ N,N-Dimethyl-	H^+	$\text{L}/(\text{H}_{-1}\text{L}).\text{H}$	12.3
		HL/H.L	7.61
		$\text{H}_2\text{L}/\text{HL.H}$	(1.8)
(C ₄ H ₁₁ ON ₃)	Ni^{2+}	ML/M.L	3.98
		$\text{ML}_2/\text{M.L}^2$	5.52
		$\text{M}(\text{H}_{-1}\text{L}).\text{H}/\text{M.L}^2$	-3.24
		$\text{M}_4(\text{OH})_2(\text{H}_{-1}\text{L})_4.\text{H}^6/\text{M}^4.\text{L}^4$	(-26.77)

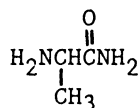
Bibliography: 83SO

 $\text{C}_4\text{H}_{10}\text{ON}_2$ Glycine ethylamide

L

Metal		Log K
<u>ion</u>	<u>Equilibrium</u>	<u>25°, 0.5</u>
H^+	HL/H.L	8.19
Cu^{2+}	ML/M.L	5.50
	$\text{ML}_2/\text{M.L}^2$	9.86
	$\text{ML}/\text{M}(\text{H}_{-1}\text{L})\cdot\text{H}$	7.4
	$\text{ML}/\text{MOH}(\text{H}_{-1}\text{L})\cdot\text{H}^2$	16.50
	$\text{ML}_2/\text{M}(\text{H}_{-1}\text{L})\text{L}\cdot\text{H}$	8.09
	$\text{M}(\text{H}_{-1}\text{L})\text{L}/\text{M}(\text{H}_{-1}\text{L})_2\cdot\text{H}$	10.23

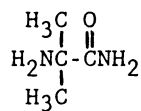
Bibliography: 82BZ

 $\text{C}_3\text{H}_8\text{ON}_2$ L-Alaninamide

L

Metal		Log K
<u>ion</u>	<u>Equilibrium</u>	<u>25°, 0.5</u>
H^+	HL/H.L	8.03
Cu^{2+}	ML/M.L	5.07
	$\text{ML}_2/\text{M.L}^2$	8.99
	$\text{ML}/\text{M}(\text{H}_{-1}\text{L})\cdot\text{H}$	7.07
	$\text{ML}_2/\text{M}(\text{H}_{-1}\text{L})\text{L}\cdot\text{H}$	6.82
	$\text{M}(\text{H}_{-1}\text{L})\text{L}/\text{M}(\text{H}_{-1}\text{L})_2\cdot\text{H}$	8.01

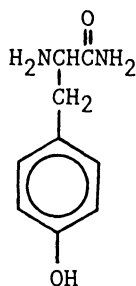
Bibliography: 82GSZ

 $\text{C}_4\text{H}_{10}\text{ON}_2$ 2-Methylalaninamide

L

Metal		Log K
<u>ion</u>	<u>Equilibrium</u>	<u>25°, 0.1</u>
H^+	HL/H.L	8.06
Cu^{2+}	ML/M.L	4.58
	$\text{ML}_2/\text{M.L}^2$	9.28
	$\text{ML}/\text{M}(\text{H}_{-1}\text{L})\cdot\text{H}$	6.29
	$\text{ML}_2/\text{M}(\text{H}_{-1}\text{L})\text{L}\cdot\text{H}$	6.99
	$\text{M}(\text{H}_{-1}\text{L})\text{L}/\text{M}(\text{H}_{-1}\text{L})_2\cdot\text{H}$	7.08

Bibliography: 83HNa

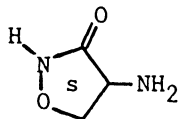
 $C_9H_{12}O_2N_2$

L-Tyrosinamide
(Other reference in Vol.2, p.332)

HL

Metal ion	Equilibrium	Log K <u>25°, 0.1</u>
H^+	HL/H.L	9.82 $\pm$ 0.05
	H_2L /HL.H	7.42 $\pm$ 0.06
Cu^{2+}	MHL/M.HL	4.52
	$M(HL)_2$ /M.(HL) 2	7.81
	MHL/M($H_{-1}L$).H	6.29
	M($H_{-1}L$)/M($H_{-1}L$).H	7.11
	M($H_{-1}L$)/MOH($H_{-1}L$).H	9.98
	$M(HL)_2$ /MHL $_2$.H	7.29
	$M_2OH(H_{-1}L)_2$ /M($H_{-1}L$).MOH($H_{-1}L$)	2.58

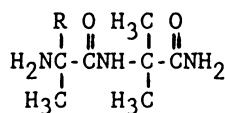
Bibliography: 81HP; Other reference: 83IS

 $C_3H_6O_2N_2$ D-4-Amino-1,2-oxazolidin-3-one (D-cycloserine)

HL

Metal ion	Equilibrium	Log K <u>25°, 0.1</u>	Log K <u>25°, 0.5</u>	ΔH <u>25°, 0.1</u>	ΔS <u>25°, 0.1</u>
H^+	HL/H.L	7.35	7.53	-7.7	8
	H_2L /HL.H	4.39	4.54	-3.5	8
Co^{2+}	ML/M.L	3.4			
	ML_2 /M.L 2	5.9			
	MHL/M.HL	1.94	1.95		
Ni^{2+}	ML/M.L	4.02			
	ML_2 /M.L 2	7.23			
	MHL/M.HL	2.06	(1.84)		
Cu^{2+}	ML/M.L	6.29			
	ML_2 /M.L 2	10.53			
	MHL/M.HL	3.07	2.87		
Zn^{2+}	ML/M.L	3.43			
	ML_2 /M.L 2	6.09			
	MHL/M.HL	1.9	(1.00)		
Cd^{2+}	MHL/M.HL		1.54		

Bibliography: 81BDM, 83GW

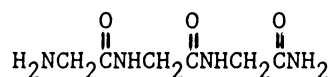
 $\text{C}_x\text{H}_y\text{O}_2\text{N}_3$ 2-Alkylalanyl-2-methylalaninamide

L

<u>Ligand</u>	<u>Metal ion</u>	<u>Equilibrium</u>	<u>Log K</u> <u>25°, 0.1</u>
R= H	H^+	HL/H.L	7.93
DL-Alanyl-	Cu^{2+}	ML/M.L	4.42
		ML/M(H ₋₁ L).H	4.45
(C ₇ H ₁₅ O ₂ N ₃)		M(H ₋₁ L)/M(H ₋₂ L).H	7.31
		M(H ₋₂ L)/MOH(H ₋₂ L).H	9.43

R= CH ₃	H^+	HL/H.L	7.93
2-Methylalanyl-	Cu^{2+}	ML/M.L	4.67
		ML/(H ₋₁ L).H	4.39
(C ₈ H ₁₇ O ₂ N ₃)		M(H ₋₁ L)/M(H ₋₂ L).H	7.91
		M(H ₋₂ L)/MOH(H ₋₂ L).H	9.97

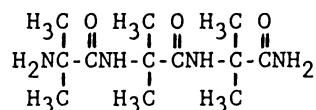
Bibliography: 83HNa

 $\text{C}_6\text{H}_{12}\text{O}_3\text{N}_4$ Glycylglycylglycinamide
(Other values in Vol.5, p.137)

L

<u>Metal ion</u>	<u>Equilibrium</u>	<u>Log K</u> <u>25°, 0.1</u>	<u>Log K</u> <u>25°, 2.0</u>
Ni ²⁺	M(H ₋₃ LH)/M(H ₋₃ L).H	2.4	2.6

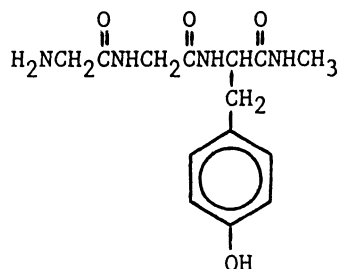
Bibliography: 72PM, 80RMb

 $\text{C}_{12}\text{H}_{24}\text{O}_3\text{N}_4$ 2-Methylalanyl-2-methylalanyl-2-methylalaninamide

L

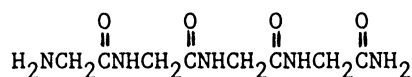
<u>Metal ion</u>	<u>Equilibrium</u>	<u>Log K</u> <u>25°, 0.1</u>
H^+	HL/H.L	7.6
Cu^{2+}	ML/M.L	4.42
	ML/M(H ₋₁ L).H	4.71
	M(H ₋₁)/M(H ₋₂ L).H	7.34
	M(H ₋₂ L)/M(H ₋₃ L).H	7.97

Bibliography: 83HNa

 $C_{14}H_{20}O_4N_4$ Glycylglycyl-L-tyrosine methylamide

HL

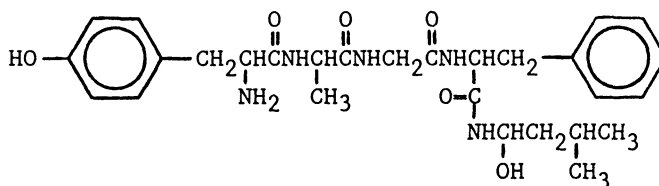
Metal		Log K
<u>ion</u>	<u>Equilibrium</u>	<u>25°, 0.15</u>
H^+	HL/H.L	9.85
	$H_2L/HL.H$	7.94
Ni^{2+}	MHL/M.HL	3.43
	$MHL/M(H_{-3}L).H^4$	33.97
	$M(H_{-2}L)HL.H/M.L^2$	2.00
	$M(H_{-2}L)HL/M(H_{-2}L)L.H$	9.85
Cu^{2+}	MHL/M.HL	4.76
	$MHL/M(H_{-1}LH).H$	5.17
	$M(H_{-1}LH)/M(H_{-2}LH).H$	7.34
	$M(H_{-2}LH)/M(H_{-2}L).H$	8.61
	$M(H_{-2}L)/MOH(H_{-2}L).H$	10.25
	$M(H_{-1}L)_2/M(H_{-2}L).L$	3.49

Bibliography: H^+, Ni^{2+} 82GSa; Cu^{2+} 84MDS $C_8H_{15}O_4N_5$ Glycylglycylglycylglycinamide
(Other values in Vol.5, p.137)

L

Metal		Log K
<u>ion</u>	<u>Equilibrium</u>	<u>25°, 1.0</u>
Ni^{2+}	$M(H_{-3}LH)/M(H_{-3}L).H$	2.4
	$M(H_{-3}LH_2)/M(H_{-3}LH).H$	1.3

Bibliography: 80RMb

 $C_{28}H_{39}O_5N_5$ L-Tyrosyl-D-alanylglycyl-L-phenylalanine 1-hydroxy-3-methylbutylamide

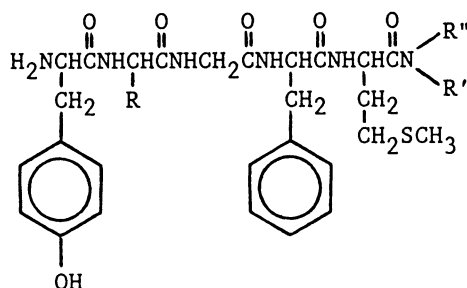
HL

Metal		Log K
<u>ion</u>	<u>Equilibrium</u>	<u>25°, 0.1</u>
H^+	HL/H.L	9.89
	$H_2L/HL.H$	6.83

L-Tyrosyl-D-alanylglycyl-L-phenylalanine 1-hydroxy-3-methylbutylamide (continued)

<u>Metal ion</u>	<u>Equilibrium</u>	<u>Log K</u> <u>25°, 0.1</u>
Cu ²⁺	MHL/M.HL	4.80
	MHL/M(H ₋₁ LH).H	5.24
	M(H ₋₁ LH)/M(H ₋₂ LH).H	8.50
	M(H ₋₂ LH)/M(H ₋₃ LH).H	9.63
	M(H ₋₃ LH)/M(H ₋₃ L).H	9.85

Bibliography: 85FP

C_xH_yO₆N_zS L-Tyrosyl-alkylglycylglycyl-L-phenylalanyl-L-methionine substituted-amide HL

<u>Ligand</u>	<u>Metal ion</u>	<u>Equilibrium</u>	<u>Log K</u> <u>25°, 0.1</u>
R= R'= H	H ⁺	HL/H.L	9.78
R''= CH ₃ , n= 1		H ₂ L/HL.H	7.01
-glycylglycyl-L-phenylalanyl-L-methionine methylamide (C ₂₈ H ₃₇ O ₆ N ₆ S)	Cu ²⁺	MHL/M.HL	3.4
		MHL/M(H ₋₁ LH).H	4.94
		M(H ₋₁ LH)/M(H ₋₂ LH).H	7.72
		M(H ₋₂ LH)/M(H ₋₃ LH).H	9.02
		M(H ₋₃ LH)/M(H ₋₃ L).H	9.61

R= R'= R''= CH ₃	H ⁺	HL/H.L	9.80
n= 1		H ₂ L/HL.H	6.97
-D-alanylglycyl-L-phenylalanyl-L-methionine dimethylamide (C ₂₉ H ₃₉ O ₆ N ₆ S)	Cu ²⁺	MHL/M.HL	3.53
		MHL/M(H ₋₁ LH).H	5.11
		M(H ₋₁ LH)/M(H ₋₂ LH).H	8.07
		M(H ₋₂ LH)/M(H ₋₃ LH).H	9.86
		M(H ₋₃ LH)/M(H ₋₃ L).H	(9.99)

R= CH ₃ , R'= H	H ⁺	HL/H.L	9.93
R''= CH ₂ CH ₂ NH ₂		H ₂ L/HL.H	9.35
n= 1		H ₃ L/H ₂ L.H	7.65
-D-alanylglycyl-L-phenylalanyl-L-methionine 2-aminoethylamide (C ₂₉ H ₄₀ O ₆ N ₇ S)	Cu ²⁺	MHL/M.HL	8.8
		MHL/M(H ₋₁ LH).H	6.02
		M(H ₋₁ LH)/M(H ₋₂ LH).H	6.87
		M(H ₋₂ LH)/M(H ₋₃ LH).H	8.74
		M(H ₋₃ LH)/M(H ₋₃ L).H	9.73

Bibliography: 85FP

		HSCH ₂ CH ₂ NH ₂				
C ₂ H ₇ NS		2-Aminoethanethiol (2-mercaptoethylamine)			HL	
Metal ion	Equilibrium	Log K 25°, 0.1	Log K 25°, 1.0	Log K 25°, 0	ΔH 25°, 0.01 (-9) ^s	ΔS 25°, 0.1 (19)
H ⁺	HL/H.L	10.73 ±0.05 10.81 ⁱ	10.69 ^p			
	H ₂ L/HL.H	8.25 ±0.06 8.39 ⁱ	8.28 ^p	8.23	-7.4	13
Cd ²⁺	ML/M.L	10.97				
	ML ₂ /M.L ²	17.10 +3				
	M(HL) ₂ /M.(HL) ²	10.73				
	M(HL) ₃ /M.(HL) ³	15.48				
	M(HL) ₄ /M.(HL) ⁴	18.90				
	M(HL) ₃ (HL) ₂ L.H	8.03				
	M ₃ L ₄ /M ³ .L ⁴	48.1				
	M ₃ (HL) ₂ L ₂ /M ₃ L ₄ .H ²	11.65				

ⁱ20°, 0.5; ^p30°, 1.0; ^s25-45°, 0.1
Bibliography: H⁺ 83BV, 84AB; Cd²⁺ 84AB; Other references: 66SP, 77MO

		H ₂ NCH ₂ CH ₂ NH ₂				
C ₂ H ₈ N ₂		Ethylenediamine (en)				L
		(Other values in Vol.2, p.36 and Vol.5, p.142)				
Metal ion	Equilibrium	Log K 25°, 0.1	Log K 25°, 1.0	Log K 25°, 0	ΔH 25°, 0.1	ΔS 25°, 0.1
H ⁺	HL/H.L	9.89 ±0.07	10.20 ±0.04	9.928 ±0.00	-11.9 ±0.1	5
		10.03 ^b ±0.06	10.53 ^d	10.77 ^e ±0.03	-12.2 ^b ±0.1	5 ^b
	H ₂ L/HL.H		9.59 ⁿ ±0.0		-12.2 ^c ±0.0	6 ^c
		7.08 ±0.04	7.45 ±0.04	6.848 -0.01	-10.9 ±0.1	-4
Cr ²⁺	ML/M.L	7.31 ^b ±0.01	7.71 ^d ±0.03	7.95 ^e ±0.03	-10.7 ^b ±0.3	-2 ^b
			6.82 ⁿ ±0.0	8.21 ^f	-10.5 ^c ±0.2	-1 ^c
	ML ₂ /M.L ²		5.48 -0.3			
				9.63 -0.4		
Ni ²⁺	ML/M.L	7.31 ±0.08	7.56 ±0.05	7.32 +0.08	-9.0 ^c ±0.1	4 ^c
		7.41 ^b ±0.06		7.87 ^e		
	ML ₂ /M.L ²	13.4 ±0.1	14.0 ±0.1	13.5 +0.1	-18.3 ^c ±0.1	3 ^c
		13.7 ^b ±0.1		14.5 ^e		
Cu ²⁺	ML ₃ /M.L ³	17.5 ±0.2	18.4 ±0.2	17.6 +0.3	-28.0 ^c ±0.1	-10 ^c
		18.0 ^b ±0.1		19.2 ^e		
	ML/M.L	10.50 ±0.06	10.74 ±0.02	10.50 ±0.02	-12.6 ^b	6 ^b
		10.62 ^b ±0.1	11.05 ^d ±0.03	11.38 ^e	-13.1 ^c ±0.2	5 ^c
Zn ²⁺	ML ₂ /M.L ²		10.14 ⁿ			
		19.6 ±0.2	20.2 ±0.2	19.6 ±0.1	-25.2 ^b	6 ^b
	ML/M.L	19.9 ^b +0.2	20.6 ^d -0.1	21.3 ^e	-25.5 ^c ±0.2	7 ^c
			18.8 ⁿ			
	ML ₂ /M.L ²	5.7 ±0.1	5.8 ±0.1	5.66	-7.0 ^c	3 ^c
		5.75 ^b	6.15 ^d	6.49 ^e		
	ML ₃ /M.L ³	10.6 ±0.1	11.0 ±0.1	10.6	-11.5	10
		10.8 ^b ±0.0	11.5 ^d	12.4 ^e	-11.9 ^c	10 ^c
		12.6 ±0.6	12.8 ±0.1	(13.9)	-17.1 ^c	1 ^c
		(13.0) ^b		14.9 ^e		

^b25°, 0.5; ^c25°, 1.0; ^d25°, 2.0; ^e25°, 3.0; ^f25°, 4.0; ⁿ37°, 0.15

Ethylenediamine (continued)

Metal ion	Equilibrium	Log K 25°, 0.1	Log K 25°, 1.0	Log K 25°, 0	ΔH 25°, 0.1	ΔS 25°, 0.1
Cd ²⁺	ML/M.L	5.4 ±0.1	5.60 ±0.09 5.84 ^d	5.41 6.21 ^e	(-6) ^r	(5)
	ML ₂ /M.L ²	9.6 ±0.2	10.2 ±0.0 10.6 ^d	9.9 11.6 ^e	(-13.3) [*]	(-1)
	ML ₃ /M.L ³	11.6 ±0.1	12.3 ±0.0 12.7 ^d	14.4 ^e	(-19.7) [*]	(-13)
Hg ²⁺	ML/M.L	14.3	14.34			
	ML ₂ /M.L ²	23.24 ±0.07	23.44		(-33) ^s	(-5)
	ML/MOHL.H	4.3				
	MHL ₂ /ML ₂ .H	5.2				
	MH ₂ L ₂ /MHL ₂ .H	4.2				
	MH ₂ L ₃ /MHL ₂ .HL	3.6				
Pb ²⁺	ML/M.L	5.04				

^b25°,0.5; ^c25°,1.0; ^d25°,2.0; ^e25°,3.0; ^r10-40°,0; ^s10-40°,0.1; *not corrected for Cl⁻

Bibliography: H⁺ 55M,78AB,80Aa,80VKK,82HA,83IO,83WB,84ND,84PR,85ROC,85SSa;

Cr²⁺ 83MDN;

Zn²⁺ 54DS,67KW,85W;

Ni²⁺ 83IOO,84PR;

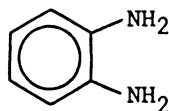
Cd²⁺ 67KW,83WB;

Cu²⁺ 80Aa,80LZ,80NW,82HA,84IO,84ND;

Pb²⁺ 85MMN;

Ag⁺,Hg²⁺ 64BL;

Other references: 61KEa,61M,62M,68YM,69VS,70F,71FD,71RMS,80BMK,80SP,81KKc,81RC,82GV,82HNS,82KJ,82MEA,82RB,82SPR,83AP,83GJ,83GV,83RV,84Gva,84LSS,84MR,84Pa,84VSL,84ZX,85NS



C₆H₈N₂

1,2-Diaminobenzene

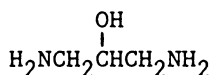
L

(Other references in Vol.2, p.49 and Vol.5, p.145)

Metal ion	Equilibrium	Log K 25°, 0.1	ΔH 25°, 0.1	ΔS 25°, 0.1
H ⁺	HL/H.L	4.63 ±0.00	(-6) ^s	(1)
Cu ²⁺	ML/M.L	4.50 ±0.05		
	ML ₂ /M.L ²	7.82 ±0.10		

^s20-32°,0.1

Bibliography: 80ACC; Other reference: 80AM



C₃H₁₀ON₂

1,3-Diamino-2-propanol (2-hydroxytrimethylenediamine)

L

(Other values in Vol.2, p.57)

Metal ion	Equilibrium	Log K 25°, 0.1	Log K 25°, 1.0	Log K 25°, 0	ΔH 25°, 0	ΔS 25°, 0
H ⁺	HL/H.L	9.58	9.83 ±0.02	9.55 ±0.00	(-13) ^r	(0)
		9.68 ^b	10.08 ^d	10.40 ^e		
	H ₂ L/HL.H	7.98	8.37 ±0.02	7.78 ±0.03	(-11) ^r	(-1)
		8.19 ^b	8.62 ^d	8.89 ^e		

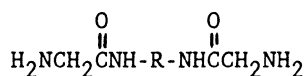
^b25°,0.5; ^d25°,2.0; ^e25°,3.0; ^r10-40°,0

2-hydroxytrimethylenediamine (continued)

Metal ion	Equilibrium	Log K 25°, 0.1	Log K 25°, 1.0	Log K 25°, 0	ΔH 25°, 0	ΔS 25°, 0
Ni ²⁺	ML/M.L	5.57 ±0.02	5.72	5.49 6.34 ^e	(-6) ^r	(5)
	ML ₂ /M.L ²	9.90 -0.1	10.1	9.72 11.52 ^e	(-11) ^r	(8)
Cu ²⁺	ML ₂ /M(H ₋₁ L)L.H	10.05				
	M(H ₋₁ L)L/M(H ₋₁ L) ₂ .H	11.00				
	ML/M.L			9.54 ^e		
	ML ₂ /M.L ²	15.72				
	ML ₂ /M(H ₋₁ L)L.H	9.78				
	M(H ₋₁ L)L/M(H ₋₁ L) ₂ .H	8.8				
	M(H ₋₁ L).H/M.L	3.75		3.61	(-5) ^r	(0)
	M(H ₋₁ L)/MOH(H ₋₁ L).H	10.3				
	M ₂ (H ₋₁ L) ₂ .H ² /M ² .L ²	10.48 10.92 ^b	11.37 12.12 ^d	10.30 12.89 ^e		

^b25°, 0.5; ^d25°, 2.0; ^e25°, 3.0; ^r10-40°, 0

Bibliography: H⁺, Ni²⁺ 81LT; Cu²⁺ 78LKd, 81LT

C_xH_yO₂N₄

N,N'-Diglycylalkylenediamine
(Other values in Vol.2, p.60,61)

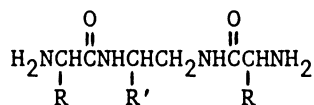
L

Ligand	Metal ion	Equilibrium	Log K 25°, 0.1	Log K 25°, 0.5	Log K 25°, 1.0
R= -CH ₂ CH ₂ -	H ⁺	HL/H.L	8.22 +0.01	8.33 +0.03	8.39 -0.04
		H ₂ L/HL.H	7.48 ±0.00	7.67 -0.01	7.71 -0.08
N,N'-Diglycyl- ethylenediamine (DGEN)	Ni ²⁺	ML/M.L	5.04 +0.3	5.32	5.65 -0.2
		ML ₂ /M.L ²	(8.50)		8.71
		ML/M(H ₋₂ L).H ²	16.05 ±0.01	16.16	16.50
(C ₆ H ₁₄ O ₂ N ₄)	Cu ²⁺	ML/M.L	7.50	7.7 +0.6	8.13
		MHL/M.HL		5.13 +0.1	
		M(HL) ₂ /M.(HL) ₂		9.28	
		M(H ₋₂ L).H ² /M.L	-6.3	-6.37 +0.2	-6.88
		M ₂ L ₂ /M ² .L ²		18.84	
		M ₂ (H ₋₁ L) ₂ .H ² /M ² .L ²	5.2	6.05	
R= -CH ₂ CH ₂ CH ₂ - N,N'-Diglycyl- trimethylene- diamine	H ⁺	HL/H.L		8.42 -0.04	
		H ₂ L/HL.H		7.75 -0.06	
	Cu ²⁺	ML/M.L		7.8 +0.4	
		MHL/M.HL		5.36 -0.03	
(C ₇ H ₁₆ O ₂ N ₄)		M(HL) ₂ /M.(HL) ₂		9.66	
		M(H ₋₂ L).H ² /M.L		-13.13 +0.3	
		M ₂ L ₂ /M ² .L ²		19.3	

Bibliography:

H⁺ 82BZ, 84MDO, 85SM;
Co²⁺ 85SM;

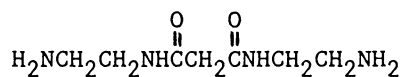
Ni²⁺ 84MDO;
Cu²⁺ 82BZ

 $\text{C}_x\text{H}_y\text{O}_2\text{N}_4$

N,N'-Bis(alkylglycyl)alkylethylenediamine
(Other values in Vol.5, p.148,149,150)

L

<u>Ligand</u>	<u>Metal ion</u>	<u>Equilibrium</u>	<u>Log K</u> <u>25°, 0.5</u>
R= H, R' = CH ₃	H ⁺	HL/H.L	8.22 ±0.01
D-N,N'-Diglycyl-		H ₂ L/HL.H	7.44 ±0.06
1,2-propylene-	Ni ²⁺	ML/M.L	5.46
diamine		ML ₂ /M.L ²	9.77
(C ₇ H ₁₆ O ₂ N ₄)		ML/(H ₂ L).H ²	15.64
R= CH ₃ , R' = H	H ⁺	HL/H.L	8.34 ±0.04
N,N'-Di-L-alanyl-		H ₂ L/HL.H	7.30 ±0.04
ethylenediamine	Ni ²⁺	ML/M.L	4.52
(C ₈ H ₁₈ O ₂ N ₄)		ML/M(H ₂ L).H ²	15.02
R= R' = CH ₃	H ⁺	HL/H.L	8.32 -0.06
N,N'-Di-L-alanyl-		H ₂ L/HL.H	7.38 ±0.00
D-1,2-propylene-	Ni ²⁺	ML/M.L	4.64
diamine		ML/M(H ₂ L).H ²	14.76
(C ₉ H ₂₀ O ₂ N ₄)			
R= R' = CH ₃	H ⁺	HL/H.L	8.31 ±0.04
N,N'-Di-L-alanyl-		H ₂ L/HL.H	7.37 -0.1
L-1,2-propylene-	Ni ²⁺	ML/M.L	4.66
diamine		ML/M(H ₂ L).H ²	15.04
(C ₉ H ₂₀ O ₂ N ₄)			
Bibliography: 84MDO			

 $\text{C}_7\text{H}_{16}\text{O}_2\text{N}_4$

5,7-Dioxo-1,4,8,11-tetraazaundecane

L

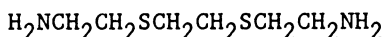
Metal ion	Equilibrium	Log K 25°, 0.2	Log K 35°, 0.2
H ⁺	HL/H.L	8.96	
	H ₂ L/HL.H	8.70	
Ni ²⁺	M(H ₂ L).H ² /M.L		-12.00
Cu ²⁺	M(H ₂ L).H ² /M.L	-5.1	

Bibliography: H⁺, Cu²⁺ 79KK; Ni²⁺ 81KK

		$\text{H}_2\text{N}(\text{CH}_2)_n\text{S}(\text{CH}_2)_m\text{NH}_2$				
$\text{C}_x\text{H}_y\text{N}_2\text{S}$		<u>Thia-α,ω-diazalkane</u>		L		
<u>Ligand</u>	<u>Metal ion</u>	<u>Equilibrium</u>	<u>Log K</u> <u>25°, 0.5</u>	<u>Log K</u> <u>25°, 1.0</u>	<u>ΔH</u> <u>25°, 0.5</u>	<u>ΔS</u> <u>25°, 0.5</u>
n= m= 2	H^+	HL/H.L	9.68	9.67	-12.93	0.9
		$\text{H}_2\text{L}/\text{HL.H}$	8.82	8.86	-12.7	-2
4-Thia-1,7-diazaheptane	Ag^+	$\text{MH}_2\text{L}/\text{M.H}_2\text{L}$	1.52		-5.3	-11
		$\text{M}(\text{H}_2\text{L})_2/\text{M}(\text{H}_2\text{L})^2$	2.3		-9.3	-21
(thiobis-(2-ethylamine))		$\text{MHL}/\text{ML.H}$	6.4			
		$\text{ML}_2/\text{M.L}^2$	9.80		-18.7	-18
(Other values in Vol.2, p.65 and Vol.5, p.150)		$\text{MHL}_2/\text{ML}_2.\text{H}$	9.25			
		$\text{M}(\text{HL})_2/\text{MHL}_2.\text{H}$	8.61			
		$\text{MH}_3\text{L}_2/\text{M}(\text{HL})_2.\text{H}$	5.7			
		$\text{M}_2\text{L}/\text{M}^2.\text{L}$	9.60			
		$\text{M}_2(\text{HL})_2/\text{M}(\text{HL})_2.\text{M}$	2.5			
		$\text{M}_2\text{HL}_2/\text{MHL}_2.\text{M}$	5.39			
		$\text{M}_2\text{L}_2/\text{ML}_2.\text{M}$	7.41		-15.7	-19
n= 2, m= 3	H^+	HL/H.L	10.14		-13.38	1.5
		$\text{H}_2\text{L}/\text{HL.H}$	9.16		-13.1	-2
4-Thia-1,8-diazaoctane	Ag^+	$\text{MH}_2\text{L}/\text{M.H}_2\text{L}$	2.30		-6.7	-12
		$\text{M}(\text{H}_2\text{L})_2/\text{M}(\text{H}_2\text{L})^2$	3.17		-13.4	-31
		$\text{MH}_2\text{L}/\text{MHL.H}$	6.94			
(Other values in Vol.5, p.150)		$\text{ML}_2/\text{M.L}^2$	9.83		-19.0	-19
		$\text{MHL}_2/\text{ML}_2.\text{H}$	9.81			
		$\text{M}(\text{HL})_2/\text{MHL}_2.\text{H}$	9.36			
		$\text{MH}_3\text{L}_2/\text{M}(\text{HL})_2.\text{H}$	7.4			
		$\text{M}_2\text{L}/\text{M}^2.\text{L}$	10.0			
		$\text{M}_2(\text{HL})_2/\text{M}(\text{HL})_2.\text{M}$	3.38			
		$\text{M}_2\text{HL}_2/\text{MHL}_2.\text{M}$	5.37			
		$\text{M}_2\text{L}_2/\text{ML}_2.\text{M}$	6.92		-14.3	-16
n= 2, m= 4	H^+	HL/H.L	10.44		-13.6	2
		$\text{H}_2\text{L}/\text{HL.H}$	9.25		-13.2	-2
4-Thia-1,9-diazanonane	Ag^+	$\text{MH}_2\text{L}/\text{M.H}_2\text{L}$	2.62		-7.2	-12
		$\text{M}(\text{H}_2\text{L})_2/\text{M}(\text{H}_2\text{L})^2$	3.70		-14.6	-32
		$\text{MH}_2\text{L}/\text{MHL.H}$	7.05			
(Other values in Vol.5, p.151)		$\text{ML}_2/\text{M.L}^2$	9.86		-19.1	-19
		$\text{MHL}_2/\text{ML}_2.\text{H}$	10.44			
		$\text{M}(\text{HL})_2/\text{MHL}_2.\text{H}$	9.66			
		$\text{MH}_3\text{L}_2/\text{M}(\text{HL})_2.\text{H}$	7.48			
		$\text{M}_2\text{L}/\text{M}^2.\text{L}$	10.26			
		$\text{M}_2(\text{HL})_2/\text{M}(\text{HL})_2.\text{M}$	3.4			
		$\text{M}_2\text{HL}_2/\text{MHL}_2.\text{M}$	5.91			
		$\text{M}_2\text{L}_2/\text{ML}_2.\text{M}$	7.34		-14.4	-15

Thia- α,ω -diazalkane (continued)

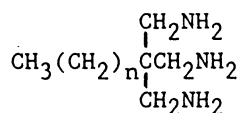
<u>Ligand</u>	<u>Metal ion</u>	<u>Equilibrium</u>	<u>Log K</u> <u>25°, 0.5</u>	<u>Log K</u> <u>25°, 1.0</u>	<u>ΔH</u> <u>25°, 0.5</u>	<u>ΔS</u> <u>25°, 0.5</u>
n= m= 3 5-Thia-1,9- diazanonane (Other values in Vol.5, p.151) (C ₆ H ₁₆ N ₂ S)	H ⁺	HL/H.L H ₂ L/HL.H	10.37 9.63		-13.50 -13.4	2.1 -1
	Ag ⁺	MH ₂ L/M.H ₂ L M(H ₂ L) ₂ /M.(H ₂ L) ₂	3.04 4.48		-7.6 -15.5	-12 -32
n= 3, m= 4 5-Thia-1,10- diazadecane (C ₇ H ₁₈ N ₂ S)	H ⁺	HL/H.L H ₂ L/HL.H	10.51 9.81		-13.70 -13.5	2.1 0
	Ag ⁺	MH ₂ L/M.H ₂ L M(H ₂ L) ₂ /M.(H ₂ L) ₂ ML ₂ /M.L ₂ MHL ₂ /ML ₂ .H M(HL) ₂ /MHL ₂ .H MH ₃ L ₂ /M(HL) ₂ .H M(H ₂ L) ₂ /MH ₃ L ₂ .H M ₂ L/M ² .L M ₂ (HL) ₂ /M(HL) ₂ .M M ₂ HL ₂ /MHL ₂ .M M ₂ L ₂ /ML ₂ .M	3.23 5.10 8.72 10.35 9.62 8.97 8.08 10.46 5.49 6.42 7.04		-7.9 -16.0 -16.3 -14.2	-12 -30 -15 -15
n= m= 4 6-Thia-1,11- dizaundecane (C ₈ H ₂₀ N ₂ S)	H ⁺	HL/H.L H ₂ L/HL.H	10.73 10.05		-13.77 -13.6	2.9 0
	Ag ⁺	MH ₂ L/M.H ₂ L M(H ₂ L) ₂ /M.(H ₂ L) ₂	3.53 5.85		-8.2 -16.0	-11 -27
Bibliography: H ⁺ 83HSG,84SG,84ST; Ag ⁺ 84SG,84ST; Other references: 74MM,83HB						



C ₆ H ₁₆ N ₂ S ₂		4,7-Dithia-1,10-diazadecane (ethylenebis(thio-2-ethylamine))				L
(Other references in Vol.2, p.67 and other values in Vol.5, p.151)						
Metal		Log K	Log K	Log K	ΔH	ΔS
<u>ion</u>	<u>Equilibrium</u>	<u>25°, 0.1</u>	<u>30°, 1.0</u>	<u>25°, 0</u>	<u>25°, 0.5</u>	<u>25°, 0.5</u>
H ⁺	HL/H.L	9.53	9.47	9.46		
		9.64 ^b			-13.0	0
	H ₂ L/HL.H	8.70	8.86	8.54		
		8.97 ^b			-12.9	-2
Ni ²⁺	ML/M.L	7.41	7.90			
		7.69 ^b			-12.0	-5
	MHL/M.HL	3.55 ^b			-4.8	0
Cu ²⁺	ML/M.L	10.70	11.32	10.63		
		10.91 ^b			-16.2	-4
	MHL/M.HL	5.6				
		5.05 ^b			-8.4	-5

^b_{25°,0.5}

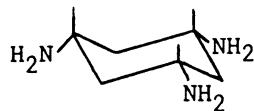
Bibliography: 80HG;
Other reference: 74MM



$\text{C}_x\text{H}_y\text{N}_3$	<u>2,2-Bis(aminomethyl)alkylamine (1,1,1-tris(aminomethyl)alkane)</u>				L
	(Other references in Vol.5, p.152,153)				
Ligand	Metal ion	Equilibrium	Log K 25°, 0.5	ΔH 25°, 0.5	ΔS 25°, 0.5
n= 0	H^+	HL/H.L	10.16	-11.72	7.2
-propylamine		$\text{H}_2\text{L}/\text{HL.H}$	8.25	-11.65	-1.3
		$\text{H}_3\text{L}/\text{H}_2\text{L.H}$	5.85	-11.71	-12.5
(...-ethane)	Ni^{2+}	ML/M.L	10.10	-10.7	11
		$\text{ML}_2/\text{M.L}^2$	17.31	-21.7	6
($\text{C}_5\text{H}_{15}\text{N}_3$)		MHL/ML.H	5.40	-8.6	-4
		$\text{MHL}_2/\text{ML}_2.\text{H}$	6.88	-7.2	7
		$\text{MH}_2\text{L}_2/\text{MHL}_2.\text{H}$	6.9		
	Cu^{2+}	ML/M.L	10.97	-15.2	-1
		$\text{ML}_2/\text{M.L}^2$	18.69	-22.8	9
		MOHL/ML.OH	5.51*	-0.4	24
		MHL/ML.H	7.42	-9.0	4
		$\text{MHL}_2/\text{ML}_2.\text{H}$	8.37	-11.6	-1
		$\text{MH}_2\text{L}_2/\text{MHL}_2.\text{H}$	7.31	-12.7	-9
	Zn^{2+}	ML/M.L	6.62	-6.1	10
		$\text{ML}_2/\text{M.L}^2$	10.88	-11.1	13
		MOHL/ML.OH	4.98*	-0.9	20
		$\text{M}(\text{OH})_2\text{L}/\text{MOHL.OH}$	3.47*	-3.5	4
		MHL/ML.H	6.92	-10.3	-3
n= 1	H^+	HL/H.L	10.23	-11.48	8.3
-butylamine		$\text{H}_2\text{L}/\text{HL.H}$	8.17	-11.68	-1.8
		$\text{H}_3\text{L}/\text{H}_2\text{L.H}$	5.53	-11.94	-14.7
(...-propane)	Ni^{2+}	ML/M.L	10.47	-10.1	14
		$\text{ML}_2/\text{M.L}^2$	17.97	-21.1	11
($\text{C}_6\text{H}_{17}\text{N}_3$)		MHL/ML.H	4.91	-8.5	-6
		$\text{MHL}_2/\text{ML}_2.\text{H}$	6.34	-8.1	2
	Cu^{2+}	ML/M.L	11.17	-13.4	6
		$\text{ML}_2/\text{M.L}^2$	19.32	-22.1	14
		MOHL/ML.OH	5.77*	-3.3	15
		MHL/ML.H	7.26	-10.6	-2
		$\text{MHL}_2/\text{ML}_2.\text{H}$	8.22	-11.7	-2
		$\text{MH}_2\text{L}_2/\text{MHL}_2.\text{H}$	7.03	-12.7	-10
	Zn^{2+}	ML/M.L	6.90	-5.4	13
		$\text{ML}_2/\text{M.L}^2$	11.25	-10.4	16
		MOHL/ML.OH	5.02*	-0.4	22
		$\text{M}(\text{OH})_2\text{L}/\text{MOHL.OH}$	3.24*	-3.4	4
		MHL/ML.H	6.67	-10.9	-6

*Value used for Kw not given.

Bibliography: 75SVa,80SV

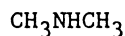
 $C_6H_{15}N_3$ cis,cis-1,3,5-Triaminocyclohexane

L

(Other reference in Vol.2, p.70 and other values in Vol.5, p.153)

Metal ion	Equilibrium	Log K 25°, 0.1	ΔH 25°, 0.1	ΔS 25°, 0.1
H^+	HL/H.L	10.16	-12.4	5
	$H_2L/HL.H$	8.66	-11.7	0
	$H_3L/H_2L.H$	7.17	-11.0	4
Ni^{2+}	ML/M.L	10.40 -0.5	-8.8	18
	$ML_2/M.L^2$	18.90	-17.4	17
Cu^{2+}	ML/M.L	10.70 -0.1	-9.6	17
	$ML_2/M.L^2$	15.51	-10.7	35
	ML/MOHL.H	7.93	-5.7	17

Bibliography: 80FMb

 C_2H_7N Dimethylamine

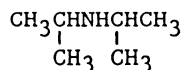
L

(Other values in Vol.2, p.72 and Vol.5, p.155)

Metal ion	Equilibrium	Log K 25°, 0.1	Log K 25°, 0.5	Log K 25°, 0	ΔH 25°, 0	ΔS 25°, 0
H^+	HL/H.L	10.77 ±0.03	10.87	10.774 -0.04	-12.0 ±0.1	9.0
			10.91 ^c			
Ni^{2+}	ML/M.L		1.47 ^c			

^c25°,1.0

Bibliography: 71RM

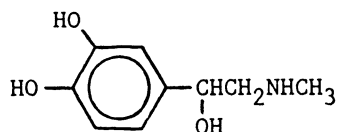
 $C_6H_{15}N$ Di-2-propylamine (diisopropylamine)

L

(Other references in Vol.1, p.335 and Vol.5, p.434)

Metal ion	Equilibrium	Log K 25°, 0.1	Log K 25°, 0	ΔH 25°, 0	ΔS 25°, 0
H^+	HL/H.L	11.09	11.15 ±0.04	-13.6 ±0.0	5
Ag^+	ML/M.L	3.41			
	$ML_2/M.L^2$	6.73			

Bibliography: 83HN

 $C_9H_{13}O_3N$

L-2-(Methylamino)-1-(3,4-dihydroxyphenyl)ethanol (adrenaline)
 (Other references in Vol.2, p.335 and other value in Vol.5, p.349)

 H_2L

Metal ion	Equilibrium	Log K <u>25°, 0.1</u> (13.1)	Log K <u>20°, 0.5</u>	Log K <u>25°, 0</u>	ΔH <u>25°, 0.1</u>	ΔS <u>25°, 0.1</u>
H^+	HL/H.L					
	$H_2L/HL.H$	9.87 ± 0.08	10.04	10.05 (10.17) ^c	(-13) ^s	(10)
	$H_3L/H_2L.H$	8.64 ± 0.04	8.52	8.62 8.73 ^c		
Mn^{2+}	$ML_2/M.L^2$	12.5				
	$MHL/M.HL$	4.46				
	$MHL/ML.H$	9.87				
	$MHL_2/ML_2.H$	10.1				
Co^{2+}	$MHL/M.HL$	5.50				
	$M(HL)_2/M.(HL)^2$	8.87				
	$MHL/ML.H$	9.37				
	$M(HL)_2/MHL_2.H$	9.82				
	$MHL_2/ML_2.H$	10.10				
Ni^{2+}	$MHL/M.HL$	5.74	5.44			
	$M(HL)_2/M.(HL)^2$	(8.3)	(8)			
	$MHL/ML.H$	9.41				
	$M(HL)_2/MHL_2.H$	9.8	9.1			
	$MHL_2/ML_2.H$	10.5	10.4			
Cu^{2+}	$MHL/M.HL$	10.47	10.65	10.68 ^c		
	$M(HL)_2/M.(HL)^2$	17.8	19.1			
	$MHL/ML.H$	8.0		7.44 ^c		
	$M(HL)_2/MHL_2.H$	9.8				
	$M(HL)_2/ML_2.H$	20.0	19.2			
Zn^{2+}	$MHL/M.HL$	6.65	6.27			
	$M(HL)_2/M.(HL)^2$	11.79				
	$M(HL)_2/MHL_2.H$	9.64				
	$MHL_2/ML_2.H$	10.16				
	$ML_2/M(H_{-1}L).H$	11.4				
Cd^{2+}	$MHL/M.HL$		4.46			
Pb^{2+}	$MHL/M.HL$		9.07			

^c25°, 1.0; ^s0-37°, 0.1

Bibliography:

H^+ 54L, 72RD, 74GS, 80JH, 81GKD, 83CVS;
 Mn^{2+} , Co^{2+} 81GKD;
 Ni^{2+} , Zn^{2+} 74GS, 81GKD;

Cu^{2+} 74RD;
 Cd^{2+} , Pb^{2+} 74GS

C₄H₁₁O₂N

Iminodi-2-ethanol (diethanolamine)
(Other values in Vol.2, p.80 and Vol.5, p.157)

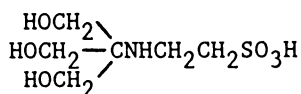
L

Metal ion	Equilibrium	Log K 25°, 0.1	Log K 25°, 1.0	Log K 25°, 0	ΔH 25°, 0	ΔS 25°, 0
H ⁺	HL/H.L	8.90 9.00 ^b ±0.09	9.10 9.32 ^d	8.883	-10.07 ±0.06	6.8
Co ²⁺	ML/M.L ML ₂ /M.L ²	1.88 ^b 3.07 ^b	2.24 ^d 3.66 ^d			
Ni ²⁺	ML/M.L ML ₂ /M.L ²	2.60 ^b 4.47 ^b	3.00 ^d 5.27 ^d			
Cu ²⁺	ML/M.L ML ₂ /M.L ² ML ₂ /M.L ³	4.20 ^b 7.55 ^b 8.66 ^b	4.74 ^d 8.64 ^d 10.30 ^d			
Zn ²⁺	ML/M.L ML ₂ /M.L ²	2.13 ^b 3.53 ^b	2.52 ^d 4.40 ^d			
Cd ²⁺	ML/M.L ML ₂ /M.L ² ML ₃ /M.L ³	2.10 ^b 3.81 ^b	2.47 ^d 4.52 ^d 5.30 ^d			

b25°, 0.5; d25°, 2.0

Bibliography: H⁺ 81BBa, 82BD; Co²⁺, Cu²⁺-Cd²⁺ 83DB; Ni²⁺ 82BD;

Other reference: 82SSb

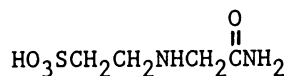
C₆H₁₅O₆NS

2-[Tris(hydroxymethyl)methylamino]ethanesulfonic acid
(Other reference in Vol.5, p.434)

HL

Metal ion	Equilibrium	Log K 25°, 0.1	Log K 25°, 0	ΔH 25°, 0	ΔS 25°, 0
H ⁺	HL/H.L	7.60	7.550	-7.7	9
Co ²⁺	ML/M.L	2.07			
Cu ²⁺	ML/M.L ML/MOHL.H M ₂ (OH) ₂ L ₂ /(MOHL) ²	3.90 6.62 2.30			
Zn ²⁺	ML/M.L	2.08			

Bibliography: 83NK

C₄H₁₀O₄N₂S

2-(Carbamylmethylamino)ethanesulfonic acid
(N-(2-acetamido)-2-aminoethanesulfonic acid)

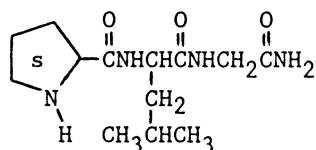
HL

Metal ion	Equilibrium	Log K 25°, 0.1
H ⁺	HL/H.L	6.81

2-(Carbamylmethylamino)ethanesulfonic acid (continued)

Metal ion	Equilibrium	Log K 25°, 0.1
Co ²⁺	ML/M.L	2.21
	ML ₂ /M.L ²	3.62
Ni ²⁺	ML/M.L	3.12
	ML ₂ /M.L ²	5.43
Cu ²⁺	ML/M.L	4.32
	ML ₂ /M.L ²	7.77
	ML ₂ /M(H ₋₁ L)L.H	7.36
	M(H ₋₁ L)L/M(H ₋₁ L) ₂ .H	8.49
Zn ²⁺	ML/M.L	2.34
	ML ₂ /M.L ²	3.74

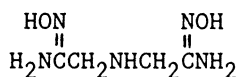
Bibliography: 80PSA

C₁₃H₂₄O₃N₄L-Prolyl-L-leucylglycinamide (Melanostatin)

L

Metal ion	Equilibrium	Log K 25°, 0.1
H ⁺	HL/H.L	8.80
Ni ²⁺	M(H ₋₃ L).H ³ /M.L	-18.1
Cu ²⁺	ML/M.L	5.69
	ML/M(H ₋₁ L).H	5.67
	M(H ₋₁ L)/M(H ₋₂ L).H	7.25
	M(H ₋₂ L)/M(H ₋₃ L).H	9.07

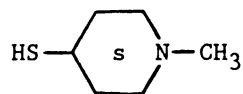
Bibliography: 81FZ

C₄H₁₁O₂N₅Iminobis(acetamidoxime)

L

Metal ion	Equilibrium	Log K 25°, 0.1
H ⁺	HL/H.L	5.86
	H ₂ L/HL.H	4.54
	H ₃ L/H ₂ L.H	(0.5)
Ni ²⁺	ML/M.L	7.59
	ML ₂ /M.L ²	14.66
	ML ₂ /M(H ₋₁ L)L.H	7.50
Cu ²⁺	ML/M.L	10.95
	ML ₂ /M.L ²	14.76
	ML ₂ /M(H ₋₁ L)L.H	6.76

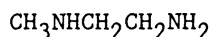
Bibliography: 85OS



$C_6H_{13}NS$ 4-Mercapto-N-methylpiperidine HL

Metal	Equilibrium	Log K 25°, 0.1
H^+	HL/H.L	10.35
	$H_2L/HL.H$	8.33
CH_3Hg^+	ML/M.L	16.06
	MHL/ML.H	9.27

Bibliography: 83AC



$C_3H_{10}N_2$ N-Methylethylenediamine L
(Other references in Vol.2, p.82 and Vol.5, p.435)

Metal <u>ion</u>	<u>Equilibrium</u>	Log K <u>25°, 0.1</u>	Log K <u>25°, 1.0</u>	Log K <u>25°, 0</u>	ΔH <u>25°, 1.0</u>	ΔS <u>25°, 1.0</u>
H^+	HL/H.L	10.11	10.30 ± 0.05	10.04 ± 0.02	-11.2 ^b	10
	$H_2L/HL.H$	10.21 ^b ± 0.08	7.45 ± 0.03	6.76 ± 0.02	-11.1 ± 0.1	-1
		7.04			-10.3 ^b	
Co^{2+}		7.27 ^b ± 0.01			-10.5 ± 0.3	
	ML/M.L		5.50			
	ML ₂ /M.L ²		9.76			
Ni^{2+}	ML ₃ /M.L ³		11.5			
	ML/M.L	7.7	7.31 ± 0.2	7.08 ± 0.03	-7.0	10
	ML ₂ /M.L ²	7.32 ^b ± 0.01	13.12 ± 0.3	12.55 ± 0.04	-15.2	9
12.79						
Cu^{2+}	ML ₃ /M.L ³	13.01 ^b ± 0.2	15.4	15.2		
	ML/M.L	15.0 ^b	10.53 ± 0.03	10.21 ± 0.03	-11.5 ^b	
	ML ₂ /M.L ²	10.33	19.3 ± 0.1	18.7 ± 0.0	-10.8	12
10.42 ^b ± 0.1		-23.7 ^b				
Zn^{2+}		18.9			-22.6	12
		19.0 ^b ± 0.4				
	ML/M.L		5.66	5.34	-2.9	16
Cd^{2+}	ML ₂ /M.L ²		10.18	9.71	-6.6	24
	ML/M.L		5.44 ± 0.03		-4.6	9
	ML ₂ /M.L ²		9.63 ± 0.07		-10.6	8
Hg^{2+}	ML ₃ /M.L ³		11.3 ± 0.1			
	ML ₂ /M.L ²		22.45		-26.4	14

^b25°, 0.5

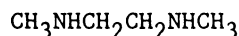
Bibliography:

H^+ 82AB, 83DP;

$Co^{2+}, Ni^{2+}, Zn^{2+} - Hg^{2+}$ 82ABa;

Cu^{2+} 82Aba, 83DP;

Other references: 61KE, 61KEa

 $\text{C}_4\text{H}_{12}\text{N}_2$ N,N'-Dimethylethylenediamine

L

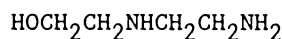
(Other values in Vol.2, p.88 and Vol.5, p.158)

Metal		Log K	Log K	Log K	ΔH	ΔS
<u>ion</u>	<u>Equilibrium</u>	<u>25°, 0.1</u>	<u>25°, 1.0</u>	<u>25°, 0</u>	<u>25°, 0.2</u>	<u>25°, 0.1</u>
H^+	HL/H.L	10.05 $\pm$ 0.03	10.34 $\pm$ 0.08	10.03	-10.2	12
		10.17 ^b $\pm$ 0.08	10.69 ^d		-10.7 ^b	11 ^b
					-10.5 ^c	12 ^c
	$\text{H}_2\text{L}/\text{HL.H}$	7.05 $\pm$ 0.04	7.52 $\pm$ 0.05	6.80	-9.1	2
		7.30 ^b $\pm$ 0.06	7.86 ^d		-9.7 ^b	1 ^b
					-10.2 ^c	0 ^c
Cu^{2+}	ML/M.L	9.97 $\pm$ 0.03	10.30 $\pm$ 0.02	9.96	-11.1	8
		10.15 ^b $\pm$ 0.03	10.67 ^d		-11.1 ^b	9 ^b
	$\text{ML}_2/\text{M.L}^2$	17.0 $\pm$ 0.0	17.7 $\pm$ 0.1	16.9	-20.5	9
		17.3 ^b $\pm$ 0.1	18.5 ^d		-20.8 ^b	9 ^b
	ML/MOHL.H	8.11 $\pm$ 0.02	8.40	7.89	(-7) ^s	(14)
		8.31 ^b	8.49 ^d			
	$\text{ML}/\text{M}(\text{OH})_2\text{L.H}^2$	18.7 $\pm$ 0.5	19.3	18.2	-19.7 ^b	21 ^b
		19.1 ^b $\pm$ 0.5	19.5 ^d			
	$\text{M}_2(\text{OH})_2\text{L}_2.\text{H}^2/\text{M}^2.\text{L}^2$	7.76 $\pm$ 0.05	8.22	7.83	-6.2 ^b	15 ^b
		7.86 ^b $\pm$ 0.04	8.65 ^d			

^b25°, 0.5; ^c25°, 1.0; ^d25°, 2.0; ^s0-43°, 0.1

Bibliography: 83DP;

Other reference: 84OY

 $\text{C}_4\text{H}_{12}\text{ON}_2$ 2-(2-Aminoethylamino)ethanol (N-(2-hydroxyethyl)ethylenediamine)

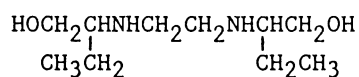
L

(Other values in Vol.2, p.95 and Vol.5, p.160)

Metal		Log K	Log K	Log K	ΔH	ΔS
<u>ion</u>	<u>Equilibrium</u>	<u>25°, 0.1</u>	<u>25°, 0.5</u>	<u>25°, 0</u>	<u>25°, 0.5</u>	<u>25°, 0.5</u>
H^+	HL/H.L	9.59 $\pm$ 0.03	9.74 $\pm$ 0.01	9.56	-11.1	7
	$\text{H}_2\text{L}/\text{HL.H}$	6.60 $\pm$ 0.01	6.85 $\pm$ 0.1	6.34	-10.1	-3
Ni^{2+}	ML/M.L	6.84 $\pm$ 0.02	6.97	6.76	-7.8	6
	$\text{ML}_2/\text{M.L}^2$	12.39 $\pm$ 0.05	12.80	12.28	-16.1	5

Bibliography: 82NT;

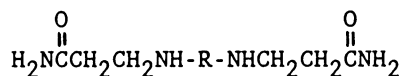
Other references: 61KE, 61KEa, 80Pb, 82SCG

 $\text{C}_{10}\text{H}_{22}\text{O}_2\text{N}_2$ D(+)-Ethylenebis(2-iminobutanol) (ethambutol)

L

Metal		Log K
<u>ion</u>	<u>Equilibrium</u>	<u>37°, 0.15</u>
H^+	HL/H.L	9.05
	$\text{H}_2\text{L}/\text{HL.H}$	6.05
Cu^{2+}	ML/M.L	9.90
	ML/MOHL.H	6.64
	MOHL/M(OH) ₂ L.H	8.31

Bibliography: 81CMW

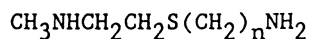
 $\text{C}_x\text{H}_y\text{O}_z\text{N}_4$ Alkylenediamine-N,N'-di-3-propanoic acid diamide

L

<u>Ligand</u>	<u>Metal ion</u>	<u>Equilibrium</u>	<u>Log K</u> <u>25°, 0.1</u>
R= -CH ₂ CH ₂ -	H ⁺	HL/H.L H ₂ L/HL.H	8.83 ±0.05 5.81 ±0.03
Ethylene-diamine-	Ni ²⁺	ML/M.L ML/M(H ₋₁ L).H M(H ₋₁ L)/M(H ₋₂ L).H	7.92 -0.3 8.46 9.69
(C ₈ H ₁₈ O ₂ N ₄)	Cu ²⁺	ML/M.L ML/M(H ₋₁ L).H M(H ₋₁ L)/M(H ₋₂ L).H	12.56 -0.7 8.05 ±0.07 9.4 ±0.1
R= -CH ₂ CH ₂ CH ₂ -	H ⁺	HL/H.L H ₂ L/HL.H	9.28 ±0.01 7.04 ±0.03
Trimethylene-diamine-	Ni ²⁺	ML/M.L ML/M(H ₋₁ L).H M(H ₋₁ L)/M(H ₋₂ L).H	6.81 9.01 10.22
(C ₉ H ₂₀ O ₂ N ₄)	Cu ²⁺	ML/M.L ML/M(H ₋₁ L).H M(H ₋₁ L)/M(H ₋₂ L).H	10.29 ±0.04 8.60 ±0.07 10.08 ±0.06
R= -CHCH ₂ - CH ₃	H ⁺	HL/H.L H ₂ L/HL.H	8.80 5.47
1,2-Propylene-diamine-	Ni ²⁺	ML/M.L ML/M(H ₋₁ L).H M(H ₋₁ L)/M(H ₋₂ L).H	7.98 8.68 9.90
(C ₉ H ₂₀ O ₂ N ₄)	Cu ²⁺	ML/M.L ML/M(H ₋₁ L).H M(H ₋₁ L)/M(H ₋₂ L).H	12.61 8.12 9.38
R= -CH ₂ CHCH ₂ - OH	H ⁺	HL/H.L H ₂ L/HL.H	8.52 6.58
2-Hydroxy-trimethylene-diamine-	Ni ²⁺	ML/M.L ML/M(H ₋₁ L).H M(H ₋₁ L)/M(H ₋₂ L).H	6.41 8.86 10.10
(C ₉ H ₂₀ O ₃ N ₄)	Cu ²⁺	ML/M.L ML/M(H ₋₁ L).H M(H ₋₁ L)/M(H ₋₂ L).H	10.04 8.31 9.78

Bibliography:

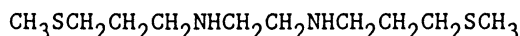
H⁺ 79WC, 81CC, 82Lb, 84LC, 84LCa, 85LC;
 Ni²⁺ 83L, 84LCa, 85LC;
 Cu²⁺ 79WC, 81CC, 82Lb, 84LC



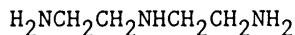
$\text{C}_x\text{H}_y\text{N}_2\text{S}$	<u>Thia-diazaalkane</u>		L		
<u>Ligand</u>	<u>Metal ion</u>	<u>Equilibrium</u>	<u>Log K</u> <u>25°, 0.5</u>	<u>ΔH</u> <u>25°, 0.5</u>	<u>ΔS</u> <u>25°, 0.5</u>
n= 2	H^+	HL/H.L	9.86	-11.8	6
		$\text{H}_2\text{L}/\text{HL.H}$	8.89	-12.4	-1
4-Thia-1,7-diaza-octane ($\text{C}_5\text{H}_{14}\text{N}_2\text{S}$)	Ni^{2+}	ML/M.L	6.76		
		$\text{ML}_2/\text{M.L}^2$	10.89		
	Cu^{2+}	ML/M.L	8.62	-9.8	7
		$\text{ML}_2/\text{M.L}^2$	12.58		
		$\text{MHL}_2/\text{ML}_2.\text{H}$	8.37		
		$\text{M}_2(\text{OH})_2\text{L}_2/(\text{ML})^2.(\text{OH})^2$	14.66*		
n= 3	H^+	HL/H.L	10.26	-13.0	3
		$\text{H}_2\text{L}/\text{HL.H}$	9.44	-12.2	2
5-Thia-1,8-diaza-nonane ($\text{C}_6\text{H}_{16}\text{N}_2\text{S}$)	Ni^{2+}	ML/M.L	5.26		
		MHL/ML.H	7.73		
		$\text{MHL}_2/\text{MHL.L}$	4.44		
	Cu^{2+}	$\text{MH}_2\text{L}_2/\text{MHL}_2.\text{H}$	8.3		
		ML/M.L	9.60	-11.7	5
		MHL/ML.H	5.11	-9.1	-7
n= 4 6-Thia-1,9-diaza-decane ($\text{C}_7\text{H}_{18}\text{N}_2\text{S}$)	H^+	HL/H.L	10.51	-13.3	3
		$\text{H}_2\text{L}/\text{HL.H}$	9.55	-12.1	3

*Value used for Kw not given.

Bibliography: H^+ 81HG,83HSG; Ni^{2+} 81HG; Cu^{2+} 81HG,83HHG



C ₁₀ H ₂₄ N ₂ S ₂		<u>2,13-Dithia-6,9-diazatetradecane</u>		L
Metal		Log K	ΔH	ΔS
<u>ion</u>	<u>Equilibrium</u>	<u>25°, 0.5</u>	<u>25°, 0.5</u>	<u>25°, 0.5</u>
H ⁺	HL/H.L	9.74	-10.3	10
	H ₂ L/HL.H	6.89	-10.2	-3
Cu ²⁺	ML/M.L	11.41	-13.8	6
	ML/MOHL.H	10.12		
Bibliography: 85MPS				



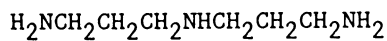
$\text{C}_4\text{H}_{13}\text{N}_3$		<u>1,4,7-Triazaheptane (diethylenetriamine, dien, 2,2-tri)</u>				L
(Other values in Vol.2, p.101 and Vol.5, p.163)						
Metal		Log K	Log K	Log K	ΔH	ΔS
<u>ion</u>	<u>Equilibrium</u>	<u>25°, 0.1</u>	<u>25°, 1.0</u>	<u>25°, 0</u>	<u>25°, 0.1</u>	<u>25°, 0.1</u>
H^+	HL/H.L	9.84 ± 0.05	9.92 ± 0.03	9.80	-11.2	7
		9.88 ^b -0.04			-11.4 ^c	7 ^c
	$\text{H}_2\text{L}/\text{HL.H}$	9.02 ± 0.06	9.24 ± 0.00	8.74	-12.0	1
		9.09 ^b -0.03			-12.4 ^c	1 ^c
	$\text{H}_3\text{L}/\text{H}_2\text{L.H}$	4.23 ± 0.03	4.73 ± 0.00	3.64	-7.2	-5
		4.47 ^b ± 0.03			-8.9 ^c	-8 ^c

^b25°,0.5; ^c25°,1.0

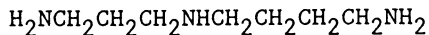
Dien (continued)

Metal ion	Equilibrium	Log K 25°, 0.1	Log K 25°, 1.0	Log K 25°, 0	ΔH 25°, 0.1	ΔS 25°, 0.1
Ag ⁺	ML/M.L	6.10 6.1 ^h 3.2 ^h				
	MHL/M.HL		3.63			
	M(HL) ₂ /M.(HL) ₂		7.09			
	MOHL.H/M.L		-5.54			
	MHL/ML.H	7.96				
	MH ₂ L/MHL.H	7.27	6.59			
	M(HL) ₂ /MHL ₂ .H		9.51			
	MHL ₂ /ML ₂ .H		9.88			
	M ₂ L/ML.M	1.4 ^h				
	M ₂ (HL) ₂ /(MHL) ₂		2.57			
	M ₂ (HL) ₂ /M ₂ HL ₂ .H		7.31			
	M ₂ HL ₂ /M ₂ L ₂ .H		7.62			
	M ₂ L ₃ /M ₂ L ₂ .L		1.29			
	M ₃ L ₂ /M ₂ L ₂ .M		2.84			
Pb ²⁺	ML/M.L	9.5 ±0.1			(-9) ^s	(13)

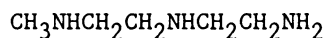
h_{20°}, 0.1; s_{15-35°}, 0.2
 Bibliography: Ag⁺ 84YMF; Pb²⁺ 85MMN;
 H⁺ 82YM; Ni²⁺ 75WO; Cu²⁺ 63PC, 81WN;
 Other references: 74MM, 8000, 82GSZ, 85MS



C ₆ H ₁₇ N ₃		<u>1,5,9-Triazanonane (3,3-tri)</u>			L
		(Other values in Vol.2, p.104 and Vol.5, p.165)			
Metal		Log K	Log K	ΔH	ΔS
<u>ion</u>	<u>Equilibrium</u>	<u>25°, 0.1</u>	<u>25°, 1.0</u>	<u>25°, 0.1</u>	<u>25°, 0.1</u>
H ⁺	HL/H.L	10.65 ±0.10	10.74 ±0.01	-12.3	7
	H ₂ L/HL.H	9.57 ±0.04	9.79 ±0.02	-13.0	0
	H ₃ L/H ₂ L.H	7.69 ±0.04	8.08 ±0.02	-10.5	0
Ni ²⁺	ML/M.L	9.19 ±0.0	9.58	-10.6	7
	ML ₂ /M.L ²	12.74		-17.6	-1
Bibliography: 75WO					



C ₇ H ₁₉ N ₃		<u>1,5,10-Triazadecane (3,4-tri, spermidine)</u>		L
		(Other values in Vol.5, p.166)		
Metal		Log K	ΔH	ΔS
<u>ion</u>	<u>Equilibrium</u>	<u>25°, 0.1</u>	<u>25°, 0.1</u>	<u>25°, 0.1</u>
H ⁺	HL/H.L	10.89 ±0.09	-13.5 ±0.1	5
	H ₂ L/HL.H	9.81 ±0.08	-12.8 ±0.0	2
	H ₃ L/H ₂ L.H	8.34 +0.1	-11.7 ±0.0	-1
Cu ²⁺	ML/M.L	11.61 +0.1	-14.1	6
	MHL/ML.H	6.12 +1	-10.4	-7
Bibliography: H ⁺ 77AFB,83TSN,84OA,85TS; Cu ²⁺ 77AFB,85TS				

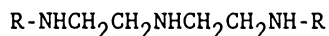
 $\text{C}_5\text{H}_{15}\text{N}_3$

1,4,7-Triazaooctane (N(1)-methyldiethylenetriamine)
(Other values in Vol.2, p.103)

L

Metal ion	Equilibrium	Log K 25°, 0.1	Log K 25°, 1.3	ΔH 25°, 1.3	ΔS 25°, 1.3
H^+	HL/H.L	(9.86)	10.10	-10.6	11
	$\text{H}_2\text{L}/\text{HL.H}$	9.18	9.43	-11.9	3
	$\text{H}_3\text{L}/\text{H}_2\text{L.H}$	3.30	(4.50)	-8.6	-8
Ag^+	MHL/M.HL		3.53		
	$\text{M}(\text{HL})_2/\text{M.}(\text{HL})_2$		6.85		
	MOHL.H/M.L		-6.10		
	$\text{MH}_2\text{L}/\text{MHL.H}$		6.79		
	$\text{M}(\text{HL})_2/\text{MHL}_2.\text{H}$		9.58		
	$\text{MHL}_2/\text{ML}_2.\text{H}$		9.88		
	$\text{M}_2(\text{HL})_2/(\text{MHL})_2$		2.50		
	$\text{M}_2(\text{HL})_2/\text{M}_2\text{HL}_2.\text{H}$		7.71		
	$\text{M}_2\text{HL}_2/\text{M}_2\text{L}_2.\text{H}$		7.91		
	$\text{M}_3\text{L}_2/\text{M}_2\text{L}_2.\text{M}$		2.33		

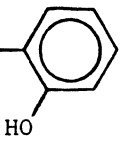
Bibliography:

 H^+ 82YM; Ag^+ 84YMF $\text{C}_x\text{H}_y\text{O}_z\text{N}_p$ N,N"-Disubstituted-diethylenetriamine

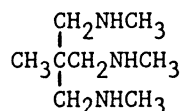
L

Ligand	Metal ion	Equilibrium	Log K 25°, 0.5
$\text{R} = \text{CH}_2\text{CH}_3$	H^+	HL/H.L	10.51
3,6,9-Triaza-		$\text{H}_2\text{L}/\text{HL.H}$	9.85
undecane		$\text{H}_3\text{L}/\text{H}_2\text{L.H}$	4.31
$(\text{C}_8\text{H}_{21}\text{N}_3)$	Cu^{2+}	ML/M.L	15.05
		MHL/ML.H	3.68
		ML/MOHL.H	9.56
$\text{R} = \text{CH}_2\text{CH}_2\text{CN}$	H^+	HL/H.L	8.86
4,7,10-Triaza-		$\text{H}_2\text{L}/\text{HL.H}$	5.83
tridecane		$\text{H}_3\text{L}/\text{H}_2\text{L.H}$	3.65
dinitrile	Cu^{2+}	ML/M.L	13.00
$(\text{C}_{10}\text{H}_{21}\text{N}_5)$		MHL/ML.H	2.3
		ML/MOHL.H	9.44
$\text{R} = \text{CH}_2\text{CH}_2\text{C}(=\text{O})\text{NH}_2$	H^+	HL/H.L	9.34
4,7,10-Triaza-		$\text{H}_2\text{L}/\text{HL.H}$	8.31
tridecanedioic		$\text{H}_3\text{L}/\text{H}_2\text{L.H}$	3.93
acid diamide	Cu^{2+}	ML/M.L	16.28
$(\text{C}_{10}\text{H}_{25}\text{O}_2\text{N}_5)$		MHL/ML.H	2.31
		ML/MOHL.H	8.98

N,N"-Disubstituted-diethylenetriamine (continued)

Ligand R= CH ₂ - 	Metal ion	Equilibrium	Log K
			25°, 0.5
1,9-Bis(2-hydroxy-phenyl)-2,5,8-triazanonane, H ₂ L (C ₁₈ H ₂₅ O ₂ N ₃)	H ⁺	HL/H.L	11.06
		H ₂ L/HL.H	10.41
		H ₃ L/H ₂ L.H	9.09
		H ₄ L/H ₃ L.H	7.94
		H ₅ L/H ₄ L.H	4.18
	Cu ²⁺	ML/M.L	22.60
		MHL/ML.H	8.65
		MH ₂ L/MHL.H	3.99

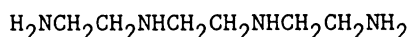
Bibliography: 84GH;
Other reference: 84Ga



C₈H₂₂N₃ N-Methyl-2,2-bis(N-methylaminomethyl)propylamine L
(1,1,1-tris(N-methylaminomethyl)ethane)

Metal ion	Equilibrium	Log K
		25°, 0.5
H ⁺	HL/H.L	10.64
	H ₂ L/HL.H	8.37
	H ₃ L/H ₂ L.H	5.61
Ni ²⁺	ML/M.L	9.37
Cu ²⁺	ML/M.L	9.56
	MHL/ML.H	6.40
	ML/MOHL.H	8.48
	MOHL/M(OH) ₂ L.H	11.68
	M ₂ (OH) ₂ L ₂ /(MOHL) ²	2.86
Zn ²⁺	ML/M.L	5.89
	ML/MOHL.H	8.96
	MOHL/M(OH) ₂ L.H	9.50

Bibliography: 83BMS



C₆H₁₈N₄ 1,4,7,10-Tetraazadecane (triethylenetetramine, trien, 2,2,2-tet) L
(Other values in Vol.2, p.105 and Vol.5, p.167)

Metal ion	Equilibrium	Log K	Log K	Log K	ΔH	ΔS
		25°, 0.1	25°, 0.5	25°, 1.0	25°, 0.1	25°, 0.1
H ⁺	HL/H.L	9.74 ±0.06	9.92 ±0.04	10.09 ±0.09	-10.8 ±0.2	8
			9.57 ⁿ		-10.9 ^c	
	H ₂ L/HL.H	9.07 ±0.03	9.21 ±0.10	9.50 ±0.1	-11.3 -0.1	4
			8.94 ⁿ		-11.2 ^c	
	H ₃ L/H ₂ L.H	6.59 ±0.06	6.87 ±0.01	7.15 ±0.08	-9.5 ±0.0	-2
	H ₄ L/H ₃ L.H	3.27 ±0.07	6.44 ⁿ	3.95 ±0.07	-10.2 ^c	-9
			3.71 ±0.05		-7.1 ±0.3	
			3.10 ⁿ		-8.0 ^c	

^c25°, 1.0; ⁿ37°, 0.15

Trien (continued)

Metal ion	Equilibrium	Log K 25°, 0.1	Log K 25°, 0.5	Log K 25°, 1.0	ΔH 25°, 0.1	ΔS 25°, 0.1
Mn ²⁺	ML/M.L	4.90		5.54 ±0.08	-2.3	15
Co ²⁺	ML/M.L	10.9 -0.5		11.33 ±0.02	-10.7 -10.6 ^c	14 16 ^c
	MHL/ML.H	5.7 ^h		5.37		
Ni ²⁺	ML/M.L	13.8 ±0.0	(14.4)	14.48 ±0.03	-14.0 +0.1 -13.6 ^c	16 21 ^c
	MHL/ML.H	4.8 ^h		4.50		
	ML(planar)/ML(oct.)	-1.9			(+3) ^s	(1)
Cu ²⁺	ML/M.L	20.05 ±0.06	19.41 ⁿ	20.97 ±0.08	-21.5 ±0.1 -21.4 ^c	20
	MHL/ML.H	3.7 3.5 ^h	(2.5) ⁿ	3.22 +0.01		
	ML/MOHL.H	10.7 ±0.1			-13	5
Pd ²⁺	ML/M.L			40.2		
	MHL/ML.H			0.84		
Zn ²⁺	ML/M.L	12.0 -0.1	(11.19) ⁿ	12.10 ±0.05	-8.9 +0.6 -8.7 ^c	25
	MHL/ML.H	5.1 ^h	4.7 ⁿ	5.01		
Cd ²⁺	ML/M.L	10.6 +0.2		11.08 ±0.04	-9.2 -9.8 ^c	18
	MHL/ML.H	6.2 ^h		5.55		
Hg ²⁺	ML/M.L	24.5 +0.5	24.4 ±0.1	24.15	-29.6 ^c	11 ^c
	MHL/ML.H		(5.5) ⁱ	2.20		
Pb ²⁺	ML/M.L	10.4 ±0.1		10.36	-11.5	9
	MHL/ML.H	5.31		5.92	-5.1	7

^c25°, 1.0; ^h20°, 0.1; ⁱ20°, 0.5; ⁿ37°, 0.15; ^s10-40°, 0.1;

Bibliography: H⁺ 71RMS, 73PA, 79MPa, 81BCS, 82AB, 83WD, 85NKM, 85YA;

Mn²⁺ 81BCS;

Co²⁺ 80KK, 82ABa;

Ni²⁺, Cd²⁺ 82ABa;

Cu²⁺ 73PA, 82ABa, 85NKM;

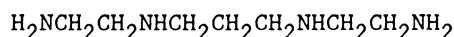
Other references: 74MM, 81FM

Pd²⁺ 85YA;

Zn²⁺ 73PA, 82ABa;

Hg²⁺ 82ABa, 83DW;

Pb²⁺ 79MPa, 82ABa, 85MMN;



C₇H₂₀N₄

1,4,8,11-Tetraazaundecane (2,3,2-tet)

L

(Other references in Vol.2, p.107 and other value in Vol.5, p.167)

Metal ion	Equilibrium	Log K 25°, 0.1	Log K 25°, 0.5	Log K 25°, 1.0	ΔH 25°, 0.5	ΔS 25°, 0.5
H ⁺	HL/H.L	10.08 ±0.09	10.25	10.28 ±0.00	-11.0 -11.1 ^c	10 10 ^c
	H ₂ L/HL.H	9.26 ±0.03	9.50	9.58 ±0.07	-11.3 -11.1 ^c	5 6 ^c
	H ₃ L/H ₂ L.H	6.88 +0.6	7.28	7.39 ±0.04	-10.0 -10.8 ^c	0 -3 ^c
	H ₄ L/H ₃ L.H	5.45 ±0.05	6.02	6.08 +0.01	-9.2 -9.8 ^c	-3 -3 ^c

^c25°, 0.1

1,4,8,11-Tetraazaundecane (continued)

Metal ion	Equilibrium	Log K 25°, 0.1	Log K 25°, 0.5	Log K 25°, 1.0	ΔH 25°, 0.5	ΔS 25°, 0.5
Co ²⁺	ML/M.L			12.2	-13.5 ^c	10 ^c
Ni ²⁺	ML/M.L	16.1	16.4	16.0	-17.9	15
	ML ₂ /M.L ²		20.1		-16.9 ^c	16 ^c
	ML(planar)/ML(oct.)				-22.0	18
		-0.55 ± 0.02		0.08 ^d	(+3) ^s ± 0	(8) ^a
Cu ²⁺	ML/M.L	23.2	23.9	23.2	-27.7	16
					-26.5 ^c	17 ^c
Pd ²⁺	ML/M.L			46.3		
Zn ²⁺	ML/M.L	12.7	12.8	12.6	-11.9	19
					-11.6 ^c	19 ^c
Gd ²⁺	ML/M.L			11.05	-11.1 ^c	14 ^c
Hg ²⁺	ML/M.L	22.1		23.3	-26.2 ^c	19 ^c

^a25°, 0.1; ^c25°, 1.0; ^d25°, 2.0; ^s19-56°, 0.1

Bibliography:

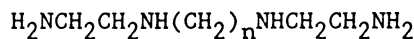
H⁺ 82AB, 85YA;

Co²⁺, Cu²⁺-Hg²⁺ 82ABa;

Ni²⁺ 80VB, 82ABa;

Pd²⁺ 85YA;

Other references: 72IJ, 73CS, 80KKa, 81LPC



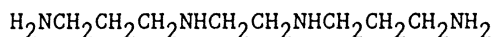
C_xH_yN₄

Tetraazaalkane (2,n,2-tet)

Ligand	Metal ion	Equilibrium	Log K 25°, 0.1	Log K 25°, 1.0	ΔH 25°, 1.0	ΔS 25°, 1.0
n= 4	H ⁺	HL/H.L		10.44 ± 0.04	-11.3	10
1,4,9,12-Tetraaza-		H ₂ L/HL.H		9.71 ± 0.03	-11.5	6
dodecane		H ₃ L/H ₂ L.H		7.64 ± 0.04	-10.9	-2
(2,4,2-tet)		H ₄ L/H ₃ L.H		6.83 ± 0.03	-10.5	-4
(C ₈ H ₂₂ N ₄)	Co ²⁺	ML/M.L		9.01	-9.7	9
		MH ₂ L/M.H ₂ L		2.77		
		MH ₂ L/MHL.H		6.65		
	Ni ²⁺	ML/M.L		12.38	-13.2	12
		MH ₂ L/M.H ₂ L		4.42		
		MH ₂ L/MHL.H		6.0		
		M ₂ L̄/ML.M		1.3		
	Cu ²⁺	ML/M.L		19.34	-20.6	19
		MH ₂ L/M.H ₂ L		7.37		
		MH ₂ L/MHL.H		4.1		
	Pd ²⁺	ML/M.L		42.0		
	Zn ²⁺	ML/M.L		9.80	-7.4	20
		MH ₂ L/M.H ₂ L		2.77		
		MH ₂ L/MHL.H		6.65		
	Cd ²⁺	ML/M.L		8.95	-7.4	16
		MH ₂ L/M.H ₂ L		2.92		
		MH ₂ L/MHL.H		7.05		
		M ₂ L̄/ML.M		2.2		

2,n,2-Tet (continued)

Ligand	Metal ion	Equilibrium	Log K 25°, 0.1	Log K 25°, 1.0	ΔH 25°, 1.0	ΔS 25°, 1.0
	Hg ²⁺	ML/M.L MH ₂ L/M.H ₂ L MH ₂ L/MHL.H		22.2 11.4 4.6	-23.6	22
n= 5	H ⁺	HL/H.L		10.6 ±0.1	-11.3	11
1,4,10,13-Tetraaza-		H ₂ L/HL.H		9.9 ±0.1	-11.5	7
tridecane		H ₃ L/H ₂ L.H		7.74 ±0.05	-11.0	-2
(2,5,2-tet)		H ₄ L/H ₃ L.H		7.03 ±0.02	-10.8	-4
(C ₉ H ₂₄ N ₄)	Pd ²⁺	ML/M.L		37.9		
n= 6	H ⁺	HL/H.L	10.40 ±0.02	10.65 ±0.05	-11.6	10
1,4,11,14-Tetraaza-		H ₂ L/HL.H	9.64 ±0.00	9.98 ±0.05	-11.5	7
tetradecane		H ₃ L/H ₂ L.H	7.33 ±0.02	7.78 ±0.02	-11.2	-2
(2,6,2-tet)		H ₄ L/H ₃ L.H	6.65 ±0.05	7.17 ±0.04	-11.0	-4
(C ₁₀ H ₂₆ N ₄)	Pd ²⁺	ML/M.L	38.1	38.9		
n= 8	H ⁺	HL/H.L		10.57	-11.8	9
1,4,13,16-Tetraaza-		H ₂ L/HL.H		10.04	-11.6	7
hexadecane		H ₃ L/H ₂ L.H		7.79	-11.1	-2
(2,8,2-tet)		H ₄ L/H ₃ L.H		7.23	-11.1	-4
(C ₁₂ H ₃₀ N ₄)						
Bibliography:						
H ⁺ 82AB, 85HA;			Pd ²⁺ 85YA			
Co ²⁺ -Cu ²⁺ , Zn ²⁺ -Hg ²⁺ 82ABa;						

C₈H₂₂N₄1,5,8,12-Tetraazadodecane (3,2,3-tet)

L

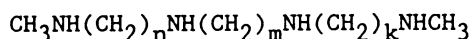
(Other values in Vol.2, p.108 and other references in Vol.5, p.462)

Metal ion	Equilibrium	Log K 25°, 0.1	Log K 25°, 0.5	Log K 25°, 0	ΔH 25°, 0.1	ΔS 25°, 0.1
H ⁺	HL/H.L	10.53		10.46	-12.35	6.8
			10.66		-12.23 ^b	7.8 ^b
	H ₂ L/HL.H	9.77		9.51	-12.38	3.2
			9.96		-12.8 ^b	3 ^b
	H ₃ L/H ₂ L.H	8.30		7.81	-10.32	3.4
			8.53		-10.7 ^b	3 ^b
	H ₄ L/H ₃ L.H	5.59		4.86	-8.16	-1.8
			5.84		-9.8 ^b	-6 ^b
Ni ²⁺	ML/M.L		14.69		-19.5 ^b	3 ^b
	MHL/ML.H		5.72		-5.0 ^b	9 ^b
	ML(planar)/ML(oct.)					
		-1.09			(+4) ^s	(8)

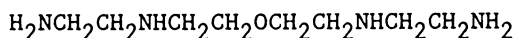
^b25°, 0.5; ^s20-45°, 0.1

Bibliography:

Ni²⁺ 77AFP, 81FM;Cu²⁺ 85CC

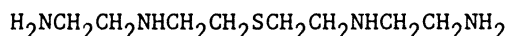


$C_xH_yN_4$	Tetraazaalkane		L		
Ligand	Metal ion	Equilibrium	Log K 25°, 0.5	ΔH 25°, 0.5	ΔS 25°, 0.5
n= m= k= 2	H^+	HL/H.L	10.75	-11.8	10
2,5,8,10-Tetraaza- dodecane		$H_2L/HL.H$	9.68	-9.8	11
		$H_3L/H_2L.H$	7.59	-10.2	0
		$H_4L/H_3L.H$	4.08	-7.4	-6
$(C_8H_{22}N_4)$	Cu^{2+}	ML/M.L	20.93	-21.1	25
		MHL/ML.H	4.42		
n= 2, m= k= 3	H^+	HL/H.L	10.30	-11.7	8
2,5,9,13-Tetraaza- tetradecane		$H_2L/HL.H$	9.57	-10.2	10
		$H_3L/H_2L.H$	7.18	-9.9	0
		$H_4L/H_3L.H$	5.66	-10.1	-8
$(C_{10}H_{26}N_4)$	Cu^{2+}	ML/M.L	21.89	-25.9	13
n= k= 3, m= 2	H^+	HL/H.L	10.84	-12.4	8
2,6,9,13-Tetraaza- tetradecane		$H_2L/HL.H$	10.12	-11.5	8
		$H_3L/H_2L.H$	8.44	-10.4	4
		$H_4L/H_3L.H$	5.69	-9.9	-7
$(C_{10}H_{26}N_4)$	Cu^{2+}	ML/M.L	18.50	-22.3	10
n= m= k= 3	H^+	HL/H.L	10.95	-12.7	7
2,6,10,14-Tetraaza- pentadecane		$H_2L/HL.H$	10.23	-11.4	9
		$H_3L/H_2L.H$	8.89	-11.6	2
		$H_4L/H_3L.H$	7.43	-10.6	-2
$(C_{11}H_{28}N_4)$	Cu^{2+}	ML/M.L	14.62	-14.9	17
Bibliography: H^+ 85CC; Cu^{2+} 82CMM,85CC					



$\text{C}_8\text{H}_{22}\text{ON}_4$	<u>7-Oxa-1,4,10,13-tetraazatridecane</u>		L		
Metal ion	Equilibrium	Log K 25°, 0.1			
H^+	HL/H.L	9.81			
	$\text{H}_2\text{L}/\text{HL.H}$	9.24			
	$\text{H}_3\text{L}/\text{H}_2\text{L.H}$	6.89			
	$\text{H}_4\text{L}/\text{H}_3\text{L.H}$	5.98			
Co^{2+}	ML/M.L	9.47			
	MHL/ML.H	6.20			
Ni^{2+}	ML/M.L	12.47			
	MHL/ML.H	5.21			
Cu^{2+}	ML/M.L	17.96			
	MHL/ML.H	3.83			
Zn^{2+}	ML/M.L	10.97			
	MHL/ML.H	5.57			

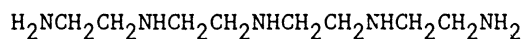
Bibliography: 82BT

C₈H₂₂N₄S7-Thia-1,4,10,13-tetraazatridecane

L

Metal <u>ion</u>	<u>Equilibrium</u>	<u>Log K</u> <u>25°, 0.1</u>
H ⁺	HL/H.L	9.78
	H ₂ L/HL.H	9.10
	H ₃ L/H ₂ L.H	6.51
	H ₄ L/H ₃ L.H	5.64
Co ²⁺	ML/M.L	11.46
	MHL/ML.H	4.29
Ni ²⁺	ML/M.L	15.45
Cu ²⁺	ML/M.L	19.67
	MHL/ML.H	2.34
Zn ²⁺	ML/M.L	11.24

Bibliography: 82BT

C₈H₂₃N₅1,4,7,10,13-Pentaazatridecane

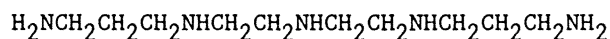
L

(tetraethylenepentaamine, tetren, 2,2,2,2-pent)
(Other values in Vol.2, p.111 and Vol.5, p.168)

Metal <u>ion</u>	<u>Equilibrium</u>	<u>Log K</u>	<u>ΔH</u>	<u>ΔS</u>
		<u>25°, 0.1</u>	<u>25°, 0.1</u>	<u>25°, 0.1</u>
H ⁺	HL/H.L	9.70 ±0.04	-10.8 -0.1	8
	H ₂ L/HL.H	9.14 ±0.04	-11.3	4
	H ₃ L/H ₂ L.H	8.05 ±0.03	-10.7	1
	H ₄ L/H ₃ L.H	4.70 ±0.02	-7.9	-5
	H ₅ L/H ₄ L.H	2.97 ±0.07	-6.8	-9
Co ²⁺	ML/M.L	13.3 ±0.2	-14.0 ±0.2	14
	MHL/ML.H	5.43 ±0.03		

Bibliography: 84CCG;

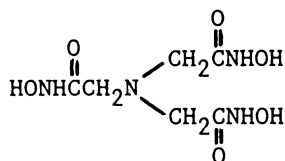
Other references: 63R,71RMS

C₁₂H₃₁N₅1,5,8,11,15-Pentaazapentadecane (3,2,2,3-pent)

L

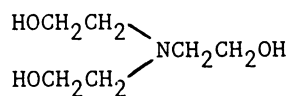
Metal <u>ion</u>	<u>Equilibrium</u>	<u>Log K</u> <u>25°, 0.5</u>
H ⁺	HL/H.L	10.72
	H ₂ L/HL.H	10.10
	H ₃ L/H ₂ L.H	8.94
	H ₄ L/H ₃ L.H	7.89
	H ₅ L/H ₄ L.H	3.96
Cu ²⁺	ML/M.L	21.65
	MHL/ML.H	8.99
	MH ₂ L/MHL.H	3.31

Bibliography: H⁺ 84GH; Cu²⁺ 84Ga,84GH

 $\text{C}_6\text{H}_{12}\text{O}_6\text{N}_4$ Nitrilotriacetohydroxamic acid H_3L

(Other values in Vol.5, p.170)

Metal ion	Equilibrium	Log K 25°, 0.1	Log K 22°, 1.0	Log K 25°, 0
H^+	HL/H.L	11.74	11.82	12.39
		11.7 ^h	11.63 ^b	
	$\text{H}_2\text{L}/\text{HL.H}$	8.84	8.85	9.22
		8.88 ^h	8.77 ^b	
	$\text{H}_3\text{L}/\text{H}_2\text{L.H}$	6.81	6.86	7.02
Co^{2+}		6.75 ^h	6.75 ^b	
	$\text{H}_4\text{L}/\text{H}_3\text{L.H}$	5.92	6.05	5.94
		5.90 ^h	5.95 ^b	
	ML/M.L	13.01		
	$\text{ML}_2/\text{M.L}^2$	19.90		
Ni^{2+}	MHL/ML.H	6.21		
	$\text{MH}_2\text{L}/\text{MHL.H}$	4.72		
	$\text{MH}_3\text{L}/\text{MH}_2\text{L.H}$	(6.86)		
	$\text{ML}_2/\text{MOHL}_2.\text{H}$	10.26		
	$\text{MHL}_2/\text{ML}_2.\text{H}$	8.91		
	$\text{MH}_2\text{L}_2/\text{MHL}_2.\text{H}$	7.49		
	ML/M.L	13.32		
	$\text{ML}_2/\text{M.L}^2$	19.71		
	$\text{MOHL}/\text{M(OH)}_2\text{L.H}$	10.92		
Zn^{2+}	ML/MOHL.H	7.98		
	MHL/ML.H	6.53		
	$\text{MH}_2\text{L}/\text{MHL.H}$	5.20		
	$\text{MH}_3\text{L}/\text{MH}_2\text{L.H}$	(6.16)		
	$\text{MHL}_2/\text{ML}_2.\text{H}$	8.52		
	$\text{M}_2\text{OHL}_2.\text{H}/\text{M}^2.\text{L}^2$	21.78		
	ML/M.L	9.73		
	ML/MOHL.H	10.9		
	MHL/ML.H	8.60		
	$\text{MH}_2\text{L}/\text{MHL.H}$	7.17		
	$\text{MH}_3\text{L}/\text{MH}_2\text{L.H}$	5.26		

^b25°,0.5; ^h20°,0.1Bibliography: H^+ 79LSN; Co^{2+} 79LSK; Ni^{2+} 80LS; Zn^{2+} 80LSK $\text{C}_6\text{H}_{15}\text{O}_3\text{N}$ Nitrilotri-2-ethanol (triethanolamine) L

(Other values in Vol.2, p.118 and other references in Vol.5, p.462)

Metal ion	Equilibrium	Log K 25°, 0.1	Log K 25°, 1.0	Log K 25°, 0	ΔH 25°, 0	ΔS 25°, 0
H^+	HL/H.L	7.8	8.02 ± 0.03	7.762	-8.1 ± 0.0	8.3
		7.90 ^b -0.01	8.12 ^d	8.35 ^e		

^b25°,0.5; ^d25°,2.0; ^e25°,3.0;

Triethanolamine (continued)

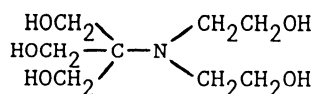
Metal ion	Equilibrium	Log K 25°, 0.1	Log K 25°, 1.0	Log K 25°, 0	ΔH 25°, 0	ΔS 25°, 0
Li ⁺	ML/M.L		-0.5			
Na ⁺	ML/M.L		-1.1			
Mg ²⁺	ML/M.L		0.24			
Ca ²⁺	ML/M.L		0.78			
Sr ²⁺	ML/M.L		0.38			
Ba ²⁺	ML/M.L		0.36			
Co ²⁺	ML/M.L	(2.25) (1.73) ^b				
Ni ²⁺	ML/M.L	2.76 2.85 ^b	2.92 (3.42) ^d		-3.9 ^b	0 ^b
	ML ₂ /M.L ²	(3.6) (3.04) ^b ± 0.05	(4.74) (4.29) ^d		-4.4 ^b	-1 ^b
	M ₂ (OH) ₂ L ₂ .H ² /(ML) ²	-14.8 ^b				
Cu ²⁺	ML/M.L	4.07 4.23 ^b				
	ML/MOHL.H	(5.41) (6.42) ^b				
	MOHL ₂ /MOHL.L	1.99				
	M ₂ (OH) ₂ L ₂ /(MOHL) ²	3.2 ^b				
Zn ²⁺	ML/M.L	(2.05) (2.00) ^b				
	ML ₂ /M.L ²	3.28				
Pb ²⁺	ML/M.L	3.39				
	ML ₂ /M.L ²	5.86				
	ML/M(OH) ₂ L.H ²	14.51				
	M ₂ OHL ₂ .H ² /(ML) ²	-4.89				
Ge(IV)	MOHL/M(OH) ₄ .H ₃ L	5.26 ^h				

^b25°, 0.5; ^d25°, 2.0; ^h20°, 0.1

Bibliography: H⁺ 82ABc, 82SSP;

Li⁺-Ba²⁺ 82SSP; Co²⁺, Zn²⁺, Pb²⁺ 84HN; Ni²⁺ 82ABc, 84HN; Cu²⁺ 81BA, 84HN; Ge(IV) 81MMB;

Other references: 63R, 82BPb, 82SSb



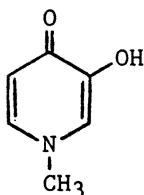
C₈H₁₉O₅N 2-(Bis(2-hydroxyethyl)amino-2-hydroxymethyl-1,3-propanediol (bistris) L

Metal ion	Equilibrium	Log K 25°, 0.1	Log K 25°, 0.5	Log K 25°, 1.0
H ⁺	HL/H.L	6.56	6.65	6.72
Li ⁺	ML/M.L			-0.3
Na ⁺	ML/M.L			-0.8
Mg ²⁺	ML/M.L			0.34
Ca ²⁺	ML/M.L			2.25
Sr ²⁺	ML/M.L			1.44
Ba ²⁺	ML/M.L			0.85

Bistris (continued)

Metal ion	Equilibrium	Log K 25°, 0.1	Log K 25°, 0.5	Log K 25°, 1.0
Mn ²⁺	ML/M.L			0.70
Co ²⁺	ML/M.L			1.78
Ni ²⁺	ML/M.L			3.59
Cu ²⁺	ML/M.L			5.27
Zn ²⁺	ML/M.L			2.38
Cd ²⁺	ML/M.L			2.47
Pb ²⁺	ML/M.L			4.32

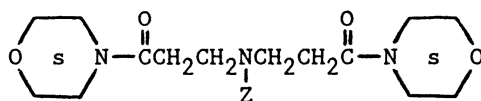
Bibliography: H⁺ 80SAP, 82SSP; Li⁺, Na⁺ 82SSP; Mg²⁺-Pb²⁺ 80SAP



C₆H₇O₂N 3-Hydroxy-1-methyl-1,4-dihydropyridin-4-one HL
(Other values in Vol.5, p.169)

Metal ion	Equilibrium	Log K 37°, 0.15
H ⁺	HL/H.L	8.68
	H ₂ L/HL.H	3.23
Mg ²⁺	ML/M.L	4.24
	ML ₂ /M.L ²	7.28
Ca ²⁺	ML/M.L	3.07
	ML ₂ /M.L ²	4.8

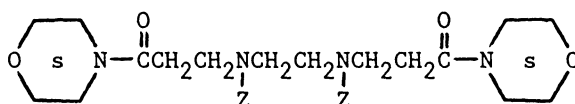
Bibliography: 80SNP



C _x H _y O ₄ N _p	<u>N-(Substituted)iminodi-3-propanoic acid di(morpholine amide)</u>				L
Ligand	Metal ion	Equilibrium	Log K 25°, 0.1	ΔH 25°, 0.1	ΔS 25°, 0.1
Z= CH ₃	H ⁺	HL/H.L	8.07	-8.4	9
N-Methyl- (C ₁₅ H ₂₇ O ₄ N ₃)					
Z= CH ₂ CH ₂ N(CH ₃) ₂	H ⁺	HL/H.L	9.05	-6.9	18
N-(N,N-Dimethyl- 2-aminoethyl)-		H ₂ L/HL.H	4.34	-6.9	-3
	Cu ²⁺	ML/M.L	8.61		
		MOHL/ML.OH	5.7*		
(C ₁₈ H ₃₄ O ₄ N ₄)		M(OH) ₂ L/ML.(OH) ²	8.7*		

*Value used for K_w not given.

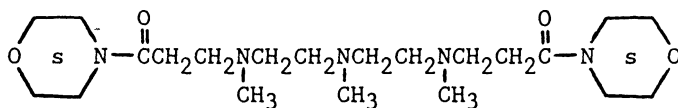
<u>Ligand</u>	<u>Metal ion</u>	<u>Equilibrium</u>	<u>Log K</u> <u>25°, 0.1</u>	<u>ΔH</u> <u>25°, 0.1</u>	<u>ΔS</u> <u>25°, 0.1</u>
Z= (CH ₂) ₃ N(CH ₃) ₂ N-(Dimethylamino- trimethylene)- (C ₁₉ H ₃₆ O ₄ N ₄)	H ⁺	HL/H.L	9.21		
		H ₂ L/HL.H	6.61		
Z= (CH ₂) ₄ N(CH ₃) ₂ N-(Dimethylamino- tetramethylene)- (C ₂₀ H ₃₈ O ₄ N ₄)	H ⁺	HL/H.L	9.52		
		H ₂ L/HL.H	7.47		
Bibliography: H ⁺ 78BBF,80FO,81BBc,81BCF; Cu ²⁺ 80BBF,80FO					



$C_xH_yO_4N_p$	N,N'-(Substituted)ethylenebis[imino-3-propanoic acid (morpholine amide)]				
Ligand	Metal ion	Equilibrium	Log K 25°, 0.1	ΔH 25°, 0.1	ΔS 25°, 0.1
Z= CH ₃	H ⁺	HL/H.L	8.25	-7.3	13
N,N'-Dimethyl-		H ₂ L/HL.H	4.80	-6.1	2
(C ₁₈ H ₃₄ O ₄ N ₄)	Cu ²⁺	ML/M.L	9.10		
		M(OH) ₂ L/ML.(OH) ²	8.4*		
Z= CH ₂ CH ₂ N(CH ₃) ₂	H ⁺	HL/H.L	9.05		
N,N'-Bis-		H ₂ L/HL.H	8.34		
(N,N-dimethyl-		H ₃ L/H ₂ L.H	4.42		
2-aminoethyl)-		H ₄ L/H ₃ L.H	2.42		
(C ₂₄ H ₄₈ O ₄ N ₆)	Cu ²⁺	ML/M.L	12.8		
		MOHL/ML.OH	5.5*		
Z= CH ₂ C ₅ H ₄ N	H ⁺	HL/H.L	7.50		
N,N'-Bis-		H ₂ L/HL.H	5.73		
(4-pyridyl-		H ₃ L/H ₂ L.H	4.3		
methyl)-		H ₄ L/H ₃ L.H	4.1		
(C ₂₈ H ₄₀ O ₄ N ₆)	Cu ²⁺	ML/M.L	7.3		
		MOHL/ML.OH	5.3*		

*Value used for K_w not given.

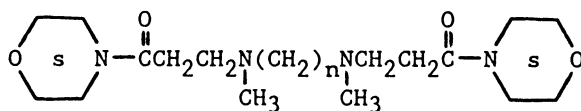
Bibliography: $\text{H}^{+78\text{BBF}, 78\text{BF}, 81\text{BBc}, 81\text{BCB}}, \text{Cu}^{2+} 80\text{BBF}, 81\text{BCB}$



C ₂₁ H ₄₁ O ₄ N ₅ <u>N,N',N''-Trimethyliminobis[ethyleneimino-3-propanoic acid (morpholine amide)]</u> L				
Metal		Log K	ΔH	ΔS
<u>ion</u>	<u>Equilibrium</u>	<u>25°, 0.1</u>	<u>25°, 0.1</u>	<u>25°, 0.1</u>
H ⁺	HL/H.L	8.25	-6.3	17
	H ₂ L/HL.H	7.44	-9.3	3
	H ₃ L/H ₂ L.H	2.56	-2.9	2
Cu ²⁺	ML/M.L	13.36		
	MOHL/ML.OH	4.62*		

*Value used for K_w not given.

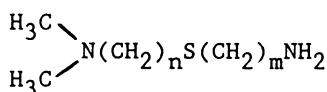
Bibliography: H^+ 78BBF, 79BF; Cu^{2+}



$C_xH_yO_4N_4$ N,N'-Dimethylpolymethylenebis[imino-3-propanoic acid (morpholine amide)]

L

Ligand	Metal ion	Equilibrium	Log K 25°, 0.1
n= 3	H ⁺	HL/H.L	8.73
-trimethylene-		H ₂ L/HL.H	6.91
(C ₁₉ H ₃₆ O ₄ N ₄)	Cu ²⁺	ML/M.L	6.45
		MOHL/ML.OH	5.09
		M(OH) ₂ L/MOHL.OH	4.81
n= 4	H ⁺	HL/H.L	9.06
-tetramethylene-		H ₂ L/HL.H	7.84
(C ₂₀ H ₃₈ O ₄ N ₄)			
Bibliography: H ⁺ 81BCF; Cu ²⁺ 82BCF			

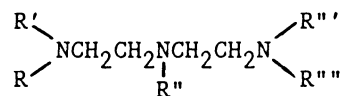


$C_xH_yN_2S$

N,N-Dimethylthiobis(alkylamine)

L

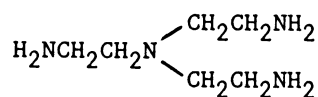
Ligand	Metal ion	Equilibrium	Log K 25°, 0.5	ΔH 25°, 0.5	ΔS 25°, 0.5
n= m= 2	H ⁺	HL/H.L	9.43	-11.5	5
-ethyl-		H ₂ L/HL.H	8.38	-9.7	6
7-Methyl-4-thia- -1,7-diazaoctane (C ₆ H ₁₆ N ₂ S)	Ni ²⁺	ML/M.L	4.52		
		MHL/ML.H	7.22		
		MHL ₂ /MHL.L	3.77		
	Cu ²⁺	ML/M.L	7.24	-6.9	10
		MHL/ML.H	5.89	-9.1	-4
n= 2, m= 3	H ⁺	HL/H.L	10.05	-12.5	4
8-Methyl-5-thia- -1,8-diazanonane (C ₇ H ₁₈ N ₂ S)		H ₂ L/HL.H	8.72	-9.2	9
n= 3, m= 2	H ⁺	HL/H.L	9.75	-10.7	9
8-Methyl-4-thia- -1,8-diazanonane		H ₂ L/HL.H	9.01	-11.3	3
	Ni ²⁺	MHL/M.HL	2.50		
		MHL ₂ /MHL.L	3.28		
(C ₇ H ₁₈ N ₂ S)	Cu ²⁺	ML/M.L	7.60	(-11.8)	(-5)
		ML ₂ /M.L ²	12.59		
		MHL/ML.H	6.55	(-5.4)	(12)
		MHL ₂ /ML ₂ .H	8.85		
n= m= 3	H ⁺	HL/H.L	10.16	-12.6	4
9-Methyl-5-thia- -1,9-diazadecane		H ₂ L/HL.H	9.32	-10.3	8
	Ni ²⁺	ML/M.L	3.48		
(C ₈ H ₂₀ N ₂ S)	Cu ²⁺	ML/M.L	7.93	-7.7	10
Bibliography: H ⁺ 81HG, 83HSG; Ni ²⁺ 81HG; Cu ²⁺ 81HG, 83HHG					



$\text{C}_x\text{H}_y\text{N}_3$	N-Substituted-diethylenetriamine					L
Ligand	Metal ion	Equilibrium	Log K 25°, 0.1	Log K 25°, 1.3	ΔH 25°, 1.3	ΔS 25°, 1.3
R = R'' = CH ₃	H ⁺	HL/H.L	10.03	10.10	-10.5	11
R' = R''' = R'''' = H		H ₂ L/HL.H	9.35	9.54	-12.7	1
N,N'-Dimethyl-		H ₃ L/H ₂ L.H	2.82	3.14	-4.6	-1
(4-methyl-1,4,7-triazaoctane)	Ag ⁺	MHL/M.HL		3.44		
		M(HL) ₂ /M.(HL) ₂		6.66		
		MHL/ML.H		8.33		
(C ₆ H ₁₇ N ₃)		ML/MOHL.H		11.70		
		M(HL) ₂ /MHL ₂ .H		9.39		
(Other values in Vol.2, p.132)		MHL ₂ /ML ₂ .H		9.91		
		M ₂ (HL) ₂ /(MHL) ₂		1.61		
		M ₂ (HL) ₂ /M ₂ L ₂ .H ²		15.22		
R = R' = CH ₃	H ⁺	HL/H.L	9.62	9.77	-10.0	11
R'' = R''' = R'''' = H		H ₂ L/HL.H	8.63	8.98	-9.8	8
N,N-Dimethyl-		H ₃ L/H ₂ L.H	3.62	4.22	-8.1	-8
(7-methyl-1,4,7-triazaoctane)	Ag ⁺	MHL/M.HL		3.27		
		M(HL) ₂ /M.(HL) ₂		6.17		
		MOHL.H/M.L		-5.96		
(C ₆ H ₁₇ N ₃)		MHL/MHL.H		6.38		
		M(HL) ₂ /ML ₂ .H ²		18.25		
(Other values in Vol.2, p.133)		M ₂ (HL) ₂ /(MHL) ₂		2.05		
		M ₂ (HL) ₂ /M ₂ HL ₂ .H		(7.55)		
		M ₂ HL ₂ /M ₂ L ₂ .H		(7.02)		
		M ₃ L ₂ /M ₂ L ₂ .M		1.51		
R = R' = R'' = CH ₃	H ⁺	HL/H.L	10.13	10.22	-10.2	13
R' = R'' = H		H ₂ L/HL.H	9.37	9.70	-11.8	5
N,N',N''-Trimethyl-		H ₃ L/H ₂ L.H	2.93	2.99	-4.1	0
(5-methyl-2,5,8-triazanonane)	Ag ⁺	MHL/M.HL		3.17		
		MHL ₂ /MHL.L		3.43		
		ML/MOHL.H		11.85		
(C ₇ H ₁₉ N ₃)		MHL/ML.H		8.34		
(Other values in Vol.2, p.133)		MHL ₂ /ML ₂ .H		9.57		
		M ₂ L ₂ /ML ₂ .M		5.02		
R = R' = R'' = CH ₃	H ⁺	HL/H.L		9.74	-9.7	12
R''' = R'''' = H		H ₂ L/HL.H		9.09	-10.5	6
N,N,N'-Trimethyl-		H ₃ L/H ₂ L.H		3.05	-4.5	-1
(4,7-dimethyl-1,4,7-triazaoctane)	Ag ⁺	MHL/M.HL		3.12		
		M(HL) ₂ /M.(HL) ₂		5.88		
		ML.MOHL.H		11.30		
		MHL/ML.H		7.89		
(C ₇ H ₁₉ N ₃)		M(HL) ₂ /MHL ₂ .H		8.87		
		MHL ₂ /ML ₂ .H		9.12		
		M ₂ L ₂ /ML ₂ .M		4.66		

N-Substituted-diethylenetriamine (continued)

Ligand	Metal ion	Equilibrium	Log K 25°, 0.1	Log K 25°, 1.3	ΔH 25°, 1.3	ΔS 25°, 1.3
R= R'= R''= R'''=	H ⁺	HL/H.L		9.45	-7.0	20
CH ₃ , R''= H		H ₂ L/HL.H		8.82	-9.0	10
N,N,N'',N''-Tetra-		H ₃ L/H ₂ L.H		3.70	-7.0	-7
methyl-	Ag ⁺	MHL/M.HL		3.00		
		M(HL) ₂ /M.(HL) ₂		4.97		
(2,8-dimethyl-		ML/MOHL.H		10.76		
2,5,8-triaza-		MHL/ML.H		8.45		
nonane)		MH ₂ L/MHL.H		6.22		
		M(HL) ₂ /MHL ₂ .H		8.34		
(C ₈ H ₂₁ N ₃)		MHL ₂ /ML ₂ .H		8.57		
		M ₂ L ₂ /ML ₂ .M		3.65		
		M ₃ L ₂ /M ₂ L ₂ .M		1.46		
R= R'= R''= R'''=	H ⁺	HL/H.L		9.41	-6.5	21
R'''= CH ₃		H ₂ L/HL.H		8.73	-9.2	9
N,N,N',N'',N''-		H ₃ L/H ₂ L.H		2.60	-4.0	-2
Pentamethyl-	Ag ⁺	MHL/M.HL		2.65		
(2,5,8-trimethyl-		M(HL) ₂ /M.(HL) ₂		4.99		
2,5,8-triaza-		ML/MOHL.H		11.26		
nonane)		MHL/ML.H		7.43		
		M(HL) ₂ /ML ₂ .H ²		17.59		
(C ₉ H ₂₃ N ₃)		M ₂ L ₂ /ML ₂ .M		3.40		
Bibliography:			Ag ⁺ 83YMF, 84YMF			
H ⁺ 82YM;						

C₆H₁₈N₄Nitrilotris(2-ethylamine) (tris(2-aminoethyl)amine, tren)
(Other values in Vol.2, p.137 and Vol.5, p.178)

L

Metal ion	Equilibrium	Log K 25°, 0.1	Log K 25°, 1.0	Log K 25°, 0	ΔH 25°, 0.1	ΔS 25°, 0.1
H ⁺	HL/H.L	10.13 ±0.02	10.39	10.03	-11.7	7
		10.14 ^b	9.86 ⁿ			
	H ₂ L/HL.H	9.43 ±0.02	9.81	9.13	-12.8	0
		9.68 ^b	9.15 ⁿ			
	H ₃ L/H ₂ L.H	8.41 ±0.04	8.89	7.85	-12.2	-2
		8.64 ^b	8.13 ⁿ			
Co ²⁺	ML/M.L	12.7 ±0.0			-10.7	22
	ML/MOHL.H	9.9				
Ni ²⁺	ML/M.L	14.6 -0.1	14.8 ⁱ		-15.2	16
	ML/MOHL.H	9.8				
	MHL/ML.H	5 ^h	5.4 ⁱ			

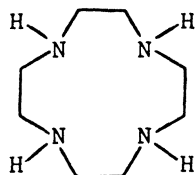
^b25°,0.5; ^h20°,0.1; ⁱ20°,0.5; ⁿ37°,0.15

Tren (continued)

Metal ion	Equilibrium	Log K 25°, 0.1	Log K 25°, 1.0	Log K 25°, 0	ΔH 25°, 0.1	ΔS 25°, 0.1
Cu ²⁺	ML/M.L	18.8 ±0.3	19.3	18.4	-20.4	18
			18.4 ⁿ			
	ML ₂ /M.L ²		21.7 ⁿ			
	ML/MOHL.H	9.2 ±0.1	9.51		-9.8	9
			8.97 ⁿ			
	MHL/ML.H		4.16			
Zn ²⁺	MHL ₂ /ML ₂ .H		3.51 ⁿ			
	M(HL) ₂ /MHL ₂ .H		9.47 ⁿ			
			8.4 ⁿ			
	ML/M.L	14.5 ±0.1			-13.9	20
Cd ²⁺		14.5 ^b				
	ML/MOHL.H	10.84 ^b				
	ML/M.L	11.7				
		11.8 ^b				

^b25°, 0.5; ⁿ37°, 0.15

Bibliography:

H⁺-Ni²⁺ 82MML, 84MMN;Cu²⁺ 61MF, 63PC, 81WN, 82MML;Zn²⁺ 81MS, 82MMLC₈H₂₀N₄1,4,7,10-Tetraazacyclododecane ([12]aneN₄)
(Other values in Vol.5, p.183)

L

Metal ion	Equilibrium	Log K 25°, 0.1	Log K 25°, 0.5	Log K 25°, 0	ΔH 25°, 0.2	ΔS 25°, 0.2
H ⁺	HL/H.L	10.6	10.82	10.53	(-8) ^s	(22)
	H ₂ L/HL.H	9.6	9.72	9.60	(-8) ^s	(17)
	H ₃ L/H ₂ L.H	(1.5) ^p	(1.2) ^q			
	H ₄ L/H ₃ L.H	(0.7) ^p				
Co ²⁺	ML/M.L	13.8 ^p				
Ni ²⁺	ML/M.L	16.4			-11.9 ^c	35*
	ML(planar)/ML(oct.)					
		-2.48	-2.10 ^c	-2.52	+5.8	31
			-1.70 ^d	-1.31 ^e	+5.3 ^c	27 ^c
Cu ²⁺	ML/M.L	24.6 ±0.2	23.3		-22.7 ^c	36*

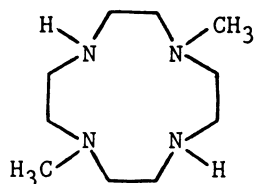
^c25°, 1.0; ^d25°, 2.0; ^e25°, 3.0; ^p35°, 0.2; ^q25°, 0.6; ^s10-40°, 0.2;*assuming ΔH for 0.1 = ΔH for 1.0

Bibliography:

H⁺, Co²⁺ 80KK;Ni²⁺ 80FM, 81CH, 85TH;

Other reference: 85KKP

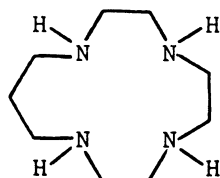
Cu²⁺ 83JN, 85THb;

 $C_{10}H_{24}N_4$ 1,7-Dimethyl-1,4,7,10-tetraazacyclododecane

L

Metal	Equilibrium	Log K
<u>ion</u>		<u>25°, 0.5</u>
H^+	HL/H.L	10.76
	$H_2L/HL.H$	9.41
Cu^{2+}	ML/M.L	17.89
	MHL/ML.H	9.30

Bibliography: 84CMN

 $C_9H_{22}N_4$ 1,4,7,10-Tetraazacyclotridecane ([13]ane N_4)
(Other values in Vol.5, p.184)

L

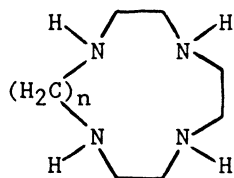
Metal	Equilibrium	Log K	Log K	Log K	ΔH	ΔS
<u>ion</u>		<u>25°, 0.1</u>	<u>25°, 0.5</u>	<u>35°, 0.2</u>	<u>25°, 0.1</u>	<u>25°, 0.1</u>
H^+	HL/H.L	11.02 $\pm$ 0.0	11.04	10.79	(-8) ^s	(24)
	$H_2L/HL.H$	9.96 $\pm$ 0.0	9.97	9.79	(-8) ^s	(19)
	$H_3L/H_2L.H$	2.0 -0.4		(1.5)		
	$H_4L/H_3L.H$			(0.8)		
Co^{2+}	ML/M.L			14.28		
Ni^{2+}	ML/M.L	18.0			-20.0 ^c	15 [*]
	ML(planar)/ML(oct.)	0.84			+7.5 ^c	29 [*]
Cu^{2+}	ML/M.L		24.4		-25.6 ^c	26 ^{b, #}
Zn^{2+}	ML/M.L	15.6	15.74		-15.3 ^b	21 ^b
Cd^{2+}	ML/M.L	12.71				
Pb^{2+}	ML/M.L	13.48				

^b25°, 0.5; ^c25°, 1.0; ^s10-40°, 0.2; ^{*}assuming ΔH for 0.1 = ΔH for 1.0;
[#]assuming ΔH for 0.5 = ΔH for 1.0

Bibliography:

H^+ , Co^{2+} 80KK, 85THb;
 Ni^{2+} 80FM, 85TH;

Cu^{2+} , Cd^{2+} , Pb^{2+} 85THb;
 Zn^{2+} 80MP

 $C_xH_yN_4$ 1,4,7,10-Tetraazacycloalkane

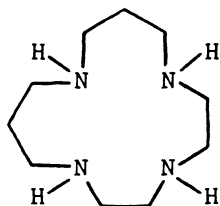
L

<u>Ligand</u>	<u>Metal ion</u>	<u>Equilibrium</u>	<u>Log K</u> <u>25°, 0.5</u>	<u>Log K</u> <u>35°, 0.2</u>	<u>ΔH</u> <u>25°, 0.5</u>	<u>ΔS</u> <u>25°, 0.5</u>
n = 4	H ⁺	HL/H.L	10.98	10.45		
-tetradecane		H ₂ L/HL.H	9.75	9.44		
		H ₃ L/H ₂ L.H	4.86	4.01		
(C ₁₀ H ₂₄ N ₄)		H ₄ L/H ₃ L.H	2.00	2.0		
	Co ²⁺	ML/M.L		11.67		
	Ni ²⁺	ML/M.L	14.81		-12.3 ^c	26 [*]
		ML(planar)/ML(oct.)	0.02		+4.1 ^c	14 [*]
	Cu ²⁺	ML/M.L	22.36		-20.3 ^c	34 [*]
n = 5	H ⁺	HL/H.L	10.33	10.25		
-pentadecane		H ₂ L/HL.H	9.48	9.23		
		H ₃ L/H ₂ L.H	5.71	5.17		
(C ₁₁ H ₂₆ N ₄)		H ₄ L/H ₃ L.H	1.28			
	Co ²⁺	ML/M.L		9.85		
	Ni ²⁺	ML/M.L	11.75		-11.4	16
		ML(planar)/ML(oct.)	0.33		+3.7	14
		MHL/ML.H	6.25			
	Cu ²⁺	ML/M.L	20.40		-19.2	29
		MHL/ML.H	1.95			
n = 6	H ⁺	HL/H.L		10.46		
-hexadecane		H ₂ L/HL.H		9.34		
		H ₃ L/H ₂ L.H		5.51		
(C ₁₂ H ₂₈ N ₄)	Co ²⁺	ML/M.L		9.04		

^c25°, 1.0; ^{*}assuming ΔH for 0.5 = ΔH for 1.0

Bibliography:

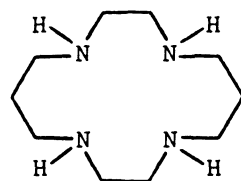
H⁺ 82MPP, 83MK, 84BBD;
Co²⁺ 83MK;Ni²⁺ 80PC, 82MPP, 83MPS, 84BBD;
Cu²⁺ 82MPP, 84BBD



$C_{10}H_{24}N_4$		<u>1,4,7,11-Tetraazacyclotetradecane (isocyclam)</u>				L
		(Other values in Vol.5, p.184)				
Metal		Log K	Log K	Log K	ΔH	ΔS
<u>ion</u>	<u>Equilibrium</u>	<u>25°, 0.1</u>	<u>25°, 0.5</u>	<u>35°, 0.2</u>	<u>25°, 0.2</u>	<u>25°, 0.2</u>
H^+	HL/H.L	10.93	11.14	10.69	(-9) ^s	(20)
	H ₂ L/HL.H	9.86	10.04	9.62	(-9) ^s	(15)
	H ₃ L/H ₂ L.H	3.2	4.17	2.91	(-9) ^s	(-16)
	H ₄ L/H ₃ L.H	(0.9)		(0.8)	(-4) ^s	(-9)
Co^{2+}	ML/M.L			10.9		
Ni^{2+}	ML/M.L				-19.7 ^c	
	ML(planar)/ML(oct.)					
		0.19			+5.3 ^c	19*

^c25°, 1.0; ^s25-35°, 0.2; * assuming ΔH for 0.1 = ΔH for 1.0

Bibliography: H^+ , Co^{2+} 80KK; Ni^{2+} 80FMa



C ₁₀ H ₂₄ N ₄		1,4,8,11-Tetraazacyclotetradecane ([14]aneN ₄ , cyclam)				L
		(Other values in Vol.5, p.185)				
Metal ion	Equilibrium	Log K 25°, 0.1	Log K 25°, 0.5	Log K 35°, 0.2	ΔH 25°, 0.5	ΔS 25°, 0.5
H ⁺	HL/H.L	11.49 ±0.1	11.63 ±0.05	11.11	-12.3	12
	H ₂ L/HL.H	10.5 ±0.3	10.62 -0.01	10.18	-12.8	6
	H ₃ L/H ₂ L.H	(1.5) ±0.1	(1.6)	(1.4)	(-3)	(-3)
	H ₄ L/H ₃ L.H	(0.9)		(0.7)		
Co ²⁺	ML/M.L			12.71		
Ni ²⁺	ML(oct.)/M.L	22.2			-24.1 ^c	21 ^{a,*}
	ML(planar)/ML(oct.)	0.43 ±0.05			+5.4 ^c	20 ^{a,*}
	MOHL/ML.H	13.0	13.7 ^c			
Cu ²⁺	ML/M.L	27.2	26.5			
Zn ²⁺	ML/M.L	15.5 ±0.0	15.34		-14.8 ^c	21 ^{a,*}
Cd ²⁺	ML/M.L	11.7 [#]				
Pb ²⁺	ML/M.L	11.3 [#]				

^a25°, 0.1; ^c25°, 1.0; * assuming ΔH for 0.1 = ΔH for 1.0;

[#]increased by 0.5 to adjust from the utilized protonation constants to the listed ones.

Bibliography: H^+ 79LC, 80KK, 84SLH, 85THb;

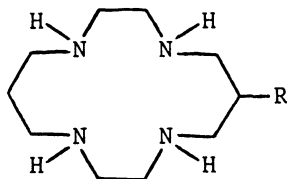
Co^{2+} 80KK;

Ni^{2+} 79HM, 80FMa, 80VB;

Other references: 82CH, 85MMa

Zn^{2+} 80MP, 84BSa;

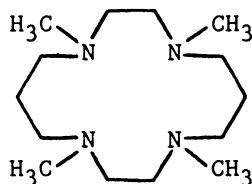
Cd^{2+} , Pb^{2+} 85THb;

 $C_xH_yN_4$ 6-Alkyl-1,4,8,11-tetraazacyclotetradecane

L

<u>Ligand</u>	<u>Metal ion</u>	<u>Equilibrium</u>	<u>Log K</u> <u>35°, 0.2</u>
R= CH ₃ 6-Methyl-	H ⁺	HL/H.L H ₂ L/HL.H H ₃ L/H ₂ L.H	11.08 10.12 2.0
(C ₁₁ H ₂₆ N ₄)	Co ²⁺	ML/M.L	12.04
R= CH ₂ CH ₃ 6-Ethyl-	H ⁺	HL/H.L H ₂ L/HL.H H ₃ L/H ₂ L.H	10.90 10.02 2.6
(C ₁₂ H ₂₈ N ₄)	Co ²⁺	ML/M.L	11.00
R= (CH ₂) ₂ CH ₃ 6-Propyl-	H ⁺	HL/H.L H ₂ L/HL.H H ₃ L/H ₃ L.H	10.52 9.92 3.2
(C ₁₃ H ₃₀ N ₄)	Co ²⁺	ML/M.L	10.64
R= (CH ₂) ₃ CH ₃ 6-Butyl-	H ⁺	HL/H.L H ₂ L/HL.H H ₃ L/H ₂ L.H	10.52 9.88 2.8
(C ₁₄ H ₃₂ N ₄)	Co ²⁺	ML/M.L	10.15
R= CH ₂ C ₆ H ₅ 6-Benzyl-	H ⁺	HL/H.L H ₂ L/HL.H H ₃ L/H ₂ L.H	10.51 9.74 2.4
(C ₁₇ H ₃₀ N ₄)	Co ²⁺	ML/M.L	9.28
R= CH ₂ C ₁₀ H ₇ 6-Naphthylmethyl- (isomer not stated)	H ⁺	HL/H.L H ₂ L/HL.H H ₃ L/H ₂ L.H	10.53 9.64 2.5
(C ₂₁ H ₃₂ N ₄)	Co ²⁺	ML/M.L	9.51

Bibliography: 83MK

 $C_{14}H_{32}N_4$

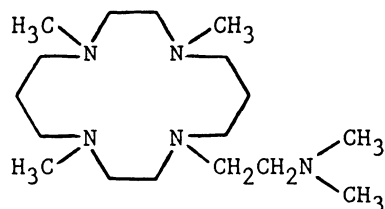
1,4,8,11-Tetramethyl-1,4,8,11-tetraazacyclotetradecane
(Other values in Vol.5, p.186)

L

Metal <u>ion</u>	<u>Equilibrium</u>	<u>Log K</u> <u>25°, 0.1</u>	<u>Log K</u> <u>25°, 0.5</u>	<u>Log K</u> <u>25°, 0</u>	<u>ΔH</u> <u>25°, 0.5</u>	<u>ΔS</u> <u>25°, 0.5</u>
H^+	HL/H.L	9.34	9.70		-5.1	27
	H_2L /HL.H	8.99	9.31		-10.3	8
	H_3L / H_2L .H	2.58	3.09		-3.6	2
	H_4L / H_3L .H	2.25	2.64		-6.9	-11
Co^{2+}	ML/M.L	7.58				
	ML/MOHL.H	8.02	8.31		-7.8	12
Ni^{2+}	ML/M.L	8.65			-1.5	49
	ML(planar)/ML(oct.)	-0.02	0.18	-0.22	+2.9 ^a	10 ^a
					+2.8	10
	ML/MOHL.H		10.7	10.8 ^c	-9.3	18
	MOHL(planar)/MOHL(oct.)		0.02		-12.2	-41
Cu^{2+}	ML/M.L	18.3			-13.4	(36)
Zn^{2+}	ML/M.L	10.4				
	MOHL/ML.OH	5.44				
Cd^{2+}	ML/M.L	9.0				
	MOHL/ML.OH	4.4				
Hg^{2+}	ML/M.L	20.3				

^a25°, 0.2; ^c25°, 1.0

Bibliography: H^+ , Zn^{2+} - Hg^{2+} 83NW, 84MMH; Co^{2+} 82MPB, 83NW; Ni^{2+} 79HM, 82CH, 82MPB, 83NH, 85BP;
 Cu^{2+} 83NW, 85BP

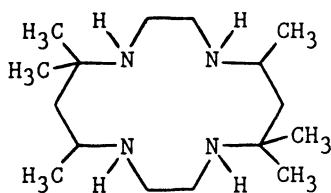
 $C_{17}H_{39}N_5$

1-(2-Dimethylaminoethyl)-4,8,11-trimethyl-
1,4,8,11-tetraazacyclotetradecane

L

Metal <u>ion</u>	<u>Equilibrium</u>	<u>Log K</u> <u>25°, 0.5</u>
H^+	HL/H.L	9.92
	H_2L /HL.H	9.49
	H_3L / H_2L .H	8.00
	H_4L / H_3L .H	3.17
Cu^{2+}	MHL/ML.H	7.28

Bibliography: 83BK

 $C_{16}H_{36}N_4$

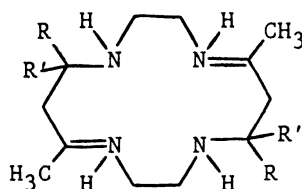
5,5,7,12,12,14-Hexamethyl-1,4,8,11-tetraazacyclotetradecane
(Other values in Vol.5, p.186)

L

<u>Isomer</u>	<u>Metal ion</u>	<u>Equilibrium</u>	<u>Log K</u> <u>25°, 0.1</u>	<u>ΔH</u> <u>25°, 0.1</u>	<u>ΔS</u> <u>25°, 0.1</u>
meso-	H^+	HL/H.L	(12.6)		
		H_2L /HL.H	10.4		
		H_3L / H_2L .H	(0.8)		
	Cu^{2+}	ML(blue)/M.L	20		
		ML(red)/ML(blue)	8		
		MOHL/ML(blue).OH	1.70		
		MOHL(red)/MOHL(blue)	6.20		
rac-	Cu^{2+}	ML(red)/ML(blue)	2.84		
		MOHL/ML(blue).OH	2.71		
		MOHL(red)/MOHL(blue)	0.11		
	Zn^{2+}	ML/M.L	12.9	-14.3	11

Bibliography: Cu^{2+} 79LM,80LC,80LCa; Zn^{2+} 81YP,81YV

Other references: 79CK,79LC,85MMa,85PP

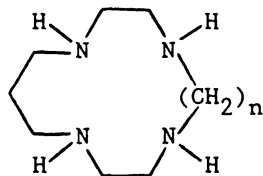
 $C_xH_yN_4$ 7,14-Disubstituted-5,12-dimethyl-1,4,8,11-tetraazacyclotetradec-4,11-diene

L

<u>Isomer</u>	<u>Metal ion</u>	<u>Equilibrium</u>	<u>Log K</u> <u>25°, 0.1</u>	<u>ΔH</u> <u>25°, 0.1</u>	<u>ΔS</u> <u>25°, 0.1</u>
R= R'= H 5,12-Dimethyl- ($C_{12}H_{24}N_4$)	Zn^{2+}	ML/M.L	15.0	-13.3	23
R= H, R'= CH_3 5,7,12,14- Tetramethyl- ($C_{14}H_{28}N_4$)	Zn^{2+}	ML/M.L	13.0	$(-12)^s$	(20)
R= R'= CH_3 5,7,7,12,14,14- Hexamethyl- ($C_{16}H_{32}N_4$)	Zn^{2+}	ML/M.L	9.5	-8.7	15

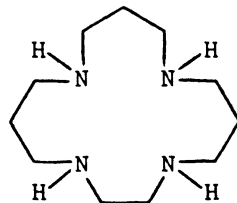
^s5-40°,0.1

Bibliography: 80YP,81YP,81YV



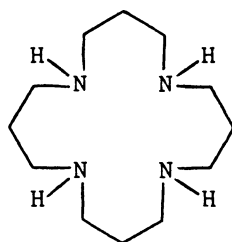
$C_xH_yN_4$		<u>1,4,8,11-Tetraazacycloalkane</u>				L
<u>Ligand</u>	<u>Metal ion</u>	<u>Equilibrium</u>	<u>Log K</u> <u>25°, 0.5</u>	<u>Log K</u> <u>35°, 0.2</u>	<u>ΔH</u> <u>25°, 0.5</u>	<u>ΔS</u> <u>25°, 0.5</u>
n= 4	H^+	HL/H.L	11.04	10.64	-11.1	13
-pentadecane		H ₂ L/HL.H	10.47	9.82	-12.3	7
		H ₃ L/H ₂ L.H	3.98	3.5	-6.5	-4
(C ₁₁ H ₂₆ N ₄)		H ₄ L/H ₃ L.H	3.41	(1.4)	-7.3	-9
	Co^{2+}	ML/M.L		12.41		
n= 5	H^+	HL/H.L		9.81		
-hexadecane		H ₂ L/HL.H		9.28		
		H ₃ L/H ₂ L.H		5.42		
(C ₁₂ H ₂₈ N ₄)		H ₄ L/H ₃ L.H		2.9		
	Co^{2+}	ML/M.L		11.70		

Bibliography: H^+ 82BBb,83MK; Co^{2+} 83MK; Other reference: 84BBS



$C_{11}H_{26}N_4$		<u>1,4,8,12-Tetraazacyclopentadecane ([15]aneN₄)</u>			L
		(Other values in Vol.5, p.187)			
Metal		Log K	Log K	ΔH	ΔS
<u>ion</u>	<u>Equilibrium</u>	<u>25°, 0.2</u>	<u>25°, 0.5</u>	<u>25°, 0.5</u>	<u>25°, 0.5</u>
H^+	HL/H.L	11.1	11.1 ±0.0	-10.8	15
	H ₂ L/HL.H	10.0	10.3 ±0.2	-12.3	6
	H ₃ L/H ₂ L.H		5.23 ±0.06	-7.2	0
	H ₄ L/H ₃ L.H		3.62 ±0.02	-7.7	-9
Ni^{2+}	ML(oct.)/M.L		18.38	-17.8 ^c	24 [*]
	MHL/ML.H		3.66		
Zn^{2+}	ML/M.L	15.0	15.35	-16.5 ^c	15 [*]

^c25°,1.0; ^{*} assuming ΔH for 0.5 = ΔH for 1.0
Bibliography: Ni^{2+} 80FM,83MPS; Zn^{2+} 80MP

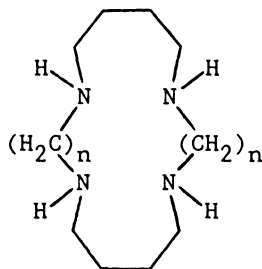
 $C_{12}H_{28}N_4$

1,5,9,13-Tetraazacyclohexadecane ([16]aneN₄)
(Other reference in Vol.5, p.438)

L

Metal		Log K	Log K	ΔH	ΔS
<u>ion</u>	<u>Equilibrium</u>	<u>25°, 0.1</u>	<u>25°, 0.5</u>	<u>25°, 0.5</u>	<u>25°, 0.5</u>
H^+	HL/H.L	10.64	10.70	-10.0	15
	$H_2L/HL.H$	9.49	9.65	-10.7	8
	$H_3L/H_2L.H$	6.77	7.06	-10.3	-2
	$H_4L/H_3L.H$	5.25	5.54	-10.6	-10
Ni^{2+}	ML(oct.)/M.L		13.23	-9.7	28
	MHL/ML.H		5.57		
Cu^{2+}	ML/M.L	(21.6)	(20.92)	-20.0	29
	MHL/ML.H		2.56		
Zn^{2+}	ML/M.L		13.05	-7.1	36

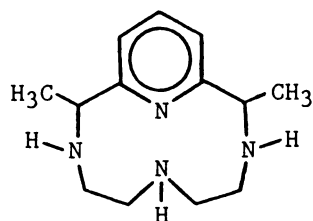
Bibliography: H^+ 80GMM,84SLH; Ni^{2+} 80GMM,83MP; Cu^{2+} 80GMM,83JN; Zn^{2+} 80MP

 $C_xH_yN_4$ Tetraazacycloalkane

L

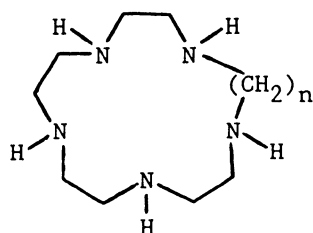
<u>Ligand</u>	Metal	<u>Equilibrium</u>	Log K
<u>ion</u>	<u>ion</u>		<u>20°, 0.1</u>
n= 3	H^+	HL/H.L	11.44
1,5,10,14-tetraa- cyclooctadecane ([18]aneN ₄)	Ag^+	$H_2L/HL.H$	10.51
		$H_3L/H_2L.H$	7.27
		$H_4L/H_3L.H$	6.90
		$ML_2/M.L^2$	8.0
(C ₁₄ H ₃₂ N ₄)		$M_2L_3/M^2.L^3$	16.6
n= 4	H^+	HL/H.L	11.82
1,6,11,16-Tetraaza- cycloeicosane ([20]aneN ₄)	Ag^+	$H_2L/HL.H$	11.38
		$H_3L/H_2L.H$	10.63
		$H_4L/H_3L.H$	8.87
		$ML/M.L$	5.7
(C ₁₆ H ₃₆ N ₄)		$ML_2/M.L^2$	8.3

Bibliography: 84SLH; Other reference: 82KKY



$C_{13}H_{26}N_4$ Meso-2,12-Dimethyl-3,7,11,17-tetraazabicyclo[11.3.1]heptadeca-13,15,17-triene L
(Other values in Vol.5, p.438)

Metal		ΔH
<u>ion</u>	<u>Equilibrium</u>	<u>25°, 1.0</u>
Ni^{2+}	ML/M.L	-12.0
	ML(planar)/ML(oct.)	4.4
Bibliography: 80FMa		



$C_xH_yN_5$		<u>1,4,7,10,13-Pentaazacycloalkane</u>					L
<u>Ligand</u>	<u>Metal ion</u>	<u>Equilibrium</u>	<u>Log K</u> <u>25°, 0.2</u>	<u>Log K</u> <u>35°, 0.2</u>	<u>ΔH</u> <u>25°, 0.2</u>	<u>ΔS</u> <u>25°, 0.2</u>	
n= 2	H^+	HL/H.L	10.73	10.60	(-7) ^s	(26)	
-pentadecane		H ₂ L/HL.H	9.53	9.33	(-7) ^s	(20)	
([15]aneN ₅)		H ₃ L/H ₂ L.H	5.88	5.69	(-8) ^s	(0)	
(C ₁₀ H ₂₅ N ₅)		H ₄ L/H ₃ L.H	(1.6)				
(C ₁₀ H ₂₅ N ₅)		H ₅ L/H ₄ L.H	(1.0)				
(Other values in Vol.5, p.187)	Co ²⁺ Ni ²⁺	ML/M.L ML/M.L		16.76	-16.1 ^c		
n= 3	H^+	HL/H.L	10.52	10.30	(-9) ^s	(18)	
-hexadecane		H ₂ L/HL.H	9.37	9.15	(-9) ^s	(13)	
([16]aneN ₅)		H ₃ L/H ₂ L.H	7.16	6.94	(-9) ^s	(3)	
(C ₁₁ H ₂₇ N ₅)		H ₄ L/H ₃ L.H	(1.6)				
(C ₁₁ H ₂₇ N ₅)		H ₅ L/H ₄ L.H	(1.3)				
(Other values in Vol.5, p.188)	Fe ²⁺ Co ²⁺ Ni ²⁺	ML/M.L ML/M.L ML/M.L		14.57 15.95	-23.0 ^c		
n= 4	H^+	HL/H.L		10.38			
-heptadecane		H ₂ L/HL.H		9.61			
(C ₁₂ H ₂₉ N ₅)		H ₃ L/H ₂ L.H		7.85			
(C ₁₂ H ₂₉ N ₅)	Co ²⁺	ML/M.L		15.40			
n= 5	H^+	HL/H.L		10.03			
-octadecane		H ₂ L/HL.H		9.40			
(C ₁₃ H ₃₁ N ₅)		H ₃ L/H ₂ L.H		8.43			
(C ₁₃ H ₃₁ N ₅)	Co ²⁺	ML/M.L		11.54			

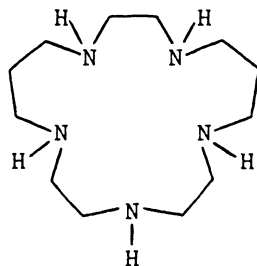
^c25°,1.0; ^s15-35°,0.2

^c25°, 1.0; ^s15-35°, 0.2

1,4,7,10,13-Pentaazacycloalkane (continued)

<u>Ligand</u>	<u>Metal ion</u>	<u>Equilibrium</u>	<u>Log K</u> <u>25°, 0.2</u>	<u>Log K</u> <u>35°, 0.2</u>	<u>ΔH</u> <u>25°, 0.2</u>	<u>ΔS</u> <u>25°, 0.2</u>
n= 6	H ⁺	HL/H.L		9.99		
-nonadecane		H ₂ L/HL.H		9.40		
		H ₃ L/H ₂ L.H		8.39		
(C ₁₄ H ₃₃ N ₅)		H ₄ L/H ₃ L.H		2.4		
	Co ²⁺	ML/M.L		7.36		

Bibliography: H⁺ 83MK; Fe²⁺ 82KKM; Co²⁺ 80Kka,83MK; Ni²⁺ 80Pc,81FMP

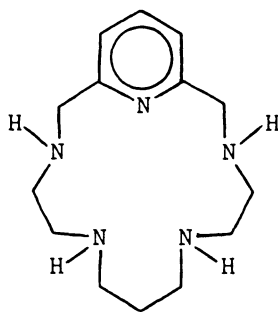
C₁₂H₂₉N₅

1,4,7,11,14-Pentaazacycloheptadecane
(Other values in Vol.5, p.188)

L

<u>Metal ion</u>	<u>Equilibrium</u>	<u>ΔH</u> <u>25°, 1.0</u>
Ni ²⁺	ML/M.L	-19.4

Bibliography: 80Pc,81FMP

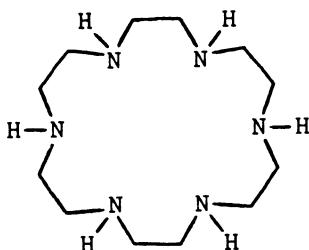
C₁₄H₂₅N₅

3,6,10,13,19-Heptaazabicyclo[13.3.1]-nonadeca-16,18,19-triene

L

<u>Metal ion</u>	<u>Equilibrium</u>	<u>Log K</u> <u>25°, 0.2</u>	<u>Log K</u> <u>35°, 0.2</u>	<u>ΔH</u> <u>25°, 0.2</u>	<u>ΔS</u> <u>25°, 0.2</u>
H ⁺	HL/H.L	9.36	9.15	(-8) ^s	(16)
	H ₂ L/HL.H	8.44	8.23	(-8) ^s	(12)
	H ₃ L/H ₂ L.H	5.71	5.56	(-6) ^s	(6)
	H ₄ L/H ₃ L.H		(1.8)		
Fe ²⁺	ML/M.L		10.76		
Co ²⁺	ML/M.L		13.96		

^s15-35°,0.2Bibliography: H⁺ 82KKM,82KKY; Fe²⁺,Co²⁺ 82KKM

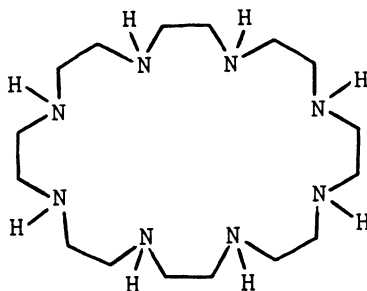


$C_{12}H_{30}N_6$		<u>1,4,7,10,13,16-Hexaazacyclooctadecane ([18]aneN₆)</u>				L
Metal	Equilibrium	Log K	Log K	ΔH	ΔS	
ion		<u>25°, 0.2</u>	<u>35°, 0.2</u>	<u>25°, 0.2</u>	<u>25°, 0.2</u>	
H^+	HL/H.L	10.07	9.80	$(-11)^S$	(9)	
	H ₂ L/HL.H	9.11	8.84	$(-11)^S$	(5)	
	H ₃ L/H ₂ L.H	8.61	8.33	$(-11)^S$	(2)	
	H ₄ L/H ₃ L.H	3.97	3.77	$(-8)^S$	(-9)	
K^+	ML/M.L	0.8				
Ca^{2+}	ML/M.L	2.4	2.5	$(-7)^S$	(-13)	
Sr^{2+}	ML/M.L	3.2				
La^{3+}	ML/M.L	5.7				
Co^{2+}	ML/M.L		18.9			
	MHL/ML.H		2.7			
Ni^{2+}	ML/M.L		19.6			
	MHL/ML.H		4.1			
Cu^{2+}	MHL/M.HL	21.6		$(-23)^S$	(22)	
	MH ₂ L/M.H ₂ L	16.1				
Zn^{2+}	ML/M.L	17.8		$(-12)^S$	(41)	
Cd^{2+}	ML/M.L	17.9		$(-14)^S$	(35)	
Hg^{2+}	ML/M.L	29.1		$(-42)^S$	(-8)	
Pb^{2+}	ML/M.L	14.1		$(-13)^S$	(21)	

^S15-35°, 0.2

Bibliography: 80KKY;

Other reference: 82CGM



$C_{16}H_{40}N_8$		<u>1,4,7,10,13,16,19,22-Octaazacyclotetracosane ([24]aneN₈)</u>				L
Metal	Equilibrium	Log K	ΔH	ΔS		
ion		<u>25°, 0.5</u>	<u>25°, 0.5</u>	<u>25°, 0.5</u>		
H^+	HL/H.L	10.01				
	H ₂ L/HL.H	9.50				

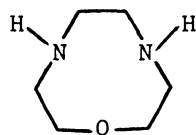
D. CYCLIC AMINES

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[24]aneN₈ (continued)

Metal		Log K	ΔH	ΔS
<u>ion</u>	<u>Equilibrium</u>	<u>25°, 0.5</u>	<u>25°, 0.5</u>	<u>25°, 0.5</u>
(H ⁺)	H ₃ L/H ₂ L.H	9.10		
	H ₄ L/H ₃ L.H	8.29		
	H ₅ L/H ₄ L.H	5.01		
	H ₆ L/H ₅ L.H	3.71		
	H ₇ L/H ₆ L.H	2.98		
	H ₈ L/H ₇ L.H	2.0		
Cu ²⁺	M ₂ L/M ² .L	36.63	-39.0	37
	M ₂ H ₂ L/M ₂ L.H ²	5.39		
	M ₂ L/M ₂ OHL.H	10.51		

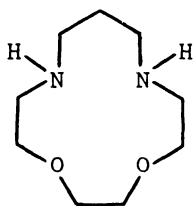
Bibliography: 85BMM

C₆H₁₄ON₂1-Oxa-4,7-diazacyclononane

L

Metal		Log K
<u>ion</u>	<u>Equilibrium</u>	<u>25°, 0.1</u>
H ⁺	HL/H.L	9.59
	H ₂ L/HL.H	5.32
Ni ²⁺	ML/M.L	8.59
	ML ₂ /M.L ²	15.86
Cu ²⁺	ML/M.L	10.85
	ML ₂ /M.L ²	19.49
Zn ²⁺	ML/M.L	6.32
	ML ₂ /M.L ²	11.39

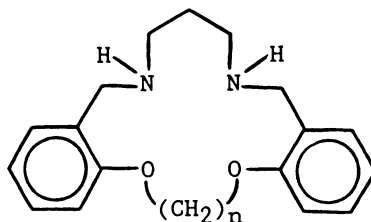
Bibliography: 82HT

C₉H₂₀O₂N₂1,4-Dioxa-7,11-diazacyclotridecane

L

Metal		Log K
<u>ion</u>	<u>Equilibrium</u>	<u>25°, 0.1</u>
H ⁺	HL/H.L	10.36
	H ₂ L/HL.H	6.62
Cu ²⁺	ML/M.L	8.39
Zn ²⁺	ML/M.L	4.89

Bibliography: 85THa

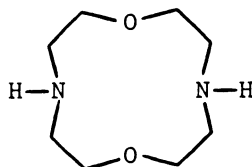
 $C_xH_yO_2N_2$ Dioxo-diazadibenzocycloalkane

L

<u>Ligand</u>	<u>Metal ion</u>	<u>Equilibrium</u>	<u>Log K</u> <u>25°, 0.1</u>	<u>Log K</u> <u>25°, 1.0</u>
n= 2	H ⁺	HL/H.L	9.69	9.96
1,4-Dioxo-8,12-diazadibenzo-		H ₂ L/HL.H	7.63	8.01
[5,6-14,15]-cyclopentadecane	Ni ²⁺	ML/M.L	5.1	5.4
(C ₁₉ H ₂₄ O ₂ N ₂)				
n= 3	H ⁺	HL/H.L	9.95	10.14
1,5-Dioxo-9,13-diazadibenzo-		H ₂ L/HL.H	7.71	8.07
[6,7-15,16]-cyclohexadecane	Ni ²⁺	ML/M.L	5.2	5.5

(C₂₀H₂₆O₂N₂)

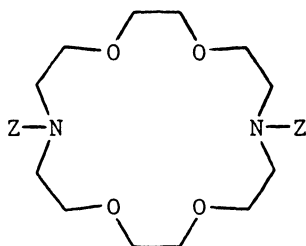
Bibliography: 80AEL

 $C_8H_{18}O_2N_2$ 1,7-Dioxo-4,10-diazacyclododecane

L

<u>Metal ion</u>	<u>Equilibrium</u>	<u>Log K</u> <u>25°, 0.1</u>
H ⁺	HL/H.L	9.39
	H ₂ L/HL.H	7.74
Co ²⁺	ML/M.L	6.01
	ML/MOHL.H	10.3
Ni ²⁺	ML/M.L	6.73
	ML/MOHL.H	8.0
Cu ²⁺	ML/M.L	7.92
	ML/MOHL.H	7.69
Ag ⁺	ML/M.L	4.65
	MHL/ML.H	7.4
Zn ²⁺	ML/M.L	6.51
	ML/MOHL.H	8.6
Cd ²⁺	ML/M.L	6.55
	ML/MOHL.H	7.7
Pb ²⁺	ML/M.L	6.37
	ML/MOHL.H	9.3

Bibliography: 85ASY; Other reference: 83LC



$C_xH_yO_zN_q$	7,16-Disubstituted-1,4,10,13-tetraoxa-7,16-diazacyclooctadecane					L
Ligand	Metal ion	Equilibrium	Log K 25°, 0.1	Log K 25°, 0.5	ΔH 25°, 0.1	ΔS 25°, 0.1
Z= H	H ⁺	HL/H.L	9.08 +0.01	9.25	-8.6	13
1,4,10,13-		H ₂ L/HL.H	7.94 -0.03	8.22	-9.5	4
(C ₁₂ H ₂₆ O ₄ N ₂)	Sr ²⁺	ML/M.L	2.65 ±0.0		-2.6	3
(Other values in Vol.5, p.189)	Ag ⁺	ML/M.L	7.8 +0.1	8.08	-9.2	5
	Cd ²⁺	ML/M.L	5.28 ±0.03	5.59	-0.7	22
	Pb ²⁺	ML/M.L	6.8	7.01		
Z= CH ₃	H ⁺	HL/H.L	9.58 ^Z			
7,16-Dimethyl-		H ₂ L/HL.H	7.61 ^Z			
(C ₁₄ H ₃₀ O ₄ N ₂)	Co ²⁺	ML/M.L	(4.4) ^Z			
	Ni ²⁺	ML/M.L	3.9 ^Z			
	Cu ²⁺	ML/M.L	6.82 ^Z			
		MHL/ML.H	7.17 ^Z			
	Ag ⁺	ML/M.L	7.27 ^Z			
	Zn ²⁺	ML/M.L	3.8 ^Z			
	Cd ²⁺	ML/M.L	4.38 ^Z			
	Hg ²⁺	ML/M.L	15.38 ^Z			
	Pb ²⁺	ML/M.L	8.39 ^Z			
Z= -CH ₂ CH ₂ OCH ₃	H ⁺	HL/H.L		8.54		
7,16-Bis-		H ₂ L/HL.H		7.43		
(2-methoxyethyl)-	Ag ⁺	ML/M.L		7.25		
(C ₁₈ H ₃₆ O ₆ N ₂)	Cd ²⁺	ML/M.L		5.01		
	Pb ²⁺	ML/M.L		8.39		
Z= -CH ₂ CH ₂ OH	H ⁺	HL/H.L		8.70		
7,16-Bis-		H ₂ L/HL.H		7.47		
(2-Hydroxyethyl)-	Ca ²⁺	ML/M.L		4.08		
(C ₁₆ H ₃₂ O ₆ N ₂)	Cu ²⁺	ML/M.L		6.60		
	Ag ⁺	ML/M.L		7.27		
	Cd ²⁺	ML/M.L		7.96		
	Pb ²⁺	ML/M.L		9.20		

^Z(CH₃CH₂)₄NC10₄ used as background electrolyte.

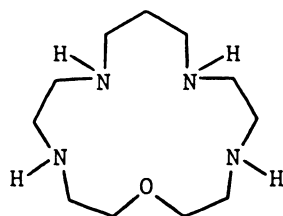
7,16-Disubstituted-1,4,10,13-tetraoxa-7,16-diazacyclooctadecane (continued)

<u>Ligand</u>	<u>Metal</u> <u>ion</u>	<u>Equilibrium</u>	<u>Log K</u> <u>25°, 0.1</u>	<u>Log K</u> <u>25°, 0.5</u>	<u>ΔH</u> <u>25°, 0.1</u>	<u>ΔS</u> <u>25°, 0.1</u>
Z= -CH ₂ C(=O)NH ₂	H ⁺	HL/H.L		6.68		
7,16-Bis-		H ₂ L/HL.H		5.40		
(carbamylmethyl)-	Ca ²⁺	ML/M.L		5.65		
(C ₁₆ H ₃₀ O ₆ N ₄)	Cu ²⁺	ML/M.L		7.38		
	Ag ⁺	ML/M.L		6.25		
	Cd ²⁺	ML/M.L		8.60		
	Pb ²⁺	ML/M.L		10.70		

Bibliography:

H⁺, Cu²⁺, Ag⁺, Cd²⁺, Pb²⁺ 81KMB, 85CSA;Ca²⁺ 81KMB;

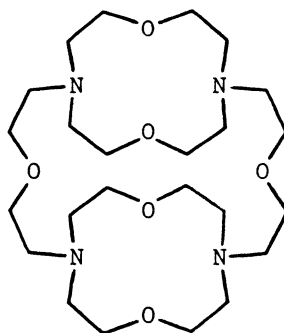
Other references: 79GF, 83LC

Sr²⁺ 85GLa;
Co²⁺, Ni²⁺, Zn²⁺, Hg²⁺ 85CSA;C₁₁H₂₆ON₂1-Oxa-4,7,11,14-tetraazacyclohexadecane

L

<u>Metal</u> <u>ion</u>	<u>Equilibrium</u>	<u>Log K</u> <u>35°, 0.2</u>
H ⁺	HL/H.L	9.23
	H ₂ L/HL.H	7.78
	H ₃ L/H ₂ L.H	4.78
	H ₄ L/H ₃ L.H	3
Co ²⁺	ML/M.L	11.42
Ni ²⁺	ML/M.L	12.30
Cu ²⁺	ML/M.L	15.62

Bibliography: H⁺, Co²⁺ 80KKA; Ni²⁺, Cu²⁺ 84KKH



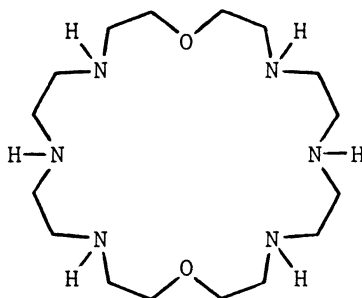
$C_{24}H_{48}O_6N_4$ 4,10,16,22,27,32-Hexaoxa-1,7,13,19-tetraazatricyclo[17.5.5^{7,13}]-tetratriacontane

L

Metal ion	Equilibrium	Log K 25°, 0.1
H^+	HL/H.L	10.2 ^z
	$H_2L/HL.H$	8.4 ^z
	$H_3L/H_2L.H$	6.7 ^z
	$H_4L/H_3L.H$	4 ^z
Co^{2+}	ML/M.L	5.6 ^z
	ML/MOHL.H	9.6 ^z
Cu^{2+}	$M_2L/M^2.L$	13.9 ^z
	$M_2L/M_2OHL.H$	6.8 ^z
	$M_2OHL/M_2(OH)_2L.H$	7.0 ^z
Ag^+	MHL/M.HL	6.1 ^z
	$M_2L/M^2.L$	13.5 ^z
Zn^{2+}	$M_2L/M^2.L$	9.3 ^z
	$M_2L/M_2(OH)_2L.H^2$	15.67 ^z
Cd^{2+}	ML/M.L	8.8 ^z
	MHL/ML.H	6.59 ^z
Pb^{2+}	ML/M.L	10.6 ^z
	MHL/ML.H	6.74 ^z
	ML/MOHL.H	8.38 ^z

^z(CH_3CH_2)₄NC10₄ used as background electrolyte.

Bibliography: 85ASY



$C_{16}H_{38}O_2N_6$ 1,4,7,13,16,19-Hexaaza-10,22-dioxacyclotetracosane (bisdien)

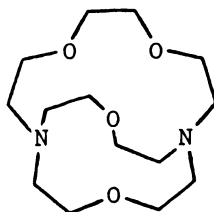
L

Metal ion	Equilibrium	Log K 25°, 0.1
H^+	HL/H.L	9.65
	$H_2L/HL.H$	8.92
	$H_3L/H_2L.H$	8.30

Bisdien (continued)

Metal ion	Equilibrium	Log K 25°, 0.1
(H ⁺)	H ₄ L/H ₃ L.H	7.64
	H ₅ L/H ₄ L.H	3.81
	H ₆ L/H ₅ L.H	3.26
Co ²⁺	ML/M.L	9.73
	MHL/ML.H	7.58
	MH ₂ L/MHL.H	5.97
	M ₂ L/ML.M	2.7
Ni ²⁺	ML/M.L	13.65
	MHL/ML.H	7.17
	MH ₂ L/MHL.H	5.03
Cu ²⁺	ML/M.L	16.46
	MHL/ML.H	8.01
	MH ₂ L/MHL.H	7.46
	MH ₃ L/MH ₂ L.H	3.45
	ML/MOHL.H	10.63
	M ₂ L/ML.M	10.84
	M ₂ L/M ₂ OHL.H	6.51
	M ₂ OHL/M ₂ (OH) ₂ L.H	10.40
Zn ²⁺	ML/M.L	10.66
	MHL/ML.H	7.58
	MH ₂ L/MHL.H	5.63
	ML/MOHL.H	10.63
	M ₂ L/ML.M	4.20

Bibliography: 83MML



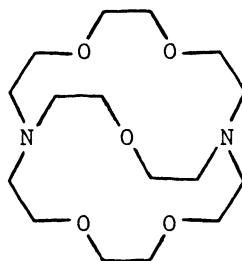
C₁₄H₂₈O₄N₂ 4,7,13,18-Tetraoxa-1,10-diazabicyclo[8.5.5]eicosane ([2.1.1]cryptand) L
 (Other values in Vol.5, p.190)

Metal ion	Equilibrium	Log K 25°, 0.05	Log K 25°, 0.1	Log K 25°, 0.25	ΔH 25°, 0.1	ΔS 25°, 0.05
H ⁺	HL/H.L	10.64 ^z		(10.48) ^z		
	H ₂ L/HL.H	7.85 ^z		7.86 ^z		
Li ⁺	ML/M.L	5.5 ^z			-5.2 ±0.1	8
Ca ²⁺	ML/M.L	2.4 ^z ±0.1			-0.3 ±0.2	10
Sm ³⁺	ML/M.L			6.8 ^z		
Ho ³⁺	ML/M.L			6.21 ^z		
Tm ³⁺	ML/M.L			6.8 ^z		
Yb ³⁺	ML/M.L			6.51 ^z		
Lu ³⁺	ML/M.L			6.55 ^z		
Ag ⁺	ML/M.L		8.51 ^z			

^z(alkyl)₄N⁺ salt used as background electrolyte.

Bibliography: H⁺-Lu³⁺ 81BB; Li⁺, Ca²⁺ 81L; Ag⁺ 84CSF

Other references: 75LW, 77GOa, 78CK, 78LL, 79BL, 82AS, 82ASa, 82FP



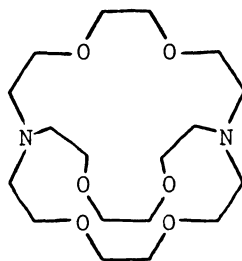
$C_{16}H_{32}O_5N_2$ 4,7,13,16,21-Pentaoxa-1,10-diazabicyclo[8.8.5]tricosane ([2.2.1]cryptand) L
(Other values in Vol.5, p.190)

Metal ion	Equilibrium	Log K <u>25°, 0.05</u>	Log K <u>25°, 0.1</u>	Log K <u>25°, 0.25</u>	ΔH <u>25°, 0.06</u>	ΔS <u>25°, 0.05</u>
H^+	HL/H.L	10.53 ^Z		10.75 ^Z		
	H ₂ L/HL.H	7.50 ^Z		7.68 ^Z		
Ca^{2+}	ML/M.L	6.90 ^Z ±0.06		7.6 ^Z	-2.9	22
Eu^{2+}	ML/M.L		9.3 ^Z	9.3 ^Z	(-9) ^S	(12) ^a
La^{3+}	ML/M.L			6.59 ^Z		
Pr^{3+}	ML/M.L			6.58 ^Z		
Sm^{3+}	ML/M.L			6.76 ^Z		
Eu^{3+}	ML/M.L			6.8 ^Z		
Gd^{3+}	ML/M.L			6.7 ^Z		
Tb^{3+}	ML/M.L			6.6 ^Z		
Er^{3+}	ML/M.L			6.60 ^Z		
Tm^{3+}	ML/M.L			6.88 ^Z		
Tl^+	ML/M.L		6.8 ^Z			

^Z(alkyl)₄N⁺ salt used as background electrolyte.

Bibliography: H^+ , Ca^{2+} , La^{3+} - Tm^{3+} 81BB; Eu^{2+} 80YG, 81BB; Tl^+ 80GB

Other references: 75LW, 78CK, 78LL, 79BL, 82AS, 82ASa, 83CS



$C_{18}H_{36}O_6N_2$ 4,7,13,16,21,24-Hexaoxa-1,10-diazabicyclo[8.8.8]hexacosane ([2.2.2]cryptand) L
(Other values in Vol.5, p.191)

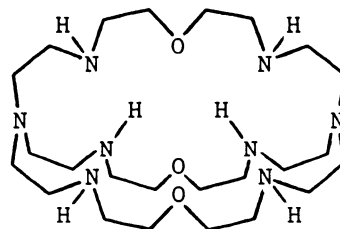
Metal ion	Equilibrium	Log K <u>25°, 0.1</u>	Log K <u>25°, 0.25</u>	Log K <u>25°, 0</u>	ΔH <u>25°, 0</u>	ΔS <u>25°, 0</u>
H^+	HL/H.L	9.71 ^Z ±0.1	9.95 ^Z		-10.8 ^a	8 ^a
		9.60 ^{P, Z}				
	H ₂ L/HL.H	7.31 ^Z ±0.1	7.59 ^Z		-4.5 ^a	18 ^a
		7.28 ^{P, Z}				

^a25°, 0.1; ^P25°, 0.05; ^Z(alkyl)₄N⁺ salt used as background electrolyte.

[2.2.2]Cryptand (continued)

Metal ion	Equilibrium	Log K 25°, 0.1	Log K 25°, 0.25	Log K 25°, 0	ΔH 25°, 0	ΔS 25°, 0
Li ⁺	ML/M.L			(1.25)	-1.4	1
Na ⁺	ML/M.L	4.0 ^Z ±0.1			-7.5 ^a ±0.1	-7 ^a
K ⁺	ML/M.L	5.5 ^Z ±0.1			-11.3 ^a ±0.3	-13 ^a
Cs ⁺	ML/M.L			(1.45)	-5.2	-11
Eu ²⁺	ML/M.L	10.5 ^Z	10.3 ^Z		(-14) ^s	(+1) ^a
La ³⁺	ML/M.L		6.45 ^Z			
Pr ³⁺	ML/M.L		6.37 ^Z			
Sm ³⁺	ML/M.L		5.94 ^Z			
Eu ³⁺	ML/M.L		5.90 ^Z			
Ho ³⁺	ML/M.L		6.2 ^Z			
Ag ⁺	ML/M.L(s)			-4.56		
Tl ⁺	ML/M.L	6.4 ^Z -0.9 6.3 ^{P, Z} ±0.1			-13.2 ^a	-15 ^a

^a25°, 0.1; ^P25°, 0.05; ^s5-35°, 0.1; ^Z(alkyl)₄N⁺ salt used as background electrolyte.
 Bibliography: H⁺ 81BB; Li⁺-Cs⁺ 77AD, 79YT, 80ADS, 82CF; Eu²⁺ 80YG, 81BB; La³⁺-Ho³⁺ 81BB;
 Ag⁺ 82CGa; Tl⁺ 79YT, 80GB;
 Other references: 75LW, 78CK, 78LL, 79BL, 82ASa

C₂₄H₅₄O₃N₈

7,19,30-Trioxa-1,4,10,13,16,22,27,33-octaazabicyclo-
[11.11.11]pentatriacontane (bistren)

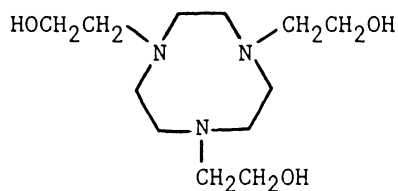
L

Metal ion	Equilibrium	Log K 25°, 0.1
H ⁺	HL/H.L	9.89
	H ₂ L/HL.H	9.23
	H ₃ L/H ₂ L.H	8.29
	H ₄ L/H ₃ L.H	7.65
	H ₅ L/H ₄ L.H	6.64
	H ₆ L/H ₅ L.H	6.01

Bistren (continued)

<u>Metal ion</u>	<u>Equilibrium</u>	<u>Log K 25°, 0.1</u>
Co ²⁺	ML/M.L	11.20
	ML/MOHL.H	9.13
	MHL/ML.H	8.52
	MH ₂ L/MHL.H	7.16
	MH ₃ L/MH ₂ L.H	6.85
	M ₂ L/ML.M	5.60
	M ₂ L/M ₂ OHL.H	7.20
Ni ²⁺	ML/M.L	11.70
	ML/MOHL.H	10.3
	MHL/ML.H	8.72
	MH ₂ L/MHL.H	7.76
	MH ₃ L/MH ₂ L.H	5.45
	M ₂ L/ML.M	6.8
	M ₂ L/M ₂ OHL.H	6.0
Cu ²⁺	ML/M.L	16.54
	ML/MOHL.H	10.23
	MHL/ML.H	8.78
	MH ₂ L/MHL.H	7.70
	MH ₃ L/MH ₂ L.H	6.87
	M ₂ L/ML.M	12.67
	M ₂ L/M ₂ OHL.H	4.26
Zn ²⁺	ML/M.L	11.86
	ML/MOHL.H	11.1
	MHL/ML.H	8.47
	MH ₂ L/MHL.H	7.72
	MH ₃ L/MH ₂ L.H	7.03
	M ₂ L/ML.M	6.36
	M ₂ L/M ₂ OHL.H	6.00

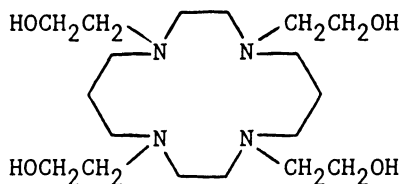
Bibliography: 82MML; Other references: 84DG, 84MMD

C₁₂H₂₇O₃N₃ N,N',N''-Tris(2-hydroxyethyl)-1,4,7-triazacyclononane

L

<u>Metal ion</u>	<u>Equilibrium</u>	<u>Log K 25°, 0.1</u>
H ⁺	HL/H.L	11.52
	H ₂ L/HL.H	3.42
Cu ²⁺	ML/M.L	15.50
Zn ²⁺	ML/M.L	12.07

Bibliography: 83SMH

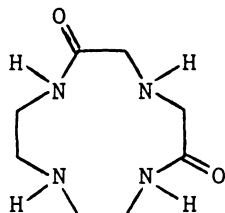


$C_{18}H_{40}O_4N_4$ 1,4,8,11-Tetra(2-hydroxyethyl)-1,4,8,11-tetraazacyclotetradecane L

Metal ion	Equilibrium	Log K 25°, 0.1
H^+	HL/H.L	8.80
	$H_2L/HL.H$	8.24
	$H_3L/H_2L.H$	2.69
	$H_4L/H_3L.H$	(1.2)
Mg^{2+}	ML/M.L	1.86
Co^{2+}	ML/M.L	6.10
	MOHL/ML.OH	6.85*
Ni^{2+}	ML/M.L	7.31
	MOHL/ML.OH	5.01*
Cu^{2+}	ML/M.L	15.69
Zn^{2+}	ML/M.L	6.43
	MOHL/ML.OH	7.32*
Cd^{2+}	ML/M.L	9.38
	MOHL/ML.OH	4.28*
Hg^{2+}	ML/M.L	17.94
Pb^{2+}	ML/M.L	6.28
	MOHL/ML.OH	5.1*

*Value used for K_w not stated.

Bibliography: 84MMH

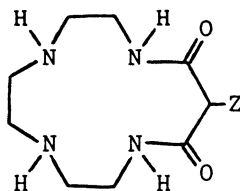


$C_8H_{16}O_2N_4$ 1,4,7,10-Tetraazacyclododecan-2,6-dione L

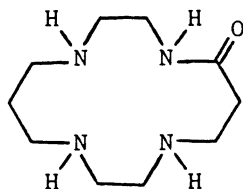
Metal ion	Equilibrium	Log K 25°, 0.2	Log K 35°, 0.1	ΔH 25°, 0.2	ΔS 25°, 0.2
H^+	HL/H.L	7.48	7.28	$(-8)^s$	(7)
	$H_2L/HL.H$	4.28	4.08	$(-8)^s$	(-34)
Ni^{2+}	ML/M.L		3.82		
	ML(planar)/ML(oct.)	-0.13		$(+9)^t$	(30)
	$M(H_2L).H^2/M.L$		-12.96		
Cu^{2+}	$M(H_1L).H/M.L$	-2.56			
	$M(H_2L).H^2/M.L$	-9.17			

^s25-35°, 0.2; ^t2-50°, 0.2

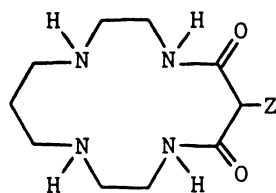
Bibliography: 81KK



$C_xH_yO_zN_q$	<u>12-Substituted-1,4,7,10-Tetraazacyclotridecan-11,13-dione</u>						L
<u>Ligand</u>	<u>Metal ion</u>	<u>Equilibrium</u>	<u>Log K</u> <u>25°, 0.1</u>	<u>Log K</u> <u>35°, 0.2</u>	<u>ΔH</u> <u>25°, 0.2</u>	<u>ΔS</u> <u>25°, 0.2</u>	
Z= H	H ⁺	HL/H.L H ₂ L/HL.H	8.78 +0.1 4.12 -0.4				
(C ₉ H ₁₈ O ₂ N ₄)	Co ²⁺	M(H ₋₂ L).H ² /M.L		-9.64			
	Ni ²⁺	M(H ₋₂ L).H ² /M.L ML(planar)/ML(oct.)		-6.05			
			0.23		(+9) ^s	(31)	
	Cu ²⁺	ML/M.L M(H ₋₂ L).H ² /M.L	7.73 -2.02 -0.2				
Z= CH ₂ CH ₂ C ₆ H ₅ 12-(2-Phenyl-ethyl)- (C ₁₇ H ₂₆ O ₂ N ₄)	H ⁺	HL/H.L H ₂ L/HL.H	8.99 3.67				
	Ni ²⁺	M(H ₋₂ L).H ² /M.L		-6.50			
	Cu ²⁺	M(H ₋₂ L).H ² /M.L	-3.66				
Z= CH ₂ CH ₂ C ₅ H ₄ N 12-(2-(2-Pyridyl)-ethyl)- (C ₁₆ H ₂₅ O ₂ N ₅)	H ⁺	HL/H.L H ₂ L/HL.H H ₃ L/H ₂ L.H	8.97 5.45 3.77				
	Ni ²⁺	M(H ₋₂ L).H ² /M.L		-7.11			
	Cu ²⁺	M(H ₋₂ L).H ² /M.L	-3.34				
Z= CH ₂ CH ₂ C ₅ H ₄ NO 12-(2-(2-Pyridyl)-ethyl)-...-N-oxide (C ₁₆ H ₂₅ O ₃ N ₅)	H ⁺	HL/H.L H ₂ L/HL.H	8.66 5.16				
	Ni ²⁺	M(H ₋₂ L).H ² /M.L		-9.15			
	Cu ²⁺	M(H ₋₂ L).H ² /M.L	-6.21				
^s 2-50°, 0.2							
Bibliography: H ⁺ 79KK, 83MK, 84BF, 84KKM; Co ²⁺ 83MK; Ni ²⁺ 81KK, 84KKM; Cu ²⁺ 79KK, 84KKM							



$C_{10}H_{22}ON_4$	<u>1,4,8,11-Tetraazacyclotetradecan-5-one</u>				L
<u>Metal ion</u>	<u>Equilibrium</u>	<u>Log K</u> <u>25°, 0.2</u>	<u>Log K</u> <u>35°, 0.2</u>		
H ⁺	HL/H.L H ₂ L/HL.H H ₃ L/H ₂ L.H	10.30 6.99 3.1	10.12 6.78 2.8		
Co ²⁺	M(H ₋₁ L).H/M.L		1.48		
Ni ²⁺	M(H ₋₁ L).H/M.L		4.00		
Cu ²⁺	M(H ₋₁ L).H/M.L	13.00			
Bibliography: H ⁺ , Co ²⁺ 83MK; Ni ²⁺ , Cu ²⁺ 84KKM					

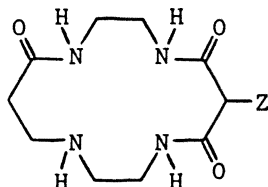


$C_xH_yO_zN_q$	<u>6-Substituted-1,4,8,11-tetraazacyclotetradecan-5,7-dione</u>						L
<u>Ligand</u>	<u>Metal ion</u>	<u>Equilibrium</u>	<u>Log K</u> <u>25°, 0.1</u>	<u>Log K</u> <u>35°, 0.2</u>	<u>ΔH</u> <u>25°, 0.2</u>	<u>ΔS</u> <u>25°, 0.2</u>	
Z= H	H ⁺	HL/H.L H ₂ L/HL.H	9.51 ±0.1 5.80 ±0.05	9.22 5.30			
(5,7-dioxocyclam)	Co ²⁺	M(H ₂ L).H ² /M.L		-11.10			
(C ₁₀ H ₂₀ O ₂ N ₄)	Ni ²⁺	M(H ₂ L).H ² /M.L ML(planar)/ML(oct.)		-5.15			
	Cu ²⁺	ML/M.L M(H ₂ L).H ² /M.L	0.20 8.75 0.44 ±0.6		(+7) ^S	(24)	
Z= CH ₃ 6-Methyl-	H ⁺	HL/H.L H ₂ L/HL.H		9.23 5.04			
(C ₁₁ H ₂₂ O ₂ N ₄)	Co ²⁺	M(H ₂ L).H ² /M.L		-11.89			
Z= CH ₂ CH ₃ 6-Ethyl-	H ⁺	HL/H.L H ₂ L/HL.H		9.20 ^P 5.06 ^P			
(C ₁₂ H ₂₄ O ₂ N ₄)	Co ²⁺	M(H ₂ L).H ² /M.L		-12.19			
Z= (CH ₂) ₂ CH ₃ 6-Propyl-	H ⁺	HL/H.L H ₂ L/HL.H		9.23 ^P 5.05 ^P			
(C ₁₃ H ₂₆ O ₂ N ₄)	Co ²⁺	M(H ₂ L).H ² /M.L		-12.22 ^P			
Z= (CH ₂) ₃ CH ₃ 6-Butyl-	H ⁺	HL/H.L H ₂ L/HL.H		9.25 ^P 5.09 ^P			
(C ₁₄ H ₂₈ O ₂ N ₄)	Co ²⁺	M(H ₂ L).H ² /M.L		-12.32 ^P			
Z= CH ₂ C ₆ H ₅ 6-Benzyl-	H ⁺	HL/H.L H ₂ L/HL.H	9.35 5.70	9.09 ^P 5.09 ^P			
(C ₁₇ H ₂₆ O ₂ N ₄)	Co ²⁺ Cu ²⁺	M(H ₂ L).H ² /M.L M(H ₂ L).H ² /M.L		-11.43 ^P			
Z= CH ₂ CH ₂ C ₆ H ₅ 6-(2-Phenylethyl)-	H ⁺	HL/H.L H ₂ L/HL.H	9.57 5.69				
(C ₁₈ H ₂₈ O ₂ N ₄)	Ni ²⁺ Cu ²⁺	M(H ₂ L).H ² /M.L M(H ₂ L).H ² /M.L		-6.30 -1.10			
Z= CH ₂ C ₁₀ H ₇ 6-Naphtylmethyl-	H ⁺	HL/H.L H ₂ L/HL.H		9.22 ^P 4.99 ^P			
(C ₂₂ H ₂₈ O ₂ N ₄) (isomer not stated)	Co ²⁺	M(H ₂ L).H ² /M.L		-12.05 ^P			

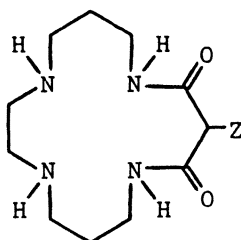
^P35°, 0.01; ^S2-50°, 0.2

6-Substituted-1,4,8,11-tetraazacyclotetradecan-5,7-dione (continued)

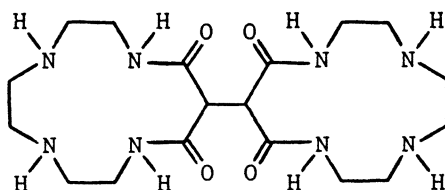
<u>Ligand</u>	<u>Metal ion</u>	<u>Equilibrium</u>	<u>Log K</u> <u>25°, 0.1</u>	<u>Log K</u> <u>35°, 0.2</u>	<u>ΔH</u> <u>25°, 0.2</u>	<u>ΔS</u> <u>25°, 0.2</u>
Z= CH ₂ CH ₂ C ₅ H ₄ N	H ⁺	HL/H.L	9.58			
6-(2-(2-pyridyl)-ethyl)-		H ₂ L/HL.H	5.89			
		H ₃ L/H ₂ L.H	4.07			
(C ₁₇ H ₂₇ O ₂ N ₅)	Ni ²⁺	M(H ₂ L).H ² /M.L		-5.94		
	Cu ²⁺	M(H ₂ L).H ² /M.L	-1.00			
Z= CH ₂ CH ₂ C ₅ H ₄ NO	H ⁺	HL/H.L	9.33			
6-(2-(2-pyridyl)-ethyl)-...-N-oxide		H ₂ L/HL.H	5.22			
	Ni ²⁺	M(H ₂ L).H ² /M.L		-10.25		
(C ₁₇ H ₂₇ O ₃ N ₅)	Cu ²⁺	M(H ₂ L).H ² /M.L	-2.34			
Bibliography: H ⁺ 79KK, 80HN, 83FP, 83MK, 84FF, 84KKM; Co ²⁺ 83MK; Ni ²⁺ 81KK, 84KKM; Cu ²⁺ 79KK, 83FP, 84FF, 84KKM						



<u>C_xH_yO_zN_q</u>	<u>6-Substituted-1,4,8,11-tetraazacyclotetradecan-5,7,14-trione</u>				L
<u>Ligand</u>	<u>Metal ion</u>	<u>Equilibrium</u>	<u>Log K</u> <u>25°, 0.2</u>	<u>Log K</u> <u>35°, 0.2</u>	
R= H	H ⁺	HL/H.L	8.26	7.95	
(C ₁₀ H ₁₈ O ₃ N ₄)	Cu ²⁺	M(H ₂ L).H ² /M.L	-9.24		
R= CH ₂ CH ₂ C ₆ H ₅	H ⁺	HL/H.L	7.59		
6-(2-phenylethyl)-	Cu ²⁺	M(H ₃ L).H ³ /M.L	-16.34		
(C ₂₀ H ₂₆ O ₃ N ₄)					
R= CH ₂ CH ₂ C ₅ H ₄ N	H ⁺	HL/H.L	7.58		
6-(2-(2-pyridyl)-ethyl)-		H ₂ L/HL.H	4.93		
	Cu ²⁺	M(H ₃ L).H ³ /M.L	-16.20		
(C ₁₉ H ₂₅ O ₃ N ₅)					
R= CH ₂ CH ₂ C ₅ H ₄ NO	H ⁺	HL/H.L	5.31		
6-(2-(2-pyridyl)-ethyl)-...-N-oxide	Cu ²⁺	M(H ₃ L).H ³ /M.L	-18		
(C ₁₉ H ₂₅ O ₄ N ₅)					
Bibliography: H ⁺ 83MK, 84KKM; Cu ²⁺ 84KKM					



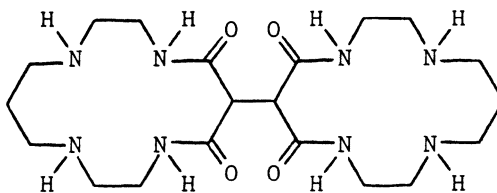
$C_xH_yO_2N_z$	<u>10-Substituted-1,4,8,12-tetraazacyclopentadecan-9,11-dione</u>						L
<u>Ligand</u>	<u>Metal ion</u>	<u>Equilibrium</u>	<u>Log K</u> <u>25°, 0.2</u>	<u>Log K</u> <u>35°, 0.2</u>	<u>ΔH</u> <u>25°, 0.2</u>	<u>ΔS</u> <u>25°, 0.2</u>	
R= H	H ⁺	HL/H.L H ₂ L/HL.H	9.28 6.40				
(C ₁₁ H ₁₈ O ₂ N ₄)	Ni ²⁺	M(H ₋₂ L).H ² /M.L ML(planar)/ML(oct.)		-8.92			
			0.40		(+7) ^s	(25)	
	Cu ²⁺	M(H ₋₂ L).H ² /M.L	-4.49				
R= CH ₂ CH ₂ C ₆ H ₅ 10-(2-phenyl-ethyl)-	H ⁺	HL/H.L H ₂ L/HL.H	9.27 6.21				
(C ₁₉ H ₂₆ O ₂ N ₄)	Ni ²⁺	M(H ₋₂ L).H ² /M.L		-8.65			
	Cu ²⁺	M(H ₋₂ L).H ² /M.L	-4.43				
R= CH ₂ CH ₂ C ₅ H ₄ N 10-(2-(2-pyridyl)-ethyl)-	H ⁺	HL/H.L H ₂ L/HL.H H ₃ L/H ₂ L.H	9.32 6.33 5.23				
(C ₁₈ H ₂₅ O ₂ N ₅)	Ni ²⁺	M(H ₋₂ L).H ² /M.L		-8.94			
	Cu ²⁺	M(H ₋₂ L).H ² /M.L	-4.23				
^s 2-50°, 0.2							
Bibliography: H ⁺ , Cu ²⁺ 79KK, 84KKM; Ni ²⁺ 81KK, 84KKM							



$C_{18}H_{34}O_4N_8$	<u>Bis(11,13-dioxo-1,4,7,10-tetraazacyclotridecan-12-yl)</u> ([13]bisdioxocyclam)	L
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<u>Metal ion</u>	<u>Equilibrium</u>	<u>Log K</u> <u>25°, 0.1</u>
H ⁺	HL/H.L H ₂ L/HL.H H ₃ L/H ₂ L.H H ₄ L/H ₃ L.H	8.98 8.51 3.71 2.78
Cu ²⁺	M ₂ L/M ² .L M ₂ L/M ₂ (H ₋₂ L).H ² M ₂ (H ₋₂ L)/M ₂ (H ₋₄ L).H ²	14.00 10.34 10.75

Bibliography: 84BF

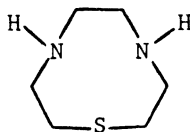
 $C_{20}H_{38}O_4N_8$

Bis(5,7-dioxo-1,4,8,11-tetraazacyclotetradecan-6-yl)
([14]bisdioxocyclam)

L

Metal		Log K
<u>ion</u>	<u>Equilibrium</u>	<u>25°, 0.1</u>
H^+	HL/H.L	9.96
	$H_2L/HL.H$	9.45
	$H_3L/H_2L.H$	5.40
	$H_4L/H_3L.H$	4.62
Cu^{2+}	ML/M.L	14.54
	$ML/M(H_2LH).H$	4.96
	$M(H_2LH)/M(H_2L).H$	9.33
	$M_2L/ML.M$	3.25
	$M_2L/M_2(H_2L).H^2$	9.20
	$M_2(H_2L)/M_2(H_4L).H^2$	9.93

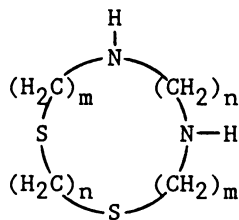
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 $C_6H_{14}N_2S$ 1-Thia-4,7-diazacyclononane

L

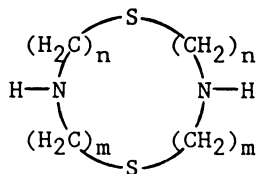
Metal		Log K
<u>ion</u>	<u>Equilibrium</u>	<u>25°, 0.1</u>
H^+	HL/H.L	9.67
	$H_2L/HL.H$	3.98
Ni^{2+}	ML/M.L	10.45
	$ML_2/M.L^2$	20.05
Cu^{2+}	ML/M.L	12.42
	$ML_2/M.L^2$	22.29

Bibliography: 83HB

 $C_xH_yN_2S_2$ Dithia-diazacycloalkane

L

<u>Ligand</u>	<u>Metal ion</u>	<u>Equilibrium</u>	<u>Log K</u> <u>25°, 0.5</u>	<u>Log K</u> <u>20°, 0.2</u>	<u>ΔH</u> <u>25°, 0.5</u>	<u>ΔS</u> <u>25°, 0.5</u>
n= m= 2 1,4-Dithia- 7,10-diaza- cyclododecane ($C_8H_{18}N_2S_2$)	H^+	HL/H.L H ₂ L/HL.H	9.13 5.04	9.11 5.20	-8.1 -9.1	15 -7
	Ni^{2+}	ML/M.L	7.80			
	Cu^{2+}	ML/M.L MOHL/ML.OH	14.21 2.79*	13.95	-14.2	17
	Cu^+	ML/M.L MHL/ML.H		13.14 2.97		
n= 2, m= 3 1,4-Dithia- 8,11-diaza- cyclotetradecane ($C_{10}H_{22}N_2S_2$)	H^+	HL/H.L H ₂ L/HL.H	9.77 5.72	9.75 6.01	-9.7 -8.6	12 -3
	Ni^{2+}	ML/M.L	8.91			
	Cu^{2+}	ML/M.L	15.96	15.85	-15.8	20
	Cu^+	ML/M.L MHL/ML.H		13.39 4.09		
n= m= 3 1,5-Dithia- 9,13-diaza- cyclohexadecane ($C_{12}H_{26}N_2S_2$)	H^+	HL/H.L H ₂ L/HL.H	10.49 7.74	10.45 7.86	-11.0 -10.7	11 -1
	Cu^{2+}	ML/M.L	10.56	10.15		
	Cu^+	ML/M.L		14.35		

*Value used for K_w not given.Bibliography: H^+ , Cu^{2+} 84BKS, 85MPS; Ni^{2+} 85MPS; Cu^+ 84BKS $C_xH_yN_2S_2$ Dithia-diazacycloalkane

L

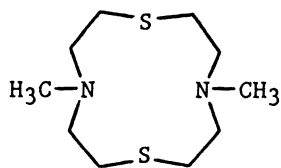
<u>Ligand</u>	<u>Metal ion</u>	<u>Equilibrium</u>	<u>Log K</u> <u>25°, 0.5</u>	<u>Log K</u> <u>25°, 0.2</u>	<u>ΔH</u> <u>25°, 0.5</u>	<u>ΔS</u> <u>25°, 0.5</u>
n= m= 2 1,7-Dithia- 4,10-diaza- cyclododecane ($C_8H_{18}N_2S_2$)	H^+	HL/H.L H ₂ L/HL.H	9.24 6.26	9.14 6.29	-9.6 -10.1	10 -5
	Ni^{2+}	ML/M.L	9.07			
	Cu^{2+}	ML/M.L MOHL/ML.OH	12.02 4.76*	11.69	-9.5	23
	Cu^+	ML/M.L MHL/ML.H		12.33 3.30		

*Value used for K_w not given.

Dithia-diazacycloalkane (continued)

<u>Ligand</u>	<u>Metal ion</u>	<u>Equilibrium</u>	<u>Log K</u> <u>25°, 0.5</u>	<u>Log K</u> <u>25°, 0.2</u>	<u>ΔH</u> <u>25°, 0.5</u>	<u>ΔS</u> <u>25°, 0.5</u>
n= 2, m= 3	H ⁺	HL/H.L	9.25	9.22		
1,8-Dithia-		H ₂ L/HL.H	7.95	8.00		
4,12-diaza-	Ni ²⁺	ML/M.L	8.32			
cyclotetradecane	Cu ²⁺	ML/M.L	13.14	12.89	-13.9	13
(C ₁₀ H ₂₂ N ₂ S ₂)	Cu ⁺	ML/M.L		14.20		
		MHL/ML.H		4.48		
n= m= 3	H ⁺	HL/H.L	9.95	9.89	-12.1	5
1,9-Dithia-		H ₂ L/HL.H	9.09	9.11	-11.2	4
5,13-diaza-	Cu ²⁺	ML/M.L	10.60	10.27		
cyclohexadecane	Cu ⁺	ML/M.L		13.95		
(C ₁₂ H ₂₆ N ₂ S ₂)		MHL/ML.H		6.11		

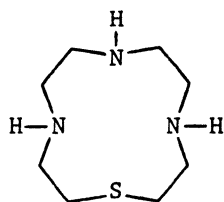
Bibliography: H⁺, Cu²⁺ 84BKS, 85MPS; Ni²⁺ 85MPS; Cu⁺ 84BKS



C₁₀H₂₂N₂S₂ 4,10-Dimethyl-1,7-dithia-4,10-diazacyclododecane L

<u>Metal ion</u>	<u>Equilibrium</u>	<u>Log K</u> <u>25°, 0.1</u>
H ⁺	HL/H.L	9.39
	H ₂ L/HL.H	6.03
Co ²⁺	ML/M.L	4.24
	ML/MOHL.H	3.16
Cu ²⁺	ML/M.L	12.10
Ag ⁺	ML/M.L	11.15
	MHL/ML.H	3.56
Zn ²⁺	ML/M.L	4.87
	ML/MOHL.H	1.78
Cd ²⁺	ML/M.L	6.59
	ML/MOHL.H	2.16
Pb ²⁺	ML/M.L	6.16

Bibliography: 85AAS

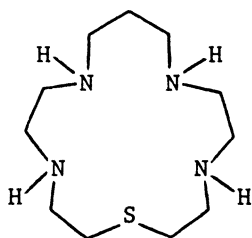
 $C_8H_{19}N_3S$ 1-Thia-4,7,10-triazacyclododecane

L

Metal ion	Equilibrium	Log K <u>25°, 0.2</u>	Log K <u>35°, 0.2</u>	ΔH <u>25°, 0.2</u>	ΔS <u>25°, 0.2</u>
H^+	HL/H.L	9.53	9.23	$(-12)^S$	(3)
	$H_2L/HL.H$	8.15	7.95	$(-8)^S$	(10)
	$H_3L/H_2L.H$	3.09	2.9	$(-8)^S$	(-13)
Fe^{2+}	ML/M.L		7.82		
Co^{2+}	ML/M.L		11.11		
Ni^{2+}	ML/M.L		(9.45)		
Cu^{2+}	ML/M.L	17.98			
Hg^{2+}	ML/M.L	24.32			

^S25-35°, 0.2

Bibliography: 84KKH

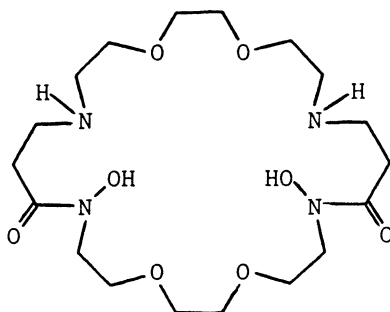
 $C_{11}H_{26}N_4S$ 1-Thia-4,7,11,14-tetraazacyclohexadecane

L

Metal ion	Equilibrium	Log K <u>25°, 0.2</u>	Log K <u>35°, 0.2</u>	ΔH <u>25°, 0.2</u>	ΔS <u>25°, 0.2</u>
H^+	HL/H.L	9.33	9.03	$(-12)^S$	(2)
	$H_2L/HL.H$	8.85	8.65	$(-8)^S$	(14)
	$H_3L/H_2L.H$	4.49	4.28	$(-8)^S$	(-6)
	$H_4L/H_3L.H$	3.2	3.0	$(-8)^S$	(-12)
Fe^{2+}	ML/M.L		10.29		
Co^{2+}	ML/M.L		13.39		
Ni^{2+}	ML/M.L		(7.82)		
Cu^{2+}	ML/M.L	24.14			
Hg^{2+}	ML/M.L	25.15			

^S25-35°, 0.2

Bibliography: 84KKH

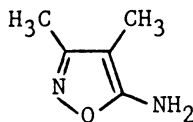
 $C_{18}H_{36}O_8N_4$

7,24-Dihydroxy-8,23-dioxo-1,4,14,17-tetraoxa-
7,11,20,24-tetraazacyclohexacosane

 H_2L

Metal ion	Equilibrium	Log K 25°, 0.1
H^+	HL/H.L	9.86
	$H_2L/HL.H$	9.21
	$H_3L/H_2L.H$	7.70
	$H_4L/H_3L.H$	4.14
Ni^{2+}	ML/M.L	10.82
	MHL/ML.H	8.10
	$MH_2L/MHL.H$	7.95
	$MH_3L/MH_2L.H$	4.11
Fe^{3+}	MHL/M.HL	15.78
	$MH_2L/MHL.H$	3.70

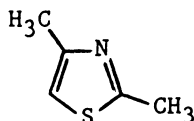
Bibliography: 85SMb

 $C_5H_8ON_2$ 5-Amino-3,4-dimethyl-1,2-oxazole

L

Metal ion	Equilibrium	Log K 25°, 0.5
H^+	HL/H.L	(1.3)
Co^{2+}	ML/M.L	0.83
Ni^{2+}	ML/M.L	0.97
Cu^{2+}	ML/M.L	1.33
	$ML_2/M.L^2$	1.78
Ag^+	ML/M.L	1.63
	$ML_2/M.L^2$	3.58
Zn^{2+}	ML/M.L	0.78
Cd^{2+}	ML/M.L	0.90

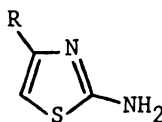
Bibliography: 83GW

 C_5H_7NS 2,4-Dimethyl-1,3-thiazole

L

Metal ion	Equilibrium	Log K 25°, 0.5
H^+	HL/H.L	4.02
Co^{2+}	$ML_2/M.L^2$	0.72
Ni^{2+}	$ML_2/M.L^2$	0.71
Cu^{2+}	ML/M.L	0.60
	$ML_2/M.L^2$	1.13
Zn^{2+}	$ML_2/M.L^2$	0.65
Cd^{2+}	ML/M.L	0.54
	$ML_2/M.L^2$	1.20

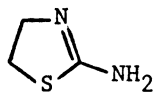
Bibliography: 82GK

 $C_xH_yN_2S$ 2-Amino-4-alkyl-1,3-thiazole

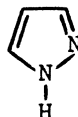
L

Ligand	Metal ion	Equilibrium	Log K 25°, 0.5
R= H	H^+	HL/H.L	5.57
2-Amino- 1,3-thiazole ($C_3H_4N_2S$)	Co^{2+}	ML/M.L	0.90
		$ML_2/M.L^2$	1.54
	Ni^{2+}	ML/M.L	1.45
		$ML_2/M.L^2$	2.50
		$ML_3/M.L^3$	3.12
	Cu^{2+}	ML/M.L	2.60
		$ML_2/M.L^2$	4.23
	Zn^{2+}	ML/M.L	0.74
		$ML_2/M.L^2$	1.24
	Cd^{2+}	ML/M.L	1.34
		$ML_2/M.L^2$	2.28
		$ML_3/M.L^3$	2.80
R= CH_3	H^+	HL/H.L	5.95
2-Amino-4-methyl- 1,3-thiazole ($C_4H_6N_2S$)	Co^{2+}	ML/M.L	0.83
		ML/M.L	0.95
	Zn^{2+}	ML/M.L	0.72
		ML/M.L	0.85

Bibliography: 82GK



C_3H_6NS		<u>2-Amino-4,5-dihydro-1,3-thiazole</u>	L
Metal		Log K	
<u>ion</u>	<u>Equilibrium</u>	<u>37°, 0.15</u>	
H^+	HL/H.L	8.48	
Zn^{2+}	ML/M.L	3.2	
Bibliography: 81HM			

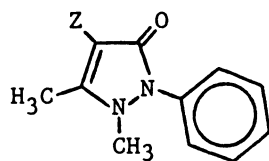


C ₃ H ₄ N ₂		1,2-Diazole (pyrazole)			L	
(Other references in Vol.2, p.349 and other values in Vol.5, p.203)						
Metal		Log K	Log K	Log K	ΔH	ΔS
ion	Equilibrium	25°, 0.1	25°, 1.0	25°, 0	25°, 0	25°, 0
H ⁺	HL/H.L	2.58	2.78	2.61	-3.52	0.2
		2.61 ^b ±0.05			-3.65 ^b	-0.3 ^b
Co ²⁺	ML/M.L	1.3 ^b ±0.1			(-5.1) ^c	(-11) ^{b*}
	ML ₂ /M.L ²	2.3 ^b ±0.1				
	ML ₃ /M.L ³	2.9 ^b				
	ML ₄ /M.L ⁴	3.2 ^b				
Ni ²⁺	ML/M.L	1.8 ±0.0	1.9		-5.1 ^c	-9 ^{b*}
		1.9 ^b ±0.1				
	ML ₂ /M.L ²	3.3			-8 ^c	-11 ^{b*}
		3.5 ^b ±0.2				
	ML ₃ /M.L ³	4.2				
		4.6 ^b ±0.6				
	ML ₄ /M.L ⁴	4.6				
		5.3 ^b ±0.8				
Cu ²⁺	ML/M.L	2.33	2.42		-5.8 ^c	-9 ^{b*}
		2.38 ^b				
	ML ₂ /M.L ²	4.2			-11 ^c	-17 ^{b*}
		4.3 ^b				
	ML ₃ /M.L ³	5.7				
		5.7 ^b				
	ML ₄ /M.L ⁴	6.6				
		6.6 ^b				
Zn ²⁺	ML/M.L	1.0			-2.9 ^c	-5 ^{b*}
		1.1 ^b ±0.1				
	ML ₂ /M.L ²	1.4				
		1.9 ^b ±0.4				
	ML ₃ /M.L ³	1.6				
		2.5 ^b				
	ML ₄ /M.L ⁴	2.7 ^b				

^b25°,0.5; ^c25°,1.0; *assuming ΔH for 0.5 = ΔH for 1.0

Bibliography: H^+ 70HB; Co^{2+} - Zn^{2+} 81Ab;

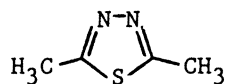
Other references: 80CF,83Cc



$C_xH_yON_q$		<u>4-Substituted-1,5-dimethyl-2-phenyl-1,2-diazolin-3-one</u>		L
<u>Ligand</u>	<u>Metal ion</u>	<u>Equilibrium</u>	<u>Log K</u> <u>25° 0.5</u>	
Z= H	H ⁺	HL/H.L	(1.6)	
1,5-Dimethyl- (antipyrine) (C ₁₁ H ₁₂ ON ₂)	Mn ²⁺	ML/M.L	0.57	
		ML ₂ /M.L ²	0.89	
		ML ₃ /M.L ³	1.02	
	Co ²⁺	ML/M.L	0.48	
		ML ₂ /M.L ²	0.78	
		ML ₃ /M.L ³	0.88	
	Ni ²⁺	ML/M.L	0.72	
		ML ₂ /M.L ²	1.23	
		ML ₃ /M.L ³	1.54	
	Cu ²⁺	ML/M.L	0.65	
		ML ₂ /M.L ²	1.09	
		ML ₃ /M.L ³	1.31	
	Zn ²⁺	ML/M.L	0.43	
		ML ₂ /M.L ²	0.64	
		ML ₃ /M.L ³	0.65	
	Cd ²⁺	ML/M.L	0.69	
		ML ₂ /M.L ²	1.18	
		ML ₃ /M.L ³	1.44	
Z= NH ₂	H ⁺	HL/H.L	4.44	
4-Amino- (C ₁₁ H ₁₃ ON ₃)	Mn ²⁺	ML/M.L	1.07	
		ML ₂ /M.L ²	1.83	
	Co ²⁺	ML/M.L	1.17	
		ML ₂ /M.L ²	2.06	
	Ni ²⁺	ML/M.L	1.65	
		ML ₂ /M.L ²	3.09	
		ML ₃ /M.L ³	4.34	
	Cu ²⁺	ML/M.L	2.46	
		ML ₂ /M.L ²	4.39	
		ML ₃ /M.L ³	5.79	
	Zn ²⁺	ML/M.L	1.32	
		ML ₂ /M.L ²	2.42	
	Cd ²⁺	ML/M.L	1.81	
		ML ₂ /M.L ²	3.43	
		ML ₃ /M.L ³	4.84	

4-Substituted-1,5-dimethyl-2-phenyl-1,2-diazol-3-one (continued)

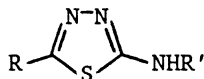
<u>Ligand</u>	<u>Metal ion</u>	<u>Equilibrium</u>	<u>Log K</u> <u>25°, 0.5</u>
Z= N(CH ₃) ₂	H ⁺	HL/H.L	5.20
4-Dimethylamino- (pyrimidone)	Mn ²⁺	ML/M.L	0.74
(C ₁₃ H ₁₇ ON ₃)	Cd ²⁺	ML/M.L	1.47
(other reference in Vol.2, p.349, and other values in Vol.5, p.206)		ML ₂ /M.L ²	2.24
Bibliography: 80LW			



C₄H₆N₂S 2,5-Dimethyl-1,3,4-thiadiazole L

<u>Metal ion</u>	<u>Equilibrium</u>	<u>Log K</u> <u>25°, 0.5</u>
H ⁺	HL/H.L	(1.0)
Co ²⁺	ML/M.L	-0.1
Ni ²⁺	ML/M.L	0.80
Cu ²⁺	ML/M.L	1.08
	ML ₂ /M.L ²	1.94
Ag ⁺	ML/M.L	1.79
	ML ₂ /M.L ²	3.25
Zn ²⁺	ML/M.L	-0.1
Cd ²⁺	ML/M.L	0.6

Bibliography: 85GL



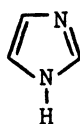
C_xH_yN₃S 2-Alkylamino-5-alkyl-1,3,4-thiadiazole L

<u>Ligand</u>	<u>Metal ion</u>	<u>Equilibrium</u>	<u>Log K</u> <u>25°, 0.5</u>
R= R'= H	H ⁺	HL/H.L	2.93
2-Amino- 1,3,4- thiadiazole	Co ²⁺	ML/M.L	0.69
		ML ₂ /M.L ²	1.09
		ML ₃ /M.L ³	1.21
(C ₂ H ₃ N ₃ S)	Ni ²⁺	ML/M.L	1.06
		ML ₂ /M.L ²	2.40
		ML ₃ /M.L ³	2.69

2-Alkylamino-5-alkyl-1,3,4-thiadiazole (continued)

<u>Ligand</u>	<u>Metal ion</u>	<u>Equilibrium</u>	<u>Log K</u> <u>25°, 0.5</u>
	Cu ²⁺	ML/M.L	1.52
		ML ₂ /M.L ²	2.67
		ML ₃ /M.L ³	3.49
		ML ₄ /M.L ⁴	3.97
	Zn ²⁺	ML/M.L	0.32
		ML ₂ /M.L ²	0.45
	Cd ²⁺	ML/M.L	1.01
		ML ₂ /M.L ²	1.77
		ML ₃ /M.L ³	2.21
		ML ₄ /M.L ⁴	2.98
R= CH ₃ , R'= H	H ⁺	HL/H.L	3.35
2-Amino-	Co ²⁺	ML/M.L	0.85
5-methyl-1,3,4-	Ni ²⁺	ML/M.L	1.24
thiadiazole	Cu ²⁺	ML/M.L	1.63
		ML ₂ /M.L ²	2.80
(C ₃ H ₅ N ₃ S)	Zn ²⁺	ML/M.L	0.70
	Cd ²⁺	ML/M.L	1.18
R= CH ₂ CH ₃ , R'= H	H ⁺	HL/H.L	3.50
2-Amino-	Co ²⁺	ML/M.L	0.92
5-ethyl-1,3,4-	Ni ²⁺	ML/M.L	1.15
thiadiazole	Cu ²⁺	ML/M.L	1.86
		ML ₂ /M.L ²	2.97
(C ₄ H ₇ N ₃ S)	Zn ²⁺	ML/M.L	0.56
	Cd ²⁺	ML/M.L	1.24
R= H, R'= CH ₂ CH ₃	H ⁺	HL/H.L	3.16
2-Ethylamino-	Co ²⁺	ML/M.L	0.80
1,3,4-		ML ₂ /M.L ²	1.13
thiadiazole	Ni ²⁺	ML/M.L	0.84
		ML ₂ /M.L ²	1.75
(C ₄ H ₇ N ₃ S)	Cu ²⁺	ML/M.L	1.53
	Zn ²⁺	ML/M.L	0.53
		ML ₂ /M.L ²	0.61
	Cd ²⁺	ML/M.L	1.06
		ML ₂ /M.L ²	1.67
		ML ₃ /M.L ³	1.83

Bibliography: 82GL,85GL

 $C_3H_4N_2$

1,3-Diazole (imidazole)
(Other values in Vol.2, p.144 and Vol.5, p.207)

L

Metal ion	Equilibrium	Log K <u>25°, 0.1</u>	Log K <u>25°, 1.0</u>	Log K <u>25°, 0</u> (14.4)	ΔH <u>25°, 0</u> -14.6 -15.1 ^d	ΔS <u>25°, 0</u> 17
H^+	$L/(H_1L) \cdot H$					
	HL/H.L	7.01 $\pm$ 0.03 7.18 ^b $\pm$ 0.05	7.31 $\pm$ 0.03 7.58 ^d 6.78 ⁿ	6.993 7.90 ^e $\pm$ 0.02	-8.8 $\pm$ 0.1 -9.0 ^b $\pm$ 0.1 -9.1 ^c $\pm$ 0.2	2.5 2.6 ^b 2.9 ^c
Mn^{2+}	ML/M.L ML ₂ /M.L ²	1.4 $\pm$ 0.2 2.9				
Co^{2+}	ML/M.L ML ₂ /M.L ² ML ₃ /M.L ³ ML ₄ /M.L ⁴	2.41 $\pm$ 0.02 2.49 ^b 4.34 $\pm$ 0.06 5.9 $\pm$ 0.1 6.9 $\pm$ 0.3	2.50 2.30 ⁿ 4.04 ⁿ 5.3 ⁿ 6.1 ⁿ	2.73 ^e 4.92 ^e 6.5 ^e 7.5 ^e	(-4) ^s (-8) ^s (-12) ^s (-15) ^s	(-2) ^a (-7) ^a (-14) ^a (-19) ^a
Ni^{2+}	ML/M.L ML ₂ /M.L ² ML ₃ /M.L ³ ML ₄ /M.L ⁴	3.03 $\pm$ 0.04 5.46 $\pm$ 0.10 7.4 $\pm$ 0.1 8.5 $\pm$ 0.6	3.11 $\pm$ 0.01 2.89 ⁿ 5.55 $\pm$ 0.02 5.14 ⁿ 7.6 $\pm$ 0.1 6.9 ⁿ 8.8 8.0 ⁿ	3.37 ^e 6.14 ^e 8.4 ^e 10.1 ^e	-5.8 ^a (-11) ^s (-15) ^s -18.4 ^a	-6 ^a (-12) ^a (-17) ^a -23 ^a
Cu^{2+}	ML/M.L ML ₂ /M.L ² ML ₃ /M.L ³ ML ₄ /M.L ⁴	4.20 $\pm$ 0.10 4.21 ^b 7.73 $\pm$ 0.10 7.84 ^b 10.6 $\pm$ 0.1 10.7 ^b 12.6 $\pm$ 0.1 14.0 ^b	4.30 4.47 ^d 4.04 ⁿ 7.93 8.11 ^d 7.39 ⁿ 10.1 ⁿ 14.1 12.1 ⁿ	4.65 ^e 8.60 ^e 11.9 ^e 14.6 ^e	-7.6 ^a (-14) ^s (-19) ^s -23.0 ^a	-6 ^a (-12) ^a (-15) ^a -20 ^a
Ag^+	ML/M.L ML ₂ /M.L ²	3.0 ^b $\pm$ 0.3 6.83 ^b $\pm$ 0.05	3.08 $\pm$ 0.03 6.90 $\pm$ 0.06	3.34 ^e 7.55 ^e	-7.3 ^c -15.7 ^c	-10 ^c -21 ^c
Zn^{2+}	ML/M.L ML ₂ /M.L ² ML ₃ /M.L ³ ML ₄ /M.L ⁴	2.55 $\pm$ 0.05 2.61 ^b 4.86 $\pm$ 0.05 7.17 $\pm$ 0.04 9.15 $\pm$ 0.07	2.66 2.75 ^d (2.19) ⁿ (4.40) ⁿ 6.88 ⁿ 8.65 ⁿ	2.93 ^e (4.93) ^e (8.75) ^e (11.4) ^e	-3.8 ^a	-1 ^a

^a25°, 0.1; ^b25°, 0.5; ^c25°, 1.0; ^d25°, 2.0; ^e25°, 3.0; ⁿ37°, 0.15; ^s10-50°, 0.16

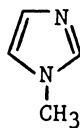
1,3-Imidazole (continued)

Metal ion	Equilibrium	Log K 25°, 0.1	Log K 25°, 1.0	Log K 25°, 0	ΔH 25°, 0	ΔS 25°, 0
Cd ²⁺	ML/M.L	2.75 $\pm$ 0.05 2.72 ^b $\pm$ 0.04	2.78 -0.08 2.89 ^d (2.67) ⁿ	3.09 ^e	-4.9 ^b	-4 ^b
	ML ₂ /M.L ²	4.8 $\pm$ 0.1 4.81 ^b $\pm$ 0.08	4.83 +0.3 5.02 ^d 4.59 ⁿ	5.50 ^e	-10 ^b	-12 ^b
	ML ₃ /M.L ³	6.3 $\pm$ 0.2 6.32 ^b -0.3	6.63 7.00 ^d 6.01 ⁿ	7.29 ^e		
	ML ₄ /M.L ⁴	7.2 $\pm$ 0.3 7.3 ^b $\pm$ 0.2	6.45 ⁿ	8.51 ^e		

^b25°, 0.5; ^d25°, 2.0; ^e25°, 3.0; ⁿ37°, 0.15;

Bibliography:

H⁺ 71MB, 79KB, 81BKS, 82SS, 83RY, 85BG, 85VKA; Cu²⁺ 79KB, 81BKS, 82SS;
Mn²⁺ 58ME, 82SS; Ag⁺ 85BG;
Co²⁺ 59ML, 79KB, 81BKS, 81FGS, 82SS; Zn²⁺ 79KB, 81BK, 82SS;
Ni²⁺ 79KB, 81BKS, 82SS; Cd²⁺ 79KB, 81GS, 82SS, 84C;
Other references: 61S, 80BT, 80NS, 81SS, 82NV, 82SSa, 83ER, 83SSa, 84OC, 85K, 85SSb

C₄H₆N₂

1-Methylimidazole

L

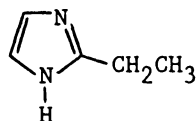
(Other values in Vol.2, p.146 and Vol.5, p.208)

Metal ion	Equilibrium	Log K 25°, 0.1	Log K 25°, 0.5	Log K 25°, 1.0	ΔH 25°, 0.1	ΔS 25°, 0.1
H ⁺	HL/H.L	7.06 $\pm$ 0.03	7.14 $\pm$ 0.06		-7.8 $\pm$ 0.1	6
Co ²⁺	ML/M.L	2.29	2.40		-4.0 ^c	-2 ^{b*}
	ML ₂ /M.L ²	4.25	4.40			
	ML ₃ /M.L ³	5.32	5.85			
	ML ₄ /M.L ⁴	6.70	6.95			
Ni ²⁺	ML/M.L		3.05		-5.4 ^c	-4 ^{b*}
	ML ₂ /M.L ²		5.95			
	ML ₃ /M.L ³		7.61			
	ML ₄ /M.L ⁴		9.13			
Cu ²⁺	ML/M.L	4.22	4.30		-6.9 ^c	-3 ^{b*}
	ML ₂ /M.L ²	7.76	7.94			
	ML ₃ /M.L ³	10.65	10.96			
	ML ₄ /M.L ⁴	12.86	13.33			
Zn ²⁺	ML/M.L	(2.88)	(2.70)		-4.9 ^c	-4 ^{b*}
	ML ₂ /M.L ²	(4.92)	(4.80)			
	ML ₃ /M.L ³	(6.60)	(7.41)			
	ML ₄ /M.L ⁴	(9.21)	(9.32)			
Ag ⁺	ML/M.L		2.93	3.00		
	ML ₂ /M.L ²		6.56	3.89	-15.7 ^c	-23 ^{b*}

^b25°, 0.5; ^c25°, 1.0; * assuming ΔH for 0.5 = ΔH for 1.0

Bibliography:

H⁺ 71MB, 77LB, 81AMW, 85BG; Co²⁺-Cu²⁺ 77LB, 83Aa; Zn²⁺ 77LB, 77S, 83Aa; Ag⁺ 85BG;
Other references: 84KMa, 84Mb

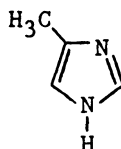
C₅H₈N₂

2-Ethylimidazole
(Other values in Vol.2, p.148)

L

Metal ion	Equilibrium	Log K 25°, 0.5	Log K 25°, 1.0
H ⁺	HL/H.L	7.99	8.02
Co ²⁺	ML/M.L	1.48	
	ML ₂ /M.L ²	(1.78)	
	ML ₃ /M.L ³	(3.30)	
Ni ²⁺	ML/M.L	1.65	
	ML ₂ /M.L ²	2.78	
	ML ₃ /M.L ³	3.40	
Cu ²⁺	ML/M.L	3.60	
	ML ₂ /M.L ²	6.65	
	ML ₃ /M.L ³	8.90	
	ML ₄ /M.L ⁴	10.30	
Zn ²⁺	ML/M.L	1.80	
	ML ₂ /M.L ²	(4.48)	
	ML ₃ /M.L ³	(6.30)	
	ML ₄ /M.L ⁴	(8.60)	
Cd ²⁺	ML/M.L	2.17	
	ML ₂ /M.L ²	3.67	
	ML ₃ /M.L ³	4.55	

Bibliography: 82LK

C₄H₆N₂

4-Methylimidazole
(Other references in Vol.2, p.149 and Vol.5, p.439)

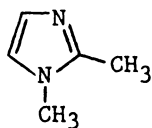
L

Metal ion	Equilibrium	Log K 25°, 0.1	Log K 25°, 0.5	Log K 25°, 0	ΔH 25°, 0.1	ΔS 25°, 0.1
H ⁺	HL/H.L	7.56 ±0.01	(7.80)	7.54 ±0.02	-9.6	2
Co ²⁺	ML/M.L		2.34			
	ML ₂ /M.L ²		4.09			
	ML ₃ /M.L ³		5.33			
	ML ₄ /M.L ⁴		6.67			
Ni ²⁺	ML/M.L		2.92			
	ML ₂ /M.L ²		5.25			
	ML ₃ /M.L ³		7.03			
	ML ₄ /M.L ⁴		8.25			

4-Methylimidazole (continued)

Metal ion	Equilibrium	Log K <u>25°, 0.1</u>	Log K <u>25°, 0.5</u>	Log K <u>25°, 1.0</u>	ΔH <u>25°, 0.1</u>	ΔS <u>25°, 0.1</u>
Cu ²⁺	ML/M.L	4.13	4.18			
	ML ₂ /M.L ²	7.62	7.74			
	ML ₃ /M.L ³	10.49	10.70			
	ML ₄ /M.L ⁴	12.45	13.05			
Zn ²⁺	ML/M.L	2.44	2.48			
	ML ₂ /M.L ²	(4.97)	(5.06)			
	ML ₃ /M.L ³	(7.61)	(7.74)			
	ML ₄ /M.L ⁴	(9.99)	(10.52)			
Cd ²⁺	ML/M.L		2.65			
	ML ₂ /M.L ²		4.65			
	ML ₃ /M.L ³		6.30			
	ML ₄ /M.L ⁴		6.70			

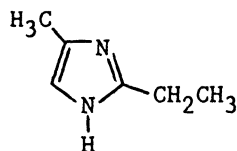
Bibliography: H⁺, Co²⁺, Ni²⁺, Zn²⁺ 77LO; Cu²⁺, Cd²⁺ 81LK

C₅H₈N₂1,2-Dimethylimidazole

L

Metal ion	Equilibrium	Log K <u>25°, 0.5</u>
H ⁺	HL/H.L	8.21
Co ²⁺	ML/M.L	1.13
	ML ₂ /M.L ²	(2.39)
	ML ₃ /M.L ³	(3.81)
	ML ₄ /M.L ⁴	(4.32)
Ni ²⁺	ML/M.L	2.15
	ML ₂ /M.L ²	3.55
	ML ₃ /M.L ³	4.24
Cu ²⁺	ML/M.L	3.70
	ML ₂ /M.L ²	6.80
	ML ₃ /M.L ³	9.18
	ML ₄ /M.L ⁴	10.80
Zn ²⁺	ML/M.L	1.92
	ML ₂ /M.L ²	(4.32)
	ML ₃ /M.L ³	(7.11)
	ML ₄ /M.L ⁴	(9.00)

Bibliography: 80LB

 $C_6H_{10}N_2$

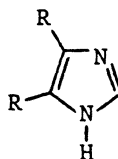
2-Ethyl-4-methylimidazole
(Other values in Vol.2, p.150)

L

Metal ion	Equilibrium	Log K 25°, 0.5 (8.68)	Log K 25°, 1.0 (8.52)	ΔH 20°, 0 -9.5	ΔS 25°, 0.5 (8)*
H^+	HL/H.L				
Co^{2+}	ML/M.L	0.54			
	$ML_2/M.L^2$	0.69			
Zn^{2+}	ML/M.L	1.30			
	$ML_2/M.L^2$	2.00			
Cd^{2+}	ML/M.L	1.54			
	$ML_2/M.L^2$	2.54			

*Assuming ΔH for 0 = ΔH for 0.5

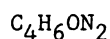
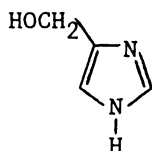
Bibliography: H^+ 71MB, 82LK; Co^{2+} - Cd^{2+} 82LK

 $C_xH_yN_2$ 4,5-Dialkylimidazole

L

Ligand	Metal ion	Equilibrium	Log K 25°, 0.5
R= CH_3	H^+	HL/H.L	8.19
4,5-Dimethyl- ($C_5H_8N_2$)	Co^{2+}	ML/M.L	1.17
	Cu^{2+}	ML/M.L	3.72
		$ML_2/M.L^2$	6.92
		$ML_3/M.L^3$	9.55
		$ML_4/M.L^4$	10.78
	Zn^{2+}	ML/M.L	2.48
	Cd^{2+}	ML/M.L	2.48
		$ML_2/M.L^2$	4.30
R= CH_2CH_3	H^+	HL/H.L	8.19
4,5-Diethyl- ($C_7H_{12}N_2$)	Co^{2+}	ML/M.L	(1.37)
	Cu^{2+}	ML/M.L	3.48
		$ML_2/M.L^2$	6.54
	Cd^{2+}	ML/M.L	2.18

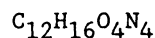
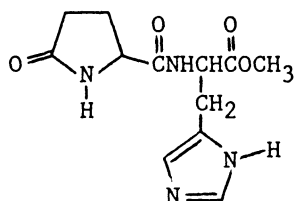
Bibliography: 81LK, 82LK



4-(Hydroxymethyl)imidazole
(Other references in Vol.2, p.152)

L

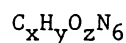
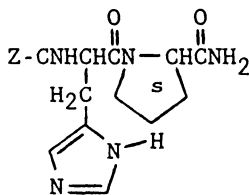
Metal		Log K	Log K	Log K	ΔH	ΔS
<u>ion</u>	<u>Equilibrium</u>	<u>25°, 0.1</u>	<u>25°, 3.0</u>	<u>25°, 0</u>	<u>25°, 3.0</u>	<u>25°, 3.0</u>
H ⁺	HL/H.L	6.46	7.42	6.38	-9.3	3
Cu ²⁺	ML/M.L	3.96	4.25		-7.0	-4
	ML ₂ /M.L ₂	7.26	8.15		-14.1	-10
	ML ₃ /M.L ₃	10.02	11.26		-21.1	-19
	ML ₄ /M.L ₄	12.2	13.3		-28.2	-34

Bibliography: H⁺ 83LN; Cu²⁺ 85LSL-Pyroglutamyl-L-histidine methylester

L

Metal		Log K
<u>ion</u>	<u>Equilibrium</u>	<u>25°, 0.2</u>
H ⁺	HL/H.L	6.33
Cu ²⁺	ML/M.L	4.11
	ML/M(H ₂ L).H ²	11.09

Bibliography: 84FS

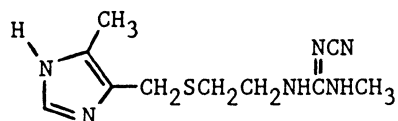
Acyl-histidyl-L-proline amide

L

Ligand	Metal		Log K	Log K
	<u>ion</u>	<u>Equilibrium</u>	<u>25°, 0.2</u>	<u>22°, 0.1</u>
	H ⁺	HL/H.L	6.30	6.38
	Ni ²⁺	ML/M.L		3.17
		ML/M(H ₂ L).H ²		17.82
L-Pyroglutamyl-L- (C ₁₆ H ₂₂ O ₄ N ₆)	Cu ²⁺	ML/M.L	3.64	3.85
		ML/M(H ₂ L).H ²	11.31	11.52

Acyl-histidyl-L-proline amide (continued)

Ligand	Metal ion	Equilibrium	Log K 25°, 0.2	Log K 22°, 0.1
	H ⁺	HL/H.L		6.15
	Ni ²⁺	ML/M.L		3.9
		ML/M(H ₂ L).H ²		17.6
L-Pyroglutamyl-D- (C ₁₆ H ₂₂ O ₄ N ₆)	Cu ²⁺	ML/M.L		3.77
		ML/M(H ₁ L).H		6.3
		ML/M(H ₂ L).H ²		11.70
	H ⁺	HL/H.L		6.40
	Ni ²⁺	ML/M.L		4.29
		ML/M(H ₁ L).H		4.01
Picolyl-L- (C ₁₇ H ₂₀ O ₃ N ₆)	Cu ²⁺	ML/M(H ₂ L).H ²		11.0
		M(H ₁ L).H ¹ /M.L		4.8
		M(H ₂ L).H ² /M.L		-3.66
Bibliography: H ⁺ , Cu ²⁺ 83FB, 84FS; Ni ²⁺ 83FB				

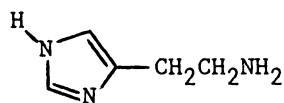
C₁₀H₁₆N₆S

N-Cyano-N'-methyl-N''-[2-(5-methyl-4-imidazolyl-methylthio)ethyl]guanidine (cimetidine)

L

Metal ion	Equilibrium	Log K 37°, 0.15
H ⁺	HL/H.L	6.70
Cu ²⁺	ML/M.L	4.16
	ML ₂ /M.L ₂	8.30
	ML ₃ /M.L ₃	10.71
	ML ₂ /M(H ₁ L)L.H	7.75
Zn ²⁺	ML ₂ /M.L ₂	5.09

Bibliography: 84ABH

C₅H₉N₃4-(2-Aminoethyl)imidazole (histamine)

L

(Other values in Vol.2, p.156 and other references in Vol.5, p.213)

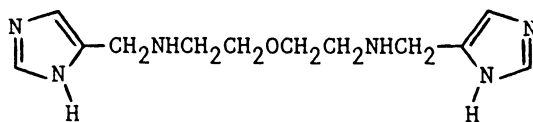
Metal ion	Equilibrium	Log K 25°, 0.1	Log K 25°, 1.0	Log K 25°, 0	ΔH 25°, 0.1	ΔS 25°, 0.1
H ⁺	HL/H.L	9.83 ±0.04 9.91 ^b	10.03 ±0.01 9.45 ⁿ ±0.05	9.80 ±0.05	-12.3 ±0.3	4
	H ₂ L/HL.H	6.11 ±0.05 6.25 ^b	6.34 ±0.00 5.90 ⁿ ±0.03	5.96 -0.1	-7.5 ±0.1	3
Mn ²⁺	ML/M.L	3.00			(-2) ^s	(7)
Co ²⁺	ML/M.L	5.10 ±0.07 5.30 ^b	5.42 4.90 ⁿ -0.01	5.12	(-6) ±1	(3)
	ML ₂ /M.L ²	8.79 ±0.05	9.23 8.43 ⁿ +0.2	(8.89)	(-11) ±1	(3)
	ML ₃ /M.L ³	10.8	11.0 ^p (10.7) ⁿ			
	ML/MOHL.H		10.11 ⁿ			
Ni ²⁺	ML/M.L	6.80 ±0.05 6.87 ^b	7.00 6.46 ⁿ +0.1	(6.91)	-10.0 ±0.2	-2
	ML ₂ /M.L ²	11.85 ±0.07 11.90 ^b	12.06 11.31 ⁿ +0.1	(12.02)	-17.7 ±0.9	-5
	ML ₃ /M.L ³	15.0 ±0.1	15.2 14.3 ⁿ +0.1	(15.3)	-24	-12
	MHL/ML.H	4.71	3.97 ⁿ			
	ML/MOHL.H		9.42 ⁿ			
Cu ²⁺	ML/M.L	9.55 ±0.04	9.76 9.19 ⁿ ±0.03	(9.66)	-12.4 ±0.3	2
	ML ₂ /M.L ²	16.1 ±0.1	16.4 15.5 ⁿ ±0.1	(16.2)	-22.4 ±0.3	-2
	MHL/ML.H	3.30 ±0.01			-5.8	-4
	MHL ₂ /ML ₂ .H	5.71 ±0.02	5.55 ⁿ -0.3		-6.8 -0.8	3
	ML ₂ /MOHL ₂ .H	10.73 ±0.01	10.44 ⁿ +0.8		-12.4	7
	M ₂ (OH) ₂ L ₂ .H ² /M ² .L ²	7.42 ±0.02	(7.1) ⁿ -0.4		-8.8 -1	4
Zn ²⁺	ML/M.L	5.20 ±0.05	4.95 ⁿ ±0.08		-5.7	5
	ML ₂ /M.L ²	10.1 ±0.1	9.73 ⁿ ±0.08		-10.4	11
	MHL/ML.H	6.21			-8.8	-1
	ML/MOHL.H		7.61 ⁿ			
Cd ²⁺	ML/M.L	4.75 ±0.01	4.55 ⁿ +0.08	(4.82)	-6.4	0
	ML ₂ /M.L ²	7.91	(7.73) ⁿ	(8.22)	-12.2	-5
	ML ₃ /M.L ³	9.93			(-12)	(5)
	MHL/ML.H	6.77			-10.5	-4
	ML/MOHL.H		9.94 ⁿ			

^b25°, 0.5; ⁿ37°, 0.15; ^p30°, 1.0; ^s15-45°, 0.2

Bibliography:

H⁺, Cu²⁺ 80GMR, 80KB, 84ABH, 84AC, 85DR;Zn²⁺ 80KB, 84AC;Co²⁺, Ni²⁺ 80KB, 83LW;Cd²⁺ 80KB, 81AAD;

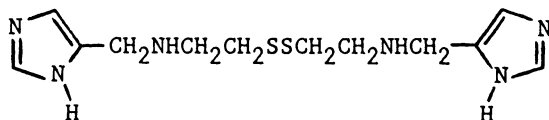
Other references: 80NS, 82NV, 84PBa, 85DJa, 85RRc

 $C_{12}H_{20}ON_6$ 1,9-Di-4-imidazolyl-2,8-diaza-5-oxanonane

L

Metal ion	Equilibrium	Log K 25°, 0.1
H^+	HL/H.L	9.16
	$H_2L/HL.H$	8.17
	$H_3L/H_2L.H$	4.66
	$H_4L/H_3L.H$	3.88
Co^{2+}	ML/M.L	9.64
Ni^{2+}	ML/M.L	12.38
	MHL/ML.H	2.80
Cu^{2+}	ML/M.L	15.94
	MHL/ML.H	3.84
Zn^{2+}	ML/M.L	9.52

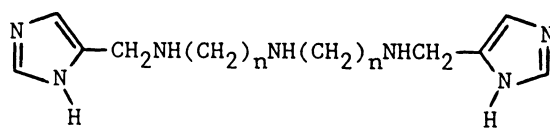
Bibliography: 82BT

 $C_{12}H_{20}N_6S_2$ 1,10-Di-4-imidazolyl-2,9-diaza-5,6-dithiadecane

L

Metal ion	Equilibrium	Log K 25°, 0.1
H^+	HL/H.L	8.74
	$H_2L/HL.H$	7.85
	$H_3L/H_2L.H$	4.62
	$H_4L/H_3L.H$	3.89
Cu^{2+}	ML/M.L	13.38
	MHL/ML.H	3.84
	$MH_2L/MHL.H$	3.29
	$M_2L/ML.M$	2.92

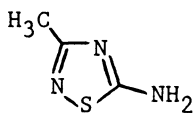
Bibliography: 83YS

 $C_xH_yN_7$ 1,ω-Di-4-imidazolyl-triazaalkane

L

<u>Ligand</u>	<u>Metal ion</u>	<u>Equilibrium</u>	<u>Log K</u> <u>25°, 0.1</u>	<u>ΔH</u> <u>25°, 0.1</u>	<u>ΔS</u> <u>25°, 0.1</u>
n= 2	H ⁺	HL/H.L	9.22		
1,9-Di-4-imidazolyl-		H ₂ L/HL.H	8.18		
2,5,8-triaza-		H ₃ L/H ₂ L.H	4.91		
nonane		H ₄ L/H ₃ L.H	3.90		
		H ₅ L/H ₄ L.H	2.92		
(N,N"-bis(4-imidazolylmethyl)-	Co ²⁺	ML/M.L	13.84	-13.2	19
diethylene-		MHL/ML.H	3.3		
triamine)	Ni ²⁺	ML/M.L	17.35	-18.0	19
		MHL/ML.H	2.01		
(4-IMDIEN)	Cu ²⁺	ML/M.L	12.41	-21.3	22
(C ₁₂ H ₂₁ N ₇)		MHL/ML.H	3.35		
(Other reference	Zn ²⁺	ML/M.L	13.30	-10.2	27
in Vol.5, p.216)		MHL/ML.H	2.69		
n= 3	H ⁺	HL/H.L	10.12		
1,11-Di-		H ₂ L/HL.H	8.62		
4-imidazolyl-		H ₃ L/H ₂ L.H	7.36		
2,6,10-triaza-		H ₄ L/H ₃ L.H	4.51		
undecane		H ₅ L/H ₄ L.H	3.82		
(N,N"-bis(4-imidazolylmethyl)-	Co ²⁺	ML/M.L	11.36	-9.2	21
di-1,3-propylene-		MHL/ML.H	3.99		
triamine)	Ni ²⁺	ML/M.L	14.93	-16.4	13
		MHL/ML.H	3.23		
(4-IMDPT)	Cu ²⁺	ML/M.L	18.97	-20.2	19
(C ₁₄ H ₂₅ N ₇)		MHL/ML.H	3.62		
(Other reference	Zn ²⁺	ML/M.L	11.83	-9.9	21
in Vol.5, p.217)		MHL/ML.H	4.52		

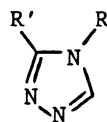
Bibliography: 82TMH

 $C_3H_5N_3S$ 5-Amino-3-methyl-1,2,4-thiadiazole

L

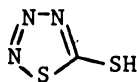
<u>Metal ion</u>	<u>Equilibrium</u>	<u>Log K</u> <u>25°, 0.5</u>
H ⁺	HL/H.L	2.50
Co ²⁺	ML/M.L	0.51
Ni ²⁺	ML/M.L	0.76
Cu ²⁺	ML/M.L	1.13
	ML ₂ /M.L ²	1.36
Zn ²⁺	ML/M.L	0.23
Cd ²⁺	ML/M.L	0.82

Bibliography: 82GL



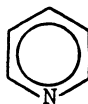
$C_2H_yN_z$		<u>Substituted-1,2,4-triazole</u>				L	
<u>Ligand</u>	<u>Metal ion</u>	<u>Equilibrium</u>	<u>Log K</u> <u>25°, 0.5</u>	<u>Log K</u> <u>25°, 0</u>	<u>ΔH</u> <u>25°, 0</u>	<u>ΔS</u> <u>25°, 0</u>	
R= R'= H	H ⁺	L/(H ₁ L) .H	9.99	10.00 ±0.04	-7.9	19	
1,2,4-Triazole		HL/H.L	2.46 ±0.04	2.42 ±0.03	-9.42 ^b	14.1 ^b	
(C ₂ H ₃ N ₃)					-2.30	3.5	
					-2.43 ^b	3.1 ^b	
(Other values in Vol.5, p.218)	Co ²⁺	ML/M.L	1.32				
		ML ₂ /M.L ²	(2.74)				
		ML ₃ /M.L ³	3.07				
	Ni ²⁺	ML/M.L	1.90				
		ML ₂ /M.L ²	(4.84)				
		ML ₃ /M.L ³	5.41				
		ML ₄ /M.L ⁴	5.64				
	Zn ²⁺	ML/M.L	1.19				
		ML ₂ /M.L ²	2.04				
		ML ₃ /M.L ³	2.56				
	Cd ²⁺	ML/M.L	1.50				
		ML ₂ /M.L ²	2.56				
		ML ₃ /M.L ³	3.16				
R= H, R'= NH ₂	H ⁺	L/(H ₁ L) .H	10.51				
		HL/H.L	4.41				
3-Amino-	Co ²⁺	ML/M.L	1.40				
-1,2,4-triazole		ML ₂ /M.L ²	(3.40)				
		ML ₃ /M.L ³	(4.54)				
(C ₂ H ₄ N ₄)	Ni ²⁺	ML/M.L	2.34				
		ML ₂ /M.L ²	(5.81)				
		ML ₃ /M.L ³	(6.95)				
		ML ₄ /M.L ⁴	7.30				
	Cd ²⁺	ML/M.L	1.39				
		ML ₂ /M.L ²	2.49				
		ML ₃ /M.L ³	3.30				
R= NH ₂ , R'= H	H ⁺	HL/H.L	2.53				
4-Amino-		H ₂ L/HL.H	(1.5)				
1,2,4-triazole	Ni ²⁺	ML/M.L	2.18				
(C ₂ H ₄ N ₄)		ML ₂ /M.L ²	(5.65)				
		ML ₃ /M.L ³	(6.90)				
		ML ₄ /M.L ⁴	(7.70)				
	Zn ²⁺	ML/M.L	1.14				
		ML ₂ /M.L ²	1.98				
		ML ₃ /M.L ³	2.56				
	Cd ²⁺	ML/M.L	0.70				
		ML ₂ /M.L ²	1.08				

^b_{25°, 0.5}Bibliography: H⁺ 70HB,80LK; Co²⁺-Cd²⁺ 80LK; Other reference: 83KS



CHN ₃ S ₂		1,2,3,4-Thiatriazol-5-thiol	HL
Metal ion	Equilibrium	Log K 25°, 2.0	
Cu ⁺	ML ₄ /M.L ⁴	16.5	
Zn ²⁺	ML/M.L	(0.26)	
	ML ₂ /M.L ²	(0.9)	
	ML ₃ /M.L ³	(1.7)	
	ML ₄ /M.L ⁴	2.84	

Bibliography: Cu⁺ 75NF; Zn²⁺ 81NM



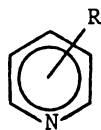
C ₅ H ₅ N		Pyridine (azine)				L
(Other values in Vol.2, p.165 and Vol.5, p.219)						
Metal ion	Equilibrium	Log K 25°, 0.1	Log K 25°, 1.0	Log K 25°, 0	ΔH 25°, 0	ΔS 25°, 0
H ⁺	HL/H.L	5.24 ±0.02 5.31 ^b ±0.02	5.41 ±0.04	5.229 ±0.04	-4.80 ±0.1 -5.41 ^b	7.8 6.1 ^b
Co ²⁺	ML/M.L	1.20 ±0.05 1.24 ^b ±0.01	1.35 ^j			
	ML ₂ /M.L ²	1.75 ^b ±0.05	1.9 ^j			
	ML ₃ /M.L ³	1.8 ^b ±0.2				
	ML ₄ /M.L ⁴	1.6 ^b ±0.2				
Ni ²⁺	ML/M.L	1.87 ±0.03 1.88 ^b ±0.02	1.94		-3 ^c	-1 ^c
	ML ₂ /M.L ²	3.10 ^b ±0.02				
	ML ₃ /M.L ³	3.6 ^b ±0.2				
	ML ₄ /M.L ⁴	3.4 ^b ±0.2				
Cu ²⁺	ML/M.L	2.54 ±0.05 2.56 ^b ±0.04	2.59 ±0.2	2.50	-4.0	-2
	ML ₂ /M.L ²	4.4 4.45 ^b ±0.07	4.51 -0.1	4.30	-8.9	-10 ^b
	ML ₃ /M.L ³	5.7 5.7 ^b ±0.1	5.9 ±0.1	(5.2)	-16	-28 ^b
	ML ₄ /M.L ⁴	6.4 ^b ±0.2	6.6 ±0.1	(6.0)	-22	-45 ^b
	ML/MOHL.H	1.37				
Zn ²⁺	ML/M.L	1.05 ±0.05 1.08 ^b -0.09	1.2 ±0.2		-3 ^c	-5 ^c
	ML ₂ /M.L ²	1.4 ±0.3 1.5 ^b ±0.2	1.8 ±0.2			
	ML ₃ /M.L ³	1.6 ^b ±0.1				
	ML ₄ /M.L ⁴	1.4 ^b				

^b25°, 0.5; ^c25°, 1.0; ^j20°, 1.0

Bibliography: H⁺ 68PP, 69BB, 78ABG, 81BKS, 85CT;

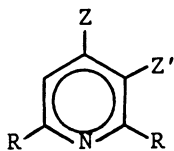
Co²⁺, Zn²⁺ 81BKS; Ni²⁺ 81AC, 81BKS, 81TMb; Cu²⁺ 78AB, 81BKS, 85CT;

Other references: 61S, 73BM, 74KI, 80AJ, 80CZ, 81FS, 81LD, 82ABS, 82KN, 83SPK, 84SLC, 84SSa, 85GN, 85KS, 85PS



C_xH_yN			<u>Alkylpyridine</u>			L	
<u>Ligand</u>	<u>Metal ion</u>	<u>Equilibrium</u>	<u>Log K</u> <u>25°, 0.5</u>	<u>Log K</u> <u>25°, 0</u>	<u>ΔH</u> <u>25°, 0</u>	<u>ΔS</u> <u>25°, 0</u>	
R= CH ₂ CH ₃	H ⁺	HL/H.L	5.83 ±0.02	(5.56)	-6.10	6.2	
3-Ethyl-	Ni ²⁺	ML/M.L	1.87				
(C ₇ H ₉ N)		ML ₂ /M.L ²	3.32				
		ML ₃ /M.L ³	4.36				
		ML ₄ /M.L ⁴	4.97				
(Other reference in Vol.2, p.340 and other values in Vol.5, p.223)	Zn ²⁺	ML/M.L	(1.00)				
		ML ₂ /M.L ²	2.15				
	Cd ²⁺	ML/M.L	1.53				
		ML ₂ /M.L ²	2.69				
		ML ₃ /M.L ³	3.47				
		ML ₄ /M.L ⁴	3.87				
R= C(CH ₃) ₃	H ⁺	HL/H.L	6.20				
4-(1,1-Dimethyl-ethyl)-	Co ²⁺	ML/M.L	1.20				
	Ni ²⁺	ML/M.L	1.98				
		ML ₂ /M.L ²	3.94				
(C ₉ H ₁₃ N)	Cu ²⁺	ML/M.L	2.86				
	Zn ²⁺	ML/M.L	1.38				

Bibliography: 81LR,83LR

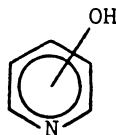


$C_xH_yO_zN_pS_q$	<u>2,6-Dialkyl-3,4-disubstituted-pyridine</u>					
<u>Ligand</u>	<u>Metal ion</u>	<u>Equilibrium</u>	<u>Log K</u> <u>25°, 0.5</u>	<u>Log K</u> <u>25°, 0</u>	<u>ΔH</u> <u>25°, 0</u>	<u>ΔS</u> <u>25°, 0</u>
R= CH ₃ , Z= Z'= H	H ⁺	HL/H.L	6.93 ±0.03	6.73 ±0.02	-7.2	7
2,6-Dimethyl-					(-8.36) ^b	(3.5) ^b
(2,6-lutidine)	Ag ⁺	ML/M.L	2.60 ±0.09		-7.2 ^b	-12 ^b
(C ₇ H ₉ N), L		ML ₂ /M.L ²	5.06		-12.2 ^b	-18 ^b
(Other references in Vol.2, p.172 and Vol.5, p.225)						
R= CH ₃	H ⁺	HL/H.L	2.87			
Z= H, Z'= NO ₂	Ag ⁺	ML/M.L	1.12			
2,6-Dimethyl-3-nitro-(C ₇ H ₈ O ₂ N ₂), L						

^b_{25°, 0.5}

2,6-Dialkyl-3,4-disubstituted-pyridine (continued)

<u>Ligand</u>	<u>Metal ion</u>	<u>Equilibrium</u>	<u>Log K</u> <u>25°, 0.5</u>	<u>Log K</u> <u>25°, 0</u>	<u>ΔH</u> <u>25°, 0</u>	<u>ΔS</u> <u>25°, 0</u>
R= CH ₃ Z= CN, Z'= H 4-Cyano-2,6-dimethyl- (C ₈ H ₈ N ₂), L	H ⁺ Ag ⁺	HL/H.L ML/M.L	3.68 1.56			
R= CH ₃ Z= H, Z'= SO ₃ H 2,6-Dimethyl- pyridine-3- sulfonic acid (C ₇ H ₉ O ₃ NS), HL	H ⁺ Ag ⁺	HL/H.L ML/M.L	4.80 1.95			
R= C(CH ₃) ₃ Z= CH ₃ , Z'= SO ₃ H 2,6-Bis(1,1-di- methylethyl)-4- methylpyridine- 3-sulfonic acid (C ₁₆ H ₂₇ O ₃ N ₅), HL	H ⁺ Ag ⁺	HL/H.L ML/M.L	5.05 0.69			
R= CH ₃ Z= CH ₃ , Z'= CCH ₃ 3-Acetyl-2,4,6- trimethyl- (C ₁₀ H ₁₃ ON), L	H ⁺ Ag ⁺	HL/H.L ML/M.L	5.91 2.13			
R= CH ₃ Z= OCH ₃ , Z'= H 2,6-Dimethyl- 4-methoxy- (C ₈ H ₁₁ ON), L b _{25°, 0.5}	H ⁺ Ag ⁺	HL/H.L ML/M.L	8.04 2.62			
Bibliography: H ⁺ 68PP, 83BEH, 84ER; Ag ⁺ 84ER						

C₅H₅ONHydroxypyridine

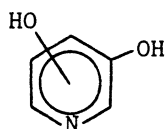
HL

<u>Isomer</u>	<u>Metal ion</u>	<u>Equilibrium</u>	<u>Log K</u> <u>25°, 0.2</u>	<u>Log K</u> <u>25°, 0</u>	<u>ΔH</u> <u>25°, 0</u>	<u>ΔS</u> <u>25°, 0</u>
2-Hydroxy- (Other references in Vol.2, p.340 and Vol.5, p.464 c _{25°, 1.0}	H ⁺ Fe ³⁺	HL/H.L H ₂ L/HL.H ML.H/M.HL		9.5 ^c 1.25 5.6 ^c	+0.1	5

Hydroxypyridine (continued)

<u>Isomer</u>	<u>Metal ion</u>	<u>Equilibrium</u>	<u>Log K</u>		<u>ΔH 25°, 0</u>	<u>ΔS 25°, 0</u>
			25°, 0.2	25°, 0		
3-Hydroxy- (Other references in Vol.2, p.340 and other values in Vol.5, p.231)	H ⁺	HL/H.L	8.50 -0.01	8.78		
		H ₂ L/HL.H	4.89 ±0.10 5.00 ^b	4.82 ±0.05 5.09 ^c	-4.0	9
	Fe ³⁺	MHL/M.HL		3.69 ^c		
	Ag ⁺	MHL/M.HL	1.35 ^b			
		M(HL) ₂ /M.(HL) ₂	3.49 ^b			
4-Hydroxy- (Other reference in Vol.2, p.340)	H ⁺	H ₂ L/HL.H		3.23 3.52 ^c	-1.5	10
	Fe ³⁺	MHL/M.HL		2.15 ^c		

^b25°, 0.5; ^c25°, 1.0
 Bibliography: H⁺ 55MS, 73MHJ, 80Tma, 84SLC, 84TM; Fe³⁺ 80Tma, 84TM; Ag⁺ 85KLR;
 Other reference: 76MP

C₅H₅O₂NDihydroxypyridine

HL

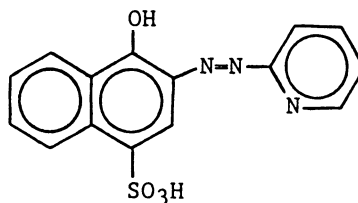
<u>Isomer</u>	<u>Metal ion</u>	<u>Equilibrium</u>	<u>Log K</u>	
			37°, 0.15	25°, 1.0
2,3-Dihydroxy-	H ⁺	HL/H.L	8.54	8.69
		H ₂ L/HL.H		(0.1)
(3-hydroxy- 1,2-dihydro- pyridin-2-one)	Mg ²⁺	ML/M.L	3.44	
		ML ₂ /M.L ²	5.89	
	Ca ²⁺	ML/M.L	2.68	
	Cu ²⁺	ML/M.L	7.66	
(Other values in Vol.2, p.179 and other references in Vol.5, p.464)	Cu ²⁺	ML ₂ /M.L ²	13.77	
		ML ₂ /MOHL ₂ .H	9.5	
		ML/M.L	5.57	
		ML ₂ /M.L ²	10.12	
	Zn ²⁺	ML ₃ /M.L ³	12.30	
3,4-Dihydroxy- (3-hydroxy- 1,4-dihydro- pyridin-4-one)	H ⁺	HL/H.L	8.89	
		H ₂ L/HL.H	3.24	
	Mg ²⁺	ML/M.L	4.33	
		ML ₂ /M.L ²	7.48	
	Ca ²⁺	ML/M.L	3.16	
		ML ₂ /M.L ²	4.7	
	Cu ²⁺	ML/M.L	9.49	
		ML ₂ /M.L ²	17.13	
		MHL/ML.H	1.6	
		ML ₂ /MOHL ₂ .H	10.3	

3,4-Dihydroxypyridine (continued)

Isomer	Metal	Equilibrium	Log K	Log K
	ion		37°, 0.15	25°, 1.0
	Zn ²⁺	ML/M.L	6.81	
		ML ₂ /M.L ²	12.54	
		ML ₃ /M.L ³	14.6	
		ML ₂ /MOHL ₂ .H	10.6	

Bibliography: 80SNP;

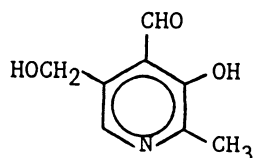
Other references: 76NP, 79BM, 85SS



C ₁₅ H ₁₁ ON ₃		<u>2-(2-Pyridylazo)-1-naphthol-4-sulfonic acid (1-PAN-4S)</u>		H ₂ L
Metal		Log K		
ion	Equilibrium	25°, 0.1		
H ⁺	HL/H.L	7.89		
	H ₂ L/HL.H	2.69		
Zn ²⁺	ML/M.L	7.82		
	ML ₂ /M.L ²	15.17		
	MHL/M.HL	2.29		
Cd ²⁺	ML/M.L	6.70		
	ML ₂ /M.L ²	12.94		
	MHL/M.HL	1.52		

Bibliography: 82JHK;

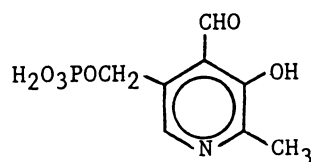
Other reference: 80VH



C ₈ H ₉ O ₃ N		<u>3-Hydroxy-5-hydroxymethyl-2-methylpyridine-4-carboxaldehyde (pyridoxal)</u>			HL
(Other values in Vol.2, p.181 and other references in Vol.5, p.464)					
Metal		Log K	Log K	Log K	
<u>ion</u>	<u>Equilibrium</u>	<u>25°, 0.1</u>	<u>25°, 0.5</u>	<u>25°, 1.0</u>	
H ⁺	L/(H ₋₁ L).H			12.93	
	HL/H.L	8.57 ±0.02	8.39	8.28	
	H ₂ L/HL.H	4.10 ±0.02	4.10	3.92	
Zn ²⁺	ML/M.L	2.32	2.32		
Al ³⁺	ML/M.L	(2.45)			
Ga ³⁺	ML/M.L	(2.67)			
Bibliography: H ⁺ 85La; Zn ²⁺ -Ga ²⁺ 81TMM;					
Other reference: 65PP					

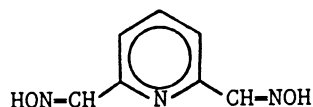
Bibliography: H⁺ 85La; Zn²⁺-Ga²⁺ 81TMM;

Other reference: 65PP

 $C_8H_{10}O_6NP$ Pyridoxal-5-(dihydrogenphosphate) H_3L

(Other references in Vol.1, p.182 and other values in Vol.5, p.232)

Metal ion	Equilibrium	Log K 25°, 0.1	Log K 22°, 1.0	Log K 25°, 2.0
H^+	HL/H.L	8.52 ± 0.07	7.92	8.17
		8.00 ^b ± 0.01		
	$H_2L/HL.H$	6.04 ± 0.04	5.76	5.75
		5.84 ^b ± 0.01		
	$H_3L/H_2L.H$	3.44 + 0.6	3.56 ± 0.02	3.68
		3.52 ^b ± 0.04		
	$H_4L/H_3L.H$	(1.4)		(1.6)
Zn^{2+}	ML/M.L	3.6 ^b	3.47	
	MHL/ML.H	6.3 ^b	6.71	
	$MH_2L/MHL.H$	5.6 ^b	5.17	
Al^{3+}	ML/M.L		10.48	
	MHL/ML.H		4.23	
Ga^{3+}	ML/M.L		14.61	
	MHL/ML.H		3.43	

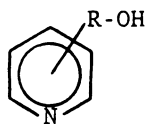
^b25°, 0.5Bibliography: H^+ 54WN, 61ZM, 84SM; Zn^{2+} 84Sma; Al^{3+}, Ga^{3+} 85Sma $C_7H_7O_2N_3$ Pyridine-2,6-dicarboxaldehyde dioxime H_2L

(Other values in Vol.2, p.185 and Vol.5, p.233)

Metal ion	Equilibrium	Log K 25°, 0.05	Log K 20°, 0.5	Log K 25°, 0	ΔH 25°, 0.5	ΔS 25°, 0.05
H^+	HL/H.L	10.54	10.21	10.88	(-7) ^s	(25)
	$H_2L/HL.H$	9.91	9.47	10.08	(-5) ^s	(29)
	$H_3L/H_2L.H$		2.18			
Cd^{2+}	$MH_2L/M.H_2L$		3.74			
	$M(H_2L)_2/M.(H_2L)_2$		6.29			
	$MH_2L/MHL.H$		7.23			
	MHL/ML.H		7.90			
	$M(H_2L)_2/MH_3L_2.H$		6.72			
	$MH_3L_2/MH_2L_2.H$		8.06			
	$MH_2L_2/MHL_2.H$		8.05			
	$MHL_2/ML_2.H$		9.27			

^s20-35°, 0.05

Bibliography: 79P

 C_xH_yON (Hydroxyalkyl)pyridine

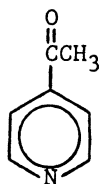
L

Isomer	Metal ion	Equilibrium	Log K 25°, 0.5	Log K 25°, 0
R= -CH ₂ -	H ⁺	HL/H.L	5.07 ±0.03	4.90
3-(Hydroxymethyl)-			5.10 ⁱ	5.00 ^a
(C ₆ H ₇ ON)	Co ²⁺	ML/M.L ML ₂ /M.L ² ML ₃ /M.L ³	1.25 1.93 2.03	
(Other values in Vol.2, p.187)	Ni ²⁺	ML/M.L ML ₂ /M.L ² ML ₃ /M.L ³ ML ₄ /M.L ⁴	1.86 -0.01 3.06 ±0.07 3.80 3.90	
	Cu ²⁺	ML/M.L ML ₂ /M.L ² ML ₃ /M.L ³ ML ₄ /M.L ⁴	2.45 ±0.02 4.30 ±0.03 5.63 6.35	2.49 ^a 4.37 ^a
	Zn ²⁺	ML/M.L ML ₂ /M.L ²	1.07 1.72	
	Cd ²⁺	ML/M.L ML ₂ /M.L ² ML ₃ /M.L ³	1.47 2.39 2.82	
R= -CH ₂ CH ₂ CH ₂ -	H ⁺	HL/H.L	5.65	5.47 5.57 ^a
3-(3-Hydroxy- propyl)-	Co ²⁺	ML/M.L ML ₂ /M.L ² ML ₃ /M.L ³	1.18 2.05 3.61	
(C ₈ H ₁₀ ON)	Ni ²⁺	ML/M.L ML ₂ /M.L ² ML ₃ /M.L ³ ML ₄ /M.L ⁴	2.00 3.46 4.42 4.85	
(Other reference in Vol.2, p.340)	Cu ²⁺	ML/M.L ML ₂ /M.L ² ML ₃ /M.L ³ ML ₄ /M.L ⁴	2.64 4.80 6.46 7.64	
	Zn ²⁺	ML/M.L ML ₂ /M.L ²	(1.00) 2.08	
	Cd ²⁺	ML/M.L ML ₂ /M.L ² ML ₃ /M.L ³ ML ₄ /M.L ⁴	1.51 2.58 3.32 3.72	

^a25°, 0.1; ⁱ20°, 0.5

(Hydroxyalkyl)pyridine (continued)

Isomer	Metal ion	Equilibrium	Log K 25°, 0.5	Log K 25°, 0
R= -CH ₂ -	H ⁺	HL/H.L	5.53 ±0.02	5.33
4-(Hydroxymethyl)-				5.41 ^a
(C ₆ H ₇ ON)	Ag ⁺	ML/M.L	2.18 ±0.03	
(Other values in Vol.2, p.188)		ML ₂ /M.L ²	4.25 ±0.02	

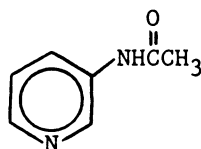
^a25°, 0.1;Bibliography: H⁺ 81LR, 82MT, 85KLR; Co²⁺-Cd²⁺ 81LR; Ag⁺ 85KLRC₇H₇ON

4-Acetylpyridine
(Other reference in Vol.2, p.341)

L

Metal ion	Equilibrium	Log K 25°, 0.5	Log K 25°, 0	ΔH 25°, 0	ΔS 25°, 0
H ⁺	HL/H.L	3.70	3.51	-3.6	4
Co ²⁺	ML/M.L	0.97			
	ML ₂ /M.L ²	1.32			
Ni ²⁺	ML/M.L	1.50			
	ML ₂ /M.L ²	2.43			
	ML ₃ /M.L ³	2.79			
Cu ²⁺	ML/M.L	1.83			
	ML ₂ /M.L ²	3.13			
	ML ₃ /M.L ³	3.89			
	ML ₄ /M.L ⁴	4.11			
Zn ²⁺	ML/M.L	0.90			
	ML ₂ /M.L ²	1.32			
Cd ²⁺	ML/M.L	1.15			
	ML ₂ /M.L ²	1.81			

Bibliography: H⁺ 73BM, 83LR; Co²⁺-Cd²⁺ 83LR;
Other reference: 81FS

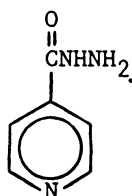
C₇H₈ON₂

3-(Acetamido)pyridine
(Other reference in Vol.5, p.238)

L

Metal ion	Equilibrium	Log K 25°, 0.5
H ⁺	HL/H.L	4.57 ±0.02
Co ²⁺	ML/M.L	1.10 +0.1
	ML ₂ /M.L ²	1.22 +0.3
	ML ₃ /M.L ³	2.46
Ni ²⁺	ML/M.L	1.58 +0.1
	ML ₂ /M.L ²	2.86 ±0.01
	ML ₃ /M.L ³	3.81
Cu ²⁺	ML/M.L	2.16 -0.06
	ML ₂ /M.L ²	3.96 -0.3
	ML ₃ /M.L ³	5.38
	ML ₄ /M.L ⁴	6.43
Zn ²⁺	ML/M.L	1.00 +0.4
	ML ₂ /M.L ²	1.69 ±0.01
	ML ₃ /M.L ³	2.02
Cd ²⁺	ML/M.L	1.37
	ML ₂ /M.L ²	2.44
	ML ₃ /M.L ³	3.38

Bibliography: 81LR

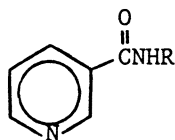
C₆H₇ON₃.

Pyridine-4-carboxylic acid hydrazide (isonicotinoylhydrazine)
(Other values in Vol.2, p.194 and other reference in Vol.5, p.464)

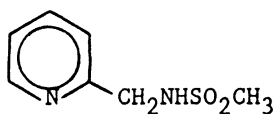
HL

Metal ion	Equilibrium	Log K 37°, 0.15	Log K 25°, 1.0
H ⁺	HL/H.L	10.47	10.89
	H ₂ L/HL.H.	3.53	3.67
	H ₃ L/H ₂ L.H	(1.8)	2.0
Cu ²⁺	MHL/M.HL	2.97	3.15
	M(HL)/M.(HL) ²	5.11	5.08
	MH ₂ L/MHL.H	1.85	
	MHL/ML.H	(4.36)	(4.02)
	M(HL) ₂ /MHL ₂ .H	(3.83)	(2.11)
	MHL ₂ /ML ₂ .H		(3.81)
Zn ²⁺	MHL/M.HL	1.88	1.86
	MHL/ML.H	(6.75)	(5.57)

Bibliography: 83CM; Other reference: 80ZM



$C_xH_yON_2$		<u>Pyridine-3-carboxylic acid alkylamide</u>			L
<u>Ligand</u>	<u>Metal ion</u>	<u>Equilibrium</u>	<u>Log K</u> <u>25°, 0.5</u>	<u>Log K</u> <u>25°, 0</u>	
R= H amide	H^+	HL/H.L	3.41 ±0.06	3.35 ^o 3.31 ^a	
(nicotinamide)	Co^{2+}	ML/M.L	0.87 ±0.1		
(C ₆ H ₆ ON ₂) (Other values in Vol.2, p.197 and Vol.5, p.237)	Ni^{2+}	ML/M.L	1.28 ±0.06		
		ML ₂ /M.L ²	1.92 ±0.01		
		ML ₃ /M.L ³	2.05		
	Cu^{2+}	ML/M.L	1.65 +0.1		
ML ₂ /M.L ²		2.69 +0.1			
ML ₃ /M.L ³		3.19 +0.1			
	Ag^+	ML/M.L	1.67		
		ML ₂ /M.L ²	3.06	3.22 3.21 ^a	
	Zn^{2+}	ML/M.L	0.78 ±0.00		
		ML ₂ /M.L ²	1.15 ±0.04		
R= CH ₃ methanamide	H^+	HL/H.L	3.43		
(C ₇ H ₈ ON ₂) ^a 25°,0.2; °20°,0	Ag^+	ML/M.L	1.52		
		ML ₂ /M.L ²	3.18		
Bibliography:					
H^+ 80BT, 81LR, 85KLR;			Ag^+ 80BT, 85KLR;		
Co^{2+} - Cu^{2+} , Zn^{2+} 81LR;					
Other reference: 83D					

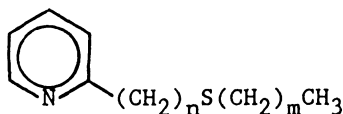


$C_7H_{10}O_2N_2S$		<u>2-(Methanesulfonamidomethyl)pyridine</u>			HL
<u>Metal ion</u>	<u>Equilibrium</u>	<u>Log K</u> <u>30°, 0.1</u>			
H^+	HL/H.L	11.22			
	H ₂ L/HL.H	4.30			
Co^{2+}	ML/M.L	6.09			
	ML ₂ /M.L ²	11.14			
Ni^{2+}	ML/M.L	6.73			
	ML ₂ /M.L ²	12.06			
Cu^{2+}	ML/M.L	9.90			
	ML ₂ /M.L ²	17.69			

2-(Methanesulfonamidomethyl)pyridine (continued)

Metal ion	Equilibrium	Log K 30°, 0.1
Fe ³⁺	ML/M.L	11.70
	ML ₂ /M.L ²	22.94
Zn ²⁺	ML ₂ /M.L ²	12.16
Cd ²⁺	ML/M.L	5.58
	ML ₂ /M.L ²	10.17
Hg ²⁺	ML/M.L	9.51
	ML ₂ /M.L ²	17.61
Pb ²⁺	ML/M.L	6.73
	ML ₂ /M.L ²	12.26

Bibliography: 82MYT

C_xH_yNS2-(Thiaalkyl)pyridine

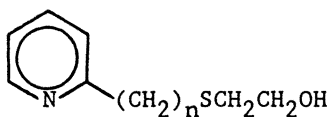
L

Ligand	Metal ion	Equilibrium	Log K 25°, 0.1	Log K 25°, 0.5	ΔH 25°, 0.5	ΔS 25°, 0.5
n= 1, m= 0	H ⁺	HL/H.L	4.53	4.72	-4.71	5.8
2-(2-Thiapropyl)- (2-methyl- thiomethyl-...) (C ₇ H ₉ NS) (Other values in Vol.2, p.199)	Ag ⁺	MHL/M.HL		2.12	-6.5	-12
		M(HL) ₂ /M.(HL) ²		3.28	-9.8	-18
		MHL/ML.H		2.47		
		M(HL) ₂ /ML ₂ .H ²		4.78		
		MHL ₂ /ML ₂ .H		2.9		
		M ₂ L/ML.M		1.14		
		M ₂ L ₂ /ML ₂ .M		3.14		
n= m= 1	H ⁺	HL/H.L		4.72	-4.61	6.1
2-(2-Thiabutyl)- (C ₈ H ₁₁ NS)	Ag ⁺	MHL/M.HL		2.49	-7.2	-13
		M(HL) ₂ /M.(HL) ²		4.01	-11.1	-19
		MHL/ML.H		2.7		
		M(HL) ₂ /MHL ₂ .H		2.45		
		MHL ₂ /ML ₂ .H		2.51		
		M ₂ L/ML.M		1.3		
		M ₂ L ₂ /ML ₂ .M		3.12		
n= 2, m= 0	H ⁺	HL/H.L		5.33	-5.43	6.2
2-(3-Thiabutyl)- (C ₈ H ₁₁ NS)	Ag ⁺	MHL/M.HL		3.00	-7.3	-11
		M(HL) ₂ /M.(HL) ²		4.85	-14.0	-25
		MHL/ML.H		4.4		
		M(HL) ₂ /MHL ₂ .H		3.68		
		MHL ₂ /ML ₂ .H		4.34		
		M ₂ L/ML.M		1.7		
		M ₂ L ₂ /ML ₂ .M		3.51		

2-(Thiaalkyl)pyridine (continued)

<u>Ligand</u>	<u>Metal ion</u>	<u>Equilibrium</u>	<u>Log K</u> <u>25°, 0.1</u>	<u>Log K</u> <u>25°, 0.5</u>	<u>ΔH</u> <u>25°, 0.5</u>	<u>ΔS</u> <u>25°, 0.5</u>
n= 2, m= 1	H ⁺	HL/H.L		5.33	-5.35	6.4
2-(3-Thiapentyl)- (C ₉ H ₁₃ NS)	Ag ⁺	MHL/M.HL		3.34	-8.2	-12
		M(HL) ₂ /M.(HL) ₂		5.36	-15.1	-26
		MHL/ML.H		4.57		
		M(HL) ₂ /MHL ₂ .H		3.60		
		MHL ₂ /ML.H		4.45		
		M ₂ L/ML.M		1.95		
		M ₂ L ₂ /ML ₂ .M		3.73		

Bibliography: H⁺ 81SHG; Ag⁺ 82SG,82SGa

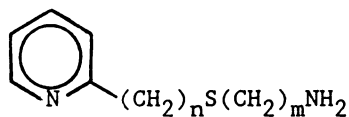
C_xH_yONS

2-(ω-Hydroxy-thiaalkyl)pyridine

L

<u>Ligand</u>	<u>Metal ion</u>	<u>Equilibrium</u>	<u>Log K</u> <u>25°, 0.5</u>	<u>ΔH</u> <u>25°, 0.5</u>	<u>ΔS</u> <u>25°, 0.5</u>
n= 1	H ⁺	HL/H.L	4.61	-4.90	4.6
2-(4-Hydroxy- 2-thiabutyl)- (C ₈ H ₁₁ ONS)	Ag ⁺	MHL/M.HL	2.03	-6.2	-12
		M(HL) ₂ /M.(HL) ₂	3.23	-9.2	-16
		MHL/ML.H	2.26		
		M(HL) ₂ /ML ₂ .H ²	4.59	-3.0	11
		MHL ₂ /ML ₂ .H	2.72		
		M ₂ L/ML.M	1.15		
		M ₂ L ₂ /ML ₂ .M	2.87	-9.8	-20
n= 2	H ⁺	HL/H.L	5.28	-6.62	1.9
2-(5-Hydroxy- 3-thiapentyl)- (C ₉ H ₁₃ ONS)	Ag ⁺	MHL/M.HL	2.89	-7.2	-11
		M(HL) ₂ /M.(HL) ₂	4.67	-13.4	-24
		MHL/ML.H	4.3		
		M(HL) ₂ /ML ₂ .H ²	7.97	-10.9	0
		MHL ₂ /ML ₂ .H	4.38		
		M ₂ L/ML.M	1.7		
		M ₂ L ₂ /ML ₂ .M	3.59		

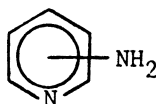
Bibliography: H⁺ 81SHG; Ag⁺ 82SG,82SGa

2-(ω -Amino-thiaalkyl)pyridine

$C_xH_yN_2S$	Metal ion	Equilibrium	Log K 25°, 0.5	ΔH 25°, 0.5	ΔS 25°, 0.5
n= 1, m= 2	H ⁺	HL/H.L H ₂ L/HL.H	9.28 4.21	-12.45 -4.90	0.7 2.8
2-(4-Amino-2-thiabutyl)-	Ni ²⁺	ML/M.L ML ₂ /M.L ² MHL/ML.H	6.99 12.96 3.1	-10.3 -20.1 -5.1	-3 -8 -3
(C ₈ H ₁₂ N ₂ S)	Ag ⁺	MHL/M.HL M(HL) ₂ /M.(HL) ² MH ₂ L/MHL.H M(H ₂ L) ₂ /M(HL) ₂ .H ² MH ₃ L ₂ /M(HL) ₂ .H M ₂ L/M ² .L M ₂ L ₂ /M ² .L ² M ₂ HL ₂ /M ₂ L ₂ .H M ₂ H ₂ L ₂ /M ₂ HL ₂ .H	3.32 6.53 2.05 3.78 1.9 8.42 15.28 6.77 5.5	-7.6 -15.7 -2.1 (+1.0)	-10 -23 2 (12)
n= 1, m= 3	H ⁺	HL/H.L H ₂ L/HL.H	9.97 4.46	-13.31 -4.92	0.9 3.9
2-(5-Amino-2-thiapentyl)-	Ni ²⁺	ML/M.L ML ₂ /ML.L MHL/ML.H M(HL) ₂ /ML ₂ .H ²	5.13 3.19 6.35 14.41	-7.9	-12
(C ₉ H ₁₄ N ₂ S)	Ag ⁺	MHL/M.HL M(HL) ₂ /M.(HL) ² MH ₂ L/MHL.H M(H ₂ L) ₂ /M(HL) ₂ .H ² MH ₃ L ₂ /M(HL) ₂ .H M ₂ HL/MHL.M M ₂ L/M ² .L M ₂ L ₂ /M ² .L ² M ₂ HL ₂ /M ₂ L ₂ .H M ₂ H ₂ L ₂ /M ₂ HL ₂ .H	3.81 7.44 2.48 4.11 2.4 0.90 8.72 15.12 8.03 7.1	-8.8 -16.4 -1.8 -4.5 (-4.3)	-12 -21 5 4 (-3)
n= m= 2	H ⁺	HL/H.L H ₂ L/HL.H	9.35 5.12	-12.60 -5.71	0.5 4.3
2-(5-Amino-3-thiapentyl)-	Ni ²⁺	ML/M.L ML ₂ /M.L ² MHL/ML.H	4.45 7.51 5.50	-7.8 -14.8 -5.3	-6 -15 7
(C ₉ H ₁₄ N ₂ S)	Ag ⁺	MHL/M.HL M(HL) ₂ /M.(HL) ² MH ₂ L/MHL.H M(H ₂ L) ₂ /M(HL) ₂ .H ² MH ₃ L ₂ /M(HL) ₂ .H M ₂ HL/MHL.M M ₂ L/M ² .L M ₂ L ₂ /M ² .L ² M ₂ HL ₂ /M ₂ L ₂ .H M ₂ H ₂ L ₂ /M ₂ HL ₂ .H	3.15 5.70 3.91 7.05 4.0 0.75 8.66 15.16 6.56 5.48	-6.9 -14.5 -5.3 -5.6 -2.3	-9 -23 0 13 11

2-(ω -Amino-thiaalkyl)pyridine (continued)

<u>Ligand</u>	<u>Metal ion</u>	<u>Equilibrium</u>	<u>Log K</u> <u>25°, 0.5</u>	<u>ΔH</u> <u>25°, 0.5</u>	<u>ΔS</u> <u>25°, 0.5</u>
n= 2, m=3	H^+	HL/H.L	10.03	-13.22	1.5
		$H_2L/HL.H$	5.19	-5.66	4.8
2-(6-Amino-3-thiahexyl)- ($C_{10}H_{16}N_2S$)	Ag^+	MHL/M.HL	3.76	-8.6	-12
		$M(HL)_2/M.(HL)_2^2$	6.55	-15.3	-21
		$MH_2L/MHL.H$	4.09	-5.2	1
		$M(H_2L)_2/MH_3L_2.H$	5.19	-4.3	9
		$MH_3L_2/M(HL)_2.H$	2.52	(-6.9)	(-12)
		$M_2HL/MHL.M$	1.47		
		$M_2L/M^2.L$	9.04		
		$M_2L_2/M^2.L^2$	14.74	-29.2	-31
		$M_2HL_2/M_2L_2.H$	8.11	-12.0	-3
		$M_2H_2L_2/M_2HL_2.H$	7.10		

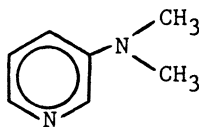
Bibliography: H^+ 81SHG; Ni^{2+} 84HG; Ag^+ 83SGa, 83SHG $C_5H_6N_2$ Aminopyridine

L

<u>Isomer</u>	<u>Metal ion</u>	<u>Equilibrium</u>	<u>Log K</u> <u>25°, 0.1</u>	<u>Log K</u> <u>25°, 0</u>	<u>ΔH</u> <u>25°, 0</u>	<u>ΔS</u> <u>25°, 0</u>
2-Amino-	H^+	HL/H.L	6.78	6.739 $\pm$ 0.03	-8.33 $\pm$ 0.07	2.9
			6.84 ^b $\pm$ 0.05	6.93 ^c	-8.39 ^b	3.2 ^b
(Other values in Vol.2, p.205 and Vol.5, p.239)	Ag^+	ML/M.L $ML_2/M.L^2$	2.35 ^b $\pm$ 0.03 (4.85)			
			4.77 ^b $\pm$ 0.03			
3-Amino-	H^+	HL/H.L	6.05 $\pm$ 0.02	6.02 $\pm$ 0.01	-6.42 $\pm$ 0.01	6.0
			6.16 ^b $\pm$ 0.05		-6.66 ^b	5.8 ^b
(Other values in Vol.2, p.207 and Vol.5, p.239)	Ag^+	ML/M.L $ML_2/M.L^2$	2.22 ^b $\pm$ 0.03 (4.44)		-5.5 ^b	-8
			4.44 ^b $\pm$ 0.04		-12.4 ^b	-21

^b25°, 0.5; ^c25°, 1.0Bibliography: H^+ 71BF, 73BM, 80BT, 81TB, 81YB, 85KLR; Ag^+ 80BT, 85KLR;

Other reference: 74KI

 $C_7H_{10}N_2$ 3-(Dimethylamino)pyridine

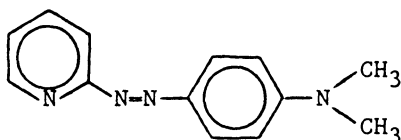
L

<u>Metal ion</u>	<u>Equilibrium</u>	<u>Log K</u> <u>25°, 0.5</u>
H^+	HL/H.L	6.52
Co^{2+}	ML/M.L	1.23
	$ML_2/M.L^2$	2.28

4-(Dimethylamino)pyridine (continued)

<u>Metal ion</u>	<u>Equilibrium</u>	<u>Log K</u> <u>25°, 0.5</u>
Ni ²⁺	ML/M.L	1.81
	ML ₂ /M.L ²	3.21
	ML ₃ /M.L ³	4.19
	ML ₄ /M.L ⁴	4.75
Zn ²⁺	ML/M.L	1.18
	ML ₂ /M.L ²	1.95
Cd ²⁺	ML/M.L	1.52
	ML ₂ /M.L ²	2.62
	ML ₃ /M.L ³	3.50
	ML ₄ /M.L ⁴	4.16

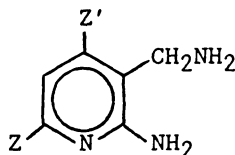
Bibliography: 81LR



C₁₃H₁₄N₄ 2[4-(Dimethylamino)phenylazo]pyridine (pyridine-2-azo-4-dimethylaniline) L
(Other values on Vol.2, p.218 and other reference on Vol.5, p.465)

<u>Metal ion</u>	<u>Equilibrium</u>	<u>Log K</u> <u>20°, 0.1</u>
CH ₃ Hg ⁺	HL/H.L	5.75

Bibliography: 73GE

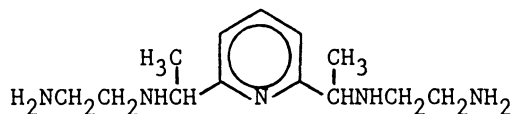


C_xH_yO_zN₃ 2-Amino-3-aminomethyl-4-substituted-6-substituted-pyridine L

<u>Ligand</u>	<u>Metal ion</u>	<u>Equilibrium</u>	<u>Log K</u> <u>25°, 0.35</u>
Z = Z' = CH ₃ -4,6-dimethyl- (C ₈ H ₁₃ N ₃)	H ⁺	HL/H.L	9.14
		H ₂ L/HL.H	6.60
	Cu ²⁺	ML/M.L	6.52
		ML ₂ /M.L ²	11.42
Z' = CH ₂ OCH ₃ Z = CH ₃ -4-methoxymethyl- 6-methyl- (C ₉ H ₁₅ ON ₃)	H ⁺	HL/H.L	8.96
		H ₂ L/HL.H	5.78
	Ni ²⁺	ML/M.L	3.56
		ML ₂ /M.L ²	5.85
	Cu ²⁺	ML/M.L	5.85
		ML ₂ /M.L ²	10.18
	Zn ²⁺	ML/M.L	2.93
		ML ₂ /M.L ²	5.7

2-Amino-3-aminomethyl-4-substituted-6-substituted-pyridine (continued)

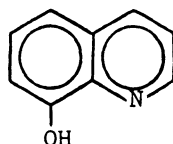
Ligand	Metal ion	Equilibrium	Log K 25°, 0.35
Z' = CH ₃	H ⁺	HL/H.L	8.96
Z = CH ₂ OCH ₃		H ₂ L/HL.H	5.41
-4-methyl-	Cu ²⁺	ML/M.L	5.78
-6-methoxymethyl- (C ₉ H ₁₅ ON ₃)		ML ₂ /M.L ²	10.10
Bibliography: 85CS			



C ₁₃ H ₂₅ N ₅		<u>2,6-Bis[1-(2-aminoethylamino)ethyl]pyridine (epyden)*</u>		L
		(Other reference in Vol.5, p.244)		
Metal		Log K	ΔH	ΔS
<u>ion</u>	<u>Equilibrium</u>	<u>25°, 0.1</u>	<u>25°, 0.1</u>	<u>25°, 0.1</u>
H ⁺	HL/H.L	9.75		
	H ₂ L/HL.H	9.05		
	H ₃ L/H ₂ L.H	6.32		
	H ₄ L/H ₃ L.H	5.47		
Co ²⁺	ML/M.L	13.99	-12.1	24
	MHL/ML.H	4.35		
Ni ²⁺	ML/M.L	17.78	-16.5	26
	MHL/ML.H	3.50		
Cu ²⁺	ML/M.L	21.22	-21.6	25
	MHL/ML.H	4.95		
Zn ²⁺	ML/M.L	15.73	-13.9	25
	MHL/ML.H	2.74		

*Stereoisomerism (meso- or DL-) not specified.

Bibliography: 82TMH



C ₉ H ₇ ON		<u>8-Hydroxyquinoline (8-quinolinol, oxine)</u>				HL
(Other values in Vol.2, p.223 and other references in Vol.5, p.441)						
Metal		Log K	Log K	Log K	ΔH	ΔS
<u>ion</u>	<u>Equilibrium</u>	<u>25°, 0.1</u>	<u>25°, 1.0</u>	<u>25°, 0</u>	<u>25°, 0</u>	<u>25°, 0</u>
H ⁺	HL/H.L	9.65 ±0.03	9.60 ±0.03	9.82 -0.01	-7 ^r ±2	20
		9.62 ^b ±0.07				
	H ₂ L/HL.H	4.97 ±0.06	5.19 ±0.06	4.92 ±0.04	-5 ^s -1	5
		5.12 ^b ±0.04				
Be ²⁺	ML ₂ /M.L ²	14.3 ^h				
Mg ²⁺	ML/M.L	4.31 ^h	3.91 ^j	4.74 ^o		
	M.L ² /ML ₂ (s)			-15.6 ^o		
Ca ²⁺	ML/M.L	2.82 ^h	2.44 ^j	3.27 ^o		
	M.L ² /ML ₂ (s)			-11.2 ^o		
^b 25°,0.5; ^h 20°,0.1; ^j 20°,1.0; ^o 20°,0; ^r 20-40°,0; ^s 25-45°,0.1						

^b25°, 0.5; ^h20°, 0.1; ^j20°, 1.0; ^o20°, 0; ^r20-40°, 0; ^s25-45°, 0.1

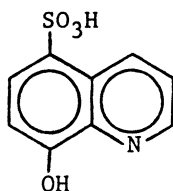
Oxine (continued)

Metal ion	Equilibrium	Log K 25°, 0.1	Log K 25°, 1.0	Log K 25°, 0	ΔH 25°, 0	ΔS 25°, 0
Sr ²⁺	ML/M.L	2.11 ^h	1.55 ^j	2.56 ^o		
	M.L ² /ML ₂ (s)			-9.3 ^o		
Ba ²⁺	ML/M.L	1.62 ^h	1.26 ^j	2.07 ^o		
	M.L ² /ML ₂ (s)			-8.5 ^o		
Th ⁴⁺	ML/M.L	10.5				
	ML ₂ /M.L ²	20.4				
	ML ₃ /M.L ³	29.9				
	ML ₄ /M.L ⁴	38.8				
	M.L ⁴ /ML ₄ (s)	-45.3 ±0.2				
Co ²⁺	ML/M.L			8.65		
	M.L ² /ML ₂ (s)			-24.8		
Ni ²⁺	ML/M.L			9.27		
	M.L ² /ML ₂ (s)			-26.1		
Cu ²⁺	ML/M.L	12.0 ±0.1		12.56 ^o		
	ML ₂ /M.L ²	22.9 ±0.1				
	M.L ² /ML ₂ (s)	-29.0 ±0.2		-29.6		
Fe ³⁺	ML/M.L	13.69	(13.0) ^b	14.52		
	ML ₂ /M.L ²	26.3	(25.3) ^b			
	ML ₃ /M.L ³	36.9	36.9 ^b			
	M.L ³ /ML ₃ (s)	-43.4 ±0.2				
Zn ²⁺	ML/M.L	8.52		8.56 ^o		
	ML ₂ /M.L ²	15.8				
	M.L ² /ML ₂ (s)	-23.5 ±0.2		-24.5 ^o		
Cd ²⁺	ML/M.L	7.34		7.78 ^o		
	ML ₂ /M.L ²	13.44				
	ML ₃ /M.L ³	17.96				
	M.L ² /ML ₂ (s)	-21.4		-22.0		
Pb ²⁺	ML/M.L			9.02		
	M.L ² /ML ₂ (s)			-22.0		
Al ³⁺	M.L ³ /ML ₃ (s)	-30.6 ^h		-32.3 ^p		
Ga ³⁺	ML/M.L	14.5 ^h				
	ML ₂ /M.L ²	28.0 ^h				
	ML ₃ /M.L ³	40.5 ^h				
	M.L ³ /ML ₃ (s)	-39.8 ^h		-40.8 ^p		
In ³⁺	ML/M.L	12.0 ±0.0				
	ML ₂ /M.L ²	23.9 ±0.1				
	ML ₃ /M.L ³	35.4 ±0.1				
	M.L ³ /ML ₃ (s)	-37 ^h		-36.7 ^p		
Ge(IV)	M(OH) ₂ L ₂ ./M(OH) ₄ .(HL) ²	6.61 ^b	6.70	6.53		

^b25°, 0.5; ^h20°, 0.1; ^j20°, 1.0; ^o20°, 0; ^p18°, 0

Bibliography: H⁺ 61JF, 66ML, 74MW, 75PK, 76P, 78SF, 79SZ, 82ABS, 85VZ; Be²⁺, Th⁴⁺, Fe³⁺ 79SZ; Cu²⁺ 74MW, 79SZ; Zn²⁺ 61FF, 79SZ; Cd²⁺ 76MW; Al³⁺, Ga³⁺, In³⁺ 47L, 79SZ;

Other references: 50T, 52BP, 58KK, 63LC, 66KF, 690, 70KK, 700a, 73KZ, 78SF, 80BP, 80NKB, 80R, 81LM, 83VZP, 84VSL, 84VZ, 85SA, 85VS

 $C_9H_7O_4NS$

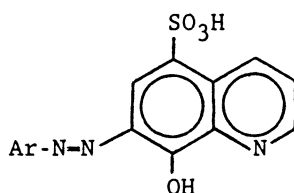
8-Hydroxyquinoline-5-sulfonic acid (sulfoxine)
(Other values in Vol.2, p.227 and Vol.5, p.245)

 H_2L

Metal		Log K	Log K	Log K	ΔH	ΔS
<u>ion</u>	<u>Equilibrium</u>	<u>25°, 0.1</u>	<u>25°, 1.0</u>	<u>25°, 0</u>	<u>25°, 0.1</u>	<u>25°, 0.1</u>
H^+	HL/H.L	8.42 ± 0.07	8.22 ± 0.1	8.757	-4.1 ± 0.1	25
		$8.23^b \pm 0.01$			-4.8^b	22 ^b
	$H_2L/HL.H$	3.95 ± 0.07	3.97 ± 0.1	4.112	-4.4	3
		$3.89^b \pm 0.06$			-4.4^b	3 ^b
Al^{3+}	ML/M.L	8.7				
	$ML_2/M.L^2$	16.6				
	$ML_3/M.L^3$	23.2				
Ga^{3+}	ML/M.L	11.97				
	$ML_2/M.L^2$	23.44				
	$ML_3/M.L^3$	33.4				

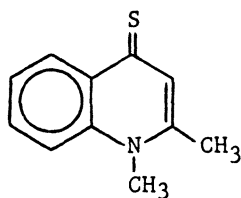
^b_{25°, 0.5}Bibliography: H^+ 71GK, 80LM; Al^{3+} 83H00; Ga^{3+} 80LM;

Other references: 80Ag, 80NW, 80RB, 81VS, 83Ac, 83IT

 $C_xH_yO_zN_3S_p$ 8-Hydroxy-7-(aryldiazo)quinoline-5-sulfonic acid H_3L

Ligand	Metal		Log K
	<u>ion</u>	<u>Equilibrium</u>	<u>25°, 0.1</u>
Ar = $C_6H_4CO_2H$ -7-(2-carboxy-phenylazo)- ($C_{16}H_{11}O_6N_3S$)	H^+	HL/H.L	9.02
		$H_2L/HL.H$	3.63
		$H_3L/H_2L.H$	3.34
	Al^{3+}	ML/M.L	9.86
		$ML_2/M.L^2$	16.8
Ar = $C_{10}H_6SO_3H$ -7-(6-sulfo-2-naphthylazo)- ($C_{19}H_{13}O_7N_3S_2$)	H^+	HL/H.L	7.62
		$H_2L/HL.H$	3.00
		$H_3L/H_2L.H$	7.9
Ar = $C_{10}H_6(SO_3H)_2OH$ -7-(8-hydroxy-3,6-disulfo-1-naphthylazo)- ($C_{19}H_{13}O_{11}N_3S_3$) H_5L	H^+	HL/H.L	11.46
		$H_2L/HL.H$	8.33
		$H_3L/H_2L.H$	3.81
	Al^{3+}	ML/M.L	16.03

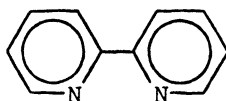
Bibliography: 82HOH, 83IOH, 84OF



$C_{11}H_{11}NS$ 1,2-Dimethylquinoline-4-thione (1-methylquinaldine-4-thione) HL

Metal		Log K
<u>ion</u>	<u>Equilibrium</u>	<u>20°, 0.1</u>
CH_3Hg^+	ML/M.L	9.7

Bibliography: 73GE



$C_{10}H_8N_2$ 2,2'-Bipyridyl L
(Other values in Vol.1, p.235 and Vol.5, p.248)

Metal		Log K	Log K	Log K	ΔH	ΔS
<u>ion</u>	<u>Equilibrium</u>	<u>25°, 0.1</u>	<u>25°, 1.0</u>	<u>25°, 0</u>	<u>25°, 0.1</u>	<u>25°, 0.1</u>
H^+	HL/H.L	4.43 $\pm$ 0.04	4.64 $\pm$ 0.04	4.34 $\pm$ 0.01	-3.6 $\pm$ 0.1	8
		4.53 ^b $\pm$ 0.05			-4.0 ^c $\pm$ 0.0	8 ^c
	H_2L /HL.H	(1.5) $\pm$ 0.1				
Mg^{2+}	ML/M.L	0.28	0.52		(-1) ^s	(-2)
		0.39 ^b	0.44 ^q			
Ca^{2+}	ML/M.L	-0.09	0.15		(-4) ^s	(-14)
		0.02 ^b	0.07 ^q			
Sr^{2+}	ML/M.L	-0.20	0.04		(-4) ^s	(-14)
		-0.09 ^b	-0.04 ^q			
Ba^{2+}	ML/M.L	-0.28	-0.04		(-4) ^s	(-15)
		-0.17 ^b	-0.12 ^q			
Zn^{2+}	ML/M.L	5.12 $\pm$ 0.09			-7.1 ^h	0
			5.34		-6.3 ^t	3 ^c
	ML_2 /M.L ²	9.63 $\pm$ 0.04			-12.5 ^h	2
			9.96		-11.8 ^t	6 ^c
	ML_3 /M.L ³	13.3 $\pm$ 0.1			-17.5 ^h	
			14.0		-15.9 ^t	11 ^c
Cd^{2+}	ML/M.L	4.22 $\pm$ 0.03			-5.1 ^h	2
	ML_2 /M.L ²	7.80 $\pm$ 0.05			-9.4 ^h	4
	ML_3 /M.L ³	10.40 $\pm$ 0.05			-14.0 ^h	0

^b25°, 0.5; ^c25°, 1.0; ^h20°, 0.1; ^q25°, 0.7; ^s10-40°, 0.1; ^t30°, 1.0

Bibliography:

H^+ 81BSM, 81TS, 82ABS, 82DN, 82RS, 82SPK, 83PSK, 84RH, 85CD, 85DR, 85RRb, 85SC;

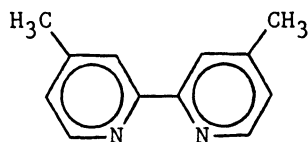
Mg^{2+} - Ba^{2+} 85CD;

Cu^{2+} 76CM;

Co^{2+} 85SC;

Cd^{2+} 79DA;

Other references: 80Ag, 80BL, 80NW, 81BL, 81HW, 82BMA, 82BPc, 82CCM, 82DE, 82GF, 82ML, 83Ac, 83AM, 83EB, 83YW, 84ASE, 84KPN, 84MA, 84VSL, 85VS

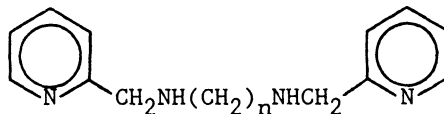
 $C_{12}H_{12}N_2$

4,4'-Dimethyl-2,2'-bipyridyl
(Other reference in Vol.2, p.341)

L

Metal ion	Equilibrium	Log K 25°, 0.1
H^+	HL/H.L	5.34 $\pm$ 0.02
Co^{2+}	ML/M.L	6.4
	$ML_2/M.L^2$	11.3
	$ML_3/M.L^3$	16.6

Bibliography: 85SC

 $C_xH_yN_4$

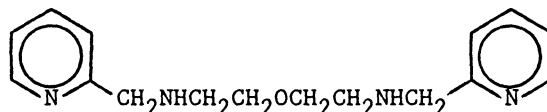
N,N'-Bis(2-pyridylmethyl)-1,n-diaminoalkane (2,n,2-dpa)
(Other values in Vol.2, p.248, 250, and 251)

L

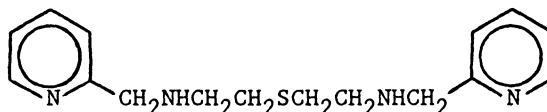
Ligand	Metal ion	Equilibrium	Log K 25°, 0.1	Log K 25°, 1.0	ΔH 25°, 0.1	ΔS 25°, 0.1
n= 2	H^+	HL/H.L	8.22 $\pm$ 0.06	8.39 $\pm$ 0.06	-7.7	12
-1,2-diamino- ethane (2,2,2-dpa)		$H_2L/HL.H$	5.40 $\pm$ 0.07	5.75 $\pm$ 0.04	-6.7	2
		$H_3L/H_2L.H$	(1.8) $\pm$ 0.3	(1.7) $\pm$ 0.1		
		$H_4L/H_3L.H$	(1.6) $\pm$ 0.2			
$(C_{14}H_{18}N_4)$	Co^{2+}	ML/M.L	12.4 $\pm$ 0.4		-17.4	7
	Pd^{2+}	ML/M.L		35.6		
n= 3	H^+	HL/H.L	8.80	8.99 $\pm$ 0.05	-8.9	10
-1,3-diamino- propane (2,3,2-dpa)		$H_2L/HL.H$	6.93	7.28 $\pm$ 0.02	-8.8	2
		$H_3L/H_2L.H$		2.34 $\pm$ 0.06		
		$H_4L/H_3L.H$		(1.3)		
$(C_{15}H_{20}N_4)$	Pd^{2+}	ML/M.L		39.1		
n= 4	H^+	HL/H.L	9.06	9.34 $\pm$ 0.08	-9.6	9
-1,4-diamino- butane (2,4,2-dpa)		$H_2L/HL.H$	7.56	8.04 $\pm$ 0.02	-9.6	2
		$H_3L/H_2L.H$		2.4 -0.3		
		$H_4L/H_3L.H$		(1.5)		
$(C_{16}H_{22}N_4)$	Pd^{2+}	ML/M.L		37.0		
n= 5	H^+	HL/H.L	9.15	9.33 $\pm$ 0.05		
-1,5-diamino- pentane (2,5,2-dpa)		$H_2L/HL.H$	8.17	8.59 $\pm$ 0.06		
		$H_3L/H_2L.H$	2.05	2.62 $\pm$ 0.05		
		$H_4L/H_3L.H$		(1.0) -0.4		
$(C_{17}H_{24}N_4)$	Pd^{2+}	ML/M.L	34.0	34.7		

N,N'-Bis(2-pyridylmethyl)-1,n-diaminoalkane (continued)

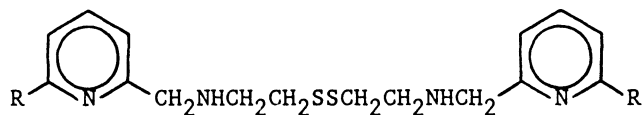
<u>Ligand</u>	<u>Metal ion</u>	<u>Equilibrium</u>	<u>Log K</u>	<u>Log K</u>	<u>ΔH</u>	<u>ΔS</u>
			<u>25°, 0.1</u>	<u>25°, 1.0</u>	<u>25°, 0.1</u>	<u>25°, 0.1</u>
n= 6	H ⁺	HL/H.L		9.34		
-1,6-diamino-		H ₂ L/HL.H		8.73		
hexane		H ₃ L/H ₂ L.H		2.43		
(2,6,2-dpa)		H ₄ L/H ₃ L.H		(1.3)		
(C ₁₈ H ₂₆ N ₄)						
Bibliography: H ⁺ 85BM,85YA; Co ²⁺ 85BM; Pd ²⁺ 85YA						



C ₁₆ H ₂₂ ON ₄		<u>1,9-Di(2-pyridyl)-2,8-diaza-5-oxanonane</u>	L
<u>Metal ion</u>	<u>Equilibrium</u>	<u>Log K 25°, 0.1</u>	
H ⁺	HL/H.L	8.32	
	H ₂ L/HL.H	7.28	
	H ₃ L/H ₂ L.H	(1.9)	
	H ₄ L/H ₃ L.H	(1.4)	
Co ²⁺	ML/M.L	9.84	
	MHL/ML.H	3.80	
Ni ²⁺	ML/M.L	13.28	
	MHL/ML.H	2.48	
Cu ²⁺	ML/M.L	15.38	
Zn ²⁺	ML/M.L	9.52	
Bibliography: 82BT			



C ₁₆ H ₂₂ N ₄ S		<u>1,9-Di(2-pyridyl)-2,8-diaza-5-thianonane</u>	L
<u>Metal ion</u>	<u>Equilibrium</u>	<u>Log K 25°, 0.1</u>	
H ⁺	HL/H.L	8.00 ±0.02	
	H ₂ L/HL.H	6.98 ±0.02	
	H ₃ L/H ₂ L.H	(1.9) -0.1	
	H ₄ L/H ₃ L.H	(0.9)	
Co ²⁺	ML/M.L	11.75	
	MHL/ML.H	2.92	
Ni ²⁺	ML/M.L	14.88	
Cu ²⁺	ML/M.L	18.1	
Zn ²⁺	ML/M.L	10.64	
	MHL/ML.H	2.88	
Bibliography: H ⁺ 82BT,83YS; Co ²⁺ -Zn ²⁺ 82BT			

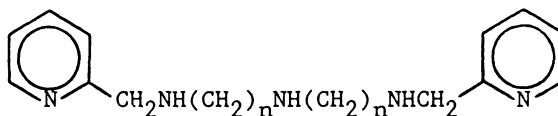
 $C_xH_yN_4S_2$ 1,10-Bis(6-alkyl-2-pyridyl)-2,9-diaza-5,6-dithiadecane

L

<u>Ligand</u>	<u>Metal ion</u>	<u>Equilibrium</u>	<u>Log K</u> <u>25°, 0.1</u>
R= H	H ⁺	HL/H.L	7.88
1,10-Di(2-pyridyl)-		H ₂ L/HL.H	7.02
		H ₃ L/H ₂ L.H	(1.9)
(C ₁₆ H ₂₂ N ₄ S ₂)	Cu ²⁺	ML/M.L	13.32
		MHL/ML.H	2.94
		M ₂ L/ML.M	3.30

R= CH ₃	H ⁺	HL/H.L	7.80
1,10-Bis(6-methyl-2-pyridyl)-		H ₂ L/HL.H	7.01
		H ₃ L/H ₂ L.H	2.79
		H ₄ L/H ₃ L.H	2.16
(C ₁₈ H ₂₆ N ₄ S ₂)	Cu ²⁺	ML/M.L	9.46
		MHL/ML.H	4.08
		MH ₂ L/MHL.H	3.21

Bibliography: 83YS

 $C_xH_yN_5$ 1- ω -Di(2-pyridyl)-triazalkane
(Other reference in Vol.5, p.252)

L

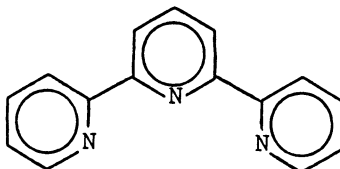
<u>Ligand</u>	<u>Metal ion</u>	<u>Equilibrium</u>	<u>Log K</u> <u>25°, 0.1</u>	<u>ΔH</u> <u>25°, 0.1</u>	<u>ΔS</u> <u>25°, 0.1</u>
n= 2	H ⁺	HL/H.L	8.88		
1,9-Di(2-pyridyl)-2,5,8-triazanonane		H ₂ L/HL.H	7.04		
		H ₃ L/H ₂ L.H	3.82		
		H ₄ L/H ₃ L.H	(1.4)		
(N,N"-bis(2-pyridylmethyl)-diethylene-triamine)	Co ²⁺	ML/M.L	14.73	-15.4	16
		MHL/ML.H	2.28		
(pydien)	Ni ²⁺	ML/M.L	19.2	-20.2	20
(pydien)	Cu ²⁺	ML/M.L	20.9	-22.3	21
(C ₁₆ H ₂₃ N ₅)	Zn ²⁺	ML/M.L	13.71	-13.0	19
		MHL/ML.H	1.83		

n= 3	H ⁺	HL/H.L	9.92		
1,11-Di(2-pyridyl)-2,6,10-triaza-undecane		H ₂ L/HL.H	7.63		
		H ₃ L/H ₂ L.H	6.76		
		H ₄ L/H ₃ L.H	(1.8)		
(N,N"-bis(2-pyridylmethyl)-di-1,3-propylene-triamine)	Co ²⁺	ML/M.L	11.47	-13.1	9
		MHL/ML.H	4.42		
(pydpt)	Ni ²⁺	ML/M.L	15.38	-18.1	10
		MHL/ML.H	3.35		
(C ₁₈ H ₂₇ N ₅)					

1,ω-Di(2-pyridyl)-triazalkane (continued)

<u>Ligand</u>	<u>Metal ion</u>	<u>Equilibrium</u>	<u>Log K</u> <u>25°, 0.5</u>	<u>ΔH</u> <u>25°, 0.5</u>	<u>ΔS</u> <u>25°, 0.5</u>
	Cu ²⁺	ML/M.L	18.85	-21.2	15
		MHL/ML.H	2.46		
	Zn ²⁺	ML/M.L	11.18	-9.7	19
		MHL/ML.H	4.03		

Bibliography: 82TMH

C₁₅H₁₁N₃

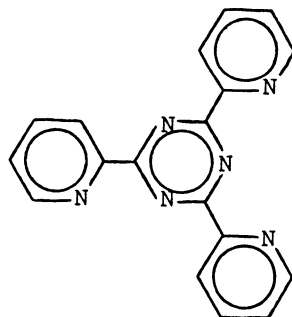
2,6-Di(2-pyridyl)pyridine (2,2',2''-terpyridine)
 (Other references in Vol.2, p.352 and other values in Vol.5, p.253)

L

<u>Metal ion</u>	<u>Equilibrium</u>	<u>Log K</u> <u>25°, 0.1</u>	<u>Log K</u> <u>25°, 0.5</u>	<u>ΔH</u> <u>25°, 0.1</u>	<u>ΔS</u> <u>25°, 0.1</u>
H ⁺	HL/H.L	4.65 ±0.10	4.69 ±0.00	-3.5 ±0.7	10
	H ₂ L/HL.H	3.5 ±0.1	3.54	-5.2 ±0.7	-1
Mn ²⁺	ML/M.L	4.44 ±0.0			
Fe ²⁺	ML/M.L	7.1 ^t			
	ML ₂ /M.L ²	20.7 ±0.3	21.1	-27	4
Cu ²⁺	ML/M.L	12.3 +1		-14.0 -2	9
	ML ₂ /M.L ²	19.1		-21.0	17
	ML/MOHL.H	8.08 -0.01		-9.7	4
	MOHL/M(OH) ₂ L.H	10.4		-7.9	21
	M ₂ (OH) ₂ L ₂ /(MOHL) ₂	3.5		+1.4	21

^t25°, 0.002-0.1Bibliography: H⁺ 79CRa, 81BS, 84SW; Mn²⁺ 85MEa; Fe²⁺ 81BS, 84SW; Cu²⁺ 79CRa, 81WN;

Other references: 80EL, 83EB, 84ASE

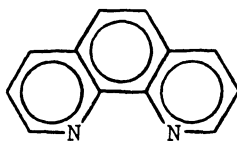
C₁₈H₁₂N₆

2,4,6-Tri(2-pyridyl)-1,3,5-triazine
 (Other references in Vol.2, p.353 and Vol.5, p.253)

L

<u>Metal ion</u>	<u>Equilibrium</u>	<u>Log K</u> <u>25°, 0.1</u>	<u>Log K</u> <u>23°, 0.5</u>
H ⁺	HL/H.L	3.53	(3.4)
	H ₂ L/HL.H	2.73	(2.2)
Fe ²⁺	ML ₂ /M.L ²	12.3 ±0.4	(11.0)

Bibliography: 84SW

 $C_{12}H_8N_2$ 1,10-Phenanthroline

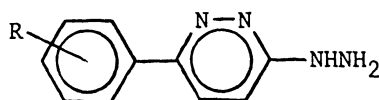
L

(Other values in Vol.2, p.251 and Vol.5, p.254)

Metal		Log K	Log K	Log K	ΔH	ΔS
<u>ion</u>	<u>Equilibrium</u>	<u>25°, 0.1</u>	<u>25°, 1.0</u>	<u>25°, 0</u>	<u>25°, 0</u>	<u>25°, 0</u>
H^+	HL/H.L	4.93 $\pm$ 0.04	5.17 $\pm$ 0.02	4.86	-3.6 $\pm$ 0.1	10
		5.03 ^b $\pm$ 0.03			-3.9 ^h	9 ^a
	H ₂ L/HL.H	(1.5) $\pm$ 0.4				
Mg ²⁺	ML/M.L	1.51 $\pm$ 0.0	1.75		(-2) ^s	(0)
		1.62 ^b	1.67 ^q			
Ca ²⁺	ML/M.L	1.05 $\pm$ 0.0	1.29		(-3) ^s	(-5)
		1.16 ^b	1.21 ^q			
Sr ²⁺	ML/M.L	0.87	0.98		(-3) ^s	(-6)
		0.89 ^b	0.94 ^q			
Ba ²⁺	ML/M.L	0.53	0.77		(-2) ^s	(-4)
		0.64 ^b	0.69 ^q			

^a25°, 0.1; ^b25°, 0.5; ^h20°, 0.1; ^q25°, 0.7; ^s10-40°, 0.1Bibliography: H^+ 82RS, 85DR, 85IWO, 85KSR; Mg^{2+} - Ba^{2+} 85CD;

Other references: 63R, 74SD, 80Ag, 80BB, 80MMF, 80NW, 81BL, 81TS, 82ABS, 82BPc, 82ML, 83AC, 83EB, 83YW, 84PM, 84RH, 84YK

 $C_xH_yO_zN_q$ 3-Hydrazino-6-substituted-phenyl-1,2-diazine

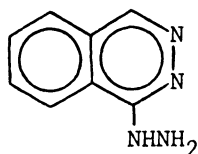
L

<u>Ligand</u>	<u>Metal</u>	<u>Equilibrium</u>	<u>Log K</u>
$R=H$	H^+	HL/H.L	5.46
$(C_{10}H_{10}N_4)$	Zn^{2+}	ML/M.L	3.79
		ML/M(H ₁ L).H	5.35
$R=OCH_3$	H^+	HL/H.L	5.40
-2-methoxy- $(C_{11}H_{12}ON_4)$	Cu^{2+}	ML ₂ /M.L ²	11.92
	Zn^{2+}	ML/M.L	3.60
		ML ₂ /M.L ²	7.25
$R=OCH_3$	H^+	HL/H.L	5.45
-3-methoxy- $(C_{11}H_{12}ON_4)$	Zn^{2+}	ML ₂ /M.L ²	7.51
		ML ₃ /M.L ³	10.00

3-Hydrazino-6-substituted-phenyl-1,2-diazine (continued)

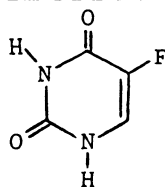
<u>Ligand</u>	<u>Metal ion</u>	<u>Equilibrium</u>	<u>Log K</u> <u>37°, 0.15</u>
R= OCH ₃	H ⁺	HL/H.L	5.57
-4-methoxy- (C ₁₁ H ₁₂ ON ₄)	Zn ²⁺	ML/M.L	3.79
OH	H ⁺	HL/H.L	9.24
R=OCH ₂ CHCH ₂ NHC(CH ₃) ₃		H ₂ L/HL.H	5.15
-2-[3-(1,1-dimethylethyl-amino)-2-hydroxy-propoxy]- (prizidilol) (C ₁₇ H ₂₄ O ₂ N ₅)	Fe ²⁺	MHL/M.HL	3.50
	Zn ²⁺	ML/M.L	12.32
		M(HL) ₂ /M.(HL) ₂	6.59

Bibliography: 84AM



C ₈ H ₈ N ₄	<u>3-Hydrazinobenzo[d]-1,2-diazine (hydralazine)</u>		L
<u>Metal ion</u>	<u>Equilibrium</u>	<u>Log K</u> <u>37°, 0.15</u>	
H ⁺	HL/H.L	6.86	
Fe ²⁺	ML ₂ /M.L ²	7.82	
	ML ₃ /M.L ³	11.65	
Zn ²⁺	ML/M.L	4.20	
	ML ₂ /M.L ²	8.12	
	ML/MOHL.H	1.2	

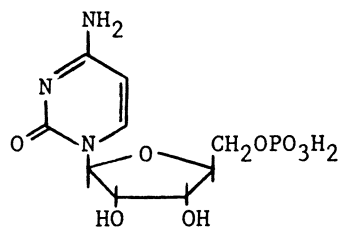
Bibliography: 84AM



C ₄ H ₃ O ₂ N ₂ F	<u>5-Fluorouracil (5-FU)</u>	HL
(Other references in Vol.5, p.466)		

<u>Metal ion</u>	<u>Equilibrium</u>	<u>Log K</u> <u>25°, 1.0</u>
H ⁺	HL/H.L	7.86
Ni ²⁺	ML/M.L	1.49
Cu ²⁺	ML/M.L	3.15
	ML ₂ /M.L ²	5.9
Zn ²⁺	ML/M.L	1.65

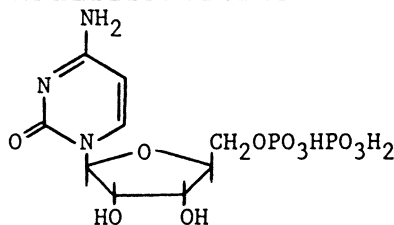
Bibliography: 85ADG

 $C_9H_{14}O_8N_3P$

Cytidine-5'-(dihydrogenphosphate) (CMP-5)
(Other references in Vol.2, p.266 and Vol.5, p.466)

 H_2L

Metal ion	Equilibrium	Log K $25^\circ, 0.1$	Log K $15^\circ, 0.1$	Log K $25^\circ, 0$	ΔH $25^\circ, 0$	ΔS $25^\circ, 0$
H^+	HL/H.L $H_2L/HL.H$	$6.28^v \pm 0.04$ 4.36 ± 0.03	6.27^v 4.52 $4.21^{c,u}$	6.62	$(-0.5)^t$	(29)
Mg^{2+}	ML/M.L	1.86^u	1.75^v			
Mn^{2+}	ML/M.L	2.37^v				
Co^{2+}	ML/M.L	2.30^v				
Ni^{2+}	ML/M.L MHL/M.HL	$2.00^v - 0.01$	$(1.90)^v$ 0.5			
Cu^{2+}	ML/M.L	3.20^v				
Zn^{2+}	ML/M.L	$2.55^v \pm 0.01$				

 $^c 25^\circ, 1.0$; $^t 10-37^\circ, 0$; $^u Na^+$ salt used as background electrolyte; $^v K^+$ salt used as background electrolyte.Bibliography: H^+ 63SV, 76OI, 80OF, 84MDA, 85KSR, 88SC; Mg^{2+} 79TP; Mn^{2+} - Zn^{2+} 80OF, 84MDA $C_9H_{15}O_{11}N_3P_2$ Cytidine-5'-(trihydrogendiphosphate) (CDP) H_3L

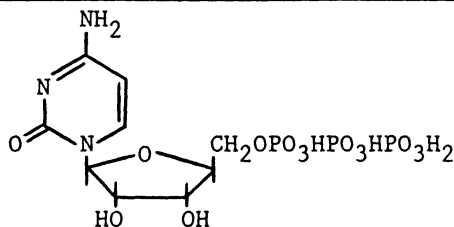
(Other references in Vol.2, p.267 and other references in Vol.5, p.466)

Metal ion	Equilibrium	Log K $25^\circ, 0.1$	Log K $15^\circ, 0.1$	Log K $25^\circ, 0$	ΔH $25^\circ, 0$	ΔS $25^\circ, 0$
H^+	HL/H.L $H_2L/HL.H$	$6.4^u \pm 0.0$ 4.46^v	6.38^v 4.56^v	7.18	$(-0.6)^t$	(27)
Mg^{2+}	ML/M.L $M_2L/ML.M$		3.22^v 1.0^v			
Mn^{2+}	HL/H.L MHL/M.HL	$(3.82)^v$ (1.79)				
Co^{2+}	ML/M.L MHL/M.HL	$(3.87)^v$ (2.37)				
Ni^{2+}	ML/M.L $ML_2/M.L^2$ MHL/M.HL	3.82^v 2.33	$(3.48)^v$ $(5.47)^v$ (1.87)			

 $^t 10-37^\circ, 0$; $^u Na^+$ salt used as background electrolyte; $^v K^+$ salt used as background electrolyte.

CDP (continued)

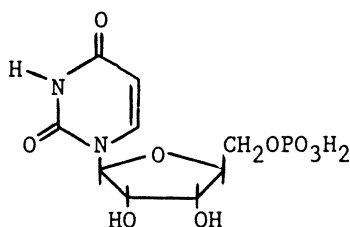
Metal ion	Equilibrium	Log K 25°, 0.1	Log K 15°, 0.1	Log K 25°, 0	ΔH 25°, 0	ΔS 25°, 0
Cu ²⁺	ML/M.L	4.89 ^v				
	MHL/M.HL	2.70				
Zn ²⁺	ML/M.L	3.93 ^v				
	MHL/M.HL	(2.47)				

^r_{10-37°}, 0; ^uNa⁺ salt used as background electrolyte;^vK⁺ salt used as background electrolyte.Bibliography: H⁺ 73BS, 88SC; Mg²⁺ 72FBS; Mn²⁺-Zn²⁺ 84MDAC₉H₁₆O₁₄N₃P₃Cytidine-5'-(tetrahydrogentriphosphate) (CTP)
(Other references in Vol.2, p.268 and Vol.5, p.257)H₄L

Metal ion	Equilibrium	Log K 25°, 0.1	Log K 15°, 0.1	Log K 25°, 0	ΔH 25°, 0	ΔS 25°, 0
H ⁺	HL/H.L	6.52 ^u ±0.02	(6.63) ^v	7.65	(-0.1) ^r	(35)
		6.55 ^v ±0.09				
	H ₂ L/HL.H	4.53	(4.85)			
Mg ²⁺	ML/M.L	4.07 ^u ±0.02	4.03 ^v			
	M ₂ L/ML.M		1.7			
Ca ²⁺	ML/M.L	3.77 ^u ±0.05				
Mn ²⁺	ML/M.L	4.77 ^u ±0.03				
	MHL/M.HL	2.51				
Co ²⁺	ML/M.L	4.50 ^u				
		4.69 ^v				
	MHL/M.HL	2.58				
Ni ²⁺	ML/M.L	4.51 ^v	(4.41) ^v			
	MHL/M.HL	2.74	2.68			
	M ₂ L/ML.M		2.23			
Cu ²⁺	ML/M.L	(5.7) ^u				
		5.64 ^v				
	MHL/M.HL	3.42				
Zn ²⁺	ML/M.L	4.79 ^u				
		4.79 ^v				
	MHL/M.HL	(2.90)				
Cd ²⁺	ML/M.L	4.99 ^u				
	MHL/M.HL	(3.18)				
	ML/MOHL.H	10.0				

^r_{10-37°}, 0; ^uNa⁺ salt used as background electrolyte;^vK⁺ salt used as background electrolyte.Bibliography: H⁺ 84MDA, 84SSM, 88SC; Mg²⁺ 72FBS; Mn²⁺-Zn²⁺ 78FS, 84MDA; Cd²⁺ 84SSM;

Other reference: 83RRa

 $C_9H_{13}O_9N_2P$

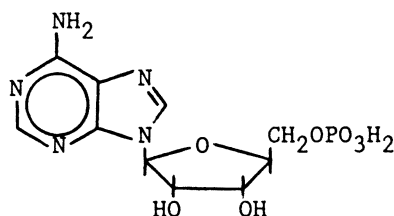
Uridine-5'-(dihydrogenphosphate) (UMP-5)
(Other reference in Vol.2, p.269)

 H_2L

Metal ion	Equilibrium	Log K 25°, 0.1	Log K 25°, 0	ΔH 25°, 0	ΔS 25°, 0
H^+	$L/(H_1L) \cdot H$ HL/H.L	9.39 ± 0.04 6.15^u	6.63	$(-7)^s$ $(-0.8)^r$	$(20)^a$ (28)
Mg^{2+}	ML/M.L	$(1.48)^u$			
Mn^{2+}	ML/M.L	$(2.01)^u$			
Cu^{2+}	ML/M.L	2.80^u			
Zn^{2+}	ML/M.L	$(2.03)^u$			

^a25°, 0.1; ^r10-37°, 0; ^s20-50°, 0.1; ^uNa⁺ salt used as background electrolyte.

Bibliography: H^+ 63SV, 67Aa, 76OI, 84SS, 88SC; Mg^{2+} - Zn^{2+} 84SS

 $C_{10}H_{14}O_7N_5P$

Adenosine-5'-(dihydrogenphosphate) (AMP-5)
(Other references in Vol.2, p.280 and Vol.5, p.260)

 H_2L

Metal ion	Equilibrium	Log K 25°, 0.1	Log K 37°, 0.15	Log K 25°, 0	ΔH 25°, 0	ΔS 25°, 0
H^+	$L/(H_1L) \cdot H$ HL/H.L	$6.18^u \pm 0.08$ $6.21^v \pm 0.02$ $6.29^z \pm 0.02$	$6.14^u \pm 0.06$ $5.97^{c,u}$	13.06 6.67	-10.9 -1.1 ^a	23 25 ^a
	$H_2L/HL \cdot H$	3.80 ± 0.07	3.67 ± 0.05 $3.91^{c,u}$		-4.2	4 ^a
Li^+	ML/M.L	1.22^z				
Na^+	ML/M.L	$0.51^u \pm 0.03$ $0.88^z - 0.01$				
K^+	ML/M.L	0.35^v $0.71^z \pm 0.01$				
Mg^{2+}	ML/M.L	$1.89^u \pm 0.07$ $1.93^v \pm 0.08$ $2.02^z \pm 0.08$	1.92^u	2.74 ± 0.01	+1.8 ^a	15 ^a
Ca^{2+}	ML/M.L	$1.79^u - 0.02$ $1.83^v \pm 0.02$ $1.92^z \pm 0.02$	1.8^u	2.64 ± 0.05	(0) ^t	(8) ^a

^a25°, 0.1; ^c25°, 1.0; ^t0-40°, 0.1; ^uNa⁺ salt used as background electrolyte;

^vK⁺ salt used as background electrolyte; ^z(CH₃)₄N⁺ salt used as background electrolyte.

AMP-5 (continued)

Metal ion	Equilibrium	Log K <u>25°, 0.1</u>	Log K <u>37°, 0.15</u>	Log K <u>25°, 0</u>	ΔH <u>25°, 0</u>	ΔS <u>25°, 0</u>
Sr ²⁺	ML/M.L	1.79 ^v	1.8 ^v		(-1) ^t	(5) ^a
Ba ²⁺	ML/M.L	1.73 ^v	1.7 ^v		(-2) ^t	(1) ^a
Mn ²⁺	ML/M.L	2.33 ^u -0.01 2.37 ^v ± 0.03 2.46 ^z ± 0.03	2.38 ^u		+2.2 ^a	18 ^a
Co ²⁺	ML/M.L	2.50 ^u ± 0.09 2.54 ^v ± 0.03 2.63 ^z ± 0.09	2.53 ^u		(0) ^s +1	(12) ^a
Ni ²⁺	ML/M.L	2.7 ^u -0.08 2.7 ^v ± 0.1 2.8 ^z ± 0.1	2.7 ^u		-2.4 ^a	4 ^a
	MHL/M.HL	1.2 ^h				
Cu ²⁺	ML/M.L	3.09 ^u -0.05 3.13 ^v +0.05 3.22 ^z ± 0.05	3.0 ^u		(-3) ^t	(4) ^a
Zn ²⁺	ML/M.L	2.72 ^v	2.7 ^v		(-2) ^t	(6) ^a

^a25°, 0.1; ^h15°, 0.1; ^s15-37°, 0.2; ^t0-40°, 0.1; ^uNa⁺ salt used as background electrolyte;
^vK⁺ salt used as background electrolyte; ^z(CH₃)₄N⁺ salt used as background electrolyte.

Bibliography:

H⁺ 56BL, 56SA, 63PG, 75BSa, 76OI, 76TD,

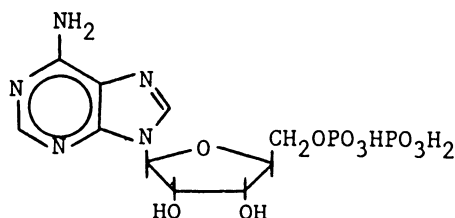
Mg²⁺-Ba²⁺ 76KR, 79TP, 88SC;

78GBF, 79TP, 80TS, 88SC;

Mn²⁺-Zn²⁺ 77PD, 80MGF, 80OF, 80TFa, 88SC;

Li⁺-K⁺ 88SC;

Other references: 63SV, 70Bd, 77NG, 80DM, 80DMA, 80DMY



C₁₀H₁₅O₁₀N₅P₂

Adenosine-5'-(trihydrogendiphosphate) (ADP)
 (Other references in Vol.2, p.281 and Vol.5, p.260)

H₃L

Metal ion	Equilibrium	Log K <u>25°, 0.1</u>	Log K <u>37°, 0.15</u>	Log K <u>25°, 0</u>	ΔH <u>25°, 0</u>	ΔS <u>25°, 0.1</u>
H ⁺	HL/H.L	6.34 ^u ± 0.06 6.39 ^v ± 0.05 6.60 ^z ± 0.05	6.30 ^u ± 0.05 5.89 ^{c, u}	7.20	-0.7 ^a	27
	H ₂ L/HL.H	3.94 ± 0.05	3.82 3.96 ^c		-4.1	4
Li ⁺	ML/M.L	1.32 ^z				
Na ⁺	ML/M.L	0.89 ^u ± 0.05 1.11 ^z ± 0.04	0.71 ^u			

^a25°, 0.1; ^c25°, 1.0; ^uNa⁺ salt used as background electrolyte;

^vK⁺ salt used as background electrolyte; ^z(CH₃)₄N⁺ salt used as background electrolyte.

ADP (continued)

Metal ion	Equilibrium	Log K 25°, 0.1	Log K 37°, 0.15	Log K 25°, 0	ΔH 25°, 0	ΔS 25°, 0.1
K ⁺	ML/M.L	0.82 ^v ±0.05 1.04 ^z ±0.05				
Mg ²⁺	ML/M.L	3.17 ^u 3.23 ^v ±0.06 3.43 ^z ±0.07	3.22 ^u		+3.2 ^a	26
	MHL/M.HL	1.61 ^v ±0.03	1.63 ^v		(+1) ^r	(11)
	M ₂ L/ML.M	1.0 ^h				
Ca ²⁺	ML/M.L	2.82 ^u +0.01 2.88 ^v -0.02 3.08 ^z ±0.02				
	MHL/M.HL	1.58 ^v -0.01			(0) ^s	(7)
Sr ²⁺	ML/M.L	2.54 ^v				
	MHL/M.HL	1.53 ^v			(-1) ^s	(4)
Ba ²⁺	ML/M.L	2.36 ^v				
	MHL/M.HL	1.44 ^v			(-2) ^s	(0)
Mn ²⁺	ML/M.L	4.03 ^u -0.07 4.09 ^v +0.07 4.29 ^z ±0.07	4.08 ^u ±0.0		+3.2 ^a	29
	MHL/M.HL	1.89 ^v				
Co ²⁺	ML/M.L	4.20 ^v	4.3 ^v		(+3) ^t	(29)
	MHL/M.HL	2.01 ^v				
Ni ²⁺	ML/M.L	4.4 ^v ±0.2	4.5 ^v		+1.5 ^a	25
	MHL/M.HL	2.31 ^v ±0.01				
	M ₂ L/ML.M	2.32 ^z 1.6 ^{h,v}				
Cu ²⁺	ML/M.L	5.90 ^v				
	MHL/M.HL	2.63 ^v				
	ML/MOHL.H	7.08 ^v				
	M ₂ (OH) ₂ L ₂ /(MOHL) ₂	3.42 ^v				
Tl ⁺	MHL/M.HL	1.3 ^u				
Zn ²⁺	ML/M.L	4.21 ^v ±0.08				
	MHL/M.HL	2.04 ^v				
	ML/MOHL.H	8.51 ^v				
	M ₂ (OH) ₂ L ₂ /(MOHL) ₂	3.34 ^v				

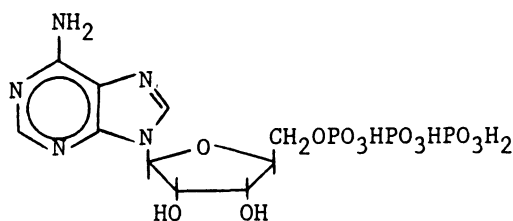
^a25°,0.1; ^h15°,0.1; ^r10-37°,0; ^s0-40°,0.1; ^t15-37°,0.2;

^uNa⁺ salt used as background electrolyte; ^vK⁺ salt used as background electrolyte;

^z(CH₃)₄N⁺ salt used as background electrolyte.

Bibliography:

H⁺ 51AS, 56BL, 56SA, 63PG, 78GBF, 80DM, 80TS, 88SC; Mn²⁺-Cu²⁺, Zn²⁺ 58WS, 64OP, 70JC, 78FSa, 78GB,
Li⁺-K⁺ 70Bd, 88SC; 80MGF, 88SC;
Mg²⁺-Ba²⁺ 64OP, 72FBS, 88SC; Tl⁺ 71MMW;
Other references: 53BK, 62IC, 63WT, 66B, 70CLa, 74EM, 74FRa, 77NG, 78AMa, 79BS, 80DMa, 80DMY, 80Ka,
80RMa, 82VE, 83CVL, 83GAD, 84GK, 84PHC

 $C_{10}H_{16}O_{13}N_5P_3$

Adenosine-5'-(tetrahydrogentriphosphate) (ATP)
 (Other references in Vol.2, p.283 and Vol.5, p.261)

 H_4L

Metal ion	Equilibrium	Log K <u>25°, 0.1</u>	Log K <u>37°, 0.15</u>	Log K <u>25°, 0</u>	ΔH <u>25°, 0.1</u>	ΔS <u>25°, 0.1</u>
H^+	HL/H.L	$6.47^u \pm 0.05$ $6.53^v \pm 0.03$ $6.82^z \pm 0.01$	$6.43^u \pm 0.05$ $5.81^{c,u}$ $6.09^{c,v}$	7.68	-0.2	29
	$H_2L/HL.H$	4.05 ± 0.05	3.93 ± 0.05 $3.96^c \pm 0.01$		-3.6 -0.1	6
	$H_3L/H_2L.H$			1.90		
Li^+	ML/M.L	$1.80^z \pm 0.07$				
Na^+	ML/M.L	$1.11^u \pm 0.05$ $1.33^z \pm 0.04$	$0.83^u \pm 0.1$		-0.2	4
K^+	ML/M.L	$0.95^v \pm 0.05$ $1.17^z \pm 0.03$			+0.3	5
Rb^+	ML/M.L	1.11^z				
Cs^+	ML/M.L	1.06^z				
Mg^{2+}	ML/M.L	$4.20^u \pm 0.04$ $4.26^v \pm 0.1$ $4.55^z \pm 0.07$	$4.24^u \pm 0.07$	5.87	+4.5 ± 0	35
	MHL/M.HL	$2.24^v - 0.01$	2.19^v		$(+2)^r \pm 0$	(17) ,
	$M_2L/ML.M$	1.7 ± 0.1				
Ca^{2+}	ML/M.L	$3.90^u - 0.02$ $3.96^v \pm 0.01$ $4.25^z \pm 0.02$				
	MHL/M.HL	2.13^v			$(0)^t$	(10)
Sr^{2+}	ML/M.L	3.53^v 3.82^z				
	MHL/M.HL	2.05^v			$(-1)^t$	(6)
Ba^{2+}	ML/M.L	3.28^v 3.57^z				
	MHL/M.HL	1.85^v			$(-2)^t$	(2)
Mn^{2+}	ML/M.L	$4.76^u \pm 0.06$ $4.82^v \pm 0.04$ $5.11^z \pm 0.06$	4.79^u		+4.3	37
	MHL/M.HL	2.39^v 2.59^z				

c 25°,1.0; r 10-37°,0; t 0-40°,0.1; $^uNa^+$ salt used as background electrolyte;

$^vK^+$ salt used as background electrolyte; $^z(CH_3)_4N^+$ salt used as background electrolyte.

ATP (continued)

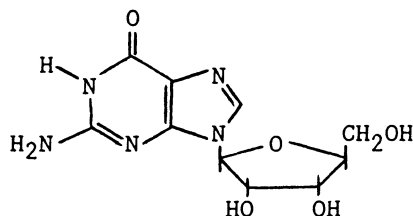
Metal ion	Equilibrium	Log K 25°, 0.1	Log K 37°, 0.15	Log K 25°, 0	ΔH 25°, 0.1	ΔS 25°, 0.1
Co ²⁺	ML/M.L	4.7 ^u ± 0.1	4.8 ^u		+4.5	37
		4.8 ^v - 0.1				
		5.1 ^z ± 0.1				
	MHL/M.HL	2.32 ^v				
		2.63 ^z				
Ni ²⁺	ML/M.L	4.87 ^u - 0.02				
		4.93 ^v ± 0.10				
		5.22 ^z ± 0.10				
	MHL/M.HL	2.76 ^v ± 0.04				
		2.97 ^z				
Cu ²⁺	M ₂ L/ML.M	2.40 ^{h, v}	5.99 ^u			
	ML/M.L	6.07 ^u ± 0.04				
		6.13 ^v - 0.05				
		6.42 ^z ± 0.04				
	MHL/M.HL	3.12 ^v ± 0.1				
	M ₂ L/ML.M	2.36 ^v				
	ML/MOHL.H	6.56 ^v ± 0.09				
	M ₂ (OH) ₂ L ₂ /(MOHL) ₂	2.4 ^v ± 0.2				
Tl ⁺	MHL/M.HL	2.0 ^u	4.83 ^u		+3.9	35
Zn ²⁺	ML/M.L	4.81 ^u				
		4.87 ^v ± 0.07				
		5.16 ^z ± 0.05				
	MHL/M.HL	2.66 ^v ± 0.02				
		2.89 ^z				
Cd ²⁺	M ₂ L/ML.M	1.85 ^v	1.95 ^v		+3.0	19
	ML/M.L	5.31 ^u				
	MHL/M.HL	2.95 ^u				
	ML/MOHL.H	10.1 ^u				

^h_{15°}, 0.1; ^uNa⁺ salt used as background electrolyte;

^vK⁺ salt used as background electrolyte; ^z(CH₃)₄N⁺ salt used as background electrolyte.

Bibliography:

H⁺ 51AS, 54M, 56SA, 63PG, 64OP, 64SBE, 66PSa, 67SBM, 71MMW, 72FS, 80TS, 81CMR, 83JKa, 83WR, 84PHC, 84SSM, 85MK, 85TMS, 88SC; Mn²⁺-Zn²⁺ 64HL, 66Pa, 77RSB, 78FSa, 78GFB, 80DMY, 83ACC, 83JKa, 83WR, 85MK, 88SC;
 Li⁺-Cs⁺ 70Bd, 73BS, 81CMR, 88SC; Tl⁺ 71MMW;
 Mg²⁺-Ba²⁺ 61Na, 63WT, 64OP, 70NR, 72FBS, Cd²⁺ 84SSM;
 73BJ, 78AMa, 82SH, 88SC;
 Other references: 53BK, 58MM, 60BF, 68NR, 70CLa, 70JC, 70N, 71BR, 73VC, 74EM, 74MR, 77NG, 78GB, 78GBF, 79MKN, 80DM, 80DMa, 80Ka, 80MC, 80RMa, 80VM, 81BKO, 81WP, 83Mca, 83SUV, 84CCB, 84EM, 84GK, 84JML, 85BC, 85Ja, 85OM

 $C_{10}H_{13}O_5N_5$

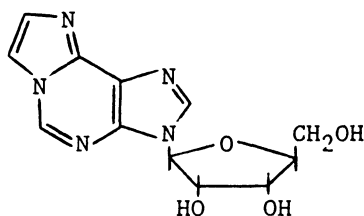
9-(β-D-Ribofuranosyl)-2-amino-6-oxopurine (guanosine)
(Other references in Vol.2, p.345)

L

Metal ion	Equilibrium	Log K 25°, 0.1	Log K 25°, 1.0	Log K 25°, 0	ΔH 25°, 0	ΔS 25°, 0
H^+	$(H_{-1}L)/(H_{-2}L) \cdot H$			12.33	-10.9	20
	$L/(H_{-1}L) \cdot H$	9.13	9.14 8.91 ⁿ	9.25	-7.7	17
	HL/H.L	2.15 ± 0.02	2.17 ± 0.01 2.06 ⁿ	(1.9)	-3.2	(-2)
	H.L/HL(s)			-3.37	(+12) ^r	(56)
Cu^{2+}	ML/M.L		2.30 ⁿ			

ⁿ37°, 0.15; ^r15-35°, 0Bibliography: H^+ 76OI, 80TV, 81VL, 82HA; Cu^{2+} 82HA;

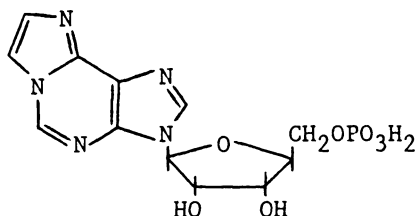
Other references: 64S, 80GCD, 80GD, 82RK, 84KMa

 $C_{12}H_{13}O_4N_5$ 1,N⁶-Ethenoadenosine

L

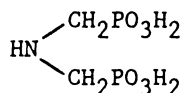
Metal ion	Equilibrium	Log K 25°, 0.1
H^+	HL/H.L	4.05
Mn^{2+}	ML/M.L	0.72
Cu^{2+}	ML/M.L	2.81
Zn^{2+}	ML/M.L	1.51

Bibliography: 83SS; Other reference: 79VW

 $C_{12}H_{14}O_7N_5$ 1,N⁶-Ethenoadenosine-5'-(dihydrogenphosphate) H_2L

Metal ion	Equilibrium	Log K 25°, 0.1
H^+	HL/H.L	6.23
	H_2L /HL.H	4.23
Mg^{2+}	ML/M.L	1.61
Mn^{2+}	ML/M.L	2.59
	MHL/ML.H	4.95
Cu^{2+}	ML/M.L	5.87
	MHL/ML.H	4.04
Zn^{2+}	ML/M.L	3.18
	MHL/ML.H	5.09

Bibliography: 84SS; Other reference: 79VW

 $C_2H_9O_6NP_2$ Iminobis(methylenephosphonic acid)
(Other reference in Vol.5, p.467) H_4L

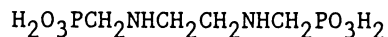
Metal ion	Equilibrium	Log K 25°, 0.1	Log K 25°, 1.0	Log K 25°, 0
H^+	HL/H.L	10.79 ^v	10.35 ^v +0.3	11.64
		10.40 ^{b,v}		
	H_2L /HL.H	6.08	5.80 ±0.03	6.74
		5.82 ^b		
	H_3L / H_2L .H	5.04	4.85 ±0.02	5.51
		4.90 ^b		
H_4L / H_3L .H		(0.9)	(1.1)	(1.4)
		(1.1) ^b		
	H_5L / H_4L .H	(0.5) ^b	(0.5)	
Mg^{2+}	ML/M.L	4.25		
	MHL/ML.H	9.25		
	MH_2L /MHL.H	5.24		
Ca^{2+}	ML/M.L	3.84	2.79	
	MHL/ML.H	9.38	9.40	
	MH_2L /MHL.H	5.36		
La^{3+}	ML/M.L	9.24		
	MHL/ML.H	9.19		

^b25°, 0.5; ^vK⁺ salt used as background electrolyte.

Iminobis(methylenephosphonic acid) (continued)

Metal ion	Equilibrium	Log K 25°, 0.1	Log K 25°, 1.0	Log K 25°, 0
Mn ²⁺	ML/M.L	6.26		
	MHL/M.HL	2.71	2.95	
	MH ₂ L/MHL.H	4.86		
Fe ²⁺	ML/M.L	7.70		
	MHL/ML.H	6.65		
	MH ₂ L/MHL.H	4.99		
Co ²⁺	ML/M.L	7.75	7.16	
	MHL/ML.H	6.32	6.23	
	MH ₂ L/MHL.H	4.82		
Ni ²⁺	ML/M.L	8.32	7.71	
	ML ₂ /M.L ²	9.84		
	MHL/ML.H	5.91	5.92	
	MH ₂ L/MHL.H	4.78		
Cu ²⁺	ML/M.L	12.84	12.53	
	MHL/ML.H	4.60	4.35	
	MH ₂ L/MHL.H	3.46	4.00	
	ML/MOHL.H	10.29		
Fe ³⁺	ML ₂ /M.L ²	30.96		
	MHL/ML.H	3.90		
	MOHL.H/M.L	10.35		
Zn ²⁺	ML/M.L	9.03		
	MHL/ML.H	6.49		
	MH ₂ L/MHL.H	3.4		
	ML/MOHL.H	9.86		
Cd ²⁺	ML/M.L	9.3		
	MHL/ML.H	6.0		
	MH ₂ L/MHL.H	3.2		
Pb ²⁺	ML/M.L	10.17		
	MHL/ML.H	6.8		
	MH ₂ L/MHL.H	4.4		
	ML/MOHL.H	10.69		
Al ³⁺	ML ₂ /M.L ²	20.60		
	MOHL.H/M.L	6.92		

Bibliography; H⁺ 82BGP, 83VKA, 85MM; Mg²⁺, La³⁺, Fe²⁺, Fe³⁺ - Al³⁺ 85MM;
Ca²⁺, Mn²⁺ - Cu²⁺ 82BGP, 85MM

C₄H₁₄O₆N₂P₂Ethylenebis(iminomethylenephosphonic acid)H₄L

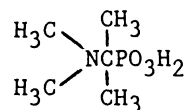
(Other values in Vol.2, p.305 and other reference in Vol.5, p.467)

Metal ion	Equilibrium	Log K 25°, 0.1
H ⁺	HL/H.L	10.60 ^v ± 0.1
	H ₂ L/HL.H	7.72 ± 0.3
	H ₃ L/H ₂ L.H	5.74 - 0.09
	H ₄ L/H ₃ L.H	4.58 ± 0.1

^vK⁺ salt used as background electrolyte.

Ethylenebis(iminomethylenephosphonic acid) (continued)

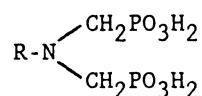
Metal ion	Equilibrium	Log K 25°, 0.1
Ga ³⁺	ML/M.L	19.84
	ML/MOHL.H	7.2
	MHL/ML.H	5.0
	MH ₂ L/MHL.H	1.5

Bibliography: Ga³⁺ 80MM; Other references: 81LY,83KDMC₅H₁₂O₃NP 1-Dimethylamino-1-methylethylphosphonic acidH₂L

Metal ion	Equilibrium	Log K 25°, 0.1
H ⁺	HL/H.L	(12.22) ^v
	H ₂ L/HL.H	5.74
Ca ²⁺	MHL/M.HL	1.03
	MHL/ML.H	(12.0)
Cu ²⁺	MHL/M.HL	2.48
	M(HL) ₂ /M.(HL) ₂	4.5
	ML/MOHL.H	7.36
	MHL/ML.H	6.43

^vK⁺ salt used as background electrolyte.

Bibliography: 81WNa

C_xH_yO₆NP₂ N-Substituted-iminobis(methylenephosphonic acid)H₄L

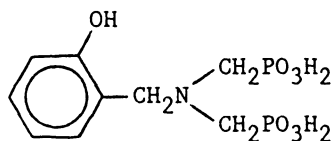
Ligand	Metal ion	Equilibrium	Log K 25°, 1.0
R= CH ₂ CH ₃ N-Ethyl-	H ⁺	HL/H.L	(12.2) ^v ± 0.2
		H ₂ L/HL.H	5.92 ± 0.00
		H ₃ L/H ₂ L.H	4.69 ± 0.01
(C ₄ H ₁₃ O ₆ NP ₂)	Ca ²⁺	ML/M.L	3.2 ± 0.1
		MHL/ML.H	10.4 ± 0.1
(Other values in Vol.2, p.318)	Mn ²⁺	ML/M.L	6.94
		MHL/ML.H	8.33
	Co ²⁺	ML/M.L	7.86
		MHL/ML.H	6.98
	Ni ²⁺	ML/M.L	7.97
		MHL/ML.H	6.73
	Cu ²⁺	ML/M.L	13.09
		MHL/ML.H	4.29
		MH ₂ L/MHL.H	4.12

^vK⁺ salt used as background electrolyte.

N-Substituted-iminobis(methylenephosphonic acid) (continued)

<u>Ligand</u>	<u>Metal ion</u>	<u>Equilibrium</u>	<u>Log K</u> <u>25°, 1.0</u>
R= C(CH ₃) ₃ N-(Dimethylethyl)- (C ₆ H ₁₇ O ₆ NP ₂)	H ⁺	HL/H.L	(12.0) ^v
		H ₂ L/HL.H	7.62
		H ₃ L/H ₂ L.H	4.16
	Ca ²⁺	MHL/M.HL	2.91
	Mn ²⁺	MHL/M.HL	(4.57)
		MHL/ML.H	10.17
	Co ²⁺	MHL/M.HL	(4.34)
	Ni ²⁺	MHL/M.HL	(4.05)
	Cu ²⁺	MHL/M.HL	6.28
		MHL/ML.H	(7.14)
		MH ₂ L/MHL.H	4.44
R= C ₆ H ₁₁ N-Cyclohexyl- (C ₈ H ₁₈ O ₆ NP ₂)	H ⁺	HL/H.L	(11.9) ^v
		H ₂ L/HL.H	5.87
		H ₃ L/H ₂ L.H	4.57
	Mn ²⁺	MHL/M.HL	(3.35)
		MHL/ML.H	9.17
	Co ²⁺	MHL/M.HL	(2.80)
	Ni ²⁺	MHL/M.HL	(2.53)
	Cu ²⁺	MHL/M.HL	(4.73)
		MHL/ML.H	4.78
		MH ₂ L/MHL.H	4.18
R= CH ₂ C ₆ H ₅ N-Benzyl- (C ₉ H ₁₃ O ₆ NP ₂)	H ⁺	HL/H.L	11.15 ^v
		H ₂ L/HL.H	5.96
		H ₃ L/H ₂ L.H	4.59
	Ca ²⁺	ML/M.L	3.05
		MHL/ML.H	9.77
	Mn ²⁺	ML/M.L	6.54
		MHL/ML.H	7.84
	Co ²⁺	ML/M.L	7.75
		MHL/ML.H	6.37
	Ni ²⁺	ML/M.L	7.75
		MHL/ML.H	6.25
	Cu ²⁺	ML/M.L	12.73
		MHL/ML.H	4.30
		MH ₂ L/MHL.H	4.06

^vK⁺ salt used as background electrolyte.
Bibliography: 82BCP



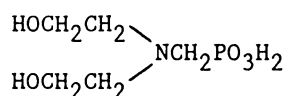
$C_9H_{15}O_7NP_2$ 2-Hydroxybenzyliminobis(methylenephosphonic) acid

H_5L

Metal		Log K
<u>ion</u>	<u>Equilibrium</u>	<u>25°, 0.1</u>
H^+	HL/H.L	11.08 ^V
	$H_2L/HL.H$	9.44
	$H_3L/H_2L.H$	6.24
	$H_4L/H_3L.H$	4.89
	$H_5L/H_4L.H$	(0.9)
Ga^{3+}	ML/M.L	23.78
	ML/MOHL.H	6.95
	MHL/ML.H	5.60
	$MH_2L/MHL.H$	3.30

$\sqrt{K^+}$ salt used as background electrolyte.

Bibliography: 80MM



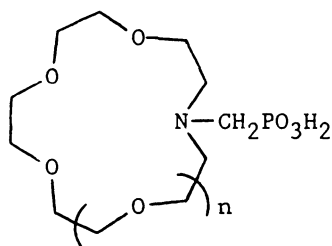
$C_5H_{14}O_5NP$ N,N-Bis(2-hydroxyethyl)aminomethylphosphonic acid
(Other values in Vol.2, p.317)

H_2L

Metal		Log K	Log K
<u>ion</u>	<u>Equilibrium</u>	<u>25°, 0.1</u>	<u>20°, 0.1</u>
H^+	HL/H.L	(9.82) ^V	(9.46) ^U
	$H_2L/HL.H$	5.04	4.98
Mn^{2+}	ML/M.L	4.61	
Zn^{2+}	ML/M.L	6.33	

${}^U Na^+$ salt used as background electrolyte, ${}^V K^+$ salt used as background electrolyte.

Bibliography: 81BG



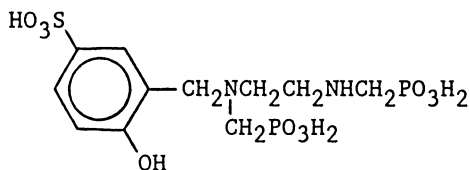
$C_xH_yO_zNP$ Multioxa-azacycloalkane-N-methylenephosphonic acid

H_2L

Ligand	Metal		Log K
<u>ion</u>	<u>ion</u>	<u>Equilibrium</u>	<u>25°, 0.1</u>
$n=1$	Na^+	ML/M.L	1.6
1,4,7,10-Tetraoxa- 13-azacyclo- pentadecane ($C_{10}H_{24}O_7NP$)			

Multioxa-azacycloalkane-N-methylenephosphonic acid (continued)

<u>Ligand</u>	<u>Metal ion</u>	<u>Equilibrium</u>	<u>Log K 25°, 0.1</u>
n= 2 1,4,7,10,13- Pentaoxa-16-aza- cyclooctadecane (C ₁₂ H ₂₈ O ₈ NP) Bibliography: 82TN	Na ⁺	ML/M.L	1.3



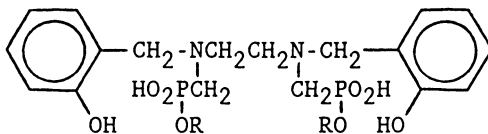
C₁₁H₂₀O₁₀N₂P₂S N-(2-Hydroxy-5-sulphobenzyl)ethylenediamine-N,N'-bis(methylenephosphonic acid)

H₆L

<u>Metal ion</u>	<u>Equilibrium</u>	<u>Log K 25°, 0.1</u>
H ⁺	HL/H.L	11.93 ^v
	H ₂ L/HL.H	9.17
	H ₃ L/H ₂ L.H	8.04
	H ₄ L/H ₃ L.H	6.12
	H ₅ L/H ₄ L.H	2.98
Ga ³⁺	ML/M.L	31.5 ^v
	ML/MOHL.H	10.36
	MHL/ML.H	8.98
	MH ₂ L/MHL.H	4.01
	MH ₃ L/MH ₂ L.H	2.82

^vK⁺ salt used as background electrolyte.

Bibliography: 80MM



C_xH_yO₈N₂P₂ N,N'-Bis(2-hydroxybenzyl)ethylenediamine-N,N'-bis(methylenephosphonic acid alkylester)

H₄L

<u>Ligand</u>	<u>Metal ion</u>	<u>Equilibrium</u>	<u>Log K 25°, 0.1</u>
R= CH ₃ methylester	H ⁺	HL/H.L	(12.23) ^v
		H ₂ L/HL.H	11.64
		H ₃ L/H ₂ L.H	7.04
		H ₄ L/H ₃ L.H	3.33
(C ₂₀ H ₃₀ O ₈ N ₂ P ₂)			

^vK⁺ salt used as background electrolyte.

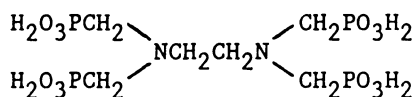
N,N'-Bis(2-hydroxybenzyl)ethylenediamine-N,N'-bis(methylenephosphonic acid methylester)
(continued)

<u>Ligand</u>	<u>Metal ion</u>	<u>Equilibrium</u>	<u>Log K</u> <u>25°, 0.1</u>
	Co ²⁺	ML/M.L	(19.11)
		MHL/ML.H	6.92
		MH ₂ L/MHL.H	5.93
	Ni ²⁺	ML/M.L	18.51
		MHL/ML.H	7.04
		MH ₂ L/MHL.H	3.98
	Cu ²⁺	ML/M.L	23.04
		MHL/ML.H	6.60
		MH ₂ L/MHL.H	3.74
	Fe ³⁺	ML/M.L	28.21
		ML/MOHL.H	6.72
	Zn ²⁺	ML/M.L	17.61
		MHL/ML.H	6.63
		MH ₂ L/MHL.H	5.43
	Ga ³⁺	ML/M.L	(28.03)
		ML/MOHL.H	6.51
	In ³⁺	ML/M.L	(28.12)
		ML/MOHL.H	6.63

R= CH ₂ CH ₃ ethylester (C ₂₂ H ₃₄ O ₈ N ₂ P ₂)	H ⁺	HL/H.L	(12.17) ^v
		H ₂ L/HL.H	11.61
		H ₃ L/H ₂ L.H	6.98
		H ₄ L/H ₃ L.H	3.28
	Co ²⁺	ML/M.L	(19.05)
		MHL/ML.H	6.97
		MH ₂ L/MHL.H	5.98
	Ni ²⁺	ML/M.L	18.47
		MHL/ML.H	7.09
		MH ₂ L/MHL.H	4.04
	Cu ²⁺	ML/M.L	23.01
		MHL/ML.H	6.65
		MH ₂ L/MHL.H	3.79
	Fe ³⁺	ML/M.L	28.19
		ML/MOHL.H	6.70
	Zn ²⁺	ML/M.L	17.56
		MHL/ML.H	6.68
		MH ₂ L/MHL.H	5.47
	Ga ³⁺	ML/M.L	(27.98)
		ML/MOHL.H	6.46
	In ³⁺	ML/M.L	(28.09)
		ML/MOHL.H	6.61

^vK⁺ salt used as background electrolyte.

Bibliography: 84TMb



$\text{C}_6\text{H}_{10}\text{O}_{12}\text{N}_2\text{P}_4$ Ethylenedinitrilotetrakis(methylenephosphonic acid)
(Other references in Vol.2, p.323 and other values in Vol.5, p.281)

H₈L

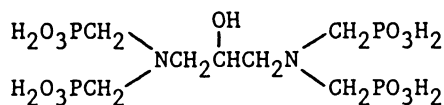
Metal		Log K	Log K
<u>ion</u>	<u>Equilibrium</u>	<u>25°, 0.1</u>	<u>25°, 3.0</u>
H^+	HL/H.L	(12.99) ^{v*}	12.01 ^v
	H ₂ L/HL.H	9.78 +0.04	9.02
	H ₃ L/H ₂ L.H	9.74 -0.09	7.42
	H ₄ L/H ₃ L.H	6.42 -0.02	5.88
	H ₅ L/H ₄ L.H	5.17 +0.05	4.77
	H ₆ L/H ₅ L.H	3.02 ±0.00	2.82
	H ₇ L/H ₆ L.H	(1.3) [*] +0.2	(1.2)
Ga^{3+}	ML/M.L	31.5 ^v	
	ML/MOHL.H	10.14	
	MHL/ML.H	6.67	
	MH ₂ L/MHL.H	5.11	
	MH ₃ L/MH ₂ L.H	3.27	
	MH ₄ L/MH ₃ L.H	2.45	

^vK⁺ salt used as background electrolyte;

*estimated value calculated from values at 3.0 ionic strength.

Bibliography: Ga^{3+} 80MM (recalculated);

Other references: 80RZ, 80ZR, 81LY, 82SPS, 83KDM, 83SBK



$\text{C}_7\text{H}_{22}\text{O}_{13}\text{N}_2\text{P}_4$ 2-Hydroxytrimethylenedinitrilotetrakis(methylenephosphonic acid)
(2-hydroxy-1,3-propylenediamine-N,N,N',N',-tetramethylenephosphonic acid)

H₈L

Metal		Log K
<u>ion</u>	<u>Equilibrium</u>	<u>25°, 0.1</u>
H^+	HL/H.L	(12.00) ^v
	H ₂ L/HL.H	11.26
	H ₃ L/H ₂ L.H	9.31
	H ₄ L/H ₃ L.H	7.08
	H ₅ L/H ₄ L.H	5.87
	H ₆ L/H ₅ L.H	4.70
	H ₇ L/H ₆ L.H	3.26
Mg^{2+}	ML/M.L	7.49
	MHL/ML.H	10.15
	MH ₂ L/MHL.H	9.47
	MH ₃ L/MH ₂ L.H	8.03
	MH ₄ L/MH ₃ L.H	6.46
	MH ₅ L/MH ₄ L.H	4.4

^vK⁺ salt used as background electrolyte.

2-Hydroxytrimethylenedinitrilotetrakis(methylenephosphonic acid) (continued)

Metal ion	Equilibrium	Log K 25°, 0.1
Ca ²⁺	ML/M.L	(4.90)
	MHL/ML.H	11.10
	MH ₂ L/MHL.H	9.73
	MH ₃ L/MH ₂ L.H	8.03
	MH ₄ L/MH ₃ L.H	6.82
	MH ₅ L/MH ₄ L.H	5.38
	M ₂ L/ML.M	2.78
Sr ²⁺	ML/M.L	6.77
	MHL/ML.H	10.09
	MH ₂ L/MHL.H	9.54
	MH ₃ L/MH ₂ L.H	7.83
	MH ₄ L/MH ₃ L.H	6.38
	MH ₅ L/MH ₄ L.H	5.53
	M ₂ L/ML.M	0.1
Ba ²⁺	ML/M.L	5.93
	MHL/ML.H	10.58
	MH ₂ L/MHL.H	9.79
	MH ₃ L/MH ₂ L.H	8.00
	MH ₄ L/MH ₃ L.H	6.46
	MH ₅ L/MH ₄ L.H	5.0
	M ₂ L/ML.M	1.4

Bibliography: 85SNM; Other reference: 84SDY

HCO ₂ H						
Methanoic acid (formic acid)						
(Other values in Vol.3, p.1 and Vol.5, p.284)						
Metal ion	Equilibrium	Log K 25°, 0.1	Log K 25°, 1.0	Log K 25°, 0	ΔH 25°, 0	ΔS 25°, 0
H ⁺	HL/H.L	3.57 ± 0.03 3.46 ^b ± 0.03	3.49 ± 0.04 3.67 ^d 3.57 ⁿ	3.745 ± 0.007 3.904 ^e ± 0.004 4.39 ^g	+0.04 ± 0.04	17.3 16 ^a
Sm ³⁺	ML/M.L	1.23	1.21			
	ML ₂ /M.L ²	1.65	1.52			
Pu ³⁺	ML/M.L		1.5			
Np ⁴⁺	ML/M.L		2.88			
Pu ⁴⁺	ML/M.L		3.64			
	ML ₂ /M.L ²		6.65			
AmO ₂ ⁺	ML/M.L		1.2 ^d			
Cu ²⁺	ML/M.L	1.65 1.38 ^p	1.40 ^d 1.53 ^e 2.30 ^d 2.42 ^e 2.2 ^d 2.68 ^e 1.9 ^d	2.00 ± 0.02 1.83 ^g 2.60 ^g 3.0 ^g 3.3 ^g		
	ML ₂ /M.L ²					
	ML ₃ /M.L ³					
	ML ₄ /M.L ⁴					

^a25°, 0.1; ^b25°, 0.5; ^d25°, 2.0; ^e25°, 3.0; ^g25°, 5.0; ⁿ37°, 0.15

Formic acid (continued)

Metal ion	Equilibrium	Log K 25°, 0.1	Log K 25°, 1.0	Log K 25°, 0	ΔH 25°, 0	ΔS 25°, 0
Zn ²⁺	ML/M.L	1.07 0.73 ^p	0.70 ^d			
	ML ₂ /M.L ²		1.18 ^d			
Cd ²⁺	ML/M.L	1.15 ^p	1.04 1.02 ^d ± 0.02			
	ML ₂ /M.L ²		(1.0) 1.21 ^d ± 0.03			
	ML ₃ /M.L ³		1.74 1.75 ^d ± 0.00			
Hg ²⁺	ML/M.L	2.85 2.78 ^b	(2.88) 3.18 ^d	(3.5) 3.64 ^e ± 0.02		

^b25°, 0.5; ^d25°, 2.0; ^e25°, 3.0; ^p30°, 0.4

Bibliography:

H⁺ 30HO, 77BMB, 81NJ, 83AH, 83DR, 84DHS, 85CDA; Zn²⁺ 85SMH;
 Sm³⁺, Pu³⁺ 81NJ; Cd²⁺ 81TMA, 84TMA;
 Np⁴⁺-AmO₂⁺ 84AK; Hg²⁺ 82KC;
 Cu²⁺ 84AS;

Other references: 66MY, 67M, 72WW, 76GF, 80ST, 81EF, 83KL, 83Mb, 83NR, 84AKa

CH₃CO₂H

C ₂ H ₄ O ₂		Ethanoic acid (acetic acid)				HL
		(Other values in Vol.3, p.3 and Vol.5, p.284)				
Metal ion	Equilibrium	Log K 25°, 0.1	Log K 25°, 1.0	Log K 25°, 0	ΔH 25°, 0	ΔS 25°, 0
H ⁺	HL/H.L	4.56 ±0.03 4.50 ^b ±0.02	4.58 ±0.03 4.80 ^d -0.01 4.60 ⁿ	4.757 ±0.002 5.015 ^e ±0.005 5.27 ^f	+0.10 ±0.01 -0.75 ^e -0.03	22.1 20.5 ^e
Li ⁺	ML/M.L	-0.11		(0.26)		
Na ⁺	ML/M.L	-0.26		-0.18	(+3) ^r	(9) ^a
K ⁺	ML/M.L	-0.41			(+1) ^r	(1) ^a
Rb ⁺	ML/M.L	-0.35				
Cs ⁺	ML/M.L	-0.31				
Mg ²⁺	ML/M.L	0.55 ±0.05		1.27 ±0.02		
Ca ²⁺	ML/M.L	0.57 ±0.05	0.45 ^k	1.18 ±0.06	(+1) ^r ±0	(6) ^a
Sr ²⁺	ML/M.L	0.49 ±0.06	0.32 ^k	1.14 ±0.06		
Ba ²⁺	ML/M.L	0.45 ±0.07	0.14 ^k	1.07 ±0.09		
Sc ³⁺	ML/M.L	3.48				
La ³⁺	ML/M.L	1.80 ±0.02	1.59 ^d	2.55	+2.2 ^d	15 ^d
	ML ₂ /M.L ²	3.0 ±0.3	2.53 ^d	4.12	+3.8 ^d	24 ^d
	ML ₃ /M.L ³	3.7 ±0.2	3.04 ^d		+4.6 ^d	29 ^d
	ML ₄ /M.L ⁴		3.0 ^k			
Nd ³⁺	ML/M.L	2.10 -0.1	1.92 ^d ±0.04	2.67	+1.7 ^d	15 ^d
	ML ₂ /M.L ²	3.59	3.02 ^d ±0.05	4.54	+3.5 ^d	26 ^d
	ML ₃ /M.L ³		3.58 ^d ±0.08		+4.4 ^d	31 ^d
	ML ₄ /M.L ⁴		3.4 ^k ±0.1			

^a25°, 0.1; ^b25°, 0.5; ^d25°, 2.0; ^e25°, 3.0; ^f25°, 4.0; ^k20°, 2.0; ⁿ37°, 0.15; ^r10-45°, 0

Acetic acid (continued)

Metal ion	Equilibrium	Log K 25°, 0.1	Log K 25°, 1.0	Log K 25°, 0	ΔH 25°, 0	ΔS 25°, 0
Sm ³⁺	ML/M.L	2.17	2.00	2.84	+1.5 ^d	14 ^d
	ML ₂ /M.L ²	3.76	2.03 ^d 3.36	4.80	+2.9 ^d	25 ^d
	ML ₃ /M.L ³		3.30 ^d 3.90 ^d		+3.8 ^d	31 ^d
	ML ₄ /M.L ⁴		3.8 ^k			
Ho ³⁺	ML/M.L	1.81	1.67 ^d ±0.08		+3.2 ^d	18 ^d
	ML ₂ /M.L ²	3.11	2.93 ^d ±0.02		+5.0 ^d	30 ^d
	ML ₃ /M.L ³	4.27	3.77 ^d ±0.04		+4.5 ^d	32 ^d
	ML ₄ /M.L ⁴		3.8 ^k ±0.2			
Er ³⁺	ML/M.L	1.79	1.64 ^d ±0.07		+3.3 ^d	18 ^d
	ML ₂ /M.L ²	3.06	2.90 ^d ±0.00		+5.5 ^d	32 ^d
	ML ₃ /M.L ³	4.20	3.72 ^d -0.2		+5.2 ^d	33 ^d
	ML ₄ /M.L ⁴		3.7 ^k ±0.2			
Pu ³⁺	ML/M.L		2.4			
	ML ₂ /M.L ²		2.02 ^d 3.34 ^d			
Cm ³⁺	ML/M.L	2.06 ⁱ	2.03 ^d		+1.4 ^d	14 ^d
	ML ₂ /M.L ²	3.09 ⁱ				
Th ⁴⁺	ML/M.L		3.89 ±0.03		+2.7 ^c	27 ^c
	ML ₂ /M.L ²		6.94 ±0.03		+3.8 ^c	45 ^c
	ML ₃ /M.L ³		9.01 ±0.09		+7.1 ^c	65 ^c
	ML ₄ /M.L ⁴		10.3		+8.3 ^c	75 ^c
	ML ₅ /M.L ⁵		11.0		+9.2 ^c	81 ^c
UO ₂ ²⁺	ML/M.L	2.61 ^h	2.44 ±0.02		+2.7 ^c ±0.2	20 ^c
	ML ₂ /M.L ²	4.9 ^h	4.42 ±0.04		+4.6 ^c ±0.4	36 ^c
	ML ₃ /M.L ³	6.3 ^h	6.43 ±0.09		+4.0 ^c ±0.4	43 ^c
Mn ²⁺	ML/M.L	0.7 ±0.1	0.69	1.40		
Co ²⁺	ML/M.L	0.7 ±0.1	0.65 ±0.1	1.38 ±0.09		
	ML ₂ /M.L ²	0.6 ^b ±0.1	0.66 ^d 0.8 ^d			
Ni ²⁺	ML/M.L	0.84 ±0.03	0.75 ±0.08	1.43		
		0.73 ^b ±0.01	0.77 ^d ±0.05			
	ML ₂ /M.L ²		1.1 ±0.2 1.1 ^d ±0.1			
Cu ²⁺	ML/M.L	1.82 ±0.07	1.67 ±0.05	2.21 ±0.03		
		1.76 ^p	1.69 ^d ±0.02	1.83 ^e ±0.04	+1.0 ^e	12 ^e
	ML ₂ /M.L ²	2.8 ±0.3	2.70 ±0.05 2.8 ^d ±0.1	3.63 3.12 ^e	+1.4 ^e	19 ^e
	ML ₃ /M.L ³	3.3 -0.1	3.0 ±0.1	3.58 ^e	+1.5 ^e	22 ^e
	ML ₄ /M.L ⁴		2.9 ^j	3.3 ^e		
VO ²⁺	ML/M.L		1.86			
	ML ₂ /M.L ²		1.10			

^b25°,0.5; ^c25°,1.0; ^d25°,2.0; ^e25°,3.0; ^h20°,0.1; ⁱ20°,0.5; ^j20°,1.0; ^k20°,2.0

Acetic acid (continued)

Metal ion	Equilibrium	Log K 25°, 0.1	Log K 25°, 1.0	Log K 25°, 0	ΔH 25°, 0	ΔS 25°, 0
Zn ²⁺	ML/M.L	1.20 ±0.09	0.90 ±0.1	1.58 ±0.01		
		0.91 ^P -0.07	0.85 ^d ±0.1	0.91 ^e ±0.1	+2.0 ^e	11 ^e
	ML ₂ /M.L ²	(2.0)	1.2 ±0.1	1.36 ^e	+5.3 ^e	24 ^e
	ML ₃ /M.L ³			1.57 ^e	+6.4 ^e	30 ^e
Cd ²⁺	ML/M.L	1.56 ±0.06	1.24 ±0.07	1.93	+1.8 ^b	
		1.24 ^b ±0.05	1.25 ^d ±0.05	1.34 ^e ±0.04	+1.5 ^e	11 ^e
	ML ₂ /M.L ²	(2.68)	1.86 ±0.04	3.15	+3.2 ^b	
		1.90 ^b	1.98 ^d ±0.04	2.26 ^e ±0.07	+2.3 ^b	18 ^e
	ML ₃ /M.L ³		2.04			
	ML ₄ /M.L ⁴	2.17 ^b	2.12 ^d ±0.04	2.42 ^e	+2.7 ^e	20 ^e
				2.0 ^e		
Hg ²⁺	ML/M.L	3.74	3.60	(4.3)		
		3.59 ^b	4.00 ^d	4.22 ^e		
	ML ₂ /M.L ²			8.45 ^e		
Pb ²⁺	ML/M.L	2.15 ±0.06	2.1 ±0.1	2.68		
		1.93 ^P	2.15 ^d ±0.04	2.33 ^e	-0.1 ^e	10 ^e
	ML ₂ /M.L ²	3.4 ±0.1	3.0	4.08		
			3.18 ^d -0.3	3.60 ^e	-0.2 ^e	16 ^e
	ML ₃ /M.L ³		3.4 ^d ±0.1	3.6 ^e	-1.2 ^e	13 ^e
	ML ₄ /M.L ⁴			2.9 ^e		

^b25°,0.5; ^d25°,2.0; ^e25°,3.0; ^j20°,1.0; ^P30°,0.4

Bibliography:

H⁺ 30HO, 68CN, 68MC, 72FB, 73KPG, 73M, 74CL, 77Bma, 78ABG, 79BJ, 80ACC, 81BK, 82BMP, 83AH, 83DD, 83DR, 84DHS, 84O, 85DDD, 85RSE;
 Li⁺-Ba²⁺ 83DD, 85DD, 85DDD;
 Sc³⁺ 84II;
 La³⁺ 85DDa;
 Nd³⁺-Er³⁺ 73SY, 81BMO, 81NJ, 84Bma;
 Eu³⁺, Cm³⁺ 85CL;
 Pu³⁺ 68MC, 81NJ;
 Mn²⁺-Ni²⁺ 83LT;
 Cu²⁺ 78AB, 78TM, 80ACC, 80NW, 84DHS, 85Bma;
 VO²⁺ 81LLa;
 Zn²⁺ 74CL, 79BJc, 85SMH;
 Cd²⁺ 80TM, 81Tma, 83YW, 84Tma;
 Hg²⁺ 82KC;
 Pb²⁺ 80NW, 93NR;

Other references: 28M, 58LD, 59JD, 61H, 63GL, 63MG, 65LY, 66MY, 67M, 71RMS, 74BEa, 74KI, 76GF, 79KK, 79MP, 80ASN, 80Ja, 80KH, 80PS, 80ST, 80TS, 81BPM, 81EBB, 81EF, 81MS, 82KYS, 82RC, 83HH, 83Mb, 84CD, 85BBB, 85O, 85SA

CH₃CH₂CO₂H

C ₃ H ₆ O ₂		Propanoic acid (propionic acid)				HL
		(Other values in Vol.3, p.8 and Vol.5, p.285)				
Metal ion	Equilibrium	Log K 25°, 0.1	Log K 25°, 1.0	Log K 25°, 0	ΔH 25°, 0	ΔS 25°, 0
H ⁺	HL/H.L	4.69 ±0.03	4.68 ±0.04	4.874 ±0.001	+0.20 ±0.03	23.0
		4.63 ^b	4.86 ^d ±0.04	5.16 ^e		
Nd ³⁺	ML/M.L	2.20 ^h	1.93 ^d ±0.09		+1.8 ^d	15 ^d
	ML ₂ /M.L ²	3.42 ^h	3.08 ^d ±0.08		+3.3 ^d	15 ^d
	ML ₃ /M.L ³		3.9 ^d		(+5) ^s	(35) ^d
	ML ₄ /M.L ⁴		3.6 ^k			

^b25°,0.5; ^d25°,2.0; ^e25°,3.0; ^h20°,0.1; ^k20°,2.0; ^s0-60°,1.0

Propanoic acid (continued)

Metal ion	Equilibrium	Log K 25°, 0.1	Log K 25°, 1.0	Log K 25°, 0	ΔH 25°, 0	ΔS 25°, 0
Sm ³⁺	ML/M.L	2.21 ^h	1.98			
	ML ₂ /M.L ²	3.70 ^h	2.02 ^d 3.26 3.24 ^d		+1.6 ^d +2.9 ^d	15 ^d 25 ^d
Ho ³⁺	ML/M.L	1.96 ^h	1.62 ^d +0.2		+3.9 ^d	21 ^d
	ML ₂ /M.L ²	3.46 ^h	2.85 ^d +0.2		+5.5 ^d	32 ^d
	ML ₃ /M.L ³		3.8 ^d		(+6) ^s	(38) ^d
	ML ₄ /M.L ⁴		4.1 ^k			
Er ³⁺	ML/M.L	1.94 ^h	1.60 ^d +0.2		+4.0 ^d	21 ^d
	ML ₂ /M.L ²	3.48 ^h	2.72 ^d +0.3		+6.3 ^d	34 ^d
	ML ₃ /M.L ³		3.7 ^d		(+6) ^s	(37) ^d
	ML ₄ /M.L ⁴		4.1 ^k			
Pu ³⁺	ML/M.L		2.8			
Cu ²⁺	ML/M.L	1.91	1.70 ±0.04	2.22	+1.0 ^c	11 ^c
			1.8 ^d ±0.2	1.86 ^e		
	ML ₂ /M.L ²		2.62 ±0.3 2.70 ^d ±0.06	3.5 3.00 ^e		
VO ²⁺	ML/M.L		1.91			
	ML ₂ /M.L ²		3.46			
Hg ²⁺	ML/M.L	3.78 (3.78) ^b	(3.90) 4.00 ^d	(4.4) 4.33 ^e +0.03		
	ML ₂ /M.L ²			8.80 ^e		
Pb ²⁺	ML/M.L		2.15 ^d ±0.03	2.64 ^o		
	ML ₂ /M.L ²		3.22 ^d -0.01	4.15 ^o		
	ML ₃ /M.L ³		3.44 ^d ±0.01			

^b25°,0.5; ^c25°,1.0; ^d25°,2.0; ^e25°,3.0; ^h20°,0.1; ^k20°,2.0; ^o35°,0; ^s0-60°,1.0

Bibliography: H⁺ 84DHS,840,85Cda,85JW; Nd³⁺,Ho³⁺,Er³⁺ 81BMO; Sm³⁺,Pu³⁺ 81NJ;
Cu²⁺ 78TM,84DHS; VO²⁺ 83LLC; Cd²⁺ 80TM,84Tma; Hg²⁺ 82KC; Pb²⁺ 80TGF,82TG;

Other references: 76GF,77Bma,80Jb,80ST,81BSa,81EF,83Mb,84II

CH₃CH₂CH₂CO₂H

C₄H₈O₂ Butanoic acid (butyric acid) HL
(Other values in Vol.3, p.10 and other references in Vol.5, p.467)

Metal ion	Equilibrium	Log K 25°, 0.1	Log K 25°, 1.0	Log K 25°, 0	ΔH 25°, 0	ΔS 25°, 0
H ⁺	HL/H.L	4.63 ±0.00 4.58 ^b	4.62 ±0.01 4.86 ^d	4.819 ±0.001 5.13 ^e	+0.64 ±0.09	24.5
Nd ³⁺	ML/M.L	2.04				
VO ²⁺	ML/M.L		1.94			
	ML ₂ /M.L ²		3.37			
Hg ²⁺	ML/M.L	3.73 3.60 ^b	3.60	(4.0)		

^b25°,0.5; ^d25°,2.0; ^e25°,3.0

Bibliography: H⁺ 61BBS; Nd³⁺ 73SY; VO²⁺ 83LLC; Hg²⁺ 82KC;

Other references: 66EI,76GF,77Bma,80Jb,81EF,83Mb

$\text{CH}_3\text{CH}_2\text{CH}_2\text{CH}_2\text{CH}_2\text{CO}_2\text{H}$					
<u>Hexanoic acid (caproic acid)</u>					
(Other references in Vol.3, p.329 and Vol.5, p.467)					
$\text{C}_6\text{H}_{12}\text{O}_2$					HL
Metal		Log K	Log K	ΔH	ΔS
<u>ion</u>	<u>Equilibrium</u>	<u>25°, 0.1</u>	<u>25°, 0</u>	<u>25°, 0</u>	<u>25°, 0</u>
H^+	HL/H.L	4.63 ± 0.03	4.857	+0.67 ± 0.03	24.5
Cu^{2+}	ML/M.L	1.51			
Bibliography: 75IP; Other reference: 77PK					

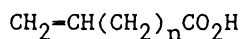
$\begin{array}{c} \text{CH}_3 \\ \\ \text{CH}_3\text{CHCO}_2\text{H} \end{array}$					
<u>2-Methylpropanoic acid (isobutyric acid)</u>					
(Other values in Vol.3, p.11 and other references in Vol.5, p.467)					
$\text{C}_4\text{H}_8\text{O}_2$					HL
Metal		Log K	Log K	ΔH	ΔS
<u>ion</u>	<u>Equilibrium</u>	<u>25°, 0.1</u>	<u>25°, 1.0</u>	<u>25°, 0</u>	<u>25°, 0</u>
H^+	HL/H.L	4.63 ± 0.03	4.64 ± 0.00	+0.77 ± 0.03	24.8
		4.62 ^b ± 0.02		5.15 ^e	
VO^{2+}	ML/M.L		1.97		
	$\text{ML}_2/\text{M.L}^2$		3.39		
^b 25°, 0.5; ^e 25°, 3.0					
Bibliography: 83LLC; Other references: 77BMA, 80RR, 84II					

$\text{C}_6\text{H}_5\text{CH}_2\text{CO}_2\text{H}$					
<u>Phenylacetic acid</u>					
(Other references in Vol.3, p.13 and other values in Vol.5, p.286)					
$\text{C}_8\text{H}_8\text{O}_2$					HL
Metal		Log K	Log K	ΔH	ΔS
<u>ion</u>	<u>Equilibrium</u>	<u>25°, 0.1</u>	<u>18°, 1.0</u>	<u>25°, 0</u>	<u>25°, 0</u>
H^+	HL/H.L	4.10 ± 0.02	4.08	+0.52	21.5
		4.06 ⁱ	4.34 ^d	4.56 ^e	
Cu^{2+}	ML/M.L	1.75		1.97	
	$\text{ML}_2/\text{M.L}^2$			1.61 ^e	
				2.4 ^e	
Zn^{2+}	ML/M.L	1.14			
^d 25°, 2.0; ^e 25°, 3.0; ⁱ 18°, 0.5					
Bibliography: H^+ 84DHS, 85RSE; Cu^{2+} 84DHS; Zn^{2+} 85SMH; Other reference: 81Ja					

$\text{C}_6\text{H}_5(\text{CH}_2)_n\text{CO}_2\text{H}$					
<u>ω-Phenylalkanoic acid</u>					
(Other references in Vol.3, p.330)					
$\text{C}_x\text{H}_y\text{O}_2$					HL
Ligand	Metal	Log K	Log K		
<u>ion</u>	<u>Equilibrium</u>	<u>25°, 0.1</u>	<u>25°, 0</u>		
$n=2$	H^+	4.44 ± 0.04	4.662 ± 0.002		
3-Phenyl-		4.42 ⁱ	4.45 ^j		
propanoic acid	Cu^{2+}	ML/M.L	1.87		
($\text{C}_9\text{H}_{10}\text{O}_2$)	Zn^{2+}	ML/M.L	1.14		

ω -Phenylalkanoic acid (continued)

<u>Ligand</u>	<u>Metal ion</u>	<u>Equilibrium</u>	<u>Log K</u> <u>25°, 0.1</u>	<u>Log K</u> <u>25°, 0</u>
n= 3	H ⁺	HL/H.L	4.59	4.757
4-Phenyl- butanoic acid (C ₁₀ H ₁₂ O ₂)	Cu ²⁺ Zn ²⁺	ML/M.L ML/M.L	1.87 1.09	
n= 4	H ⁺	HL/H.L	4.65	
5-Phenyl- pentanoic acid (C ₁₁ H ₁₄ O ₂)	Cu ²⁺	ML/M.L	1.89	
n= 5	H ⁺	HL/H.L	4.68	
6-Phenyl- hexanoic acid (C ₁₂ H ₁₆ O ₂)	Cu ²⁺	ML/M.L	1.84	
i _{18°} , 0.5; j _{18°} , 1.0 Bibliography: H ⁺ , Cu ²⁺ 84DHS, 85MSH; Zn ²⁺ 85SMH				

C_xH_yO₂

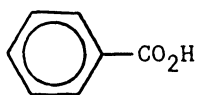
ω -Alkenoic acid
(Other references in Vol.3, p.331)

HL

<u>Ligand</u>	<u>Metal ion</u>	<u>Equilibrium</u>	<u>Log K</u> <u>25°, 0.1</u>	<u>Log K</u> <u>25°, 0</u>	<u>ΔH</u> <u>25°, 0.1</u>	<u>ΔS</u> <u>25°, 0.1</u>
n= 2	H ⁺	HL/H.L	4.45	4.677 $\pm$ 0.002		
Pent-4-enoic acid (allylacetic acid) (C ₅ H ₈ O ₂)	Cu ²⁺ Ag ⁺	ML/M.L ML/M.L	1.42 2.01		(-4) ^s	(-4)
n= 3	H ⁺	HL/H.L	4.57	4.719		
Hex-5-enoic acid (C ₆ H ₁₀ O ₂)	Cu ²⁺ Ag ⁺	ML/M.L ML/M.L	1.45 2.06			
n= 4	H ⁺	HL/H.L	4.57			
Hept-6-enoic acid (C ₇ H ₁₂ O ₂)	Cu ²⁺ Ag ⁺	ML/M.L ML/M.L	1.47 2.08			

s_{2-38°}, 0.1

Bibliography: 75IP

C₇H₆O₂

Benzenecarboxylic acid (benzoic acid)
(Other values in Vol.3, p.16 and Vol.5, p.287)

HL

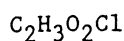
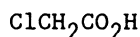
Metal ion	Equilibrium	Log K 25°, 0.1	Log K 25°, 1.0	Log K 25°, 0	ΔH 25°, 0	ΔS 25°, 0
H ⁺	HL/H.L	4.01 ±0.02 3.96 ^b ±0.03	4.00 ±0.03 4.01 ⁿ	4.202 ±0.003	-0.11 ±0.01 -0.21 ^a	18.9 18 ^a
La ³⁺	ML/M.L ML ₂ /M.L ²	1.92 3.56			+1.9 ^a	15 ^a
Pr ³⁺	ML/M.L ML ₂ /M.L ²	2.06 3.60			+2.0 ^a	16 ^a
Nd ³⁺	ML/M.L ML ₂ /M.L ²	2.15 3.83			+1.9 ^a	16 ^a
Sm ³⁺	ML/M.L ML ₂ /M.L ²	2.21 3.92			+1.8 ^a	16 ^a
Eu ³⁺	ML/M.L ML ₂ /M.L ²	2.16 3.79			+1.9 ^a	16 ^a
Gd ³⁺	ML/M.L ML ₂ /M.L ²	2.08 3.70			+2.1 ^a	17 ^a
Tb ³⁺	ML/M.L ML ₂ /M.L ²	1.95 3.65			+2.2 ^a	16 ^a
Dy ³⁺	ML/M.L ML ₂ /M.L ²	1.96 3.64			+2.5 ^a	17 ^a
Ho ³⁺	ML/M.L ML ₂ /M.L ²	2.01 3.77			+2.5 ^a	18 ^a
Er ³⁺	ML/M.L ML ₂ /M.L ²	1.92 3.63			+2.7 ^a	18 ^a
Tm ³⁺	ML/M.L ML ₂ /M.L ²	1.94 3.63			+2.4 ^a	17 ^a
Yb ³⁺	ML/M.L ML ₂ /M.L ²	1.94 3.72			+3.0 ^a	19 ^a
Lu ³⁺	ML/M.L ML ₂ /M.L ²	1.92 3.77			+2.7 ^a	18 ^a
Cu ²⁺	ML/M.L	1.76 -0.2	1.51 ^p			

^a25°,0.1; ^b25°,0.5; ⁿ37°,0.15; ^p30°,0.4;

Bibliography:

H⁺ 56WM, 67CIH, 80Mb, 81R, 82CBH, 83DR, 84DHS;La³⁺-Lu³⁺ 82CBH;Cu²⁺ 84DHS;

Other references: 74BEa, 79TP, 81CCM, 81CP, 81CPa, 82EF, 85SB

Chloroacetic acid

HL

(Other values in Vol.3, p.16 and Vol.5, p.287)

Metal ion	Equilibrium	Log K 25°, 0.1	Log K 25°, 1.0	Log K 25°, 0	ΔH 25°, 0	ΔS 25°, 0
H ⁺	HL/H.L	2.68 ±0.06 2.60 ^b	2.65 ±0.05 2.74 ^d	2.865 ±0.004 3.023 ^e ±0.005	+1.07 ±0.08 +0.75 ^c +0.74 ^d	16.7 15 ^c 15 ^d
Ce ³⁺	ML/M.L ML ₂ /M.L ²	1.18 1.95	0.98 ^d		+2.6 ^d	13 ^d
Eu ³⁺	ML/M.L ML ₂ /M.L ²	1.38 2.04	1.08 ^d		+3.0 ^d	15 ^d
Tm ³⁺	ML/M.L ML ₂ /M.L ²	1.10 1.91	0.92 ^d		+3.7 ^d	17 ^d
Am ³⁺	ML/M.L		1.31 ^d		+1.8 ^d	12 ^d
Th ⁴⁺	ML/M.L ML ₂ /M.L ² ML ₃ /M.L ³ ML ₄ /M.L ⁴		2.75 4.63 5.79 6.53		+2.9 ^c +6.0 ^c +8.6 ^c +10.5 ^c	22 ^c 41 ^c 55 ^c 65 ^c
UO ₂ ²⁺	ML/M.L ML ₂ /M.L ² ML ₃ /M.L ³		1.43 ±0.01 2.28 ±0.04 2.7 ±0.1		+1.9 ^c +3.8 ^c +5.8 ^c	13 ^c 23 ^c 32 ^c
Fe ³⁺	ML/M.L M ₂ L ₄ /M ² .L ⁴ M ₂ OHL ₄ /M ₂ L ₄ .OH		1.93 2.1 ^j 8.95 6.7			
VO ²⁺	ML/M.L ML ₂ /M.L ² ML ₃ /M.L ³		1.04 1.60 2.2			

^b25°,0.5; ^c25°,1.0; ^d25°,2.0; ^e25°,3.0; ^j20°,1.0

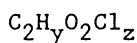
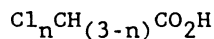
Bibliography:

H⁺ 59JD, 61BBS, 65PZ, 77BMA, 80EC, 81LL,

83AH, 85PML;

Ce³⁺-Am³⁺ 80EC;

Other references: 80KCW, 83NR, 84CD

UO₂²⁺ 69V;Fe³⁺ 71NP;VO²⁺ 81LL;Polychloroacetic acid

HL

(Other values in Vol.3, p.18,19 and other references in Vol.5, p.468,442)

Ligand	Metal ion	Equilibrium	Log K 25°, 0.2	Log K 25°, 0	ΔH 25°, 0	ΔS 25°, 0
n= 2	H ⁺	HL/H.L	(0.9) +0.1	(1.1)	+0.2 -0.1	6
Dichloroacetic acid	Ce ³⁺ Eu ³⁺ Tm ³⁺	ML/M.L ML/M.L ML/M.L		0.66 ^d 0.76 ^d 0.53 ^d	+1.6 ^d +1.8 ^d +1.7 ^d	8 ^d 10 ^d 8 ^d
(C ₂ H ₂ O ₂ Cl ₂)	Am ³⁺	ML/M.L		0.79 ^d	+0.8 ^d	6 ^d

Polychloroacetic acid (continued)

<u>Ligand</u>	<u>Metal ion</u>	<u>Equilibrium</u>	<u>Log K</u> <u>25°, 0.2</u>	<u>Log K</u> <u>25°, 0</u>	<u>ΔH</u> <u>25°, 0</u>	<u>ΔS</u> <u>25°, 0</u>
n= 3	H ⁺	HL/H.L		(-0.5) ±0.1	+0.1	-2
Trichloroacetic acid (C ₂ HO ₂ Cl ₃)	Ce ³⁺	ML/M.L		0.26 ^d	+0.6 ^d	3 ^d
	Eu ³⁺	ML/M.L		0.32 ^d	+0.1 ^d	2 ^d
	Tm ³⁺	ML/M.L		0.23 ^d	+0.6 ^d	3 ^d
	Am ³⁺	ML/M.L		0.32 ^d	+0.2 ^d	2 ^d

^d25°, 2.0Bibliography: H⁺ 59D, 59JD, 80EC; Ce³⁺-Am³⁺ 80EC;

Other references: 69KF, 69Pc, 84CD

ClCH₂CH₂CO₂HC₃H₅O₂Cl3-Chloropropanoic acid

(Other values in Vol.3, p.19 and other references in Vol.5, p.468)

HL

<u>Metal ion</u>	<u>Equilibrium</u>	<u>Log K</u> <u>25°, 0.1</u>	<u>Log K</u> <u>25°, 1.0</u>	<u>Log K</u> <u>25°, 0</u>	<u>ΔH</u> <u>25°, 0</u>	<u>ΔS</u> <u>25°, 0</u>
H ⁺	HL/H.L	3.92 3.86 ^b	3.92 ±0.04 4.13 ^d	4.11	+0.55 ±0.04 +0.17 ^c	20.7 18.5 ^c
Eu ³⁺	ML/M.L		1.61 ^d		+2.4 ^d	15 ^d
UO ₂ ²⁺	ML/M.L		2.07 ±0.01		+2.7 ^c	19 ^c
	ML ₂ /M.L ₂ ²		3.58 ±0.00		+5.0 ^c	33 ^c
	ML ₃ /M.L ₃ ³		5.1 ±0.1		+5.0 ^c	40 ^c
VO ²⁺	ML/M.L		1.54			
	ML ₂ /M.L ₂ ²		2.63			
	ML ₃ /M.L ₃ ³		3.2			

^b25°, 0.5; ^c25°, 1.0; ^d25°, 2.0Bibliography: H⁺ 73KPG, 80OD, 81LL; Eu³⁺ 80OD; VO²⁺ 81LLN≡CCH₂CO₂HC₃H₃O₂NCyanoacetic acid

(Other values in Vol.3, p.15)

HL

<u>Metal ion</u>	<u>Equilibrium</u>	<u>Log K</u> <u>25°, 2.0</u>	<u>Log K</u> <u>25°, 3.0</u>	<u>Log K</u> <u>25°, 0</u>	<u>ΔH</u> <u>25°, 0</u>	<u>ΔS</u> <u>25°, 0</u>
H ⁺	HL/H.L	2.48	2.63	2.472 ±0.002	+0.89	14.3
Co ²⁺	ML/M.L	0.39				
Ni ²⁺	ML/M.L	0.44				
Cu ²⁺	ML/M.L	0.93	0.87			
	ML ₂ /M.L ₂ ²	1.29	1.00			
Zn ²⁺	ML/M.L	0.50				
Cd ²⁺	ML/M.L	0.70				
	ML ₂ /M.L ₂ ²	0.84				
Pb ²⁺	ML/M.L	1.14				
	ML ₂ /M.L ₂ ²	1.68				

Bibliography: 81MF

$$\text{H}_2\text{O}_3\text{PCH}_2\text{CH}_2\text{CO}_2\text{H}$$
3-Phosphonopropanoic acid
 (Other reference in Vol.5, p.443)

$\text{C}_3\text{H}_7\text{O}_5\text{P}$
 H_3L

Metal ion	Equilibrium	Log K <u>25°, 0.1</u>
H^+	HL/H.L	$7.70^{\text{v}} + 0.04$
	$\text{H}_2\text{L}/\text{HL.H}$	$4.52 + 0.1$
	$\text{H}_3\text{L}/\text{H}_2\text{L.H}$	2.26
Ca^{2+}	ML/M.L	1.7
Cu^{2+}	ML/M.L	4.28
	MHL/ML.H	5.65

K^+ salt used as background electrolyte.

Bibliography: 81WNa; Other references: 81FH, 82FP

$$\begin{array}{c} \text{H}_2\text{O}_3\text{PO} \\ | \\ \text{H}_2\text{O}_3\text{POCH}_2\text{CHCO}_2\text{H} \end{array}$$

$\text{C}_3\text{H}_8\text{O}_{10}\text{P}_2$
DL-Diphospho-2,3-dihydroxypropanoic acid (diphosphoglyceric acid)
 H_5L

Metal ion	Equilibrium	Log K <u>25°, 0.1</u>	Log K <u>25°, 0.1</u>	ΔH <u>25°, 0.1</u>	ΔS <u>25°, 0.1</u>
H^+ *	HL/H.L	7.37^{v}	7.97^{z}		
	$\text{H}_2\text{L}/\text{HL.H}$	6.20^{v}	6.48^{z}		
Na^+	ML/M.L		1.44^{z}		
	MHL/M.HL		1.12^{z}		
K^+	ML/M.L		1.60^{z}		
	MHL/M.HL		1.28^{z}		
Mg^{2+}	ML/M.L	2.66^{v}	3.21^{z}	$+5.4^{\text{v}}$	30
		2.68^{u}			
	MHL/M.HL	2.40^{v}	2.59^{z}		
Ca^{2+}	ML/M.L	2.91^{v}	3.50^{z}	$+5.2^{\text{v}}$	31
	MHL/M.HL	2.60^{v}	2.83^{z}		
Sr^{2+}	ML/M.L	2.69^{v}	3.25^{z}	$+3.6^{\text{v}}$	24
	MHL/M.HL	2.38^{v}	2.52^{z}		

NaCl used as background electrolyte; KCl used as background electrolyte;

$(\text{CH}_3)_4\text{NBr}$ used as background electrolyte; *Carboxylate pk not reported.

Bibliography: H^+ , Na^+ , K^+ , Ca^{2+} , Sr^{2+} 72DS; Mg^{2+} 71BR, 72DS;

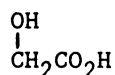
Other references: 68R, 70CL

$$\begin{array}{c} \text{O} \\ || \\ \text{HONHCCH}_2\text{CH}_2\text{CH}_2\text{CO}_2\text{H} \end{array}$$

$\text{C}_5\text{H}_9\text{O}_4\text{N}$
Carboxytrimethylenohydroxamic acid (N-hydroxyglutaramic acid)
 H_2L

Metal ion	Equilibrium	Log K <u>20°, 0.1</u>
H^+	HL/H.L	9.39
	$\text{H}_2\text{L}/\text{HL.H}$	4.37
Fe^{3+}	$\text{ML}_2/\text{M.L}^2$	22.16
	MHL/M.HL	6.54
	MHL ₂ /MHL.L	11.26
	$\text{ML}_2/\text{MOHL}_2.\text{H}$	9.54
	$\text{MHL}_2/\text{ML}_2.\text{H}$	5.03

Bibliography: H^+ 80KJ; Fe^{3+} 81KJ

 $\text{C}_2\text{H}_4\text{O}_3$ Hydroxyacetic acid (glycolic acid)

HL

(Other values in Vol.3, p.24 and Vol.5, p.288)

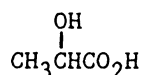
Metal ion	Equilibrium	Log K 25°, 0.1	Log K 25°, 1.0	Log K 25°, 0	ΔH 25°, 0	ΔS 25°, 0
H^+	HL/H.L	3.62 ± 0.03 3.55 ^b ± 0.03	3.61 ± 0.02 3.74 ^d ± 0.03	3.832 ± 0.001 3.91 ^e ± 0.02	-0.16 ± 0.05 -0.39 ^c	17.0 15.3 ^c
Sc^{3+}	ML/M.L	4.40			-0.56 ^d	
Nd^{3+}	ML/M.L	2.89 2.55 ^b	2.50 ^d -0.10		-1.2 ^d ± 0.2	7 ^d
	$\text{ML}_2/\text{M.L}^2$	4.85 4.39 ^b	4.31 ^d ± 0.08		-2.2 ^d ± 0.8	12 ^d
	$\text{ML}_3/\text{M.L}^3$	6.1 5.8 ^b	5.6 ^d -0.3		-3.5 ^d	14 ^d
	$\text{ML}_4/\text{M.L}^4$		6.0 ^d ± 0.3		-4.0 ^d	14 ^d
Ho^{3+}	ML/M.L	2.99	2.54 ^d -0.05		-0.1 ^d	11 ^d
	$\text{ML}_2/\text{M.L}^2$	5.04	4.47 ^d ± 0.06		-0.5 ^d	19 ^d
	$\text{ML}_3/\text{M.L}^3$	6.6	6.5 ^k ± 0.2			
	$\text{ML}_4/\text{M.L}^4$		6.5 ^k			
Er^{3+}	ML/M.L	3.00 2.61 ^b	2.60 ^d ± 0.04		-0.2 ^d ± 0.1	11 ^d
	$\text{ML}_2/\text{M.L}^2$	5.19 4.69 ^b	4.57 ^d ± 0.1		-0.6 ^d ± 0.1	19 ^d
	$\text{ML}_3/\text{M.L}^3$	6.8 6.1 ^b	6.0 ^d -0.1		-1.3 ^d	23 ^d
	$\text{ML}_4/\text{M.L}^4$		6.5 ^d ± 0.2		-1.4 ^d	25 ^d
Th^{4+}	ML/M.L		4.50 ± 0.06		+0.5 ^c	20 ^c
	$\text{ML}_2/\text{M.L}^2$		7.40 ± 0.05		+0.3 ^c	35 ^c
	$\text{ML}_3/\text{M.L}^3$		10.1 ± 0.1		-0.4 ^c	45 ^c
	$\text{ML}_4/\text{M.L}^4$		12.0 ± 0.0		-1.3 ^c	51 ^c
	$\text{ML}_5/\text{M.L}^5$		13.4		-1.9 ^c	55 ^c
Cu^{2+}	ML/M.L		2.31 ± 0.05 2.43 ^d ± 0.03	2.90 ± 0.02 2.50 ^e	-0.4 ^c	9 ^c
	$\text{ML}_2/\text{M.L}^2$		3.72 ± 0.02	4.66 4.20 ^e	-0.7 ^c	15 ^c
VO^{2+}	ML/M.L		2.56			
	$\text{ML}_2/\text{M.L}^2$		4.22			
	$\text{ML}_3/\text{M.L}^3$		5.19			
V(V)	$\text{M}_2\text{O}_4(\text{OH})_4\text{L}_2/\text{H}^2(\text{MO}_3)^2\text{L}^2$		18.66 ⁱ			
	$\text{M}_4\text{O}_4(\text{OH})_{12}\text{L}_2/\text{H}^2(\text{MO}_3)^4\text{L}^2$		25.42 ⁱ			
B(III)	$\text{M(OH)}_2(\text{H}_{-1}\text{L})/\text{M(OH)}_3\text{L}$					
		0.17 ^h				

^b25°, 0.5; ^c25°, 1.0; ^d25°, 2.0; ^e25°, 3.0; ^h20°, 0.1; ⁱ20°, 0.5; ^k20°, 2.0

Bibliography:

 H^+ 81LL, 83BS; Sc^{3+} 84II; La^{3+} 85AM; Ce^{3+} , Am^{3+} , Cm^{3+} 71M; Nd^{3+} - Er^{3+} 81BMO; Cu^{2+} 70SW, 76GF; VO^{2+} 81LL; V(V) 83BS; B(III) 77RB;

Other references: 75BJ, 77BMA, 80IA, 80PPa, 80PS, 81HL, 83IT, 83Ja, 84GSG



$\text{C}_3\text{H}_6\text{O}_3$		<u>D-2-Hydroxypropanoic acid (lactic acid)</u>				HL
		(Other values in Vol.3, p.28 and Vol.5, p.290)				
Metal ion	Equilibrium	Log K 25°, 0.1	Log K 25°, 1.0	Log K 25°, 0	ΔH 25°, 0	ΔS 25°, 0
H^+	HL/H.L	3.66 ± 0.03 3.61 ^b - 0.01	3.64 ± 0.02 3.81 ^d ± 0.02	3.860 ± 0.002	+0.08 ± 0.02 -1.7 ^d	17.9 12 ^d
Ca^{2+}	ML/M.L	1.07 ^x 0.92 ^b	0.90	1.45 ± 0.03		
	$\text{ML}_2/\text{M.L}^2$	1.62 ^b	(1.24) ^w			
Pr^{3+}	ML/M.L	2.85 ^h 2.55 ^b				
	$\text{ML}_2/\text{M.L}^2$	(4.90) ^{h,w} 4.23 ^b				
	$\text{ML}_3/\text{M.L}^3$	(6.1) ^{h,w} 5.7 ^b				
Nd^{3+}	ML/M.L	2.87 ^h 2.60 ^b	2.45 ^d ± 0.03		-3.2 ^d	1 ^d
	$\text{ML}_2/\text{M.L}^2$	(4.97) ^{h,w} 4.36 ^b	(4.37) ^{d,w} ± 0.01		(-1) ^d	(15) ^d
	$\text{ML}_3/\text{M.L}^3$	(6.4) ^{h,w} 6.1 ^b	(5.5) ^{d,w} ± 0.1 (6.3) ^{k,w}			
	$\text{ML}_4/\text{M.L}^4$					
Sm^{3+}	ML/M.L	2.88 2.63 ^b	2.56 ^d		-2.3 ^d	4 ^d
	$\text{ML}_2/\text{M.L}^2$	(5.09) ^{h,w} 4.66 ^b	(4.58) ^{d,w}		(-2) ^d	(15) ^d
	$\text{ML}_3/\text{M.L}^3$	(6.4) ^{h,w} 5.8 ^b	(5.9) ^{d,w}		(-9) ^d	(-3) ^d
Ho^{3+}	ML/M.L	3.02 ^h (5.42) ^{h,w}	2.70 ^d ± 0.01 (4.93) ^{d,w} ± 0.04			
	$\text{ML}_2/\text{M.L}^2$					
	$\text{ML}_3/\text{M.L}^3$	(6.8) ^{h,w}	(6.4) ^{d,w} ± 0.2 (7.1) ^{k,w}			
	$\text{ML}_4/\text{M.L}^4$					
Am^{3+}	ML/M.L		2.43 2.52 ^d		(-2) ^c	(4) ^c
	$\text{ML}_2/\text{M.L}^2$		(4.2) ^w (4.78) ^{d,w}		(-1) ^c	(16) ^c
	$\text{ML}_3/\text{M.L}^3$		(5.7) ^w (6.0) ^{d,w}		(-5) ^c	(9) ^c
U^{4+}	ML/M.L		4.4			
	$\text{ML}_2/\text{M.L}^2$		(8.3) ^w			
	$\text{ML}_3/\text{M.L}^3$		(11.8) ^w			
UO_2^{2+}	ML/M.L		2.72 ± 0.04			
	$\text{ML}_2/\text{M.L}^2$		(4.45) ^w ± 0.02			
	$\text{ML}_3/\text{M.L}^3$		(5.70) ^w ± 0.07			
B(III)	$\text{M(OH)}_2(\text{H}_{-1}\text{L})/\text{M(OH)}_3\cdot\text{L}$	0.92				
$\text{C}_6\text{H}_5\text{B(III)}$	$\text{MOH(H}_{-1}\text{L})/\text{M(OH)}_2\cdot\text{L}$	1.23				

^b25°, 0.5; ^c25°, 1.0; ^d25°, 2.0; ^h20°, 0.1; ^woptical isomerism not stated;
^xtemperature not stated, 0.2.

Lactic acid (continued)

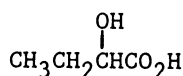
Bibliography:

H⁺, 74EP, 76KG, 77BMa, 81JP, 84LL;Ca²⁺, 81MV;Pr³⁺-Ho³⁺, 81BMO, 81JP;

Other references: 61LY, 63MG, 65ES, 71M, 75BJ, 79Ha, 80Jb, 80PG, 80TGF, 81HL, 82TG, 83BCa, 83ISK, 83IT, 83MP, 85GP, 85SA

Eu³⁺, Am³⁺-UO₂²⁺, 84LL;

B(III), 84PS;

C₆H₅B(III), 74FP;C₄H₈O₃DL-2-Hydroxybutanoic acid

HL

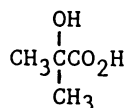
(Other values in Vol.3, p.31 and Vol.5, p.291)

Metal ion	Equilibrium	Log K 25°, 0.1	Log K 25°, 2.0
H ⁺	HL/H.L	3.68 ±0.01	3.83 ±0.02
Nd ³⁺	ML/M.L	2.63	2.62 ^k
	ML ₂ /M.L ²	(4.54) ^w	(4.72) ^{k,w}
	ML ₃ /M.L ³	(6.02) ^w	(5.93) ^{k,w}
	ML ₄ /M.L ⁴		(6.89) ^{k,w}

^k21°, 2.0; ^woptical isomerism not stated.

Bibliography: 81BMO;

Other references: 69Ma, 83IT

C₄H₈O₃2-Hydroxy-2-methylpropanoic acid

HL

(Other values in Vol.3, p.36 and other references in Vol.5, p.468)

Metal ion	Equilibrium	Log K 25°, 0.1	Log K 25°, 1.0	Log K 25°, 0	ΔH 25°, 0	ΔS 25°, 0.1
H ⁺	HL/H.L	3.79 ±0.01 3.75 ^b ±0.00	3.77 ±0.01	4.03	-0.3	16
Be ²⁺	ML/M.L	1.16 ^b				
	ML ₂ /M.L ²	2.65 ^b				
	ML/M(H ₂ L).H	4.84 ^b				
	M ₃ (OH) ₃ L ₃ /M ₃ (OH) ₃ .L ³	5.14 ^b				
Sc ³⁺	ML/M.L	4.84				
Y ³⁺	ML/M.L	3.1 ±0.2 (2.88) ^b		(2.86) ^d	-1.2 ^d	9 ^d
	ML ₂ /M.L ²	5.7 ±0.1 5.32 ^b		5.43 ^d	(-4.1) ^d	(11) ^d
	ML ₃ /M.L ³	7.5 ±0.2		7.3 ^d	-5 ^d	17 ^d
La ³⁺	ML/M.L	2.46 ±0.2 2.22 ^b	2.16	2.28 ^d	-2.0 ^d	4 ^d
	ML ₂ /M.L ²	4.23 ±0.2 (3.67) ^b	(3.63)	3.97 ^d	-2.4 ^d	10 ^d
	ML ₃ /M.L ³	5.2 ±0.3	4.4	5.2 ^d	(-6) ^d	(4) ^d

^b25°, 0.5; ^d25°, 2.0

2-Hydroxy-2-methylpropanoic acid (continued)

Metal ion	Equilibrium	Log K 25°, 0.1	Log K 25°, 1.0	Log K 25°, 0	ΔH 25°, 0	ΔS 25°, 0.1
Ce ³⁺	ML/M.L	2.6 ±0.2 2.37 ^b	2.36	2.43 ^d	-1.5 ^d	6 ^d
	ML ₂ /M.L ²	4.55 ±0.4 (4.01) ^b		4.32 ^d	-1.9 ^d	13 ^d
	ML ₃ /M.L ³	5.6 ±0.3		5.4 ^d	(-8) ^d	(-2) ^d
Pr ³⁺	ML/M.L	2.71 ±0.1 2.48 ^b				
	ML ₂ /M.L ²	4.72 ±0.3 (4.12) ^b				
	ML ₃ /M.L ³	5.8 ±0.4				
Nd ³⁺	ML/M.L	2.76 ±0.1 2.53 ^b ±0.01		2.60 ^d ±0.02	-1.6 ^d	7 ^d
	ML ₂ /M.L ²	4.74 ±0.3 4.32 ^b		4.57 ^d ±0.10	-3.3 ^d	10 ^d
	ML ₃ /M.L ³	6.0 ±0.2		6.0 ^d	-4 ^d	14 ^d
Sm ³⁺	ML/M.L	2.89 ±0.1 2.63 ^b	2.63	2.75 ^d		
	ML ₂ /M.L ²	5.11 ±0.3 (4.60) ^b	4.76	4.90 ^d		
	ML ₃ /M.L ³	6.5 ±0.3	6.1	6.5 ^d		
Eu ³⁺	ML/M.L	2.98 ±0.1 2.71 ^b ±0.01		(2.70) ^d	-1.5 ^d	7 ^d
	ML ₂ /M.L ²	5.30 ±0.4 4.92 ^b		(4.94) ^d	-3.3 ^d	11 ^d
	ML ₃ /M.L ³	6.9 ±0.6 5.9 ^b		6.5 ^d	-5 ^d	13 ^d
Gd ³⁺	ML/M.L	3.00 ±0.2 2.71 ^b		2.82 ^d		
	ML ₂ /M.L ²	5.40 ±0.4 4.97 ^b		5.15 ^d		
	ML ₃ /M.L ³	7.1 ±0.6 6.0 ^b		6.8 ^d		
Tb ³⁺	ML/M.L	3.09 ±0.2 2.87 ^b		(2.83) ^d	-1.5 ^d	7 ^d
	ML ₂ /M.L ²	5.59 ±0.3 5.21 ^b		(5.25) ^d	(-4) ^d	(11) ^d
	ML ₃ /M.L ³	7.4 ±0.5 (6.2) ^b		7.0 ^d	(-6) ^d	(12) ^d
Dy ³⁺	ML/M.L	3.13 ±0.2 (2.95) ^b	(2.83)			
	ML ₂ /M.L ²	5.70 ±0.2 5.32 ^b	5.33			
	ML ₃ /M.L ³	7.6 ±0.3 (7.2) ^b	7.0			

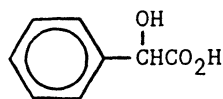
^b25°, 0.5; ^d25°, 2.0

2-Hydroxy-2-methylpropanoic acid (continued)

Metal ion	Equilibrium	Log K 25°, 0.1	Log K 25°, 1.0	Log K 25°, 0	ΔH 25°, 0.1	ΔS 25°, 0.1
Ho ³⁺	ML/M.L	3.20 $\pm$ 0.2 2.98 ^b		3.05 ^d		
	ML ₂ /M.L ²	5.84 $\pm$ 0.3 5.42 ^b		5.64 ^d		
	ML ₃ /M.L ³	7.8 $\pm$ 0.4 7.4 ^b		7.7 ^d		
Er ³⁺	ML/M.L	3.25 $\pm$ 0.2 3.03 ^b		3.07 ^d	-1.0 ^d	11 ^d
	ML ₂ /M.L ²	5.96 $\pm$ 0.3 5.54 ^b		5.73 ^d	(-5) ^d	(8) ^d
	ML ₃ /M.L ³	8.0 $\pm$ 0.4 7.6 ^b		7.8 ^d	(-7) ^d	(12) ^d
Tm ³⁺	ML/M.L	3.30 $\pm$ 0.2 3.11 ^b		(3.05) ^d		
	ML ₂ /M.L ²	6.02 $\pm$ 0.2 5.62 ^b		(5.15) ^d		
	ML ₃ /M.L ³	8.1 $\pm$ 0.4 7.8 ^b				
Yb ³⁺	ML/M.L	3.36 $\pm$ 0.3 (3.18) ^b	(3.00)	(3.15) ^d	-0.7 -1.1 ^d	13 10 ^d
	ML ₂ /M.L ²	6.14 $\pm$ 0.3 5.76 ^b	5.79	6.00 ^d	-2.3	20
	ML ₃ /M.L ³	8.2 $\pm$ 0.5 8.0 ^b	7.9	8.1 ^d	(-6) ^d -5 ^d	(6) ^d 20 ^d
Lu ³⁺	ML/M.L	3.41 $\pm$ 0.3 3.21 ^b				
	ML ₂ /M.L ²	6.24 $\pm$ 0.2 5.85 ^b				
	ML ₃ /M.L ³	8.4 $\pm$ 0.4 8.1 ^b				

^b25°, 0.5; ^d25°, 2.0Bibliography: H⁺ 67Ma, 69Da, 79DT; Be²⁺ 79DT; Sc³⁺ 84II; Y³⁺-Lu³⁺ 67Ma, 69Da;

Other references: 32Va, 71M, 80Jb, 83IT

C₈H₈O₃L-Phenylhydroxyacetic acid (mandelic acid)

HL

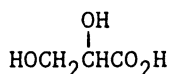
(Other values in Vol.3, p.47 and other references in Vol.5, p.468)

Metal ion	Equilibrium	Log K 25°, 0.1	Log K 25°, 1.0	Log K 25°, 0	ΔH 25°, 0	ΔS 25°, 0
H ⁺	HL/H.L	3.20 $\pm$ 0.02 3.12 ^b	3.18 $\pm$ 0.04 3.31 ^d	3.40 $\pm$ 0.01 3.49 ^e	+0.05 ^d	15.3 ^d
Co ²⁺	ML/M.L		1.19 ^d 1.22 ^k			
	ML ₂ /M.L ²		(2.07) ^{d, x} 1.74 ^k			
	ML ₃ /M.L ³		2.67 ^k			

^b25°, 0.5; ^d25°, 2.0; ^e25°, 3.0; ^k20°, 2.0; ^xDL-mixture

Mandelic acid (continued)

Metal ion	Equilibrium	Log K 25°, 0.1	Log K 25°, 1.0	Log K 25°, 0	ΔH 25°, 0	ΔS 25°, 0
Ni ²⁺	ML/M.L		1.31 ^d			
			1.41 ^k			
	ML ₂ /M.L ²		(2.48) ^{d,x}			
			2.26 ^k			
	ML ₃ /M.L ³		2.9 ^k			
Cu ²⁺	ML/M.L		2.70			
Zn ²⁺	ML/M.L		1.36 ^d			
			1.51 ^k			
	ML ₂ /M.L ²		(2.58) ^{d,x}			
			2.58 ^k			
	ML ₃ /M.L ³		3.36 ^k			
CH ₃ B(III)						
	MOH(H ₋₁ L) . H/M(OH) ₂ . HL					-2.68
C ₆ H ₅ B(III)						
	MOH(H ₋₁ L) . H/M(OH) ₂ . HL					-1.82
3-NO ₂ C ₆ H ₅ B(III)						
	MOH(H ₋₁ L) . H/M(OH) ₂ . HL					-0.72
^d 25°, 2.0; ^k 20°, 2.0; ^x DL-mixture						
Bibliography:						
H ⁺ 79ZKY, 80BP, 85MF;			Cu ²⁺ 83PR;			
Co ²⁺ , Ni ²⁺ , Zn ²⁺ 85MF;			CH ₃ B(III)-3-NO ₂ C ₆ H ₅ B(III) 80BP;			
Other references: 80CK, 80PG, 81CK, 83US, 84II, 85CA, 85KM						

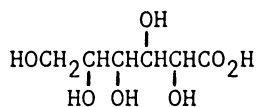


C₃H₆O₄ DL-2,3-Dihydroxypropanoic acid (glyceric acid) HL
(Other values in Vol.3, p.53 and Vol.5, p.293)

Metal ion	Equilibrium	Log K 25°, 2.0
H ⁺	HL/H.L	3.54
Co ²⁺	ML/M.L	1.30
	ML ₂ /M.L ²	(1.74) ^w
	ML ₃ /M.L ³	(2.84) ^w
Ni ²⁺	ML/M.L	1.46
	ML ₂ /M.L ²	(2.24) ^w
	ML ₃ /M.L ³	(3.00) ^w
Cu ²⁺	ML/M.L	2.18
	ML ₂ /M.L ²	(3.82) ^w

^wOptical isomerism not stated.

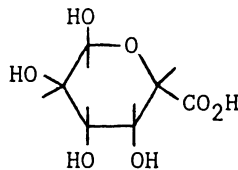
Bibliography: 75PG



$\text{C}_6\text{H}_{12}\text{O}_7$ D-2,3,4,5,6-Pentahydroxyhexanoic acid (D-gluconic acid) HL
 (Other values in Vol.3, p.59 and Vol.5, p.296)

Metal ion	Equilibrium	Log K 25°, 0.1	Log K 25°, 1.0
H^+	HL/H.L	3.44	3.48
Ca^{2+}	ML/M.L ML ₂ /M.L ²	1.21 ± 0.01	1.05 1.88
Sc^{3+}	ML/M.L	4.21	
Cd^{2+}	ML/M.L ML ₂ /M.L ²		1.15 2.09 ± 0.01
Al^{3+}	ML/M.L ML/M(H ₋₁ L).H M(H ₋₁ L)/M(H ₋₃ L).H ³	1.98 2.87 9.29	

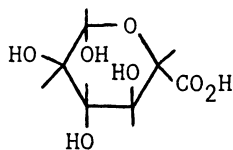
Bibliography: H^+ , Al^{3+} 84MM; Ca^{2+} 81MV; Sc^{3+} 84II; Cd^{2+} 81TV;
 Other references: 80AJ, 81FD, 83ZG, 85BS



$\text{C}_6\text{H}_{10}\text{O}_7$ D-Galacturonic acid HL
 (Other values in Vol.3, p.61 and other references in Vol.5, p.443)

Metal ion	Equilibrium	Log K 37°, 0.15	Log K 25°, 1.0	Log K 25°, 0	ΔH 25°, 1.0	ΔS 25°, 1.0
H^+	L/(H ₋₁ L).H HL/H.L	(11.42) 3.23	(12.24) 3.17	3.471		
Ca^{2+}	M(H ₋₁ L).H/M.L		(-10.15)			
Eu^{3+}	ML/M.L		1.81			
Cu^{2+}	ML/M.L		1.81		+0.6	10
Cd^{2+}	ML/M.L		1.15			
Pb^{2+}	ML/M.L		2.00			

Bibliography: H^+ - Eu^{3+} , Cd^{2+} , Pb^{2+} 77MC; Cu^{2+} 77MC, 81Ad, 82Pmb



$\text{C}_6\text{H}_{10}\text{O}_7$ D-Glucuronic acid HL
 (Other reference in Vol.5, p.443)

Metal ion	Equilibrium	Log K 25°, 1.0	Log K 25°, 0	ΔH 25°, 1.0	ΔS 25°, 1.0
H^+	L/(H ₋₁ L).H HL/H.L	(12.04) 2.95	3.231		

D-Glucuronic acid (continued)

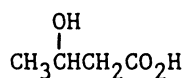
Metal ion	Equilibrium	Log K 25°, 1.0	Log K 25°, 0	ΔH 25°, 1.0	ΔS 25°, 1.0
Ca ²⁺	M(H ₁ L).H/M.L	(-10.40)			
Eu ³⁺	ML/M.L	1.60			
Cu ²⁺	ML/M.L	1.48		+0.8	9
Cd ²⁺	ML/M.L	1.10			
Pb ²⁺	ML/M.L	1.62			

Bibliography: H⁺-Eu³⁺, Cd²⁺, Pb²⁺ 77MC; Cu²⁺ 77MC, 81Ad;
Other reference: 82PMA

		HOCH ₂ CH ₂ CO ₂ H				
		3-Hydroxypropanoic acid			HL	
		(Other values in Vol.3, p.61 and Vol.5, p.296)				
Metal ion	Equilibrium	Log K 25°, 0.1	Log K 25°, 1.0	Log K 25°, 2.0	ΔH 25°, 2.0	ΔS 25°, 2.0
H ⁺	HL/H.L	4.40 ±0.02	4.32	4.56	-0.3	20
La ³⁺	ML/M.L	(1.91)		1.56	+2.6	16
Ce ³⁺	ML/M.L	2.07		1.57	+2.5	15
Pr ³⁺	ML/M.L	2.05		1.62	+1.9	14
Nd ³⁺	ML/M.L	(2.23)		1.66	+1.5	13
Sm ³⁺	ML/M.L	2.23		1.75	+2.5	16
Eu ³⁺	ML/M.L	2.08		1.65		
Gd ³⁺	ML/M.L	(1.85)		1.61	+3.8	20
Tb ³⁺	ML/M.L	1.99		1.54	+4.4	21
Dy ³⁺	ML/M.L	(2.03)		1.45	+4.2	21
Ho ³⁺	ML/M.L	1.93		(1.48)	+4.7	22
Er ³⁺	ML/M.L	1.84		1.32	+4.9	23
Tm ³⁺	ML/M.L	1.96		1.45	+5.2	24
Yb ³⁺	ML/M.L	1.99		1.51	+4.5	22
Lu ³⁺	ML/M.L	1.97		1.40	+4.5	22
Co ²⁺	ML/M.L		(0.3)	0.86	(+1.8) ^c	(10) [*]
	ML ₂ /M.L ²			1.18		
	ML ₃ /M.L ³			1.23		
Ni ²⁺	ML/M.L		(0.5)	0.96	(+1.2) ^c	(8) [*]
	ML ₂ /M.L ²			1.30		
	ML ₃ /M.L ³			1.56		
Cu ²⁺	ML/M.L	2.05 ^P	(1.5)	1.83	(+0.9) ^c	(11) [*]
	ML ₂ /M.L ²			2.79		
Zn ²⁺	ML/M.L			0.86		
	ML ₂ /M.L ²			1.11		
	ML ₃ /M.L ³			1.43		
Cd ²⁺	ML/M.L			1.28		
	ML ₂ /M.L ²			2.12		
	ML ₃ /M.L ³			2.40		
Pb ²⁺	ML/M.L		1.95	2.13 ±0.03	+0.1	10
	ML ₂ /M.L ²		2.94	3.14 ±0.03	+0.6	16
	ML ₃ /M.L ³			3.57 ±0.06		

^c25°, 1.0; ^P30°, 0.1; ^{*}assuming ΔH for 1.0 = ΔH for 2.0.

Bibliography: H⁺ 76KG, 80SY; La³⁺-Lu³⁺ 80SY; Co²⁺-Pb²⁺ 76KG; Other reference: 80Jb

 $\text{C}_4\text{H}_8\text{O}_3$ DL-3-Hydroxybutanoic acid

HL

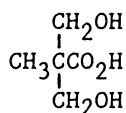
(Other values in Vol.3, p.62 and Vol.5, p.297)

Metal ion	Equilibrium	Log K 25°, 0.2	Log K 20°, 1.0	Log K 25°, 3.0
H^+	HL/H.L	4.28 ± 0.02 4.31 ^b	4.35 ± 0.00 4.55 ^d ± 0.02	4.76
Be^{2+}	ML/M.L	1.44 ^b		
	$\text{ML}_2/\text{M.L}^2$	(2.83) ^{b,w}		
	$\text{M}_3(\text{OH})_3\text{L}_3/\text{M}_3(\text{OH})_3.\text{L}^3$	(2.68) ^{b,w}		

^b25°, 0.5; ^d25°, 2.0; ^woptical isomerism not given.

Bibliography: 79DT;

Other references: 80Jb, 83IT

 $\text{C}_5\text{H}_{10}\text{O}_4$ 2,2-Bis(hydroxymethyl)propanoic acid

HL

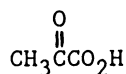
(Other reference in Vol.3, p.63)

Metal ion	Equilibrium	Log K 25°, 0.1	Log K 25°, 0
H^+	HL/H.L	4.42 ± 0.03	4.61
Y^{3+}	ML/M.L	2.20 ± 0.04	
	$\text{ML}_2/\text{M.L}^2$	3.75 ± 0.03	
	$\text{ML}_3/\text{M.L}^3$	4.7	
La^{3+}	ML/M.L	2.08 ± 0.02	
	$\text{ML}_2/\text{M.L}^2$	3.51 ± 0.03	
	$\text{ML}_3/\text{M.L}^3$	4.5 ± 0.2	
Ce^{3+}	ML/M.L	(2.31)	
	$\text{ML}_2/\text{M.L}^2$	(3.95)	
	$\text{ML}_3/\text{M.L}^3$	(5.4)	
Pr^{3+}	ML/M.L	2.32 ± 0.02	
	$\text{ML}_2/\text{M.L}^2$	3.89 ± 0.00	
	$\text{ML}_3/\text{M.L}^3$	5.0 ± 0.2	
Nd^{3+}	ML/M.L	2.38 ± 0.01	
	$\text{ML}_2/\text{M.L}^2$	3.97 ± 0.01	
	$\text{ML}_3/\text{M.L}^3$	4.9 ± 0.4	
Sm^{3+}	ML/M.L	2.47 ± 0.01	
	$\text{ML}_2/\text{M.L}^2$	4.14 ± 0.02	
	$\text{ML}_3/\text{M.L}^3$	5.1 ± 0.4	
Eu^{3+}	ML/M.L	2.45 ± 0.01	
	$\text{ML}_2/\text{M.L}^2$	4.12 ± 0.03	
	$\text{ML}_3/\text{M.L}^3$	5.0 ± 0.3	
Gd^{3+}	ML/M.L	2.38 ± 0.01	
	$\text{ML}_2/\text{M.L}^2$	4.05 ± 0.05	
	$\text{ML}_3/\text{M.L}^3$	5.2 ± 0.1	

2,2-Bis(hydroxymethyl)propanoic acid (continued)

Metal ion	Equilibrium	Log K 25°, 0.1	Log K 25°, 0
Tb ³⁺	ML/M.L	2.32 ±0.02	
	ML ₂ /M.L ²	3.96 ±0.06	
	ML ₃ /M.L ³	5.1	
Dy ³⁺	ML/M.L	2.30 ±0.03	
	ML ₂ /M.L ²	3.93 ±0.02	
	ML ₃ /M.L ³	4.4	
Ho ³⁺	ML/M.L	2.28 -0.01	
	ML ₂ /M.L ²	3.92 -0.01	
	ML ₃ /M.L ³	4.3	
Er ³⁺	ML/M.L	2.29 ±0.02	
	ML ₂ /M.L ²	3.89 ±0.02	
	ML ₃ /M.L ³	4.5	
Tm ³⁺	ML/M.L	2.32 ±0.01	
	ML ₂ /M.L ²	3.94 ±0.01	
	ML ₃ /M.L ³	4.7	
Yb ³⁺	ML/M.L	2.35 ±0.05	
	ML ₂ /M.L ²	4.01 ±0.10	
	ML ₃ /M.L ³	5.3	
Lu ³⁺	ML/M.L	2.37 ±0.03	
	ML ₂ /M.L ²	4.05 ±0.08	
	ML ₃ /M.L ³	5.4	

Bibliography: 69Da



C ₃ H ₄ O ₃		2-Oxopropanoic acid (pyruvic acid)				HL
		(Other values in Vol.3, p.66 and Vol.5, p.298)				
Metal ion	Equilibrium	Log K 25°, 0.1	Log K 25°, 1.0	Log K 25°, 0	ΔH 25°, 0	ΔS 25°, 0
H ⁺	HL/H.L	2.26 2.20 ^b	(2.15)±0.03 2.30 ^d ±0.03	2.49 +0.1 2.40 ^e	-2.90 -3.01 ^t	2 0 ^a
Mg ²⁺	ML/M.L	1.1				
La ³⁺	ML/M.L		1.00 ^d		-0.9 ^d	2 ^d
Ce ³⁺	ML/M.L		1.59 ^d		-1.1 ^d	4 ^d
Pr ³⁺	ML/M.L		1.72 ^d		-1.1 ^d	4 ^d
Nd ³⁺	ML/M.L		1.46 ^d		-1.1 ^d	3 ^d
Sm ³⁺	ML/M.L		1.53 ^d		-1.2 ^d	3 ^d
Eu ³⁺	ML/M.L		1.88 ^d +0.09		-1.2 ^d ±0.0	5 ^d
	ML ₂ /M.L ²		3.3 ^d		-3.6 ^d	3 ^d
	ML ₃ /M.L ³		3.8 ^d			
Gd ³⁺	ML/M.L		1.67 ^d		-1.2 ^d	4 ^d
Tb ³⁺	ML/M.L		1.19 ^d		-1.0 ^d	2 ^d
Dy ³⁺	ML/M.L		1.27 ^d		-1.1 ^d	2 ^d
Ho ³⁺	ML/M.L		1.34 ^d		-1.0 ^d	3 ^d

^b25°,0.5; ^c25°,1.0; ^d25°,2.0; ^e25°,3.0; ^t25°,0.05

Pyruvic acid (continued)

Metal ion	Equilibrium	Log K 25°, 0.1	Log K 25°, 1.0	Log K 25°, 0	ΔH 25°, 0	ΔS 25°, 0
Er ³⁺	ML/M.L		1.72 ^d		-1.1 ^d	4 ^d
Tm ³⁺	ML/M.L		1.89 ^d		-1.1 ^d	5 ^d
Yb ³⁺	ML/M.L		(1.56) ^d		(-1.2) ^d	(3) ^d
Lu ³⁺	ML/M.L		1.83		-1.0 ^d	5 ^d
Co ²⁺	ML/M.L		0.60 ^d			
	ML ₂ /M.L ²		0.44 ^d			
Ni ²⁺	ML/M.L	1.12 ^b	0.88			
			0.73 ^d			
	ML ₂ /M.L ²	0.46 ^b	0.95			
			0.81 ^d			
Cu ²⁺	ML/M.L	1.4 ^b	1.35 ^d	(2.2)	-0.1 ^c	6 ^d
	ML ₂ /M.L ²	2.6 ^b	2.05 ^d	(4.9)	-1.2 ^c	5 ^d
CH ₃ Hg ⁺	ML/M.L		2.31			
Zn ²⁺	ML/M.L	1.26 ^b	0.72 ^d			
	ML ₂ /M.L ²	1.98 ^b	2.00			
			0.54 ^d			
Cd ²⁺	ML/M.L		0.69 ^d	0.98 ^e		
	ML ₂ /M.L ²		1.07 ^d			
Pb ²⁺	ML/M.L		1.50 ^d	2.04 ^e		
	ML ₂ /M.L ²		2.25 ^d	3.40 ^e		

^b25°, 0.5; ^c25°, 1.0; ^d25°, 2.0; ^e25°, 3.0;

Bibliography:

H⁺ 77BMa, 80MKM;

Mg²⁺ 85ML;

La³⁺-Lu³⁺ 80CC;

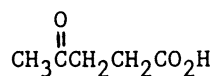
Other reference: 82VRZ

Co²⁺, Cu²⁺, Cd²⁺, Pd²⁺ 80MKM;
Ni²⁺, Zn²⁺ 69TL, 80MKM;
CH₃Hg⁺ 81JI;

		$\begin{array}{c} \text{O} \\ \parallel \\ \text{CH}_3\text{CH}_2\text{CCO}_2\text{H} \end{array}$			
C ₄ H ₆ O ₃		<u>2-Oxobutanoic acid</u>		HL	
		(Other reference in Vol.3, p.336)			
Metal ion	Equilibrium	Log K 25°, 0.1	Log K 25°, 0	ΔH 25°, 0	ΔS 25°, 0
H ⁺	HL/H.L	2.48	2.50	-2.82 -2.93 ^a	2.0
Cu ²⁺	ML/M.L	2.15			
	ML ₂ /M.L ²	3.99			
Zn ²⁺	ML/M.L	1.69			
Al ³⁺	ML/M.L	2.09			
	ML ₂ /M.L ²	3.65			

^a25°, 0.05

Bibliography: 82KM

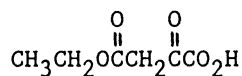


$\text{C}_5\text{H}_8\text{O}_3$ 4-Oxopentanoic acid (levulinic acid) HL
(Other references in Vol.3, p.336 and Vol.5, p.468)

Metal ion	Equilibrium	Log K <u>25°, 0.1</u>	Log K <u>25°, 1.0</u>	Log K <u>18°, 0</u>
H^+	HL/H.L	4.50 4.44 ^h 4.38 ⁱ	(4.34) 4.41 ^j	4.64
Mn^{2+}	ML/M.L	0.75		
Co^{2+}	ML/M.L	0.80		
Ni^{2+}	ML/M.L	0.79		
Cu^{2+}	ML/M.L $\text{ML}_2/\text{M.L}^2$	1.70 2.55		
CH_3Hg^+	ML/M.L		2.51	
Zn^{2+}	ML/M.L	1.13		

^h18°, 0.1; ⁱ18°, 0.5; ^j18°, 1.0

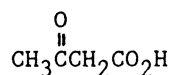
Bibliography: H^+ 81JI, 83LT; Mn^{2+} - Cu^{2+} , Zn^{2+} 83LT; CH_3Hg^+ 81JI; Other reference: 82SMK



$\text{C}_6\text{H}_8\text{O}_5$ 2-Oxobutanedioic acid 4-ethylester (4-ethyloxaloacetate) H₂L

Metal ion	Equilibrium	Log K <u>25°, 0.5</u>
H^+	HL/H.L	9.3
Mg^{2+}	ML/M.L ML/M(H ₋₁ L).H	1.06 4.5
Mn^{2+}	ML/M.L ML/M(H ₋₁ L).H	1.12 3.7

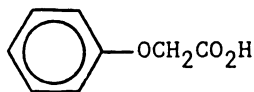
Bibliography: 82BL



$\text{C}_4\text{H}_6\text{O}_3$ 3-Oxobutanoic acid (acetoacetic acid) HL
(Other reference in Vol.3, p.336)

Metal ion	Equilibrium	Log K <u>25°, 0.1</u>	Log K <u>18°, 0</u>
H^+	HL/H.L	3.57	3.65
Cu^{2+}	ML/M.L $\text{ML}_2/\text{M.L}^2$	1.39 2.37	
Zn^{2+}	ML/M.L	0.83	
Al^{3+}	ML/M.L $\text{ML}_2/\text{M.L}^2$	1.21 1.84	

Bibliography: 82KM

 $C_8H_8O_3$

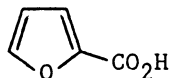
Phenoxyacetic acid
(Other values in Vol.3, p.72)

HL

Metal ion	Equilibrium	Log K 25°, 0.1	Log K 37°, 0.15	Log K 25°, 0	ΔH 25°, 0.1	ΔS 25°, 0.1
H^+	HL/H.L	2.96 ± 0.03 2.87^b	2.94 3.56^e	3.15 ± 0.02	$+1.12$	17.3
Li^+	ML/M.L	-0.04	0.00	0.13	$(+2)^s$	(7)
Na^+	ML/M.L	-0.13	-0.11	0.04	$(+1)^s$	(3)
K^+	ML/M.L	-0.15	-0.15	0.02	$(0)^s$	(-1)
Mg^{2+}	ML/M.L	0.61	0.59	0.98	$(0)^s$	(3)
Ca^{2+}	ML/M.L	0.65	0.68	1.02	$(+1)^s$	(6)

 $b_{25^\circ, 0.5}$; $e_{25^\circ, 3.0}$; $s_{10-45^\circ, 0.1}$

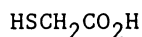
Bibliography: 85CDS; Other references: 80Jc, 85CA

 $C_5H_4O_3$

Oxole-2-carboxylic acid (2-furoic acid)
(Other values in Vol.3, p.72 and Vol.5, p.302)

HL

Metal ion	Equilibrium	Log K 25°, 0.1	Log K 25°, 1.0	Log K 25°, 0	ΔH 25°, 0	ΔS 25°, 0
H^+	HL/H.L	2.97 ± 0.03	3.02 ± 0.04 3.19^d	3.162 ± 0.007	$(-2)^f$	(8)
UO_2^{2+}	ML/M.L	1.71	1.61			
	$ML_2/M.L^2$	3.05	2.63			
PuO_2^{2+}	ML/M.L	1.41	1.24			
	$ML_2/M.L^2$	2.87	2.33			
Co^{2+}	ML/M.L		0.51		$+0.3^c$	3^c
Ni^{2+}	ML/M.L		0.81		$+0.2^c$	4^c
Cu^{2+}	ML/M.L		(0.96)	1.35 ± 0.03	$+1.1^c$	8^c

 $c_{25^\circ, 1.0}$; $d_{25^\circ, 2.0}$; $f_{25-40^\circ, 0}$ Bibliography: $H^+, UO_2^{2+}, PuO_2^{2+}$ 70Ba; $Co^{2+}-Cu^{2+}$ 82A $C_2H_4O_2S$

Mercaptoacetic acid (thioglycolic acid)
(Other values in Vol.3, p.73 and Vol.5, p.302)

 H_2L

Metal ion	Equilibrium	Log K 25°, 0.1	Log K 25°, 1.0	Log K 25°, 0	ΔH 25°, 0	ΔS 25°, 0
H^+	HL/H.L	10.11 ± 0.1 $9.96^b \pm 0.06$		10.61 ± 0.07 $(9.99)^e$	-6.2 ± 0.0 -6.5^b	28 24^b
	$H_2L/HL.H$	3.48 ± 0.07 $3.44^b \pm 0.04$	3.53	3.64 ± 0.04 3.83^e	$+0.1^b$ $0.0^c \pm 0.1$	16^b 16^c

 $b_{25^\circ, 0.5}$; $c_{25^\circ, 1.0}$; $e_{25^\circ, 3.0}$

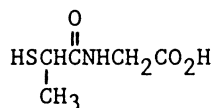
Thioglycolic acid (continued)

Metal ion	Equilibrium	Log K 25°, 0.1	Log K 25°, 1.0	Log K 25°, 0	ΔH 25°, 0	ΔS 25°, 0
Th ⁴⁺	MHL/M.HL		3.22		+2.4 ^c	23 ^c
	M(HL) ₂ /M.(HL) ₂		5.69		+4.3 ^c	40 ^c
	M(HL) ₃ /M.(HL) ₃		7.20		+6.9 ^c	56 ^c
	M(HL) ₄ /M.(HL) ₄		8.54		+7.7 ^c	65 ^c
UO ₂ ²⁺	MHL/M.HL		1.89		+2.1 ^c	16 ^c
	M(HL) ₂ /M.(HL) ₂		3.20		+4.6 ^c	30 ^c
	M(HL) ₃ /M.(HL) ₃		4.51		+4.6 ^c	36 ^c
CH ₃ Hg ⁺	ML/M.L	16.9 ±0.0				
	MHL/M.HL	10.58 ±0.06				

^b25°, 0.5; ^c25°, 1.0; ^e25°, 3.0

Bibliography: H⁺ 81RR, 83AC, 83MO, 84TZ; CH₃Hg⁺ 81RR, 83AC;

Other references: 81BCJ, 82NAN, 84J

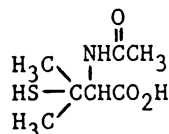
C₅H₉O₃NS

DL-(2-Mercaptopropionyl)glycine
(Other references in Vol.5, p.443)

H₂L

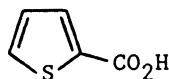
Metal ion	Equilibrium	Log K 25°, 0.1	Log K 25°, 0.5	Log K 37°, 0.15
H ⁺	HL/H.L	8.38 ±0.05	8.24 ±0.01	8.19
	H ₂ L/HL.H	3.40 ±0.02	3.27	3.43
Co ²⁺	ML/M.L	2.93		
	ML ₂ /M.L ₂	7.03		
	ML ₃ /M.L ₃	9.47		
	ML/M(H ₋₁ L).H	8.2		
	ML ₂ /M(H ₋₁ L)L.H	9.1		
Ni ²⁺	ML ₃ /M.L ₃			12.14
	M(H ₋₁ L)L.H/M.L ₂			2.14
	M ₂ (H ₋₁ L) ₂ .H ² /M ² .L ²			-0.33
Zn ²⁺	ML/M.L			5.37
	ML ₂ /M.L ₂			10.09
	ML ₃ /M.L ₃			13.29
Cd ²⁺	ML ₃ /M.L ₃			14.99
	M ₂ L ₂ /M ² .L ²			14.95
	M ₂ HL ₂ /M ₂ L ₂ .H			3.40
	M ₂ L ₃ /M ₂ L ₂ .L			5.89
	M ₂ L ₄ /M ₂ L ₃ .L			4.60
Pb ²⁺	ML/M.L			6.73
	ML ₂ /M.L ₂			11.53
	ML ₃ /M.L ₃			14.38
	MHL/ML ² .H			3.13
	M ₂ L ₃ /M ² .L ³			20.85

Bibliography: H⁺ 82TA, 83HS, 85FW; Co²⁺ 83HS; Ni²⁺-Pb²⁺ 85FW

 $C_7H_{13}O_3NS$ N-Acetyl-D-penicillamine H_2L

(Other references in Vol.3, p.337 and Vol.5, p.468)

Metal	Equilibrium	Log K
ion		25°, 0.1
H^+	HL/H.L	10.07 ±0.07
	$H_2L/HL.H$	3.27 ±0.07
Co^{2+}	ML/M.L	4.63
	$ML_2/M.L^2$	10.10
CH_3Hg^+	ML/M.L	16.5 ±0.1
	MHL/M.HL	9.66 ±0.01
$(CH_3)_3Pb^+$	ML/M.L	3.48 ^u
	MHL/M.HL	0.60 ^u

^u25°, 0.3Bibliography: H^+ 71WM, 80CJ, 81BR, 83AC, 83HS; Co^{2+} 83HS; CH_3Hg^+ 81RR, 83AC; $(CH_3)_4Pb^+$ 81BR; Other reference: 81BCJ $C_5H_4O_2S$ Thiole-2-carboxylic acid (2-thenoic acid)

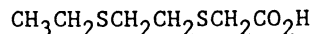
HL

(Values in Vol.3, p.83 and other reference in Vol.5, p.468)

Metal	Equilibrium	Log K	Log K	Log K	ΔH	ΔS
ion		25°, 0.1	25°, 1.0	25°, 0	30°, 0	25°, 0
H^+	HL/H.L	3.33 ±0.01	3.38 ±0.03	3.51	(+1) ¹	(19)
UO_2^{2+}	ML/M.L	1.91	1.82			
	$ML_2/M.L^2$	3.49	3.20			
PuO_2^{2+}	ML/M.L	1.70	1.57			
	$ML_2/M.L^2$	2.95	2.69			

¹30-40°, 0

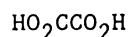
Bibliography: 70Ba; Other reference: 79A

 $C_6H_{12}O_2S_2$ 3,6-Dithiaoctanoic acid

HL

Metal	Equilibrium	Log K
ion		25°, 1.0
H^+	HL/H.L	3.61
Ni^{2+}	ML/M.L	2.08
	$ML_2/M.L^2$	(4.56)
Cu^{2+}	ML/M.L	3.11
	$ML_2/M.L^2$	5.97

Bibliography: 80PPC; Other reference: 80KVP



$\text{C}_2\text{H}_2\text{O}_4$		<u>Ethanedioic acid (oxalic acid)</u>				H_2L
		(Other values in Vol.3, p.92 and Vol.5, p.307)				
Metal ion	Equilibrium	Log K 25°, 0.1	Log K 25°, 1.0	Log K 25°, 0	ΔH 25°, 0	ΔS 25°, 0
H^+	HL/H.L	3.38 ±0.02	3.56 ^u ±0.02	4.266 ±0.001	+1.60 ±0.06	24.9
		3.94 ^z	3.63 ^v ±0.03	3.81 ^{e,u} ±0.01	+0.96 ^c	23 ^a
		3.62 ^b ±0.05	3.76 ^{n,u}			20 ^c
			3.99 ^{n,z}			
	$\text{H}_2\text{L}/\text{HL.H}$	(1.0) ±0.1	(1.0) ±0.1	1.252 ±0.00	+0.8 ±0.1	8.4
		(1.0) ^b ±0.0	(1.1) ^d ±0.1	(1.3) ^e ±0.0	+0.2 ^c	6 ^c
Li^+	ML/M.L		0.79 ^{n,z}	1.3 -0.1		
Na^+	ML/M.L		0.49 ^{n,z}	1.0 ±0.1	+1.2	9
K^+	ML/M.L		0.41 ^{n,z}	0.9 ±0.1	+1.0	7
NH_4^+	ML/M.L	0.6 ^z		0.9		
Mg^{2+}	ML/M.L	2.76 ^h	2.67 ^{n,z}	3.42 ^o		
		2.52 ^{q,z}		3.59 ^m ±0.01		
Ca^{2+}	ML/M.L	2.46 ^p	2.36 ^{n,z}	3.19		
		2.22 ^{q,z}		3.27 ^m		
	M.L/ML.H ₂ O(s)	-8.60	-8.43 ⁿ	-8.78		
	M.L/ML.3H ₂ O(s)	-8.14	-7.90 ⁿ	-8.32		
Eu^{3+}	ML/M.L	5.36	4.9 ^u ±0.1			
		4.81 ^b ±0.1				
	$\text{ML}_2/\text{M.L}^2$	9.04	4.72 ^u ±0.1			
		8.57 ^b ±0.1				
	$\text{ML}_3/\text{M.L}^3$		11.5 ^u ±0.1			
	$\text{ML}_4/\text{M.L}^4$		13.1 ^{j,u}			
Pu^{4+}	ML/M.L			8.30 ^{f,u}		
	$\text{ML}_2/\text{M.L}^2$			14.9 ^{f,u}		
UO_2^{2+}	ML/M.L	6.36 ^h	5.99 ^{j,u}	6.3 ^{f,u}		
	$\text{ML}_2/\text{M.L}^2$	10.39 ^h	10.64 ^{j,u}			
	$\text{ML}_3/\text{M.L}^3$		11.0 ^{j,u}			
Cu^{2+}	ML/M.L	(4.85)±0.01	(5.53) ^u	(6.23)	(-0.1)	(28)
	$\text{ML}_2/\text{ML.L}$	4.01 ±0.02	4.00 ^u	4.00		
Mo^{3+}	ML/M.L		6.66 ^t			
V(V)	$\text{MO}_2(\text{OH})\text{L}/\text{H.MO}_3\text{L}$	8.58 ⁱ				
	$\text{MO}_2\text{L}_2/\text{H}^2\text{.MO}_3\text{.L}^2$	17.42 ⁱ				
Pb^{2+}	ML/M.L		4.20 ^u ±0.04			
	$\text{ML}_2/\text{M.L}^2$		6.31 ^u ±0.03			
	MHL/ML.H		1.43 ^u			
	M.L/ML(s)		-8.07 ^u ±0.05			
B(III)	$\text{M(OH)}_2\text{L}/\text{M(OH)}_3\text{.HL}$	0.35 ^h				
$\text{C}_6\text{H}_5\text{B(III)}$	$\text{MOHL}/\text{M(OH)}_2\text{.HL}$	1.5				

^a25°,0.1; ^b25°,0.5; ^c25°,1.0; ^d25°,2.0; ^e25°,3.0; ^f25°,4.0; ^h20°,0.1; ⁱ20°,0.5; ^j20°,1.0; ^m37°,0; ⁿ37°,0.15; ^o18°,0; ^p37°,0.1; ^q37°,0.5; ^t Li^+ salt used as background electrolyte; ^u Na^+ salt used as background electrolyte; ^v K^+ salt used as background electrolyte; ^z $(\text{CH}_3\text{CH}_2)_4\text{NI}$ used as background electrolyte.

Oxalic acid (continued)

Metal ion	Equilibrium	Log K 25°, 0.1	Log K 25°, 1.0	Log K 25°, 0	ΔH 25°, 0	ΔS 25°, 0
Al ³⁺	ML/M.L	5.97 ^b	6.1 ^u			
	ML ₂ /M.L ²	10.93 ^b	11.09 ^u			
	ML ₃ /M.L ³	15.97	15.12 ^u		(+4) ^s	(87) ^a
		14.88 ^b				
	MHL/ML.H	0.0 ^b				
	M ₃ (OH) ₃ L ₃ .H ³ /M ³ .L ³	9.34 ^b				
In ³⁺	M ₂ (OH) ₂ L ₄ .H ² /M ² .L ⁴	13.54 ^b				
	ML/M.L	6.02	5.30			
	ML ₂ /M.L ²	11.47	10.52			
	ML ₃ /M.L ³	14.53				
	MHL/M.HL	3.08 ^p				

^a25°, 0.1; ^b25°, 0.5; ^p37°, 0.1; ^s20-70°, 0.1; ^uNa⁺ salt used as background electrolyte;

Bibliography: H⁺ 69KF, 75FP, 80ACC, 80GMR, 81DR, 81SGP, 83CH, 83DR, 83DRA;

Li⁺-K⁺ 73FR, 79TN, 81DR, 83BS, 83DRA, 85SO; NH₄⁺ 81AD, 85DDS; Mg²⁺, Ca²⁺ 74NG, 75FS, 79TN, 82DM;

Eu³⁺ 60KPa, 83CC; Pu⁴⁺, UO₂²⁺ 83CB; Cu²⁺ 65CV, 69CMA, 80ACC, 80GMR; Mo³⁺ 84KR;

Cd²⁺ 85K, 85KA; Pb²⁺ 84RBF, 85RRR; B(III) 77RB; C₆H₅B(III) 75FP; Al³⁺ 84CMS, 85SO;

In³⁺ 84PGa;

Other references: 57LW, 60KPa, 60LP, 63D, 63PK, 63WT, 66MY, 67CIH, 67KS, 67M, 67S, 70BM, 71PL, 72PH, 73KCG, 76YG, 77RR, 79MP, 80MTb, 80SGa, 80SSG, 81AAP, 81APa, 81BCC, 81CCM, 81MS, 81RA, 81UB, 82BJ, 82JC, 82RA, 82SCG, 83AP, 83CC, 83GC, 83IT, 83Ma, 84JJ, 84KS, 84LSS, 84VSL, 84ZX, 85RRb, 85SA, 85VS

HO₂CCH₂CO₂H

C ₃ H ₄ O ₄		Propanedioic acid (malonic acid)				H ₂ L
		(Other values in Vol.3, p.95 and Vol.5, p.308)				
Metal ion	Equilibrium	Log K 25°, 0.1	Log K 25°, 1.0	Log K 25°, 0	ΔH 25°, 0	ΔS 25°, 0
H ⁺	HL/H.L	5.28 ± 0.05	5.03 ^u ± 0.05	5.696 ± 0.000	+1.15 - 0.01	29.9
		5.38 ^z ± 0.04	5.09 ^v ± 0.02	5.11 ^{e, u}	+0.92 ^a - 0.1	27.3 ^a
		5.06 ^{b, u} ± 0.04	5.06 ^{d, u} ± 0.06	5.27 ^{e, v}	+0.48 ^c - 0.01	24.6 ^c
		5.10 ^{b, v} ± 0.02	5.15 ^{d, v} ± 0.02			
			5.24 ^{n, u}			
	H ₂ L/HL.H		5.39 ^{n, z}			
		2.63 ± 0.03	2.59 ± 0.03	2.847 ± 0.00	-0.04 ± 0.02	12.9
		2.55 ^b ± 0.02	2.64 ^d ± 0.04	2.79 ^e ± 0.04	-0.29 ^a - 0.2	11.1 ^a
			2.64 ⁿ		-0.36 ^c ± 0.01	10.7 ^c
Li ⁺	ML/M.L		0.67 ^{n, z}	1.1 ± 0.3	(+2) ^r	(12)
Na ⁺	ML/M.L		0.40 ^{n, z}	0.8 ± 0.1	+0.8	6
K ⁺	ML/M.L		0.47 ^{n, z}	0.9 ± 0.1	+1.0	7
Cs ⁺	ML/M.L			0.7		
NH ₄ ⁺	ML/M.L	0.84 ^z		1.1		
Mg ²⁺	ML/M.L	2.05 ± 0.06		2.85 ± 0.01	(+3) ^r	(23)
	MHL/M.HL	0.90 ± 0.06				

^a25°, 0.1; ^b25°, 0.5; ^c25°, 1.0; ^d25°, 2.0; ^e25°, 3.0; ⁿ37°, 0.15; ^r20-35°, 0;

^uNa⁺ salt used as background electrolyte; ^vK⁺ salt used as background electrolyte;

^z(CH₃CH₂)₄N⁺ salt used as background electrolyte or correction made for background electrolyte.

Malonic acid (continued)

Metal ion	Equilibrium	Log K 25°, 0.1	Log K 25°, 1.0	Log K 25°, 0	ΔH 25°, 0	ΔS 25°, 0
Ca ²⁺	ML/M.L	1.6 ± 0.1 1.71 ^z		2.43 ± 0.08	+2.3	19
	MHL/M.HL	0.50 ± 0.07		0.9	(+1) ^s	(6) ^a
La ³⁺	ML/M.L	3.69 ± 0.2 3.99 ^z	3.07 ^u	4.94 ± 0.07	+3.7 ^a +2.9 ^c	29 ^a 24 ^c
	ML ₂ /M.L ²	5.89 6.26 ^z	5.1 ^u		+4.9 ^c	40 ^c
	MHL/M.HL	1.79 ^z	1.24 ^u		+0.8 ^c	8 ^c
	MHL ₂ /ML ₂ .H		4.1 ^u		-0.6 ^c	17 ^c
Eu ³⁺	ML/M.L	4.29 ± 0.01	3.72 ^u		+3.1 ^c	27 ^c
	ML ₂ /M.L ²	6.99	6.24 ^u		+4.8 ^c	45 ^c
	MHL/M.HL	1.69	1.42 ^u		+0.9 ^c	10 ^c
	MHL ₂ /ML ₂ .H		3.76 ^u		-0.8 ^c	18 ^c
Th ⁴⁺	ML/M.L	7.58 ^b	7.47 ^u		+2.8 ^c	44 ^c
	ML ₂ /M.L ²	(13.94) ^b	12.79 ^u		+4.8 ^c	75 ^c
	ML ₃ /M.L ³		16.3 ^u		+6 ^c	90 ^c
UO ₂ ²⁺	ML/M.L	(5.43) ^b	(5.42) ^u +0.2		+2.1 ^c	32 ^c
	ML ₂ /M.L ²	(9.31) ^b	(9.48) ^u +0.2		+2.8 ^c	53 ^c
Cr ²⁺	ML/M.L		3.57 ^v			
	ML ₂ /M.L ²		5.49 ^v			
	MHL/ML.H		2.88 ^v			
Cu ²⁺	ML/M.L	5.04 ± 0.07	4.63 ^u	5.80 ± 0.00	+2.9	36
			5.33 ^{n,z}		+1.4 ^a	28 ^a
	ML ₂ /M.L ²	7.8 ± 0.1	7.66 ^u		+1.2 ^a	40 ^a
			8.3 ^{n,z}			
	MHL/M.HL	2.08 ± 0.07	2.1 ⁿ		-0.1 ^a	9 ^a
VO ²⁺	ML/M.L		5.59 ^u -0.4			
	ML ₂ /M.L ²		9.48 ^u -0.6			
	MHL/M.HL		1.2 ^u			
C ₆ H ₅ B(III)	M(OH) ₂ .H ₂ L/MOHL.H	1.59				
Al ³⁺	ML/M.L		6.26 ⁿ			
	ML ₂ /M.L ²		11.11 ⁿ			
	ML ₃ /M.L ³		13.3 ⁿ			
In ³⁺	ML/M.L	5.97				
	ML ₂ /M.L ²	10.13				

^a25°, 0.1; ^b25°, 0.5; ^c25°, 1.0; ⁿ37°, 0.15; ^r20-35°, 0; ^s10-50°, 0.1;

^uNa⁺ salt used as background electrolyte; ^vK⁺ salt used as background electrolyte;

^z(CH₃CH₂)₄N⁺ salt used as background electrolyte or correction made for background electrolyte.

Bibliography: H⁺ 76LP, 78ACa, 80GMR, 80MA, 82JC, 82NF, 83DR, 84DDa, 85AM, 85CDa, 85DDa, 85DDD;

Li⁺-K⁺ 83DRa, 84DDa, 85DDD;

NH₄⁺ 85DDS;

Mg²⁺ 76KO;

Ca²⁺ 76KO, 84DDa, 85DDD;

La³⁺ 85DDa;

Eu³⁺ 82SC;

Th⁴⁺ 85LCF;

Cr²⁺ 83MDN;

Cu²⁺ 78ACa, 80GMR, 82DR;

VO²⁺ 82NF;

C₆H₅B(III) 76LP;

Al³⁺ 82JC;

In³⁺ 84PGa;

Malonic acid (continued)

Other references: 63PK, 67CIH, 70DM, 73SS, 77RB, 80Aj, 80MPc, 80NSd, 80PS, 80SGb, 81CCM, 81MS, 81MSa, 81RA, 81RK, 81RS, 81SJb, 81SJc, 82CG, 82GV, 82SCG, 83BC, 83GJ, 83GV, 83GVa, 83IT, 83KS, 83Sc, 83VV, 84GV, 84GVa, 84LS, 84LSS, 84Ma, 84PGB, 84SSa, 84ZX, 85KM, 85KS, 85RRR, 85SSa, 85SSb

		$\begin{array}{c} \text{R} \\ \\ \text{HO}_2\text{CCHCO}_2\text{H} \end{array}$				
$\text{C}_x\text{H}_y\text{O}_4$		<u>Alkylmalonic acid</u>				H_2L
<u>Ligand</u>	<u>Metal ion</u>	<u>Equilibrium</u>	<u>Log K</u> <u>25°, 0.1</u>	<u>Log K</u> <u>25°, 0</u>	<u>ΔH</u> <u>25°, 0</u>	<u>ΔS</u> <u>25°, 0</u>
R = CH_3	H^+	HL/H.L	5.40 -0.01	5.76		
Ethane-1,1-dicarboxylic acid		$\text{H}_2\text{L}/\text{HL.H}$	5.16 ^b ±0.02			
			2.80 +0.1	3.01		
			2.80 ^b ±0.02			
(methylmalonic acid)	Y^{3+}	ML/M.L	4.21			
		$\text{ML}_2/\text{M.L}^2$	6.60			
($\text{C}_4\text{H}_6\text{O}_4$)	La^{3+}	ML/M.L	3.48			
		$\text{ML}_2/\text{M.L}^2$	5.68			
(Other values in Vol.3, p.99 and other references in Vol.5, p.469)	Ce^{3+}	ML/M.L	(3.75)			
		$\text{ML}_2/\text{M.L}^2$	(6.09)			
	Pr^{3+}	ML/M.L	3.77			
		$\text{ML}_2/\text{M.L}^2$	6.19			
	Nd^{3+}	ML/M.L	3.82			
		$\text{ML}_2/\text{M.L}^2$	6.23			
	Sm^{3+}	ML/M.L	4.07			
		$\text{ML}_2/\text{M.L}^2$	6.56			
	Eu^{3+}	ML/M.L	4.16			
		$\text{ML}_2/\text{M.L}^2$	6.65			
	Gd^{3+}	ML/M.L	4.18			
		$\text{ML}_2/\text{M.L}^2$	6.62			
	Tb^{3+}	ML/M.L	4.30			
		$\text{ML}_2/\text{M.L}^2$	6.83			
	Dy^{3+}	ML/M.L	4.36			
		$\text{ML}_2/\text{M.L}^2$	6.93			
	Ho^{3+}	ML/M.L	4.33			
		$\text{ML}_2/\text{M.L}^2$	6.86			
	Er^{3+}	ML/M.L	4.32			
		$\text{ML}_2/\text{M.L}^2$	6.82			
	Tm^{3+}	ML/M.L	4.33			
		$\text{ML}_2/\text{M.L}^2$	(6.65)			
	Yb^{3+}	ML/M.L	4.36			
		$\text{ML}_2/\text{M.L}^2$	6.94			
	Lu^{3+}	ML/M.L	4.30			
		$\text{ML}_2/\text{M.L}^2$	6.89			

^b25°, 0.5

Alkylmalonic acid (continued)

<u>Ligand</u>	<u>Metal ion</u>	<u>Equilibrium</u>	<u>Log K</u>	<u>Log K</u>	<u>ΔH</u>	<u>ΔS</u>
			<u>25°, 0.1</u>	<u>25°, 0</u>	<u>25°, 0</u>	<u>25°, 0</u>
R= CH ₂ CH ₃	H ⁺	HL/H.L	5.46 ±0.02	5.83		
Propane-1,1-dicarboxylic acid		H ₂ L/HL.H	2.81 ±0.1	2.99		
	Li ⁺	ML/M.L		0.86	(+2) ^r	(11)
	Na ⁺	ML/M.L		0.75		
(ethylmalonic acid)	Mg ²⁺	ML/M.L	1.62	2.63	(+4) ^r	(25)
	Ca ²⁺	ML/M.L	1.59	2.47	+2.3	19
(C ₅ H ₈ O ₄)	Ba ²⁺	ML/M.L	1.39	2.26	(+2) ^r	(17)
(Other values in Vol.3, p.99 and other references in Vol.5, p.469)	Y ³⁺	ML/M.L	4.88			
		ML ₂ /M.L ²	7.93			
	La ³⁺	ML/M.L	3.58			
		ML ₂ /M.L ²	5.91			
	Ce ³⁺	ML/M.L	3.69			
		ML ₂ /M.L ²	6.16			
	Pr ³⁺	ML/M.L	3.79			
		ML ₂ /M.L ²	6.32			
	Nd ³⁺	ML/M.L	3.85			
		ML ₂ /M.L ²	6.39			
	Sm ³⁺	ML/M.L	4.12			
		ML ₂ /M.L ²	(6.63)			
	Eu ³⁺	ML/M.L	4.25			
		ML ₂ /M.L ²	6.88			
	Gd ³⁺	ML/M.L	4.27			
		ML ₂ /M.L ²	6.82			
	Tb ³⁺	ML/M.L	4.38			
		ML ₂ /M.L ²	6.99			
	Dy ³⁺	ML/M.L	4.45			
		ML ₂ /M.L ²	7.09			
	Ho ³⁺	ML/M.L	4.40			
		ML ₂ /M.L ²	6.97			
	Er ³⁺	ML/M.L	4.38			
		ML ₂ /ML ²	6.97			
	Tm ³⁺	ML/M.L	4.39			
		ML ₂ /M.L ²	7.00			
	Yb ³⁺	ML/M.L	4.41			
		ML ₂ /M.L ²	7.05			
	Lu ³⁺	ML/M.L	4.36			
		ML ₂ /M.L ²	6.98			
	Cu ²⁺	ML/M.L	4.92 ±0.04			
		ML ₂ /M.L ²	7.85 ±0.08			
		MHL/M.HL	1.74			

Alkylmalonic acid (continued)

Ligand	Metal ion	Equilibrium	Log K 25°, 0.1	Log K 25°, 0	ΔH 25°, 0	ΔS 25°, 0
R= CH ₂ CH ₂ CH ₃	H ⁺	HL/H.L	5.49	5.85		
Butane-1,1-dicarboxylic acid		H ₂ L/HL.H	(2.90)	3.00		
	Y ³⁺	ML/M.L	4.37			
		ML ₂ /M.L ²	6.85			
(propylmalonic acid)	Nd ³⁺	ML/M.L	(3.83)			
		ML ₂ /M.L ²	(6.7)			
(C ₆ H ₁₀ O ₄)	Sm ³⁺	ML/M.L	4.19			
		ML ₂ /M.L ²	6.84			
(Other references in Vol.3, p.340)	Eu ³⁺	ML/M.L	4.29			
		ML ₂ /M.L ²	6.93			
	Gd ³⁺	ML/M.L	4.31			
		ML ₂ /M.L ²	6.90			
	Tb ³⁺	ML/M.L	4.45			
		ML ₂ /M.L ²	7.09			
	Dy ³⁺	ML/M.L	4.48			
		ML ₂ /M.L ²	7.12			
	Ho ³⁺	ML/M.L	4.46			
		ML ₂ /M.L ²	7.06			
	Er ³⁺	ML/M.L	4.46			
		ML ₂ /M.L ²	7.06			
	Tm ³⁺	ML/M.L	4.46			
		ML ₂ /M.L ²	7.09			
	Yb ³⁺	ML/M.L	4.48			
		ML ₂ /M.L ²	7.16			
	Lu ³⁺	ML/M.L	4.42			
		ML ₂ /M.L ²	7.11			
R= CH ₂ CH ₂ CH ₂ CH ₃	H ⁺	HL/H.L	5.51 ± 0.01	5.96		
Pentane-1,1-dicarboxylic acid			5.20 ^b			
		H ₂ L/HL.H	2.81 ± 0.1	3.02		
			2.77 ^b			
(butylmalonic acid)	Li ⁺	ML/M.L		0.84	(+3) ^r	(14)
	Na ⁺	ML/M.L		0.70		
	K ⁺	ML/M.L		0.67		
(C ₇ H ₁₂ O ₄)	Mg ²⁺	ML/M.L		2.51	(+4) ^r	(25)
(Other values in Vol.3, p.100 and other references in Vol.5, p.444)	Ca ²⁺	ML/M.L		2.49	+2.6	20
	Ba ²⁺	ML/M.L		2.24	(+2) ^r	(17)
	Y ³⁺	ML/M.L	4.29			
		ML ₂ /M.L ²	6.73			
	Nd ³⁺	ML/M.L	3.89			
		ML ₂ /M.L ²	6.38			
	Sm ³⁺	ML/M.L	4.15			
		ML ₂ /M.L ²	6.79			

^b25°, 0.5; ^r15-35°, 0

Butylmalonic acid (continued)

<u>Ligand</u>	<u>Metal ion</u>	<u>Equilibrium</u>	<u>Log K</u> <u>25°, 0.1</u>	<u>Log K</u> <u>25°, 0</u>	<u>ΔH</u> <u>25°, 0</u>	<u>ΔS</u> <u>25°, 0</u>
	Eu ³⁺	ML/M.L	4.25			
		ML ₂ /M.L ²	6.86			
	Gd ³⁺	ML/M.L	4.26			
		ML ₂ /M.L ²	6.82			
	Tb ³⁺	ML/M.L	4.38			
		ML ₂ /M.L ²	6.99			
	Dy ³⁺	ML/M.L	4.41			
		ML ₂ /M.L ²	7.01			
	Ho ³⁺	ML/M.L	4.38			
		ML ₂ /M.L ²	6.95			
	Er ³⁺	ML/M.L	4.39			
		ML ₂ /M.L ²	6.96			
	Tm ³⁺	ML/M.L	4.39			
		ML ₂ /M.L ²	7.00			
	Yb ³⁺	ML/M.L	4.41			
		ML ₂ /M.L ²	7.06			
	Lu ³⁺	ML/M.L	4.36			
		ML ₂ /M.L ²	7.03			
	Co ²⁺	ML/M.L	2.57			
	Ni ²⁺	ML/M.L	2.65 ±0.01	3.42		
	Cu ²⁺	ML/M.L	4.96 ±0.09			
		ML ₂ /M.L ²	8.13			
		MHL/M.HL	1.6			
	Ag ⁺	ML/M.L	0.74			
	Zn ²⁺	ML/M.L	2.72 ±0.02			
	Cd ²⁺	ML/M.L	2.61 ±0.05			
R= (CH ₂) ₄ CH ₃	H ⁺	HL/H.L	5.54			
Hexane-1,1-		H ₂ L/HL.H	2.80			
dicarboxylic	Y ³⁺	ML/M.L	4.36			
acid		ML ₂ /M.L ²	6.91			
(pentylmalonic	Eu ³⁺	ML/M.L	4.32			
acid)		ML ₂ /M.L ²	6.95			
(C ₈ H ₁₄ O ₄)	Gd ³⁺	ML/M.L	4.33			
		ML ₂ /M.L ²	(6.98)			
	Tb ³⁺	ML/M.L	4.44			
		ML ₂ /M.L ²	7.10			
	Dy ³⁺	ML/M.L	4.49			
		ML ₂ /M.L ²	7.15			
	Ho ³⁺	ML/M.L	4.45			
		ML ₂ /M.L ²	7.07			
	Er ³⁺	ML/M.L	4.46			
		ML ₂ /M.L ²	7.09			

Pentylmalonic acid (continued)

<u>Ligand</u>	<u>Metal ion</u>	<u>Equilibrium</u>	<u>Log K</u> <u>25°, 0.1</u>	<u>Log K</u> <u>25°, 0</u>	<u>ΔH</u> <u>25°, 0</u>	<u>ΔS</u> <u>25°, 0</u>
	Tm ³⁺	ML/M.L	4.45			
		ML ₂ /M.L ²	7.13			
	Yb ³⁺	ML/M.L	4.47			
		ML ₂ /M.L ²	7.20			
	Lu ³⁺	ML/M.L	4.43			
		ML ₂ /M.L ²	7.17			
R= C(CH ₃) ₃	H ⁺	HL/H.L		7.03		
2,2-dimethyl- propane-1,1- dicarboxylic acid	Li ⁺	ML/M.L		1.51	(+1) ^r	(10)
	K ⁺	ML/M.L		0.98	(+1) ^r	(8)
	Cs ⁺	ML/M.L		0.72	(+4) ^r	(13)
(t-butylmalonic acid)	Mg ²⁺	ML/M.L		2.95	(+3) ^r	(24)
	Ca ²⁺	ML/M.L		3.17	+1.2	19
	Ba ²⁺	ML/M.L		2.74		
(C ₇ H ₁₂ O ₄)						
R= CH ₂ C ₆ H ₅	H ⁺	HL/H.L	5.02 ^b	5.87 -0.01		
Benzylmalonic acid		H ₂ L/HL.H	2.60 ^b	2.91 -0.01		
(C ₁₀ H ₁₀ O ₄)	K ⁺	ML/M.L		0.73	(+2) ^r	(10)
(Other values in Vol.3, p.101)						

^b25°, 0.5; ^r15-35°, 0

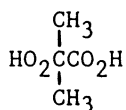
Bibliography: H⁺ 69A, 75IP, 85Sb;
Li⁺-Ba²⁺ 76KO; Y³⁺-Lu³⁺ 69A; Co²⁺, Ni²⁺, Zn²⁺, Cd²⁺ 75IP; Cu²⁺ 75IP, 85Sb;
Other references: 78KZ, 83Sc, 84Ma

$\begin{array}{c} (\text{CH}_2)_n \text{CH}=\text{CH}_2 \\ \\ \text{HO}_2\text{CCHCO}_2\text{H} \end{array}$					
<u>ω-Alkene-malonic acid</u>				H ₂ L	
<u>Ligand</u>	<u>Metal ion</u>	<u>Equilibrium</u>	<u>Log K</u> <u>25°, 0.1</u>		
n= 1	H ⁺	HL/H.L	5.24		
But-3-ene-1,1- dicarboxylic acid		H ₂ L/HL.H	2.63		
	Co ²⁺	ML/M.L	2.29		
	Ni ²⁺	ML/M.L	2.46		
(allylmalonic acid)	Cu ²⁺	ML/M.L	4.66		
	Ag ⁺	ML/M.L	2.09		
(C ₆ H ₈ O ₄)	Zn ²⁺	ML/M.L	2.45		
	Cd ²⁺	ML/M.L	2.32		
n= 2	H ⁺	HL/H.L	5.35		
Pent-4-ene-1,1- dicarboxylic acid		H ₂ L/HL.H	2.74		
	Co ²⁺	ML/M.L	2.32		
	Ni ²⁺	ML/M.L	2.48		
(C ₇ H ₁₀ O ₄)	Cu ²⁺	ML/M.L	4.74		

ω -Alkene-1,1-dicarboxylic acid (continued)

<u>Ligand</u>	<u>Metal ion</u>	<u>Equilibrium</u>	<u>Log K</u> <u>25°, 0.1</u>
	Ag ⁺	ML/M.L	2.28
	Zn ²⁺	ML/M.L	2.62
	Cd ²⁺	ML/M.L	2.39
n= 3	H ⁺	HL/H.L	5.37
Hex-5-ene-1,1-dicarboxylic acid		H ₂ L/HL.H	2.77
	Co ²⁺	ML/M.L	2.54
	Ni ²⁺	ML/M.L	(2.48)
	Cu ²⁺	ML/M.L	4.83
(C ₈ H ₁₂ O ₄)	Ag ⁺	ML/M.L	2.34
	Zn ²⁺	ML/M.L	2.68
	Cd ²⁺	ML/M.L	2.60

Bibliography: 75IP

C₅H₈O₄

Propane-2,2-dicarboxylic acid (dimethylmalonic acid)
(Other values in Vol.3, p.102 and Vol.5, p.310)

H₂L

<u>Metal ion</u>	<u>Equilibrium</u>	<u>Log K</u> <u>25°, 0.1</u>	<u>Log K</u> <u>25°, 0.5</u>	<u>Log K</u> <u>25°, 0</u>
H ⁺	HL/H.L	5.70 ±0.02	5.38 ^u	6.06
		5.78 ^z	5.46 ^v	
	H ₂ L/HL.H	2.79 ±0.03	2.87 ±0.03	3.17
Na ⁺	ML/M.L			0.79
Y ³⁺	ML/M.L	4.09		
	ML ₂ /M.L ²	6.37		
La ³⁺	ML/M.L	3.49		
	ML ₂ /M.L ²	5.78		
Ce ³⁺	ML/M.L	3.63		
	ML ₂ /M.L ²	(6.13)		
Pr ³⁺	ML/M.L	3.79		
	ML ₂ /M.L ²	6.20		
Nd ³⁺	ML/M.L	3.85		
	ML ₂ /M.L ²	6.24		
Sm ³⁺	ML/M.L	4.04		
	ML ₂ /M.L ²	6.50		
Eu ³⁺	ML/M.L	4.11		
	ML ₂ /M.L ²	(6.50)		

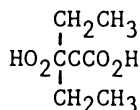
^uNa⁺ salt used as background electrolyte; ^vK⁺ salt used as background electrolyte;
^z(CH₃CH₂)₄NClO₄ used as background electrolyte.

Dimethylmalonic acid (continued)

Metal ion	Equilibrium	Log K 25°, 0.1	Log K 25°, 0.5	Log K 25°, 0
Gd ³⁺	ML/M.L	4.11		
	ML ₂ /M.L ²	6.49		
Tb ³⁺	ML/M.L	4.20		
	ML ₂ /M.L ²	6.62		
Dy ³⁺	ML/M.L	4.23		
	ML ₂ /M.L ²	6.64		
Ho ³⁺	ML/M.L	4.18		
	ML ₂ /M.L ²	6.57		
Er ³⁺	ML/M.L	4.18		
	ML ₂ /M.L ²	6.60		
Tm ³⁺	ML/M.L	4.18		
	ML ₂ /M.L ²	6.64		
Yb ³⁺	ML/M.L	4.21		
	ML ₂ /M.L ²	6.72		
Lu ³⁺	ML/M.L	4.17		
	ML ₂ /M.L ²	6.70		

Bibliography: H⁺, Y³⁺-Lu³⁺ 71J; Na⁺ 76KO;

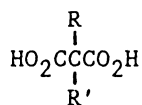
Other references: 83Sb, 83Sc



C ₇ H ₁₂ O ₄	<u>Pentane-3,3-dicarboxylic acid (diethylmalonic acid)</u>					H ₂ L
	(Other values in Vol.3, p.103 and Vol.5, p.310)					
Metal ion	Equilibrium	Log K 25°, 0.1	Log K 25°, 0.5	Log K 25°, 0	ΔH 25°, 0	ΔS 25°, 0
H ⁺	HL/H.L	6.96 ± 0.02	6.62 ^u 6.80 ^v	7.417	+0.83 ± 0.01	36.8
	H ₂ L/HL.H	2.00 ± 0.04	(1.9) ± 0.0	2.152	+0.71	12.2
Li ⁺	ML/M.L			0.93	(+2) ^r	(11)
Na ⁺	ML/M.L			0.89		
K ⁺	ML/M.L			0.94	(+4) ^r	(18)
Cs ⁺	ML/M.L			0.91	(+2) ^r	(11)
Mg ²⁺	ML/M.L			2.63	(+3) ^r	(22)
Ca ²⁺	ML/M.L			2.55	+2.4	20
Ba ²⁺	ML/M.L			2.41	(+2) ^r	(18)
Cu ²⁺	ML/M.L	4.96 4.94 ^p				
	ML ₂ /M.L ²	7.72 7.68 ^p				

P_{30°}, 0.1; ^r15-35°, 0; ^uNa⁺ salt used as background electrolyte;^vK⁺ salt used as background electrolyte.Bibliography: H⁺, Cu²⁺ 85Sb; Li⁺-Ba²⁺ 76KO

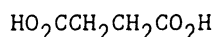
Other reference: 70DM

 $\text{C}_x\text{H}_y\text{O}_4$ Disubstituted-malonic acid H_2L

<u>Ligand</u>	<u>Metal ion</u>	<u>Equilibrium</u>	<u>Log K</u> <u>25°, 0.1</u>	<u>Log K</u> <u>25°, 0</u>	<u>ΔH</u> <u>25°, 0</u>	<u>ΔS</u> <u>25°, 0</u>
R= R'= CH ₂ CH ₂ CH ₃ Heptane-4,4-dicarboxylic acid	H ⁺	HL/H.L H ₂ L/HL.H	7.19 ±0.04 (1.9) ±0.1	7.51 2.07		
(C ₉ H ₁₆ O ₄) (Other values in Vol.3, p.104)	Li ⁺	ML/M.L		0.94	(+3) ^r	(14)
	K ⁺	ML/M.L		0.87	(0) ^r	(4)
	Ca ²⁺	ML/M.L		2.55	(+2) ^r	(18)
R= (CH ₂) ₃ (CH ₃) R'= CH ₂ CH ₃	Li ⁺	ML/M.L		0.93		
Heptane-3,3-dicarboxylic acid (C ₉ H ₂₀ O ₄)	Na ⁺	ML/M.L		0.96		
	K ⁺	ML/M.L		0.92	(+1) ^r	(8)
	Ca ²⁺	ML/M.L		2.62	+2.3	20
R= CH(CH ₃)CH ₂ CH ₃ R'= CH ₂ CH ₃	Li ⁺	ML/M.L		1.10	(+2) ^r	(12)
4-Methylhexane-3,3-dicarboxylic acid (C ₉ H ₂₀ O ₄)	K ⁺	ML/M.L		1.02	(+1) ^r	(8)
	Mg ²⁺	ML/M.L		3.10	(+4) ^r	(28)
	Ca ²⁺	ML/M.L		3.03	(+2) ^r	(21)
	Ba ²⁺	ML/M.L		2.67		
R= R'= CH ₂ C ₆ H ₅	Na ⁺	ML/M.L		0.92		
Dibenzyl-propanedioic acid (C ₁₅ H ₁₆ O ₄)	K ⁺	ML/M.L		0.93	(0) ^r	(4)
	Ca ²⁺	ML/M.L		2.56	+2.3	19
R= C ₆ H ₅ R'= CH ₃	Li ⁺	ML/M.L		0.91		
Phenylmethyl-propanedioic acid (C ₁₀ H ₁₀ O ₄)	Na ⁺	ML/M.L		0.88		
	K ⁺	ML/M.L		0.83		
	Cs ⁺	ML/M.L		0.83		

 $(\text{C}_{10}\text{H}_{10}\text{O}_4)$ ^r15-35°, 0

Bibliography: 76KO

C₄H₆O₄

Butanedioic acid (succinic acid)
(Other values in Vol.3, p.108 and Vol.5, p.313)

H₂L

Metal ion	Equilibrium	Log K 25°, 0.1	Log K 25°, 1.0	Log K 25°, 0	ΔH 25°, 0	ΔS 25°, 0
H ⁺	HL/H.L	5.24 ±0.04	5.11 ±0.02	5.636 ±0.01	+0.04 ±0.08	25.9
		5.31 ^z ±0.02	5.15 ^{d,u}	5.49 ^{e,u}	-0.17 ^a	23.4 ^a
		5.09 ^b ±0.06	5.21 ^{d,v}		-0.43 ^c	22.0 ^c
			5.29 ^{n,z}			
			5.20 ⁿ ±0.03			
	H ₂ L/HL.H	4.00 ±0.03	3.97 ±0.02	4.207 ±0.01	-0.68 ±0.08	17.0
		3.92 ^b ±0.03	4.05 ^d	4.32 ^e	-0.90 ^a	15.3 ^a
			3.93 ⁿ ±0.01		-0.98 ^c	14.9 ^c
Li ⁺	ML/M.L		0.42 ^{n,z}	0.8		
Na ⁺	ML/M.L		0.06 ^{n,z}	0.4 ±0.1	+1.3	6
K ⁺	ML/M.L		0.11 ^{n,z}	0.5	+1.0	6
NH ₄ ⁺	ML/M.L	0.73 ^z		1.1		
Ca ²⁺	ML/M.L	1.25 ±0.04		2.00	+1.8 ^b	12 ^a
	MHL/M.HL	0.54 ±0.03			(+2) ^s	(9) ^a
Th ⁴⁺	ML/M.L		6.44		+4.5 ^c	45 ^c
	MHL/M.HL		3.60		+2.0 ^c	23 ^c
	MHL ₂ /ML.HL		2.50		+1.5 ^c	16 ^c
UO ₂ ²⁺	ML/M.L	3.87 ^b	3.85 -0.2		+5.2 ^c	35 ^c
	MHL/M.HL	2.13 ^b	2.28		+2.4 ^c	21 ^c
	MHL ₂ /ML.HL		2.30		-1.5 ^c	7 ^c
Cu ²⁺	ML/M.L	2.7 ±0.1		3.48 -0.3	+4.6	31
					+2.7 ^a	21 ^a
	MHL/M.HL	1.85 ±0.03			+0.6 ^a	10 ^a
Al ³⁺	ML/M.L	3.20 ^b				
	MHL/M.HL	1.42 ^b				
	ML/MOHL.H	3.75 ^b				

^a25°,0.1; ^b25°,0.5; ^c25°,1.0; ^d25°,2.0; ^e25°,3.0; ⁿ37°,0.15; ^s10-45°,0.1;

^uNa⁺ salt used as background electrolyte; ^vK⁺ salt used as background electrolyte;

^z(CH₃CH₂)₄N⁺ salt used as background electrolyte.

Bibliography:

H⁺ 67PN, 79PM, 80GMR, 80MA, 81BCa, 82CR, 82JC, 83DD, 83DR, 83DRa, 84DD, 85CDa, 85DDD;

Li⁺-K⁺ 83DRa, 85DDD; UO₂²⁺ 81BCa;

NH₄⁺ 85DDS; Cu²⁺ 78AGa, 80GMR, 80MPc;

Ca²⁺ 84A, 84DD, 85DDD; Al³⁺ 84CDD;

Th⁴⁺ 83DC;

Other references: 75KP, 80NSd, 81CCM, 81MS, 81MSa, 81SJa, 82GV, 82JC, 82SSa, 83GVa, 83IK, 83IT, 83Sc, 83SSa, 83VN, 84LS, 84Ma, 84Pgb, 84SSa, 85KM, 85KS, 85KZ, 85SSa, 85VS



$\text{C}_4\text{H}_4\text{O}_4$ cis-Butenedioic acid (maleic acid) H_2L
(Other values in Vol.3, p.112 and Vol.5, p.314)

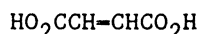
Metal ion	Equilibrium	Log K 25°, 0.1	Log K 25°, 1.0	Log K 25°, 0	ΔH 25°, 0	ΔS 25°, 0
H^+	HL/H.L	5.84 ± 0.05 6.01 ^z 5.61 ^b	5.61 ± 0.03 5.51 ^{d,u} 5.60 ^{d,v} ± 0.03 5.86 ⁿ 6.02 ^{n,z}	6.23 ± 0.01 5.59 ^{e,u} 5.69 ^{e,v}	+0.8 +0.2 ^c	31 26 ^c
	$\text{H}_2\text{L}/\text{HL.H}$	(1.7) ± 0.1 (1.6) ^b	(1.7) ± 0.1 (1.7) ^d -0.1	(1.9) ± 0.0 (1.8) ^e	-0.1 +0.1 ^c	8 8 ^c
Li^+	ML/M.L		0.72 ^{n,z}	1.0 ± 0.1	(+3) ^r	(15)
Na^+	ML/M.L		0.61 ^{n,z}	0.9 ± 0.1	+1.0	7
K^+	ML/M.L		0.48 ^{n,z}	0.8	+1.0	7
NH_4^+	ML/M.L	0.63 ^z		0.9		
Mg^{2+}	ML/M.L			2.30	(+3) ^r	(21)
Ca^{2+}	ML/M.L	1.6 ± 0.2 1.76 ^z		2.43 ± 0.04	+2.0 +1.2 ^b	18 14 ^a
	MHL/M.HL	0.67 ± 0.02		0.96		
Ba^{2+}	ML/M.L			2.30 ± 0.05		
Cu^{2+}	ML/M.L	3.41 ± 0.01			+3.5 ^a	27 ^a
	$\text{ML}_2/\text{M.L}^2$	5.2 ± 0.3			+4.1 ^a	38 ^a
In^{3+}	ML/M.L	5.05 ± 0.0				
	$\text{ML}_2/\text{M.L}^2$	7.1				

^a25°,0.1; ^b25°,0.5; ^c25°,1.0; ^d25°,2.0; ^e25°,3.0; ⁿ35°,0.15; ^r15-35°,0;

^u Na^+ salt used as background electrolyte; ^v K^+ salt used as background electrolyte;

^z $(\text{CH}_3\text{CH}_2)_4\text{NI}$ used as background electrolyte.

Bibliography: H^+ 78ACa,80DDP,80GMR,80MA,83DD,83DR,83DRa,85AM,85BSK,85DDD;
 Li^+ - K^+ 83DRa,85DDD; NH_4^+ 85DDS; Mg^{2+} - Ba^{2+} 76KO,83DD,84A,85DDD; Cu^{2+} 78ACa,80CMR;
 In^{3+} 84PGA; Other references: 63PK,80NSd,81CCM,82GV,83IK,83GVa,83Sc,83VN,84GV,84VSL,
85BCF,85DV,85GGA,85KM,85KS,85VS



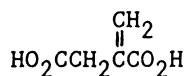
$\text{C}_4\text{H}_4\text{O}_4$ trans-Butenedioic acid (fumaric acid) H_2L
(Other values in Vol.3, p.115 and other references in Vol.5, p.469)

Metal ion	Equilibrium	Log K 25°, 0.1	Log K 25°, 1.0	Log K 25°, 0	ΔH 25°, 0	ΔS 25°, 0
H^+	HL/H.L	4.10 3.92 ^b	3.91 3.95 ^{d,u} 4.01 ^{d,v}	4.494 4.09 ^{e,u} 4.17 ^{e,v}	+0.7	23
	$\text{H}_2\text{L}/\text{HL.H}$	2.85 2.78 ^b	2.80 2.92 ^d	3.053 3.08 ^e	-0.1	14
Ca^{2+}	ML/M.L	(0.72) ^b		2.00	+1.2 ^b	(7) ^b

^b25°,0.5; ^d25°,2.0; ^e25°,3.0; ^u NaCl used as background electrolyte;

^v KCl used as background electrolyte.

Bibliography: 84A; Other references: 80DDP,84VSL,85KM,85VS

 $\text{C}_5\text{H}_6\text{O}_4$

Propene-2,3-dicarboxylic acid (itaconic acid)
(Other values in Vol.3, p.116 and other references in Vol.5, p.444)

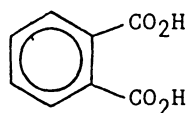
 H_2L

Metal ion	Equilibrium	Log K 25°, 0.1	Log K 25°, 1.0	Log K 25°, 0	ΔH 25°, 1.0	ΔS 25°, 1.0
H^+	HL/H.L	5.14 $\pm$ 0.02 5.25 ^z	4.99	5.58	-0.70	20.4
	$\text{H}_2\text{L}/\text{HL.H}$	3.66 $\pm$ 0.04	3.63	3.85 -0.01	-1.0	13
Ca^{2+}	ML/M.L	1.2 (0.95) ^b			+1.4 ^b	9 ^b
Cu^{2+}	ML/M.L	2.87 $\pm$ 0.1	2.15			
	$\text{ML}_2/\text{M.L}^2$	3.9				
	MHL/M.HL	1.60	1.03			

^b25°, 0.5; ^z(CH_3CH_2)₄NI used as background electrolyte.

Bibliography: H^+ 80GMR, 85CDa; Ca^{2+} 84A; Cu^{2+} 80GMR, 80MPc;

Other references: 80AJ, 80NSd, 81SJ, 83CPb, 83KC, 83Sc, 84KPM, 85KM

 $\text{C}_8\text{H}_6\text{O}_4$

Benzene-1,2-dicarboxylic acid (phthalic acid)
(Other values in Vol.3, p.120 and Vol.5, p.315)

 H_2L

Metal ion	Equilibrium	Log K 25°, 0.1	Log K 25°, 1.0	Log K 25°, 0	ΔH 25°, 0	ΔS 25°, 0
H^+	HL/H.L	4.92 $\pm$ 0.05 5.08 ^z $\pm$ 0.01 4.73 ^b $\pm$ 0.01	4.73 $\pm$ 0.05 4.73 ^{d,u} 5.09 ^{n,z}	5.408 -0.01 4.87 ^{e,u} $\pm$ 0.03	+0.52 $\pm$ 0.02 +0.2 ^a	26.5 23 ^a
	$\text{H}_2\text{L}/\text{HL.H}$	2.76 $\pm$ 0.03 2.67 ^b -0.01	2.67 $\pm$ 0.04 2.80 ^d	2.950 -0.02 2.99 ^e $\pm$ 0.07	+0.64 $\pm$ 0.01 +0.3 ^a	15.7 14 ^a
Li^+	ML/M.L		0.65 ^{n,z}	0.9 $\pm$ 0.1		
Na^+	ML/M.L		0.51 ^{n,z}	0.8 $\pm$ 0.1	+1.0	7
K^+	ML/M.L		0.41 ^{n,z}	0.7	+0.9	6
NH_4^+	ML/M.L	1.02 ^z		1.3		
Ca^{2+}	ML/M.L	1.6 $\pm$ 0.2 1.79 ^z		2.45 $\pm$ 0.04		
	MHL/M.HL	0.60 $\pm$ 0.05		1.02		
Cu^{2+}	ML/M.L	3.22 $\pm$ 0.03 2.81 ^b	2.69 ^u 2.64 ^{d,u}	4.04 $\pm$ 0.03	+2.0 +2.5 ^a	25 23 ^a
	$\text{ML}_2/\text{M.L}^2$	5.5	3.7 ^u 4.1 ^{d,u}	5.3	+3.7 ^a	38 ^a
	MHL/M.HL	1.3			+0.4 ^a	7 ^a

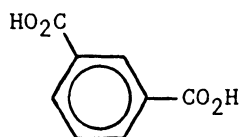
^a25°, 0.1; ^b25°, 0.5; ^d25°, 2.0; ^e25°, 3.0; ⁿ37°, 0.15;

^u Na^+ salt used as background electrolyte; ^z(CH_3CH_2)₄NI used as background electrolyte.

Bibliography: H^+ 28M, 78ACa, 82ABb, 83DD, 83DR, 83DRa, 85CDa, 85DDD;

Li^+ - K^+ 83DRa, 85DDD; NH_4^+ 85DDS; Ca^{2+} 83DD, 85DDD; Cu^{2+} 78ACa;

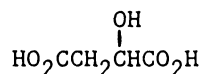
Other references: 79PM, 80MMC, 81CCM, 83SGc, 84JP, 84Pgb, 84RD, 84VSL, 85KM, 85VS



$C_8H_6O_4$		<u>Benzene-1,3-dicarboxylic acid (isophthalic acid)</u>				H_2L
		(Other values in Vol.3, p.122 and Vol.5, p.316)				
<u>Metal ion</u>	<u>Equilibrium</u>	<u>Log K</u> <u>25°, 0.1</u>	<u>Log K</u> <u>25°, 1.0</u>	<u>Log K</u> <u>25°, 0</u>	<u>ΔH</u> <u>25°, 0</u>	<u>ΔS</u> <u>25°, 0</u>
H^+	HL/H.L	4.38	4.16	4.50	+0.4	22
					+0.48 ^a	21.7 ^a
	$H_2L/HL.H$	3.30	3.41	3.50	0.0	16
					0.0 ^a	15 ^a
Y^{3+}	ML/M.L	2.51			+3.6 ^a	24 ^a
La^{3+}	ML/M.L	2.15			+3.5 ^a	22 ^a
Pr^{3+}	ML/M.L	2.55			+3.2 ^a	22 ^a
Nd^{3+}	ML/M.L	2.65			+2.8 ^a	22 ^a
Sm^{3+}	ML/M.L	2.82			+2.6 ^a	22 ^a
Eu^{3+}	ML/M.L	2.77			+2.8 ^a	22 ^a
Gd^{3+}	ML/M.L	2.73			+2.9 ^a	22 ^a
Tb^{3+}	ML/M.L	2.64			+3.1 ^a	23 ^a
Dy^{3+}	ML/M.L	2.67			+3.1 ^a	23 ^a
Ho^{3+}	ML/M.L	2.55			+3.7 ^a	24 ^a
Er^{3+}	ML/M.L	2.58			+3.9 ^a	25 ^a
Tm^{3+}	ML/M.L	2.57			+4.1 ^a	26 ^a
Yb^{3+}	ML/M.L	2.59			+4.2 ^a	26 ^a
Lu^{3+}	ML/M.L	2.58			+4.6 ^a	27 ^a

^a25°, 0.1Bibliography: $H^+, Y^{3+}-Lu^{3+}$ 82CBH;

Other reference: 84JP



$C_4H_6O_5$		<u>L-Hydroxybutanedioic acid (malic acid)</u>				H_2L
		(Other values in Vol.3, p.124 and Vol.5, p.317)				
<u>Metal ion</u>	<u>Equilibrium</u>	<u>Log K</u> <u>25°, 0.1</u>	<u>Log K</u> <u>25°, 1.0</u>	<u>Log K</u> <u>25°, 0</u>	<u>ΔH</u> <u>25°, 0</u>	<u>ΔS</u> <u>25°, 0</u>
H^+	HL/H.L	4.68 ± 0.04	4.44 ^u ± 0.02	5.097 ± 0.01	+0.30 ± 0.03	24.4
		4.77 ^z ± 0.01	4.53 ^v	4.53 ^{d,u}	+0.14 ^a	21.9 ^a
		4.50 ^{b,u} ± 0.01	4.67 ⁿ			
			4.76 ^{n,z}			
	$H_2L/HL.H$	3.24 ± 0.03	3.16 ± 0.05	3.459 ± 0.01	-0.69 ± 0.04	13.5
		3.15 ^b ± 0.03	3.23 ⁿ	3.23 ^d	-0.82 ^a	12.1 ^a
Na^+	ML/M.L	0.29 ^z ± 0.01	0.29 ^{n,z}	0.7	-0.1 ^a	1 ^a
K^+	ML/M.L	0.18 ^z	0.11 ^{n,z}	0.4	+1.0	5
NH_4^+	ML/M.L	0.58 ^z		0.9		

^a25°, 0.1; ^b25°, 0.5; ^d25°, 2.0; ⁿ37°, 0.15;^u Na^+ salt used as background electrolyte; ^v K^+ salt used as background electrolyte;^z $(CH_3CH_2)_4NI$ used as background electrolyte.

Malic acid (continued)

Metal ion	Equilibrium	Log K 25°, 0.1	Log K 25°, 1.0	Log K 25°, 0	ΔH 25°, 0	ΔS 25°, 0
Be ²⁺	ML/M.L	2.49 ^b	2.70			
	MHL/M.HL		1.21			
	M ₂ L ₂ /M ² .L ²		(8.48) ^x			
	M ₂ (OH) ₂ L.H ² /M ² .L		(3.05) ^x			
	M ₂ (OH) ₂ L ₂ /M ₂ (OH) ₂ L.L		(1.70) ^x			
	M ₃ (OH) ₃ L/M ₃ (OH) ₃ .L	5.35 ^b				
	M ₃ (OH) ₃ L ₂ /M ₃ (OH) ₃ .L ²	8.39 ^b				
	M ₃ (OH) ₃ L ₃ /M ₃ (OH) ₃ .L ³	10.61 ^b				
Mg ²⁺	ML/M.L	1.71, -0.01	(1.42)		+1.0 ^c	(10) ^c
	MHL/M.HL	0.90 ^h -0.1				
Ca ²⁺	ML/M.L	1.90 ±0.05 2.06 ^z	(1.67)	2.72 ±0.06	-0.4 ^c	(6) ^c
	MHL/M.HL	1.03 ±0.05		1.39	(-2) ^a	(-2) ^a
Sr ²⁺	ML/M.L	1.52 ±0.02	(1.32)		-0.1 ^c	(6) ^c
	MHL/M.HL	0.8				
Ba ²⁺	ML/M.L	1.42 ±0.03	(1.17)	2.20	+0.4 ^c	(7) ^c
	MHL/M.HL	0.67 ^h ±0.00				
Ra ²⁺	ML/M.L	1.03				
Cu ²⁺	ML/M.L	3.60	3.33 ^v			
	ML ₂ /M.L ²		8.40			
	MHL/M.HL	2.09	1.96			
	M ₂ (H ₋₁ L)L.H/M ² .L ²	(5.06) ^x	4.64			
	M ₂ (H ₋₁ L)L/M ₂ (H ₋₁ L) ₂ .H	(4.24) ^x				
	M ₂ L ₂ /M ² .L ²		4.33 (8.0) ^x			
	M ₂ L ₂ /M ₂ (H ₋₁ L) ₂ .H ²		(7.8) ^x			

^a25°, 0.1; ^b25°, 0.5; ^c25°, 1.0; ^d25°, 2.0; ^h20°, 0.1; ⁿ37°, 0.15;

^uNa⁺ salt used as background electrolyte; ^vK⁺ salt used as background electrolyte;

^xDL-mixture; ^z(CH₃CH₂)₄NI used as background electrolyte.

Bibliography:

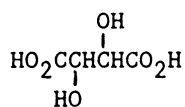
H⁺ 80ACG, 80DDP, 80DT, 80SDM, 83DR, 83DRa, 85AM, 85CDa, 85DDD;

Na⁺ 80ACG, 85DDD; Be²⁺ 80DT;

K⁺ 83DRa, 85DDD; Mg²⁺-Ba²⁺ 80A, 85DDD;

NH₄⁺ 85DDS; Cu²⁺ 75GC;

Other references: 63B, 69RH, 75DNb, 79GZ, 80G, 80KCW, 80SY, 81BC, 81HL, 81MSa, 82SCG, 82SLN, 83GC, 83SU, 83SUa, 85KM



$\text{C}_4\text{H}_6\text{O}_6$		<u>D-2,3-Dihydroxybutanedioic acid (D-tartaric acid)</u>				H_2L
		(Other values in Vol.3, p.127 and Vol.5, p.318)				
Metal ion	Equilibrium	Log K 25°, 0.1	Log K 25°, 1.0	Log K 25°, 0	ΔH 25°, 0	ΔS 25°, 0
H^+	$\text{HL}/\text{H.L}$	3.97 ± 0.04	3.69 ± 0.02	4.366 ± 0.00	-0.18 ± 0.02	19.4
		4.00 ^z ± 0.03	3.81 ^{d,u}	3.93 ^{e,u}	-0.40 ^a ± 0.05	16.8 ^a
		3.70 ^b ± 0.03	3.96 ^{n,z} ± 0.04			
	$\text{H}_2\text{L}/\text{HL.H}$	2.82 ± 0.04	2.74 ± 0.05	3.036 ± 0.00	-0.70 ± 0.04	11.6
		2.68 ^b ± 0.06	2.83 ^d	2.98 ^e	-0.82 ^a ± 0.04	10.2 ^a
			2.83 ⁿ ± 0.02			
Li^+	$\text{ML}/\text{M.L}$	0.7 ^z				
	$\text{MHL}/\text{M.HL}$	(0.4) ^z				
Na^+	$\text{ML}/\text{M.L}$	0.5 ^z ± 0.2		0.9 ± 0.1	-0.2 ^a	2 ^a
	$\text{MHL}/\text{M.HL}$	0.0 ^z ± 0.2		0.21 ± 0.02	-0.5 ^a	-2 ^a
K^+	$\text{ML}/\text{M.L}$	0.4 ^z - 0.4				
Rb^+	$\text{ML}/\text{M.L}$	0.3 ^z				
Cs^+	$\text{ML}/\text{M.L}$	0.3 ^z				
NH_4^{2+}	$\text{ML}/\text{M.L}$	0.3 ^z				
Be^{2+}	$\text{ML}/\text{M.L}$	1.69 ^b	1.74			
	$\text{ML}_2/\text{M.L}^2$	2.93 ^b				
	$\text{ML}/\text{M}(\text{H}_{-1}\text{L}).\text{H}$		4.40			
	$\text{ML}_2/\text{M}(\text{H}_{-1}\text{L})_2.\text{H}^2$	14.32 ^b				
	$\text{M}_2(\text{OH})_2\text{L}_2.\text{H}^2/\text{M}^2.\text{L}^2$		-1.46			
	$\text{M}_3(\text{OH})_3\text{L}/\text{M}_3(\text{OH})_3.\text{L}$	(3.33) ^b				
	$\text{M}_3(\text{OH})_3\text{L}/\text{M}_3(\text{OH})_3(\text{H}_{-1}\text{L}).\text{H}$	(1.03) ^b				
	$\text{M}_4(\text{OH})_6\text{L}_2.\text{H}^6/\text{M}^4.\text{L}^2$		(-15.27)			
	$\text{M}_4(\text{OH})_6\text{L}_4/\text{M}_4(\text{OH})_6\text{L}_2.\text{L}^2$		(5.44)			
	Mg^{2+}	1.44				
Ca^{2+}	$\text{ML}/\text{M.L}$	1.95 ± 0.1		2.80	(-2) ^r	(6)
		2.16 ^z ± 0.08				(2) ^a
	$\text{MHL}/\text{M.HL}$	1.16 ± 0.09		1.49	(-2) ^r	(0)
Sr^{2+}	$\text{ML}/\text{M.L}$	1.75 ± 0.05		2.55 ^o		(-1) ^a
		2.04 ^z				
	$\text{MHL}/\text{M.HL}$	1.1 ± 0.2				
Ba^{2+}	$\text{ML}/\text{M.L}$	1.72 ± 0.02		2.54		
		1.93 ^z				
	$\text{MHL}/\text{M.HL}$	1.0 ± 0.2				

^a25°, 0.1; ^b25°, 0.5; ^d25°, 2.0; ^e25°, 3.0; ^o20°, 0; ^r10-37, 0;

^u NaClO_4 used as background electrolyte; ^z $(\text{CH}_3\text{CH}_2)_4\text{NI}$ used as background electrolyte or correction for background electrolyte.

D-Tartaric acid (continued)

Metal ion	Equilibrium	Log K 25°, 0.1	Log K 25°, 1.0	Log K 25°, 0	ΔH 25°, 0	ΔS 25°, 0
Mn ²⁺	ML/M.L	2.49 ±0.00		3.38°		
	MHL/M.HL	1.21				
Fe ²⁺	ML/M.L	2.24 ^h				
Co ²⁺	ML/M.L	2.24 ±0.00	1.88	3.05 ±0.03		
	ML ₂ /M.L ²			(4.0) ^w ±0.2		
	MHL/M.HL		0.98			
Ni ²⁺	ML/M.L	2.60	2.20	3.46°		
	MHL/M.HL	1.09	1.01			
Cu ²⁺	ML/M.L	2.5 ^b	2.65 ±0.05	3.97°		
	ML ₂ /M.L ²		4.38 -0.4			
	MHL/M.HL	1.8 ^b	1.84 ±0.00			
	M ₂ L ₂ /(ML) ²	3.7 ^b	3.34			
			(3.01) ^x +0.2			
	M ₂ L ₂ /M ₂ (H ₋₁ L)L.H	4.2 ^b	4.40			
			(4.32) ^x			
	M ₂ (H ₋₁ L)L/M ₂ (H ₋₁ L) ₂ .H	4.6 ^b	3.84			
			(3.47) ^x			
	M ₂ (H ₋₁ L) ₂ /M ₂ (H ₋₂ L)(H ₋₁ L).H	7.1 ^b				
	M ₂ (H ₋₂ L)(H ₋₁ L)/M ₂ (H ₋₂ L) ₂ .H	10.3 ^b				
	M ₄ (H ₋₂ L)(H ₋₁ L) ₂ .H ⁴ /M ⁴ .L ³		(0.47) ^x			
	M ₄ (H ₋₂ L)(H ₋₁ L) ₂ /M ₄ (H ₋₂ L) ₂ (H ₋₁ L).H		(5.32) ^x			
	M ₆ (H ₋₂ L) ₃ (H ₋₁ L).H ⁷ /M ⁶ .L ⁴		(-5.53)			
	M ₆ (H ₋₂ L) ₂ (H ₋₁ L) ₃ .H ⁷ /M ⁶ .L ⁵		(2.04) ^x			
	M ₈ (H ₋₂ L) ₄ (H ₋₁ L) ₂ .H ¹⁰ /M ⁸ .L ⁶					
		-7.5 ^b	(-7.38)			
V(V)	M ₂ O ₂ (OH) ₅ (H ₋₂ L)/H.(MO ₃) ₂ .L	11.82 ⁱ				
	M ₄ O ₄ (OH) ₈ (H ₋₂ L) ₂ /H ⁴ .(MO ₃) ₄ .L ²	39.75 ⁱ				
Mo(VI)	MO ₂ (H ₋₁ L) ₂ /MO ₂ (OH) ₄ .L.H ²	16.64 ^h				
	(MO ₂) ₂ (H ₋₂ L) ₂ /(MO ₂ (OH) ₄) ₂ .L ² .H ⁴	30.90 ^h				
	(MO ₂) ₂ (H ₋₂ L)(H ₋₁ L) ₂ /(MO ₂ (OH) ₄) ₂ .L ³ .H ⁴	31 ^h				
Tl ⁺	ML/M.L	1.0				
	MHL/M.HL	0.2				
Zn ²⁺	ML/M.L	2.66 ±0.03		3.43°		
		2.2 ^b				
	ML ₂ /M.L ²	4.4 ^b				
	MHL/M.HL	1.0 ^b				

^b25°,0.5; ^h20°,0.1; ⁱ20°,0.5; °20°,0; ^woptical isomerism not stated; ^xDL-mixture;

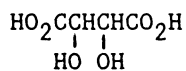
D-Tartaric acid (continued)

Metal ion	Equilibrium	Log K 25°, 0.1	Log K 25°, 1.0	Log K 25°, 0	ΔH 25°, 0	ΔS 25°, 0
Cd ²⁺	ML/M.L	1.6 ^b	1.60 ± 0.10			
	ML ₂ /M.L ²	3.0 ^b	2.7			
	MHL/M.HL		1.00 ± 0.04			
	MHL ₂ /ML ₂ .H		3.4			
	MH ₂ L ₂ /MHL ₂ .H		3.2			
	M ₂ L ₂ /(ML) ²	1.4 ^b				
	M ₂ L ₂ /M ₂ (OH) ₂ L ₂ .H	13.2 ^b				
	M(OH) ₂ L ₂ /M ₂ (OH) ₃ L ₂ .H	9.7 ^b				
Pb(II)	MOH(H ₋₁ L).OH/M(OH) ₃ L		1.1			
	M ₂ (OH) ₂ (H ₋₁ L) ₂ .OH ² /(M(OH) ₃) ² .L ²		5.5			
	M ₂ (OH) ₂ (H ₋₁ L) ₃ .OH ³ /(M(OH) ₃) ² .L ³		4.7			
B(III)	M(OH) ₂ (H ₋₁ L)/M(OH) ₃ .L	0.9 ^h				
	M(OH) ₂ L/M(OH) ₂ (H ₋₁ L).H	4.13 ^h				
	M ₂ (OH) ₄ (H ₋₂ L)/M(OH) ₂ (H ₋₁ L).M(OH) ₃	1.0 ^h				
	M(H ₋₂ L)(H ₋₁ L)/M(OH) ₂ (H ₋₁ L).L	0.2 ^h				
As(III)	M(OH) ₂ L/M(OH) ₂ .L	6.6				
Al ³⁺	M(H ₋₁ L).H/M.L	1.18				
	ML ₂ /M.L ²	7.65				
	MH ₋₄ L ₃ .H ⁴ /M.L ³	-15.92				
	M(H ₋₁ L)/M(H ₋₂ L).H	5.15				
	ML ₂ /M(H ₋₁ L)L.H	3.72				
	MH ₋₁ L ₂ /MH ₋₃ L ₂ .H ²	12.67				
	MH ₋₄ L ₃ /MH ₋₅ L ₃ .H	10.89				
	MH ₋₅ L ₃ /MH ₋₆ L ₃ .H	12.7				
Ga ³⁺	ML/M.L	4.44 ± 0.1				
	ML ₂ /M.L ²	(7.58) ^w (8.46) ^x				

^b25°, 0.5; ^h20°, 0.1; ^woptical activity not stated; ^xDL-mixture

Bibliography:

H⁺ 59WH, 75J, 80ACG, 80DT, 80J, 83BS, 83DR, 84BSb, 84MM, 85DDD;
 Li⁺-NH₄⁺ 59WH, 80ACG, 85DDD; Zn²⁺ 81MSa;
 Be²⁺ 80DT; Cd²⁺ 75B, 84BS;
 Mg²⁺-Ba²⁺ 59WH, 85DDD; Pb(II) 72BVa;
 Mn²⁺-Ni²⁺ 59WH; B(III) 77RB;
 Cu²⁺ 75J, 75JL, 80J, 84BSb; Al³⁺ 84MM;
 V(V) 83BS; In³⁺ 84PGa;
 Mo(VI) 82HHB; As(III) 80ET;
 Tl⁺ 59WH;
 Other references: 56L, 59D, 62MK, 63M, 66KG, 67KF, 67S, 73KCG, 80KCW, 80KH, 80NS, 81CCM, 81HL, 81HT, 81SS, 82HK, 82KI, 82SSC, 82SY, 83KI, 83KJ, 83MA, 84Mb, 84Pgb, 85AM, 85DV, 85KS, 85MO, 85SA, 85SCT, 85SSb



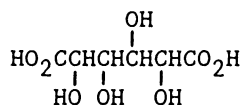
$\text{C}_4\text{H}_6\text{O}_6$ meso-2,3-Dihydroxybutanedioic acid (meso-tartaric acid) H_2L
(Other values in Vol.3, p.129 and Vol.5, p.319)

Metal ion	Equilibrium	Log K 25°, 0.1	Log K 25°, 1.0	Log K 25°, 0	ΔH 25°, 0	ΔS 25°, 0
H^+	HL/H.L	4.49 $\pm$ 0.05	4.11 $\pm$ 0.01	4.91	-1.5	17
					-1.4 ^a	16 ^a
	$\text{H}_2\text{L}/\text{HL.H}$	2.97 $\pm$ 0.02	2.87 $\pm$ 0.01	3.17	-0.8	12
					-1.0 ^a	10 ^a
Cu^{2+}	ML/M.L	3.52	3.15 $\pm$ 0.1			
	$\text{ML}_2/\text{M.L}^2$	6.04	5.31			
	$\text{MHL}/\text{M.HL}$		2.06			
	$\text{M}_2\text{L}_2/(\text{ML})^2$		2.22			
	$\text{M}_5\text{H}_5\text{L}_4.\text{H}^5/\text{M}^5.\text{L}^4$		(4.04)			
	$\text{M}_5\text{H}_5\text{L}_4/\text{M}_5\text{H}_6\text{L}_4.\text{H}$		(2.91)			
	$\text{M}_6\text{H}_7\text{L}_4.\text{H}^7/\text{M}^6.\text{L}^4$		(0.80)			

^a25°, 0.1

Bibliography: 80Ja;

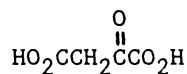
Other reference: 63M



$\text{C}_6\text{H}_{10}\text{O}_8$ D-2,3,4,5-Tetrahydroxyhexanedioic acid (D-saccharic acid) H_2L
(Other references in Vol.3, p.359 and Vol.5, p.469)

Metal ion	Equilibrium	Log K 25°, 0.1
H^+	HL/H.L	3.96
	$\text{H}_2\text{L}/\text{HL.H}$	3.17
Al^{3+}	$\text{M}(\text{H}_{-1}\text{L}).\text{H}/\text{M.L}$	1.57
	$\text{M}(\text{H}_{-1}\text{L})/\text{M}(\text{H}_{-2}\text{L}).\text{H}$	3.76

Bibliography: 84MM



$\text{C}_4\text{H}_4\text{O}_3$ Oxobutanedioic acid (oxaloacetic acid) H_2L
(Other values in Vol.3, p.131 and Vol.5, p.320)

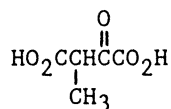
Metal ion	Equilibrium	Log K 25°, 0.1	Log K 25°, 0.5	Log K 25°, 0	ΔH 25°, 0	ΔS 25°, 0
H^+	HL/H.L	3.90 $\pm$ 0.02	3.79 ⁿ	4.37	(0) ^r	(20)
	$\text{H}_2\text{L}/\text{HL.H}$	2.26 $\pm$ 0.05	2.17 ⁿ	2.56	(-4) ^r	(0)
Mg^{2+}	ML/M.L	1.02	0.81			
	$\text{ML}/\text{M}(\text{H}_{-1}\text{L}).\text{H}$	7.5	8.5			
	$\text{M}_2(\text{H}_{-1}\text{L}).\text{H}/\text{M}^2.\text{L}$		-6.3			

ⁿ37°, 0.16; ^r25-37°, 0

Oxaloacetic acid (continued)

Metal ion	Equilibrium	Log K 25°, 0.1	Log K 25°, 0.5	Log K 25°, 0	ΔH 25°, 0	ΔS 25°, 0
Mn^{2+}	ML/M.L	1.58	1.24	2.8		
	ML/M(H ₋₁ L).H		7.8			
	M ₂ (H ₋₁ L).H/M ² .L	-3.67	-4.71			
Zn^{2+}	ML/M.L	2.38 ±0.04	1.99	3.2		
	M ₂ (H ₋₁ L).H/M ² .L					
		-1.04 ±0.01	-2.59			

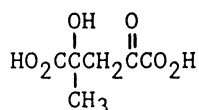
Bibliography: H^+ 74CL,81ML; Mg^{2+}, Mn^{2+} 81ML,82BL; Zn^{2+} 74CL,81ML,82BL



$C_5H_6O_3$ 1-Oxopropane-1,2-dicarboxylic acid (2-oxalopropanoic acid) H_2L

Metal ion	Equilibrium	Log K 25°, 0.1
H^+	L/(H ₋₁ L).H	(13.05)
	HL/H.L	4.18
	H ₂ L/HL.H	(1.7)
Cu^{2+}	ML/M.L	5.83
	ML/M(H ₋₁ L).H	9.3
	M ₂ L ₂ /(ML) ²	3.8
	M ₂ L ₂ /M ₂ (H ₋₁ L) ₂ .H ²	19.2
Zn^{2+}	ML/M.L	3.13
	ML/M(H ₋₁ L).H	8.8
Al^{3+}	ML/M.L	6.16
	ML ₂ /M.L ²	10.80

Bibliography: H^+ 71KM,72KM; $Cu^{2+}-Al^{3+}$ 72KM

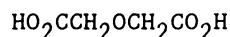


$C_6H_8O_6$ DL-3-Hydroxy-1-oxobutane-1,3-dicarboxylic acid H_2L

Metal ion	Equilibrium	Log K 25°, 1.0
H^+	HL/H.L	3.58 ^u
	H ₂ L/HL.H	(1.6)
Ni^{2+}	ML/M.L	1.50
	ML ₂ /M.L ²	(2.8) ^w
Zn^{2+}	ML/M.L	1.72
	ML ₂ /M.L ²	(3.0) ^w

^uNaCl used as background electrolyte; ^woptical isomerism not stated.

Bibliography: 69TL



C ₄ H ₆ O ₅		Oxydiacetic acid (diglycolic acid)			H ₂ L	
		(Other values in Vol.3, p.133 and Vol.5, p.321)				
Metal ion	Equilibrium	Log K 25°, 0.1	Log K 25°, 1.0	Log K 25°, 0	ΔH 25°, 0.1	ΔS 25°, 0.1
H ⁺	HL/H.L	3.92 ±0.03	3.77 ^u ±0.02	4.37 -0.0	+1.48	22.9
		4.00 ^z ±0.02			+0.76 ^c	19.8 ^c
		3.76 ^{b,u}	4.02 ^{n,z}			
	H ₂ L/HL.H	2.80 ±0.03	2.81 -0.1	3.01 ±0.05	+0.01	12.9
		2.80 ^b	2.83 ⁿ		-0.38 ^c	11.6 ^c
Li ⁺	ML/M.L	0.74 ^z		1.10	(+1) ^r	(7)
Na ⁺	ML/M.L	0.37 ^z		0.71	(+2) ^r	(8)
K ⁺	ML/M.L	0.29 ^z		0.62	(+2) ^r	(8)
Ca ²⁺	ML/M.L	3.38 ±0.02				
		(3.57) ^z	(3.55) ^{n,z}	(4.28)	(-2) ^r	(9)
	MHL/M.HL	1.36				
Th ⁴⁺	ML/M.L		8.15		+2.0 ^c	44 ^c
	ML ₂ /M.L ²		14.9		-0.7 ^c	66 ^c
	ML ₃ /M.L ³		18.2		+7.9 ^c	110 ^c
UO ₂ ²⁺	ML/M.L	5.31	5.11		+4.0 ^c	37 ^c
	ML ₂ /M.L ²		7.54		+5.6 ^c	53 ^c
	MHL ₂ /ML ₂ .H		2.5		+1.1 ^c	15 ^c
Cu ²⁺	ML/M.L	3.95 ±0.02	(3.6)		+3.6	30
					+1.9 ^c	23 ^c
	ML ₂ /M.L ²	(5.7)			(+5)	(43)
	MHL/M.HL	1.42			(+1) ^r	(10)
Hg ²⁺	ML/M.L		6.7			
	MHL/ML.H		1.8			
In ³⁺	ML/M.L		5			
Bi ³⁺	ML/M.L	7.69 ^b				
	ML ₂ /M.L ²	12.73 ^b				
	ML ₃ /M.L ³	16.19 ^b				

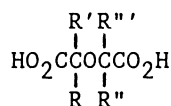
^b25°,0.5; ^c25°,1.0; ⁿ37°,0.15; ^r12-48°,0; ^u NaClO_4 used as background electrolyte;

^z $(\text{CH}_3\text{CH}_2)_4\text{NI}$ used as background electrolyte.

Bibliography: H^+ 80BTB,80CR,85CPa,85DDD;

$\text{Li}^+ - \text{Ca}^{2+}$ 85DDD; Th^{4+} 83DC; UO_2^{2+} 80DTB,83CCa; Cu^{2+} 79CR; $\text{Hg}^{2+}, \text{In}^{3+}$ 85MMN; Bi^{3+} 81NP

Other references: 80BDP,81AC,81ME,82DBa,83DBP,84MMA,85NKB



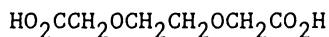
$\text{C}_x\text{H}_y\text{O}_z$		<u>Substituted-oxydiacetic acid</u>		H_nL
Ligand	Metal ion	Equilibrium	Log K 25°, 0.1	
$\text{R} = \text{CH}_2\text{OH},$ $\text{R}' = \text{R}'' = \text{R}''' = \text{H}$ DL-2-Hydroxymethyl- ($\text{C}_5\text{H}_8\text{O}_6$), H_2L	Ca^{2+}	$\text{ML}/\text{M.L}$	3.16	

Substituted-oxydiacetic acid (continued)

Ligand	Metal ion	Equilibrium	Log K 25°, 0.1
R= R''= CH ₂ OH, R'= R'''= H DL-2,2'-Bis- (hydroxymethyl)- (C ₆ H ₁₀ O ₇), H ₂ L	Ca ²⁺	ML/M.L	3.06
R= CH ₂ OH, R''= OCH ₃ , R'=R'''=H DL-2-Hydroxymethyl- 2'-methoxy- (C ₆ H ₁₀ O ₇), H ₂ L	Ca ²⁺	ML/M.L	2.25
R= R''= CH ₂ OH, R'= R'''= OCH ₃ DL-2,2'-Bis- (hydroxymethyl)- 2,2'-dimethoxy- (C ₈ H ₁₄ O ₉), H ₂ L	Ca ²⁺	ML/M.L	2.29
R= R''= OCH ₃ , R'= R'''= H DL-2,2'-Dimethoxy- (C ₆ H ₁₀ O ₇), H ₂ L	Ca ²⁺	ML/M.L	1.96
R= CH ₂ CO ₂ H, R'= R''= R'''= H DL-2-Carboxymethyl- (C ₇ H ₁₀ O ₇), H ₃ L	Ca ²⁺	ML/M.L	3.36
R= OCH ₂ CO ₂ H, R'= R''= R'''= H DL-2-(Carboxy- methyloxy)- (C ₇ H ₁₀ O ₈), H ₃ L	Ca ²⁺	ML/M.L	3.58
R= CH ₂ OCH ₂ CO ₂ H, R'= R''= R'''= H DL-2-(Carboxy- methyloxymethyl)- (C ₈ H ₁₂ O ₈), H ₃ L	Ca ²⁺	ML/M.L	3.36
R= R''= CH ₂ CO ₂ H, R'= R'''= H rac-2,2'-Bis- (carboxymethyl)- (C ₉ H ₁₂ O ₉), H ₄ L	Ca ²⁺	ML/M.L	5.26
R= R''= CH ₂ CO ₂ H, R'= R'''= H meso-2,2'-Bis- (carboxymethyl)- (C ₉ H ₁₂ O ₉), H ₄ L	Ca ²⁺	ML/M.L	4.69

Substituted-oxydiacetic acid (continued)

<u>Ligand</u>	<u>Metal ion</u>	<u>Equilibrium</u>	<u>Log K</u> <u>25°, 0.1</u>
R= R''= OCH ₂ CO ₂ H, R'= R'''= H DL-2,2'-Bis- (carboxymethyloxy)- (C ₉ H ₁₂ O ₁₁), H ₄ L	Ca ²⁺	ML/M.L	3.28
R= R''= OCH ₂ CO ₂ H, R'= R'''= H meso-2,2'-Bis- (carboxymethyloxy)- (C ₉ H ₁₂ O ₁₁), H ₄ L	Ca ²⁺	ML/M.L	3.07
R= R''= CH ₂ OCH ₂ CO ₂ H, R'= R'''= H DL-2,2'-Bis- (carboxymethyloxy- methyl)- (C ₁₁ H ₁₆ O ₁₁), H ₄ L	Ca ²⁺	ML/M.L	4.06
R= CH ₂ OH, R''= OPO ₃ H ₂ , R'= R'''= H DL-2-Hydroxy- methyl-2'-phospho- (C ₅ H ₉ O ₁₀ P), H ₄ L Bibliography: 85NKB	Ca ²⁺	ML/M.L	2.95

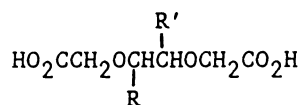
C₆H₁₀O₆(Ethylenedioxy)diacetic acid
(Other values in Vol.3, p.137)H₂L

<u>Metal ion</u>	<u>Equilibrium</u>	<u>Log K</u> <u>25°, 0.1</u>	<u>Log K</u> <u>25°, 1.0</u>	<u>ΔH</u> <u>25°, 1.0</u>	<u>ΔS</u> <u>25°, 1.0</u>
H ⁺	HL/H.L	3.83	3.70 ±0.02	+0.26	17.8
	H ₂ L/HL.H	2.99	3.06 -0.01	+0.24	14.8
Ca ²⁺	ML/M.L	3.20 ±0.06			
UO ₂ ²⁺	ML/M.L		3.08	+6.4	36

Bibliography:

H⁺, UO₂²⁺ 84TB;Ca²⁺ 85NKB;

Other reference: 84AF

 $\text{C}_x\text{H}_y\text{O}_z$ Substituted(ethylenedioxy)diacetic acid H_nL

<u>Ligand</u>	<u>Metal ion</u>	<u>Equilibrium</u>	<u>Log K</u> <u>25°, 0.1</u>
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R= $\text{CH}_2\text{OCH}_2\text{CO}_2\text{H}$, R' = H DL-1-(Carboxy- methyloxymethyl)- ($\text{C}_9\text{H}_{14}\text{O}_9$), H_3L	Ca^{2+}	ML/M.L	4.71
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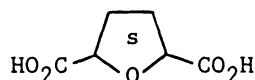
$\begin{array}{c} \text{OH} \\ \\ \text{R} = \text{CHOCH}_2\text{CO}_2\text{H}, \\ \text{R}' = \text{H} \end{array}$ RS-[Carboxymethyl- oxy(hydroxy)methyl]- ($\text{C}_9\text{H}_{14}\text{O}_{10}$), H_3L	Ca^{2+}	ML/M.L	4.69
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$\begin{array}{c} \text{OH} \\ \\ \text{R} = \text{CHOCH}_2\text{CO}_2\text{H}, \\ \text{R}' = \text{H} \end{array}$ RR-[Carboxymethyl- oxy(hydroxy)methyl]- ($\text{C}_9\text{H}_{14}\text{O}_{10}$), H_3L	Ca^{2+}	ML/M.L	4.96
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R= R' = $\text{CH}_2\text{OCH}_2\text{CO}_2\text{H}$, Ca^{2+} rac-1,2-Bis(carboxy- methyloxymethyl)- ($\text{C}_{12}\text{H}_{18}\text{O}_{12}$), H_4L		ML/M.L	5.40
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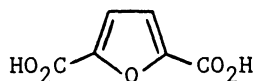
R= R' = $\text{CH}_2\text{OCH}_2\text{CO}_2\text{H}$, Ca^{2+} meso-1,2-Bis(carboxy- methyloxymethyl)- ($\text{C}_{12}\text{H}_{18}\text{O}_{12}$), H_4L		ML/M.L	5.25
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Bibliography: 85NKB

 $\text{C}_6\text{H}_4\text{O}_5$ Oxolane-2,5-dicarboxylic acid (perhydrofuran-2,5-dicarboxylic acid) H_2L

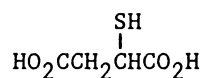
<u>Metal ion</u>	<u>Equilibrium</u>	<u>Log K</u> <u>25°, 0.1</u>
Ca^{2+}	ML/M.L	3.06

Bibliography: 85NKB

 $\text{C}_6\text{H}_4\text{O}_5$ Oxole-2,5-dicarboxylic acid (furan-2,5-dicarboxylic acid) H_2L

<u>Metal ion</u>	<u>Equilibrium</u>	<u>Log K</u> <u>25°, 0.1</u>
Ca^{2+}	ML/M.L	1.34

Bibliography: 85NKB

 $\text{C}_4\text{H}_6\text{O}_4\text{S}$ DL-Mercaptobutanedioic acid (thiomalic acid) H_3L

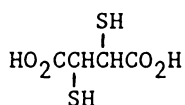
(Other values in Vol.3, p.140 and other references in Vol.5, p.469)

Metal		Log K	Log K	Log K
ion	Equilibrium	<u>25°, 0.1</u>	<u>25°, 1.0</u>	<u>25°, 3.0</u>
H^+	HL/H.L	10.39 $\pm$ 0.06	9.79 $\pm$ 0.06	10.02 ^u
		10.46 ^h $\pm$ 0.06		9.86 ^v
	$\text{H}_2\text{L}/\text{HL.H}$	4.58 $\pm$ 0.06	4.42 $\pm$ 0.02	4.88 ^u
		4.60 ^h $\pm$ 0.02		4.67 ^v
	$\text{H}_3\text{L}/\text{H}_2\text{L.H}$	3.09 $\pm$ 0.03	2.9 -0.4	3.50 ^v
		3.14 ^h $\pm$ 0.03		3.27 ^v
Co^{2+}	ML/M.L	6.71 $\pm$ 0.2		
	$\text{ML}_2/\text{M.L}^2$	(11.15) ^x		
	$\text{M}_2\text{L}_3/\text{M}^2.\text{L}^3$	(19.61) ^x		
	$\text{M}_3\text{L}_4/\text{M}^3.\text{L}^4$	(28.91) ^x		
CH_3Hg^+	ML/M.L	17.2 $\pm$ 0.1		
	MHL/M.HL	11.7 $\pm$ 0.1		
	$\text{MH}_2\text{L}/\text{M.H}_2\text{L}$	10.4 $\pm$ 0.3		

^h20°, 0.1; ^u NaClO_4 used as background electrolyte; ^v KCl used as background electrolyte; ^xDL-mixture.

Bibliography: H^+ 83AC, 83HS; Co^{2+} 83HS; CH_3Hg^+ 81RR, 83AC;

Other references: 80MPa, 81SJ, 82NAN, 83MPa, 83Sc, 84J

 $\text{C}_4\text{H}_6\text{O}_4\text{S}_2$ meso-2,3-Dimercaptobutanedioic acid (dithiotartaric acid) H_4L

(Other values in Vol.3, p.141 and other reference in Vol.5, p.469)

Metal		Log K	Log K	Log K
ion	Equilibrium	<u>25°, 0.1</u>	<u>25°, 0.3</u>	<u>37°, 0.15</u>
H^+	HL/H.L	(11.50)	(11.05)	
		(11.82) ^h		
	$\text{H}_2\text{L}/\text{HL.H}$	(9.65)	9.42	9.38 $\pm$ 0.05
		9.44 ^h		
	$\text{H}_3\text{L}/\text{H}_2\text{L.H}$	3.48		3.54 $\pm$ 0.04
		3.46 ^h		
	$\text{H}_4\text{L}/\text{H}_3\text{L.H}$	(2.71)		2.44 $\pm$ 0.03
		2.40 ^h		
CH_3Hg^+	ML/M.L		18.4	
	MHL/M.L.H		9.86	
	$\text{M}_2\text{L}/\text{ML.M}$		16.9	

^h20°, 0.1Bibliography: H^+ 84JS, 85AC, 85WW; CH_3Hg^+ 85AC

C ₄ H ₆ O ₄ S		HO ₂ CCH ₂ SCH ₂ CO ₂ H				H ₂ L
		<u>Thiodiacetic acid</u>				
(Other values in Vol.3, p.142 and Vol.5, p.323)						
Metal		Log K	Log K	Log K	ΔH	ΔS
<u>ion</u>	<u>Equilibrium</u>	<u>25°, 0.1</u>	<u>25°, 1.0</u>	<u>25°, 0</u>	<u>25°, 0.1</u>	<u>25°, 0.1</u>
H ⁺	HL/H.L	4.13 ±0.04	3.99 ±0.06	4.55 ±0.03	+0.66	21.1
		4.22 ^z	4.12 ^d ±0.02	4.35 ^{e,u}	+0.43 ^c	19.7 ^c
		4.00 ^b ±0.04		4.56 ^{f,u}		
	H ₂ L/HL.H	3.15 ±0.03	3.14 ±0.00	3.32 ±0.04	+0.06	14.6
		3.07 ^b ±0.03	3.23 ^d	3.46 ^e	-0.10 ^c	14.0 ^c
				3.66 ^f		
Th ⁴⁺	ML/M.L		5.60		+5.0 ^c	42 ^c
	ML ₂ /M.L ²		9.9		+8.6 ^c	74 ^c
	MHL/M.HL		3.3		+2.9 ^c	25 ^c
UO ₂ ²⁺	ML/M.L		2.97		+3.5 ^c	25 ^c
	MHL/M.HL		1.44		0.0 ^c	7 ^c
	MHL ₂ /ML.HL		1.4		+2.2 ^c	14 ^c
Cu ²⁺	ML/M.L	4.61 ±0.04	4.18	4.63 ^e	+1.0	24
					+0.3 ^c	20 ^c
	ML ₂ /M.L ²	7.50 ±0.0	7.08	7.86 ^e	+0.9	37
	MHL/M.HL	2.62 ±0.02		2.0 ^e	-0.2	11
Ag ⁺	ML/M.L	4.04				
		4.12 ^b				
	MHL/M.HL	3.06				
		3.15 ^b				
	MH ₂ L/M.H ₂ L	2.35				
Hg ²⁺	ML/M.L	8.83 ^b				
	ML ₂ /M.L ²	15.95 ^b				
	MHL/M.HL	6.65 ^b				

^b25°,0.5; ^c25°,1.0; ^d25°,2.0; ^e25°,3.0; ^f25°,4.0; ^uNaClO₄ used as background electrolyte; ^z(CH₃CH₂)₄NI used as background electrolyte.

Bibliography: H⁺ 80DTB,80CR,85CDa; Th⁴⁺ 83DC; UO₂²⁺ 80DTB; Cu²⁺ 79CR; Ag⁺ 81N; Hg²⁺ 76Na; Other references: 81AC,81SJ,82CC,82DBa,83DBP

^b25°,0.5; ^c25°,1.0; ^d25°,2.0; ^e25°,3.0; ^f25°,4.0; ^uNaClO₄ used as background electrolyte;
^z(CH₃CH₂)₄NI used as background electrolyte.

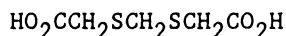
Bibliography: H⁺ 80DTB,80CR,85CDa; Th⁴⁺ 83DC, UO₂²⁺ 80DTB; Cu²⁺ 79CR; Ag⁺ 81N;
 Hg²⁺ 76Na; Other references: 81AC,81SJ,82CC,82DBa,83DBP

		HO ₂ CCH ₂ CH ₂ SC ₂ H ₂ CO ₂ H				
C ₆ H ₁₀ O ₄ S		<u>3,3'-Thiodipropanoic acid</u>				H ₂ L
		(Other values in Vol.3, p.146 and Vol.5, p.324)				
Metal		Log K	Log K	Log K	ΔH	ΔS
<u>ion</u>	<u>Equilibrium</u>	<u>25°, 0.1</u>	<u>25°, 1.0</u>	<u>25°, 0</u>	<u>25°, 0.1</u>	<u>25°, 0.1</u>
H ⁺	HL/H.L	4.67 ±0.03	4.54	5.09 ±0.02	+0.18	22.0
		4.75 ^z	4.74 ^d ±0.07	4.96 ^{e,u} ±0.03	(-0.8) ^c	(18) ^c
		4.55 ^b				
	H ₂ L/HL.H	3.90 ±0.06	3.88	4.11 ±0.02	+0.10	18.2
		3.84 ^b	4.05 ^d ±0.10	4.37 ^e ±0.01	0.0 ^c	18 ^c
Cu ²⁺	ML/M.L	2.97 ±0.0	(2.7)	3.64 ^e	+4.0	27
					+3 ^c	(22) ^c
	MHL/M.HL	1.59		1.83 ^e	+0.5	9

^b25°,0.5; ^c25°,1.0; ^d25°,2.0; ^e25°,3.0; ^uNaClO₄ used as background electrolyte;
^z(CH₃CH₂)₄NI used as background electrglyte.
 Bibliography: H⁺ 80CR,84MT,85CDa; Cu²⁺ 79CR
 Other references: 75DP,81SJ,82CC,82DBa,83DBP,85HI

^b25°,0.5; ^c25°,1.0; ^d25°,2.0; ^e25°,3.0; ^uNaClO₄ used as background electrolyte;
^z(CH₃CH₂)₄NI used as background electrolyte.

Bibliography: H⁺ 80CR,84MT,85CDa; Cu²⁺ 79CR
 Other references: 75DP,81SJ,82CC,82DBa,83DBP,85HI

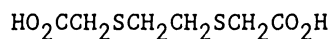
C₅H₈O₄S₂(Methylenedithio)diacetic acid
(Other values in Vol.3, p.147)H₂L

Metal ion	Equilibrium	Log K 18°, 0.1	Log K 18°, 1.0	Log K 18°, 0
H ⁺	HL/H.L	3.96	3.82	4.34
		3.91 ^b ±0.09	3.99 ^d ±0.07	
	H ₂ L/HL.H	3.16	3.10	3.31
		3.14 ^b ±0.05	3.30 ^d ±0.07	
Ag ⁺	ML/M.L	4.60 ^b		
	MHL/M.HL	4.17 ^b		

^b25°, 0.5; ^d25°, 2.0 NaClO₄ or KCl

Bibliography: 81N;

Other references: 84SGP, 84SP, 84SPG

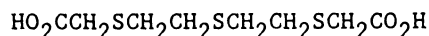
C₆H₁₀O₄S₂(Ethylenedithio)diacetic acid
(Other values in Vol.3, p.148 and Vol.5, p.325)

HL

Metal ion	Equilibrium	Log K 25°, 0.1	Log K 25°, 1.0	Log K 18°, 0
H ⁺	HL/H.L	4.00 ±0.1	3.85 ±0.02	4.35
		3.86 ^b ±0.04	4.02 ^d ±0.08	
	H ₂ L/HL.H	3.20 ±0.04	3.21 ±0.05	3.38
		3.19 ^b ±0.04	3.38 ^d ±0.09	
UO ₂ ²⁺	ML/M.L	3.06 ^b		
	ML ₂ /M.L ²	4.85 ^b		
VO ²⁺	ML/M.L	2.68 ^b		
Ag ⁺	ML/M.L	5.82 ^b		
	ML ₂ /M.L ²	9.55 ^b		
	MHL/M.HL	5.72 ^b		
	MHL ₂ /ML ₂ .H	4.18 ^b		
	M(HL) ₂ /MHL ₂ .H	3.45 ^b		
	MH ₃ L ₂ /M(HL) ₂ .H	2.97 ^b		
	M ₂ L/ML.M	3.15 ^b		
	M ₂ HL/M ₂ L.H	3.61 ^b		
Hg ²⁺	ML ₂ /M.L ²	18.99 ^b		
	MHL ₂ /ML ₂ .H	2.10 ^b		
	M(HL) ₂ /MHL ₂ .H	0.41 ^b		
Pb ²⁺	ML/M.L	3.8		
		3.62 ^b		
	MHL/M.HL	2.40 ^b		

^b25°, 0.5; ^d25°, 2.0 NaClO₄ or KClBibliography: H⁺, UO₂²⁺ 80N; VO²⁺ 81Nb; Ag⁺ 81N; Hg²⁺ 78N, 80Na; Pb²⁺ 81Na;

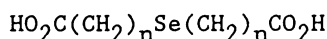
Other reference: 80KVP

 $\text{C}_8\text{H}_{14}\text{O}_4\text{S}_3$ Thiobis(ethylenethioacetic acid) (diethylenetrithiodiacetic acid) H_2L

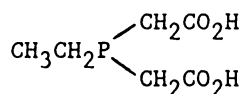
(Other values in Vol.3, p.151)

Metal		Log K	Log K
<u>ion</u>	<u>Equilibrium</u>	<u>25°, 0.1</u>	<u>25°, 0.5</u>
H^+	HL/H.L	3.93 ±0.01	
	$\text{H}_2\text{L}/\text{HL.H}$	3.18 ±0.03	
Hg^{2+}	$\text{ML}_2/\text{M.L}^2$		19.05
	$\text{MHL}_2/\text{ML}_2.\text{H}$		3.76
	$\text{M}(\text{HL})_2/\text{MHL}_2.\text{H}$		1.58

Bibliography: 79NP, 80Na

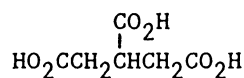
 $\text{C}_x\text{H}_y\text{O}_4\text{Se}$ Selenodialkanoic acid H_2L

Ligand	Metal	Equilibrium	Log K	Log K	ΔH	ΔS
	<u>ion</u>		<u>25°, 0.1</u>	<u>25°, 0</u>	<u>25°, 0.1</u>	<u>25°, 0.1</u>
$n=1$	H^+	HL/H.L	4.34 ±0.01	(4.76)	+0.6	22
Selenodiacetic		$\text{H}_2\text{L}/\text{HL.H}$	3.31 ±0.04	(3.57)	-0.1	15
acid ($\text{C}_4\text{H}_6\text{O}_4\text{Se}$)	Cu^{2+}	ML/M.L	3.55		+2.4	24
(Other values		MHL/M.HL	2.50		+0.4	13
in Vol.3, p.151)						
$n=2$	H^+	HL/H.L	4.71 ±0.01	(5.15)	+0.1	22
3,3'-Selenodi-		$\text{H}_2\text{L}/\text{HL.H}$	3.94 ±0.04	(4.19)	+0.1	18
propanoic acid	Cu^{2+}	ML/M.L	2.60		+3.6	24
($\text{C}_6\text{H}_{10}\text{O}_4\text{Se}$)		MHL/M.HL	1.59		+2	14
(Other values						
in Vol.3, p.153)						

Bibliography: H^+ 80CR; Cu^{2+} 79CR $\text{C}_6\text{H}_{11}\text{O}_4\text{P}$ Ethylphosphinodiacetic acid H_2L

Metal		Log K	Log K
<u>ion</u>	<u>Equilibrium</u>	<u>25°, 0.1</u>	<u>25°, 1.0</u>
H^+	HL/H.L	6.10	
	$\text{H}_2\text{L}/\text{HL.H}$	2.76	
	$\text{H}_3\text{L}/\text{H}_2\text{L.H}$		(0.9)
Ca^{2+}	MHL/M.HL	0.73	
Ni^{2+}	$\text{ML}_2/\text{M.L}^2$	9.06	
	$\text{MHL}_2/\text{ML}_2.\text{H}$	3.63	
	$\text{M}(\text{HL})_2/\text{MHL}_2.\text{H}$	3.52	
Hg^{2+}	$\text{ML}_4/\text{M.L}^4$	40.9	
	$\text{MHL}_4/\text{ML}_4.\text{H}$	3.9	
	$\text{MH}_2\text{L}_4/\text{MHL}_4.\text{H}$	3.1	
	$\text{MH}_3\text{L}_4/\text{MH}_2\text{L}_4.\text{H}$	2.8	
	$\text{MH}_4\text{L}_4/\text{MH}_3\text{L}_4.\text{H}$	2.5	
	$\text{MH}_5\text{L}_4/\text{MH}_4\text{L}_4.\text{H}$	2.1	
	$\text{MH}_6\text{L}_4/\text{MH}_5\text{L}_4.\text{H}$	(1.9)	

Bibliography: 83NP

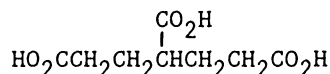


$\text{C}_6\text{H}_8\text{O}_6$ Propane-1,2,3-tricarboxylic acid (tricarballic acid) H_3L
(Other values in Vol.3, p.158 and Vol.5, p.326)

Metal ion	Equilibrium	Log K 25°, 0.1	Log K 25°, 1.0	Log K 25°, 0	ΔH 25°, 0	ΔS 25°, 0
H^+	HL/H.L	5.82 ±0.05	5.52 ±0.02	6.38	-1.8	35
			5.72 ⁿ			
	$\text{H}_2\text{L}/\text{HL.H}$	4.50 ±0.03	4.38 ±0.02	4.87	-1.5	25
			4.45 ⁿ			
	$\text{H}_3\text{L}/\text{H}_2\text{L.H}$	3.43 ±0.05	3.43 ±0.03	3.67	-0.6	15
			3.37 ⁿ			
Al^{3+}	ML/M.L		5.44 ⁿ			
	MHL/M.HL		3.13 ⁿ			
	ML/MOHL.H		3.56 ⁿ			

ⁿ37°, 0.15

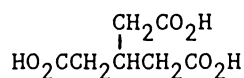
Bibliography: 82Ja; Other reference: 83GAD



$\text{C}_8\text{H}_{12}\text{O}_6$ Pentane-1,3,5-tricarboxylic acid (γ -carboxypimelic acid) H_3L
(Other values in Vol.3, p.159)

Metal ion	Equilibrium	Log K 25°, 0.16
Mn^{2+}	ML/M.L	1.91

Bibliography: 57LW



$\text{C}_7\text{H}_{10}\text{O}_6$ 3-Carboxymethylpentandioic acid H_3L

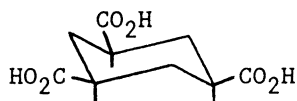
Metal ion	Equilibrium	Log K 25°, 0.5
H^+	HL/H.L	4.81 ^v
	$\text{H}_2\text{L}/\text{HL.H}$	4.10
	$\text{H}_3\text{L}/\text{H}_2\text{L.H}$	3.30
Mn^{2+}	ML/M.L	1.72
	MHL/ML.H	4.50
	$\text{MH}_2\text{L}/\text{MHL.H}$	3.59
Co^{2+}	ML/M.L	1.89
	MHL/ML.H	4.43
	$\text{MH}_2\text{L}/\text{MHL.H}$	3.66
Ni^{2+}	ML/M.L	1.90
	MHL/ML.H	4.40
	$\text{MH}_2\text{L}/\text{MHL.H}$	3.59
Cu^{2+}	ML/M.L	2.06
	MHL/ML.H	4.51
	$\text{MH}_2\text{L}/\text{MHL.H}$	3.49

^v KNO_3 used as background electrolyte.

3-Carboxymethylpentandioic acid (continued)

Metal ion	Equilibrium	Log K 25°, 0.5
Zn ²⁺	ML/M.L	2.01
	MHL/ML.H	4.49
	MH ₂ L/MHL.H	3.64

Bibliography: 83WK

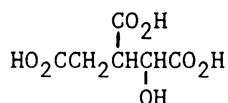


C₉H₁₂O₆ cis,cis-cyclohexane-1,3,5-tricarboxylic acid H₃L

Metal ion	Equilibrium	Log K 25°, 0.5
H ⁺	HL/H.L	4.96 ^v
	H ₂ L/HL.H	4.33
	H ₃ L/H ₂ L.H	3.75
Mn ²⁺	ML/M.L	1.65
	MHL/ML.H	4.67
	MH ₂ L/MHL.H	3.90
Co ²⁺	ML/M.L	1.68
	MHL/ML.H	4.61
	MH ₂ L/MHL.H	3.87
Ni ²⁺	ML/M.L	1.78
	MHL/ML.H	4.67
	MH ₂ L/MHL.H	3.86
Cu ²⁺	ML/M.L	2.04
	MHL/ML.H	4.56
	MH ₂ L/MHL.H	3.68
Zn ²⁺	ML/M.L	1.76
	MHL/ML.H	4.64
	MH ₂ L/MHL.H	3.88

^vKNO₃ used as background electrolyte.

Bibliography: 83WK

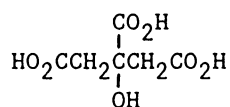


C₆H₈O₇ DL-1-Hydroxypropane-1,2,3-tricarboxylic acid (isocitric acid) H₃L
 (Other values in Vol.3, p.160 and Vol.5, p.328)

Metal ion	Equilibrium	Log K 25°, 0.1	Log K 25°, 1.0
H ⁺	HL/H.L	5.74 ±0.01	5.06 ^u
	H ₂ L/HL.H	4.30 ±0.02	3.73
	H ₃ L/H ₂ L.H	3.05 ±0.03	2.29
Cu ²⁺	ML/M.L	5.20	
	MHL/M.HL	3.21	
	ML/MOHL.H	5.97	

^uNaClO₄ used as background electrolyte.

Bibliography: 78DO; Other reference: 83GAD

 $\text{C}_6\text{H}_8\text{O}_7$ 2-Hydroxypropane-1,2,3-tricarboxylic acid (citric acid) H_3L

(Other values in Vol.3, p.161 and Vol.5, p.329)

Metal		Log K	Log K	Log K	ΔH	ΔS
<u>ion</u>	<u>Equilibrium</u>	<u>25°, 0.1</u>	<u>25°, 1.0</u>	<u>25°, 0</u>	<u>25°, 0</u>	<u>25°, 0</u>
H^+	HL/H.L	5.67 ^u ±0.03	5.22 ^u ±0.08	6.396 ±0.02	+0.78 ±0.03	31.9
		5.70 ^v ±0.02	5.31 ^v ±0.04	5.12 ^{l,u}	+0.46 ^a	28 ^a
		5.80 ^z ±0.04	5.78 ^z			
		5.30 ^{b,u} ±0.04	5.10 ^{d,u} ±0.08			
		5.39 ^{b,v}	5.64 ^{n,v} ±0.02			
		5.60 ^{b,z}	5.73 ^{n,z} ±0.02			
	$\text{H}_2\text{L}/\text{HL.H}$	4.35 ±0.05	4.12 ±0.02	4.761 ±0.02	-0.53 ±0.05	20.0
		4.11 ^b ±0.04	4.33 ⁿ ±0.04	4.15 ^l	-0.75 ^a	17 ^a
			4.10 ^d ±0.07			
	$\text{H}_3\text{L}/\text{H}_2\text{L.H}$	2.90 ±0.06	2.79 ±0.05	3.128 ±0.005	-0.98 ±0.04	11.0
		2.77 ^b ±0.03	2.87 ⁿ ±0.04	2.87 ^l	-1.08 ^a	10 ^a
			2.83 ^d ±0.07			
Li^+	ML/M.L	0.83 ^z	0.88 ^{n,z}			
Na^+	ML/M.L	0.71 ^z ±0.03	0.68 ^{n,z}		+0.4 ^a	5 ^a
K^+	ML/M.L	0.59 ^z	0.56 ^{n,z}		+0.8	5 ^{a*}
Rb^+	ML/M.L	0.49 ^z	0.52 ^{n,z}			
Cs^+	ML/M.L	0.32 ^z	(0.47) ^{n,z}			
NH_4^+	ML/M.L		0.9 ^{n,z}			
Mg^{2+}	ML/M.L	3.45 ±0.07	3.34 ⁿ ±0.00	4.84 ±0.01	(+2) ^s	(23) ^a
		3.66 ^z ±0.07	3.54 ^{n,z}			
	MHL/M.HL	1.81 ±0.04	1.66 ⁿ ±0.04	2.59 ±0.08	(0) ^s	(8) ^a
	$\text{MH}_2\text{L}/\text{M.H}_2\text{L}$	0.7 ±0.1				
Ca^{2+}	ML/M.L	3.45 ±0.10	3.30 ⁿ ±0.03		(-2) ^t	(9) ^a
		3.64 ^z ±0.07	3.49 ^{n,z}	4.85 ±0.01		
	MHL/M.HL	2.13 ±0.10	1.89 ⁿ ±0.07	2.93 ±0.02	(-1) ^s	(6) ^a
	$\text{MH}_2\text{L}/\text{M.H}_2\text{L}$	1.0 ±0.0				
Sr^{2+}	ML/M.L	3.02 ±0.06				
		3.23 ^z				
Ba^{2+}	ML/M.L	2.73 ±0.10				
		2.95 ^z				
Y^{3+}	ML/M.L	7.78 ±0.03				
La^{3+}	ML/M.L	7.1 ±0.5				
Ce^{3+}	ML/M.L	7.40 ±0.04				
Pr^{3+}	ML/M.L	7.6 ±0.3				
Nd^{3+}	ML/M.L	7.7 ±0.2				

^a25°,0.1; ^b25°,0.5; ^d25°,2.0; ^l18°.3.0; ⁿ37°.0.15; ^s25-37°,0.1; ^t20-65°,0.2;
^u Na^+ salt used as background electrolyte; ^v K^+ salt used as background electrolyte;
^z(alkyl)₄N⁺ salt used as background electrolyte or a correction was made for the
background electrolyte; *Assuming that ΔH for 0.1 = ΔH for 0.0

Citric acid (continued)

Metal ion	Equilibrium	Log K 25°, 0.1	Log K 25°, 1.0	Log K 25°, 0	ΔH 25°, 0	ΔS 25°, 0
Pm ³⁺	ML/M.L	7.71 ±0.04				
Sm ³⁺	ML/M.L	7.8				
Eu ³⁺	ML/M.L	7.80 ±0.05				
Gd ³⁺	ML/M.L	7.72				
Tb ³⁺	ML/M.L	7.74 ±0.06				
Dy ³⁺	ML/M.L	7.79				
Ho ³⁺	ML/M.L	7.84				
Er ³⁺	ML/M.L	7.86				
Tm ³⁺	ML/M.L	8.00 ±0.07				
Yb ³⁺	ML/M.L	8.05 ±0.02				
Lu ³⁺	ML/M.L	8.07 ±0.02				
Mn ²⁺	ML/M.L	3.76 ^u ±0.03 3.81 ^v 4.15 ^z	3.79 ^{n,v} 3.93 ^{n,z}			
	MHL/M.HL	2.3 ±0.2	2.22 ⁿ			
	MH ₂ L/M.H ₂ L		1.5 ⁿ			
	M ₂ (H ₋₁ L) ₂ .H ² /M ² .L ²	-6.3	-5.73 ⁿ			
Fe ²⁺	ML/M.L	(4.8) ^v 4.4 ^{n,u}	4.56 ^{n,v} 4.70 ^{n,z}			
	MHL/M.HL	2.9 2.65 ^h	3.10 ⁿ 2.6 ^e			
	MH ₂ L/M.H ₂ L		1.1 ⁿ			
	MHL ₂ /MHL.L		3.19 ⁿ			
	M ₂ (H ₋₁ L) ₂ .H ² /M ² .L ²		-5.4 ⁿ			
Co ²⁺	ML/M.L	4.89 ^u (5.00) ^{h,u}				
	MHL/M.HL	3.19 3.02 ^h				
	MH ₂ L/M.H ₂ L	1.3 ^h				
Ni ²⁺	ML/M.L	5.17 ^u 5.25 ^v ±0.2 5.56 ^z			(+4) ^t	(39)
	ML ₂ /M.L ²	8.11 ^v 8.58 ^z			(+3) ^t	(49)
	MHL/M.HL	3.25 ±0.10 3.48 ^z			(+3) ^t	(26)
	MH ₂ L/M.H ₂ L	1.8				
	MHL ₂ /MHL.L	4.4 ^v 4.61 ^z			(+4) ^t	(35)
	M ₂ (H ₋₁ L) ₂ .H ² /M ² .L ²	-3.96 ^z -4.32 ^v			(+24) ^t	(63)

^e25°.3.0; ^h20°,0.1; ⁿ37°,0.15; ^t10-45°,0.25; ^uNa⁺ salt used as background electrolyte; ^vK⁺ salt used as background electrolyte; ^z(alkyl)₄N⁺ salt used as background electrolyte or a correction was made for the background electrolyte.

Citric acid (continued)

Metal ion	Equilibrium	Log K 25°, 0.1	Log K 25°, 1.0	Log K 25°, 0	ΔH 25°, 0	ΔS 25°, 0
Cu ²⁺	MHL/M.HL	3.61 ^v ±0.2 3.91 ^z			(+2) ^t	(25)
	M ₂ (H ₋₁ L).H/M ² .L	4.86 ^v 5.30 ^z			(+7) ^t	(48)
	M ₂ L ₂ /M ² .L ²	14.5 ^v ±0.5 14.8 ^z			(+10) ^t	(101)
	M ₂ L ₂ /M ₂ (H ₋₁ L).L.H	3.3			(+1) ^t	(18)
	M ₂ (H ₋₁ L).L/M ₂ (H ₋₁ L) ₂ .H	4.86 ^v 5.24 ^z			(-1) ^t	(21)
Zn ²⁺	ML/M.L	4.76 ^u ±0.01 4.83 ^v ±0.1 4.79 ^{p,u}	4.27 ^{b,u}			
	MHL/M.HL	2.78 ±0.2	2.49 ^b			
	MH ₂ L/M.H ₂ L	1.3				
	M ₂ (H ₋₁ L) ₂ .H ² /M ² .L ²	-2.94				
Cd ²⁺	ML/M.L	3.65 ^v ±0.3	3.15 ^{b,u}	2.67 ^{d,u}		
	ML ₂ /M.L ²		4.54 ^{b,u}			
	MHL/M.HL	2.19 ±0.1	1.92 ^b	1.7 ^d		
	MH ₂ L/M.H ₂ L	1.1 ±0.2		1.0 ^d		
	ML/M(H ₋₁ L).H	7.46				
	M ₂ (H ₋₁ L) ₂ .H ² /M ² .L ²			-5.94 ^d		
Al ³⁺	ML/M.L	7.98 ^v	7.87 ^{n,u} 7.14 ^{b,u}			
	ML ₂ /M.L ²		11.7 ^{b,u}			
	MHL/M.HL	5.21	4.55 ⁿ 4.17 ^b			
	ML/M(H ₋₁ L).H	3.31	3.23 ⁿ			
	M(H ₋₁ L).L/M(H ₋₁ L).L		4.2 ⁿ			

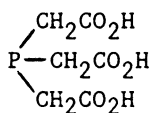
^b25°,0.5; ^d25°,2.0; ⁿ37°,0.15; ^p30°,0.1; ^t10-45°,0.25;

^uNa⁺ salt used as background electrolyte; ^vK⁺ salt used as background electrolyte;

^z(alkyl)₄N⁺ salt used as background electrolyte or a correction was made for the background electrolyte.

Bibliography:

- H⁺ 40A, 61BBS, 62FC, 72BK, 72Ka, 76NCW, 78FK, 80ACG, 80DR, 80HLR, 81MSa, 81RMD, 82CR, 83DR, 83OSa, 84DO, 84GW, 84MM, 85DDa, 85RA;
 Li⁺, Rb⁺, Cs⁺ 81CDR;
 Na⁺ 80ACG, 81CDR, 85DDa;
 K⁺ 80DR, 84DO;
 NH₄⁺ 81AD;
 Mg²⁺-Ba²⁺ 39N, 63WT, 69Mb, 69RH, 74Ma, 80P, 82AD, 85RA;
 La³⁺ 65SKP;
 Y³⁺-La³⁺ 65SKP, 66SS, 71Sf, 72BK, 85DDa;
 Mn²⁺ 85AD0;
 Fe²⁺ 82MP;
 Ni²⁺, Cu²⁺ 84DO;
 Zn²⁺ 81MSa;
 Cd²⁺ 79DA, 84GW;
 Al³⁺ 82Ja, 83OSa, 84MM;
 Other references: 48P, 59D, 59SSa, 62MK, 67KF, 69MGa, 71M, 75Ba, 75Bb, 75VD, 77Bb, 78SSb, 79Fb, 80MB, 80MPb, 80SD, 80SDa, 80SW, 80SWa, 80TSK, 80VK, 80VKa, 81B, 81DB, 81HL, 81JS, 81SBG, 82FP, 82HK, 83GAD, 83KL, 84BPG, 84PGB, 84RD, 84SDZ, 85DV, 85J, 85KS, 85RA, 85Sa, 85SA, 85SSb

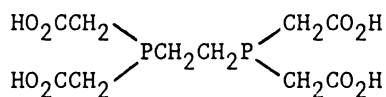
 $\text{C}_6\text{H}_9\text{O}_6\text{P}$

Phosphinotriacetic acid (tris(carboxymethyl)phosphine)
(Other values in Vol.5, p.331)

 H_3L

Metal ion	Equilibrium	Log K 25°, 0.1
H^+	HL/H.L	5.43
	$\text{H}_2\text{L}/\text{HL.H}$	3.77
	$\text{H}_3\text{L}/\text{H}_2\text{L.H}$	2.73
Ni^{2+}	ML/M.L	3.77
	$\text{ML}_2/\text{M.L}^2$	6.41
	MHL/M.HL	1.75

Bibliography: 80Pa

 $\text{C}_{10}\text{H}_{16}\text{O}_8\text{P}_2$ Ethylenediphosphinotetraacetic acid H_4L

Metal ion	Equilibrium	Log K 25°, 0.1
H^+	HL/H.L	5.97
	$\text{H}_2\text{L}/\text{HL.H}$	4.53
	$\text{H}_3\text{L}/\text{H}_2\text{L.H}$	3.67
	$\text{H}_4\text{L}/\text{H}_3\text{L.H}$	2.62
Ca^{2+}	ML/M.L	3.20
	MHL/ML.H	5.38
	$\text{MH}_2\text{L}/\text{MHL.H}$	4.22
La^{3+}	ML/M.L	4.84
	MHL/ML.H	4.86
	$\text{MH}_2\text{L}/\text{MHL.H}$	3.45
Mn^{2+}	ML/M.L	2.92
	MHL/ML.H	5.55
	$\text{MH}_2\text{L}/\text{MHL.H}$	3.99
Fe^{2+}	$\text{ML}_2/\text{M.L}^2$	(16.44)
	$\text{MH}_2\text{L}_2/\text{ML}_2.\text{H}^2$	(11.07)
	$\text{MH}_4\text{L}_2/\text{MH}_2\text{L}_2.\text{H}^2$	(7.90)
	$\text{MH}_6\text{L}_2/\text{MH}_4\text{L}_2.\text{H}^2$	(5.89)
Co^{2+}	$\text{ML}_2/\text{M.L}^2$	(22.54)
	$\text{MH}_2\text{L}_2/\text{ML}_2.\text{H}^2$	(10.17)
	$\text{MH}_4\text{L}_2/\text{MH}_2\text{L}_2.\text{H}^2$	(7.44)
	$\text{MH}_6\text{L}_2/\text{MH}_4\text{L}_2.\text{H}^2$	(5.57)
Ni^{2+}	$\text{ML}_2/\text{M.L}^2$	(22.24)
	$\text{MH}_2\text{L}_2/\text{ML}_2.\text{H}^2$	(8.98)
	$\text{MH}_4\text{L}_2/\text{MH}_2\text{L}_2.\text{H}^2$	(7.02)
	$\text{MH}_6\text{L}_2/\text{MH}_4\text{L}_2.\text{H}^2$	(5.36)

Ethylenediphosphinotetraacetic acid (continued)

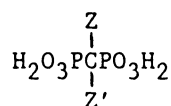
Metal ion	Equilibrium	Log K 25°, 0.1
Cu ⁺	ML/M.L	7.41
	MHL/ML.H	4.93
	MH ₂ L/MHL.H	4.04
	MH ₃ L/MH ₂ L.H	3.34
	M ₂ L/ML.M	3.53
Ag ⁺	ML/M.L	9.36
	MHL/ML.H	4.49
	MH ₂ L/MHL.H	3.59
	MH ₃ L/MH ₂ L.H	2.45
	M ₂ L/ML.M	5.47
	M ₂ HL/M ₂ L.H	4.0
	M ₂ H ₂ L/M ₂ HL.H	3.4
Zn ²⁺	ML/M.L	3.69
	MHL/ML.H	4.85
	MH ₂ L/MHL.H	4.11
Cd ²⁺	ML/M.L	6.27
	MHL/ML.H	3.86
	MH ₂ L/MHL.H	(3.92)
	M ₂ L/ML.M	4.11
Hg ²⁺	ML ₂ /M.L ²	(38.85)
	MH ₂ L ₂ /ML ₂ .H ²	(10.6)
	MH ₄ L ₂ /MH ₂ L ₂ .H ²	(8.1)
	MH ₆ L ₂ /MH ₄ L ₂ .H ²	(6.2)
Pb ²⁺	ML/M.L	6.67
	MHL/ML.H	3.41
	MH ₂ L/MHL.H	3.20
	M ₂ L/ML.M	3.10

Bibliography: H⁺ 80PP; Ca²⁺-Pb²⁺ 82PPR-PO₃H₂

C _x H _y O ₃ Cl _z PS _q	Substituted-phosphonic acid				H ₂ L
Ligand	Metal ion	Equilibrium	Log K 25°, 0.1	Log K 25°, 0	
R= CH ₃	H ⁺	HL/H.L	7.55 ^v -0.2	8.00	
Methylphosphonic acid (CH ₅ O ₃ P)		H ₂ L/HL.H	2.19 +0.2		
(Other references in Vol.3, p.360 and other values in Vol.5, p.333)	Be ²⁺	ML/M.L	6.1		
		M ₂ L ₂ /M ² .L ²	15.6		
R= CH ₂ Cl	H ⁺	HL/H.L	6.19 ^v ±0.02	6.59	
Chloromethyl- phosphonic acid		H ₂ L/HL.H	(1.0) +0.5		
(CH ₄ O ₃ ClP)	Be ²⁺	ML/M.L	5.1		
(Other values in Vol.5, p.333)		M ₂ L ₂ /M ² .L ²	13.6		

Substituted-phosphonic acid (continued)

Ligand	Metal ion	Equilibrium	Log K 25°, 0.1
R= C(CH ₃) ₃ 2-Methyl-2-propyl- 2-phosphonic acid (C ₄ H ₁₁ O ₃ P)	H ⁺ Ca ²⁺ Cu ²⁺	HL/H.L H ₂ L/HL.H ML/M.L ML/M.L	8.44 ^v 2.63 1.69 4.14
R= (CH ₂) ₉ CH ₃ Decyl- phosphonic acid (C ₁₀ H ₂₃ O ₃ P)	H ⁺	HL/H.L	7.97 ^v
R= C ₆ H ₁₁ Cyclohexyl- phosphonic acid (C ₆ H ₁₃ O ₃ P)	H ⁺ Ca ²⁺ Cu ²⁺	HL/H.L H ₂ L/HL.H ML/M.L ML/M.L	8.17 ^v 2.49 1.65 3.97
R= C ₆ H ₅ Phenyl- phosphonic acid (C ₆ H ₇ O ₃ P)	H ⁺ Ca ²⁺ Cu ²⁺	HL/H.L H ₂ L/HL.H ML/M.L ML/M.L ML/MOHL.H	7.02 ^v (1.7) 1.4 3.18 6.83
R= CH ₂ SCH ₂ CH ₃ Ethylthiomethyl- phosphonic acid (C ₃ H ₉ O ₃ PS)	H ⁺ Ca ²⁺ Cu ²⁺	HL/H.L H ₂ L/HL.H ML/M.L ML/M.L ML ₂ /M.L ² ML/MOHL.H	7.06 ^v (1.8) 1.7 4.15 7.28 7.24

^vK⁺ salt used as background electrolyte.Bibliography: H⁺ 68DM, 81WNa; Be²⁺ 68DM; Ca²⁺, Cu²⁺ 81WNa; Other reference: 80FP

C _x H _y O _z Cl _q P ₂	Substituted-methylenediphosphonic acid				H ₄ L
Ligand	Metal ion	Equilibrium	Log K 25°, 0.1	Log K 25°, 0	ΔH 25°, 0.1 ΔS 25°, 0.1
Z= Z'= H methylene- diphosphonic acid (CH ₆ O ₆ P ₂)	H ⁺	HL/H.L	10.66 ^z ±0.09 10.33 ^{h,v}	(10.96)-0.3 10.54 ^{b,z}	(-2) ^s (42)
		H ₂ L/HL.H	7.05 ^z ±0.05 6.87 ^{h,v}	7.40 ±0.05 6.87 ^{b,z}	(+1) ^s (36)
		H ₃ L/H ₂ L.H	2.76 ^z ±0.02 (2.5) ^{h,v}	2.96 ±0.09 2.49 ^{b,z}	(+2) ^s (19)
		H ₄ L/H ₃ L.H	(1.7) ^z		(-2) ^s (1)
(Other values in Vol.3, p.175)	Be ²⁺	MHL/M ₂ HL M ₂ L/M ² .L	8.82 ^v 19.15 ^v		

^b25°, 0.5; ^h20°, 0.1; ^s25-50°, 0.1; ^vK⁺ salt used as background electrolyte;
^z(CH₃)₄N⁺ salt used as background electrolyte.

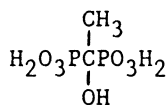
Substituted-methylenediphosphonic acid (continued)

Ligand	Metal ion	Equilibrium	Log K 25°, 0.1	Log K 25°, 0	ΔH 25°, 0.1	ΔS 25°, 0.1
	Ca ²⁺	ML/M.L MHL/M.HL M ₂ L/ML.M	5.97 ^z 2.89 ^z 3.84 ^z	4.7 ^{b,z} 2.46 ^{b,z}	+2.6 ^b	30 ^b
	Sn ²⁺	ML/M.L MHL/M.HL	13.6 ^z 7.7 ^z			
Z= Z'= Cl Dichloro- methylene- diphosphonic acid (CH ₄ O ₆ Cl ₂ P ₂)	H ⁺	HL/H.L H ₂ L/HL.H H ₃ L/H ₂ L.H	(8.84) ^v 9.6 ^z ±0.1 5.82 ^v 5.93 ^z ±0.04 (2.3) ^v			
	Mg ²⁺	ML/M.L MHL/M.HL	(4.75) ^v 2.92 ^v			
(Other reference in Vol.3, p.345)	Ca ²⁺	ML/M.L MHL/M.HL	(4.71) ^v 5.95 ^z 3.2 ^z 2.86 ^v			
	Zn ²⁺	ML/M.L MHL/M.HL	(6.70) ^v 4.61 ^v			
	Sn ²⁺	ML/M.L MHL/M.HL M ₂ L/ML.M	13.59 ^z 8.9 ^z 8.0 ^z			
Z= C ₆ H ₄ Cl Z'= H 4-Chlorophenyl- methylene- diphosphonic acid (C ₇ H ₉ O ₆ ClP ₂)	H ⁺	HL/H.L H ₂ L/HL.H H ₃ L/H ₂ L.H	11.15 ^z 6.94 2.77			
	Ca ²⁺	ML/M.L MHL/M.HL M ₂ L/ML.M	5.87 2.6 3.0			
	Sn ²⁺	ML/M.L M ₂ L/ML.M	17.0 12.5			
CO ₂ H Z= CHCH ₂ CO ₂ H Z'= H DL-2,3-Dicarboxy- propane-1,1- diphosphonic acid (C ₅ H ₁₀ O ₁₀ P ₂), H ₆ L	H ⁺	HL/H.L H ₂ L/HL.H H ₃ L/H ₂ L.H H ₄ L/H ₃ L.H H ₅ L/H ₄ L.H	11.89 ^z 9.19 6.40 4.89 2.66			
	Ca ²⁺	ML/M.L MHL/M.HL MH ₂ L/M.H ₂ L M ₂ HL/MHL.M	(4.1) 4.15 2.91 3.83			
	Sn ²⁺	ML/M.L MHL/M.HL MH ₂ L/M.H ₂ L MH ₃ L/M.H ₃ L M ₂ L/ML.M	17.31 12.90 7.6 5.7 8.9			

^b25°, 0.5; ^vK⁺ salt used as background electrolyte;

^z(CH₃)₄N⁺ salt used as background electrolyte.

Bibliography: H⁺, Ca²⁺ 76DG, 84CL; Be²⁺ 68DMa; Mg²⁺, Zn²⁺ 76DG; Sn²⁺ 84CL

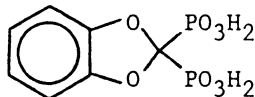
 $\text{C}_2\text{H}_8\text{O}_7\text{P}_2$ 1-Hydroxyethane-1,1-diphosphonic acid H_4L

(Other values in Vol.3, p.177 and other reference in Vol.5, p.470)

Metal ion	Equilibrium	Log K 25°, 0.1	Log K 25°, 1.0	Log K 25°, 0	ΔH 25°, 0	ΔS 25°, 0
H^+	HL/H.L	11.20 ^z ±0.04	10.98 ^v -0.4	12.0 -0.5	-2.2	48
	$\text{H}_2\text{L}/\text{HL.H}$	6.88 ^v ±0.01	6.75 ^u -0.3	7.59 ±0.3	-0.5	33
		7.00 ^z ±0.02	6.69 ^{b,u} +0.3		-1.7 ^c	25 ^c
	$\text{H}_3\text{L}/\text{H}_2\text{L.H}$	(2.52) ^v ±0.08	2.33 ^u +0.01	3.0 ±0.2	(0) ^s	(11) ^c
		(2.79) ^z ±0.02	2.40 ^{b,u} +0.1			
	$\text{H}_4\text{L}/\text{H}_3\text{L.H}$	(1.8) ±0.2	(1.2) ±0.0	2.0 ±0.1	(+1) ^s	(1) ^c
Mg^{2+}			(1.4) ^b			
	$\text{H}_4\text{L}/\text{H}_2\text{L.H}^2$		3.5 ±0.0	5.0 ±0.2	+2.1	30
					+1.5 ^c	21 ^c
	ML/M.L	6.55 ^v	6.4 ^{b,z}			
		(7.28) ^z				
	MHL/M.HL	(3.81) ^z	3.32 ^{b,z}	(3.4)	+3.5	27
Ca^{2+}	$\text{M}_2\text{L}/\text{ML.M}$	3.5 ^z				
		3.95 ^v				
	ML/M.L	6.04 ^v ±0.0	5.7 ^{b,z}		-0.5 ^b	24 ^b
		6.18 ^z +0.7				
	MHL/M.HL	3.0 ^v	(3.6) ^{b,z}	(3.3)	+3.4	27
	$\text{M}_2\text{L}/\text{ML.M}$	3.12 ^z +0.4				
Sr^{2+}		3.63 ^v				
		4.63 ^z +0.8				
	ML/M.L	5.52 ^v				
	$\text{M}_2\text{L}/\text{ML.M}$	3.59 ^v				
	ML/M.L	8.19 ^v				
	MHL/M.HL	5.00 ^v				
Zn^{2+}						
	ML/M.L	15.68 ^z				
	$\text{M}_2\text{L}/\text{ML.M}$	9.6 ^z				
Sn^{2+}						

^b25°, 0.5; ^c25°, 1.0; ^s10-35°, 1.0; ^u Na^+ salt used as background electrolyte;^v K^+ salt used as background electrolyte; ^z $(\text{CH}_3)_4\text{N}^+$ salt used as background electrolyte.Bibliography: H^+ 76DG, 77CP, 80M, 80RZI, 83VKM, 83VQ, 83VZK, 84CL, 84VOM; Mg^{2+} - Sr^{2+} 67KL, 76DG, 84CL, 84VKa; Zn^{2+} 76DG; Sn^{2+} 84CL;

Other references: 71Wa, 77CP, 80MM, 84ASa, 85GAS, 85LF

 $\text{C}_7\text{H}_8\text{O}_8\text{P}_2$ Benzo-1,3-dioxole-2,2-diphosphonic acid H_4L

[(1,2-phenylenedioxy)methylenediphosphonic acid]

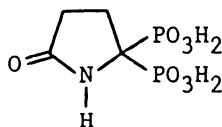
Metal ion	Equilibrium	Log K 25°, 0.5
H^+	HL/H.L	9.26 ^z
	$\text{H}_2\text{L}/\text{HL.H}$	6.35
	$\text{H}_3\text{L}/\text{H}_2\text{L.H}$	(1.9)

^z $(\text{CH}_3)_4\text{NCl}$ used as background electrolyte

(1,2-Phenylenedioxy)methylenediphosphonic acid (continued)

<u>Metal ion</u>	<u>Equilibrium</u>	<u>Log K</u> <u>25°, 0.5</u>
Li ⁺	ML/M.L	2.42
Mg ²⁺	ML/M.L	5.67
	MHL/M.HL	3.03
Ca ²⁺	ML/M.L	5.44
	MHL/M.HL	2.83
Eu ³⁺	ML/M.L	11.28
	MHL/M.HL	5.98
Gd ³⁺	ML/M.L	11.17
	MHL/M.HL	5.88
Th ⁴⁺	ML/M.L	16.4
Mn ²⁺	ML/M.L	7.25
	MHL/M.HL	4.10
Co ²⁺	ML/M.L	6.93
	MHL/M.HL	3.70
Ni ²⁺	ML/M.L	7.21
	MHL/M.HL	3.73
Cu ²⁺	ML/M.L	9.51
	MHL/M.HL	5.56
Fe ³⁺	ML/M.L	15.0
Zn ²⁺	ML/M.L	9.06
	MHL/M.HL	4.86

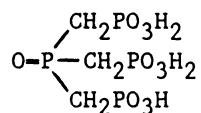
Bibliography: 85GM

C₄H₉O₇NP₂ 2-Oxoazolidine-5,5-diphosphonic acid (pyrrolidone-5,5-diphosphonic acid) H₄L

<u>Metal ion</u>	<u>Equilibrium</u>	<u>Log K</u> <u>25°, 0.1</u>
H ⁺	L/(H ₁ L).H	12.2 ^z
	HL/H.L	10.69
	H ₂ L/HL.H	6.75
	H ₃ L/H ₂ L.H	2.25
Ca ²⁺	ML/M.L	6.86
	MHL/M.HL	3.73
Sn ²⁺	ML/M.L	14.43
	MHL/M.HL	8.1

^z(CH₃)₄NNO₃ used as background electrolyte.

Bibliography: 84CL

 $\text{C}_3\text{H}_{12}\text{O}_{10}\text{P}_4$

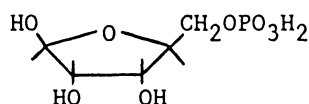
Oxophosphinotris(methylenephosphonic acid)
(tris(dihydroxyphosphonylmethyl)phosphine oxide)

 H_6L

Metal ion	Equilibrium	Log K 20°, 0.1
H^+	HL/H.L	10.04 ^z
	$\text{H}_2\text{L}/\text{HL.H}$	8.00
	$\text{H}_3\text{L}/\text{H}_2\text{L.H}$	6.00
	$\text{H}_4\text{L}/\text{H}_3\text{L.H}$	2.5
Mg^{2+}	$\text{ML}_2/\text{M.L}^2$	11.3
	$\text{MH}_2\text{L}/\text{ML.H}$	6.12
	$\text{MHL}/\text{ML.H}$	7.96
Ca^{2+}	$\text{MH}_2\text{L}/\text{M.H}_2\text{L}$	3.15
	$\text{MH}_2\text{L}/\text{MHL.H}$	6.24
	$\text{MHL}/\text{ML.H}$	8.23
Ni^{2+}	$\text{MH}_2\text{L}/\text{M.H}_2\text{L}$	3.75
	$\text{MH}_2\text{L}/\text{MHL.H}$	5.35
	$\text{MHL}/\text{ML.H}$	7.94
Cu^{2+}	$\text{MH}_2\text{L}/\text{M.H}_2\text{L}$	4.88
	$\text{MH}_2\text{L}/\text{MHL.H}$	5.31
	$\text{MHL}/\text{ML.H}$	7.71
Zn^{2+}	$\text{MH}_2\text{L}/\text{M.H}_2\text{L}$	4.41
	$\text{MH}_2\text{L}/\text{MHL.H}$	5.14
	$\text{MHL}/\text{ML.H}$	7.91

^z $(\text{CH}_3)_4\text{NCl}$ used as background electrolyte.

Bibliography: 77A

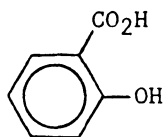
 $\text{C}_5\text{H}_{11}\text{O}_8\text{P}$

D(-)-Ribose-5-dihydrogenphosphate
 (Other references in Vol.3, p.346 and Vol.5, p.335)

 H_2L

Metal ion	Equilibrium	Log K 25°, 0.1	Log K 15°, 0.1	Log K 25°, 0	ΔH 25°, 0	ΔS 25°, 0
H^+	$\text{L}/(\text{H}_1\text{L}).\text{H}$			13.05	-6.1	39
	$\text{HL}/\text{H.L}$	(6.28) ^u	6.22 ^v	6.70	(+2.7)	(40)
	$\text{H}_2\text{L}/\text{HL.H}$	2.0				
Mg^{2+}	$\text{ML}/\text{M.L}$		1.70			
Ni^{2+}	$\text{ML}/\text{M.L}$	1.99	1.90			
	$\text{MHL}/\text{M.HL}$	0.8	0.7			

^u Na^+ salt used as background electrolyte; ^v K^+ salt used as background electrolyte.Bibliography: H^+ 62CI,72FS; Mg^{2+} 72FS; Ni^{2+} 72FS,80TF



$C_7H_6O_3$		<u>2-Hydroxybenzoic acid (salicylic acid)</u>				H_2L
		(Other values in Vol.3, p.186 and Vol.5, p.336)				
<u>Metal ion</u>	<u>Equilibrium</u>	<u>Log K</u> <u>25°, 0.1</u>	<u>Log K</u> <u>25°, 1.0</u>	<u>Log K</u> <u>25°, 0</u>	<u>ΔH</u> <u>25°, 0</u>	<u>ΔS</u> <u>25°, 0</u>
H^+	HL/H.L	(13.4) ± 0.2	(13.2) ± 0.1 (13.0) ⁿ	(13.70) ± 0.05 (13.1) ^e	-8.55 ± 0.05 -9.7 ^e	34 27 ^e
	$H_2L/HL.H$	2.80 ± 0.04 2.77 ^b ± 0.05	2.80 ± 0.05 2.79 ⁿ ± 0.02	2.974 ± 0.00 3.16 ^e ± 0.02	-0.73 ± 0.1 -2.2 ^e	11.2 7 ^e
Ca^{2+}	ML.H/M.HL MHL/M.HL		-8.71 ⁿ 0.97 ⁿ			
Cu^{2+}	ML.H/M.HL $ML_2.H^2/M.(HL)^2$	-2.80 ± 0.07	-2.75 ⁿ		+4.1 ^b	1 ^a
		-7.7 ± 0.8	-7.9 ⁿ		(+6) ^s	(-15) ^a
Fe^{3+}	ML.H/M.HL $ML_2.H^2/M.(HL)^2$ $ML_3.H^3/M.(HL)^3$	2.81 ± 0.03 (2.85) ^b 1.03 ⁿ	2.70 ± 0.04	3.85 2.69 ^e 1.22 ^e -3.5 ^e	(+3) ^t	(22) ^e
Zn^{2+}	ML.H/M.HL MHL/M.HL	-6.78 ^h 1.4 ^p				
Cd^{2+}	ML.H/M.HL MHL/M.HL	-8.06 ^h 1.9 ^p				
B(III)	$M(OH)_2L/M(OH)_3.HL$	1.29 1.23 ^h				
$CH_3B(III)$	$M(OH)_2.H_2L/MOHL.H$	2.35				
$C_6H_5B(III)$	$M(OH)_2.H_2L/MOHL.H$	1.17				
$3-NO_2C_6H_5B(III)$	$M(OH)_2.H_2L/MOHL.H$	-0.04				
Al^{3+}	ML.H/M.HL $ML_2.H^2/M.(HL)^2$ $ML_2/MOHL_2.H$	0.0 ± 0.1 -0.33 ^b -2.94 ^b 9.3 ^b				
Ga^{3+}	ML/H/M.HL MHL/M.HL	0.73 1.98				

^a25°, 0.1; ^b25°, 0.5; ^e25°, 3.0; ^h20°, 0.1; ⁿ37°, 0.15; ^p30°, 0.1; ^s25-45°, 0.1; ^t15-35°, 3.0

Bibliography:

H^+ 78BJ, 79ZKV, 80BP, 80CS, 80RC, 81LLb, 81RMD, 82C, 82CSV, 83LLK, 83OS, 85DDD, 85KSR;

Ca^{2+} 85DDD;

B(III) 78MB;

Cu^{2+} 82DJ, 83LLK;

$CH_3B(III)$ -3- $NO_2C_6H_5B(III)$ 80BP;

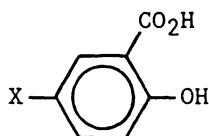
Fe^{3+} 54a, 56Aa, 82DH, 83Jb;

Al^{3+} 75SV, 83OS;

Zn^{2+} - Cd^{2+} 83B;

Ga^{3+} 82CSV;

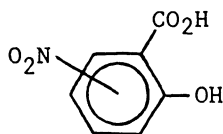
Other references: 63LC, 66DK, 77FB, 80BL, 80MS, 80YA, 81BP, 81CCM, 81CP, 81CPa, 81EE, 81SYa, 81VS, 81VV, 82CS, 82EF, 82GSS, 84Ac, 84VSL, 85PMA, 85SA, 85VS



$C_7H_5O_3X$ 5-Halogenosalicylic acid H_2L
 (Other values in Vol.3, p.188 and other references in Vol.3, p.360 and Vol.5, p.471)

<u>Ligand</u>	<u>Metal ion</u>	<u>Equilibrium</u>	<u>Log K</u> <u>25°, 0.1</u>	<u>Log K</u> <u>25°, 0</u>		
X= Cl	H^+	HL/H.L	(12.91)	(12.95)		
5-Chloro-		$H_2L/HL.H$	2.46 ± 0.02	2.64 ± 0.01		
	Ni^{2+}	ML.H/M.HL	-5.64			
	Cu^{2+}	ML.H/M.HL	-2.55			
		$ML_2.H^2/M.(HL)^2$	-6.87			
	Fe^{3+}	ML.H/M.HL			3.89	
					2.80 ^c	
	Ga^{3+}	ML.H/M.HL	0.77			
		MHL/M.HL	1.7			
X= Br	H^+	HL/H.L	(12.62)	(12.84)		
5-Bromo-		$H_2L/HL.H$	2.48	2.64 ± 0.03		
	Cu^{2+}	ML.H/M.HL	-2.43			
		$ML_2.H^2/M.(HL)^2$	-6.75			
X= I	H^+	HL/H.L	(12.36)			
5-Iodo-		$H_2L/HL.H$	2.54			
	Cu^{2+}	ML.H/M.HL	-2.51			
		$ML_2.H^2/M.(HL)^2$	-6.19			

^c25°, 1.0
 Bibliography: H^+ 82C,82CSV,83LLK; Ni^{2+} 80MS; Cu^{2+} 83LLK; Fe^{3+} 82MSc; Ga^{3+} 82CSV;
 Other references: 66DK,80CS,80YA,81GSS,82NL,83MSK,83SGS



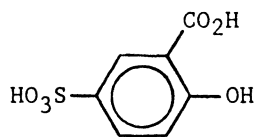
$C_7H_5O_5N$ Nitrosalicylic acid H_2L
 (Other values in Vol.3, p.189 and other references in Vol.3, p.349 and Vol.5, p.471)

<u>Isomer</u>	<u>Metal ion</u>	<u>Equilibrium</u>	<u>Log K</u> <u>25°, 0.1</u>	<u>Log K</u> <u>25°, 0</u>	<u>ΔH</u> <u>25°, 0</u>	<u>ΔS</u> <u>25°, 0</u>
3-Nitro- ($C_7H_5O_5N$)	H^+	HL/H.L	9.87	10.33		
		$H_2L/HL.H$	1.73	1.87		
4-Nitro- ($C_7H_5O_5N$)	H^+	HL/H.L	10.91			
		$H_2L/HL.H$	2.05	2.23		

Nitrosalicylic acid (continued)

Isomer	Metal ion	Equilibrium	Log K	Log K	ΔH	ΔS
			25°, 0.1	25°, 0	25°, 0	25°, 0
5-Nitro- (C ₇ H ₅ O ₅ N)	H ⁺	HL/H.L	9.90 ±0.00	10.34		
		H ₂ L/HL.H	1.94 ±0.04	2.12		
	Cu ²⁺	ML/M.L	8.42 ±0.02	9.24		
		ML ₂ /M.L ²	(14.87) -0.3	(15.43)		
	Fe ³⁺	ML.H/M.HL		3.86		
				3.23 ^c		
6-Nitro- (C ₇ H ₅ O ₅ N)	H ⁺	HL/H.L	9.04			
		H ₂ L/HL.H	1.99	2.24		
3,5-Dinitro (C ₇ H ₄ O ₇ N ₂)	H ⁺	HL/H.L	7.22 ±0.02	7.29 ^h		
		H ₂ L/HL.H	0.27 ±0.02	0.4 ^c ±0.1	(+2) ^s	(8) ^a
	Fe ³⁺	ML.H/M.HL		2.59 ^c		
	Ga ³⁺	ML.H/M.HL	1.41		(+5) ^s	(23) ^a

^a25°,0.2; ^c25°,1.0; ^h20°,0.1; ^s15-35°,0.2
 Bibliography: H⁺ 81LLb,82C,82CSV,83LLK; Cu²⁺ 83LLK; Fe³⁺ 82MSc; Ga³⁺ 80PST,82CSV;
 Other references: 66DK,80Ag,80CS,80MPc.80MS,80PT,80YA,81MGT,81GSS,82SG,82DJ,82GSS,83Ad,83SGS



C ₇ H ₆ O ₆ S		<u>2-Hydroxy-3-sulfobenzoic acid (5-sulfosalicylic acid)</u>				H ₃ L
		(Other values in Vol.3, p.190 and Vol.5, p.337)				
Metal ion	Equilibrium	Log K	Log K	Log K	ΔH	ΔS
		25°, 0.1	25°, 1.0	25°, 0	25°, 0	25°, 0
H ⁺	HL/H.L	11.85 ±0.05	11.52 ^u ±0.05	12.53	(-7) ^s	(31) ^a
		11.53 ^b ±0.06	11.54 ^{d,u}	11.72 ^{e,u} ±0.02	-9.3 ^b	26 ^b
	H ₂ L/HL.H	2.48 ±0.02	2.32 ±0.04	2.84	-0.8	10
		2.34 ^b ±0.04	2.45 ^d	2.63 ^e ±0.04		
Mg ²⁺	ML.H/M.HL	-6.75				
	MHL/M.HL		0.73			
Ca ²⁺	ML.H/M.HL	-8.38				
	MHL/M.HL		0.4			
Ba ²⁺	ML.H/M.HL	-8.77				
Ni ²⁺	ML.H/M.HL	-5.33 ±0.03				
	ML ₂ .H ² /M.(HL) ²	-13.3 ±0.1				
B(III)	M(OH) ₂ L/M(OH) ₃ .HL	0.98 ^h				

^a25°,0.1; ^b25°,0.5; ^d25°,0.2; ^e25°,3.0; ^h20°,0.3; ^s15-40°,0.1;
^uNaClO₄ used as background electrolyte.

5-Sulfosalicylic acid (continued)

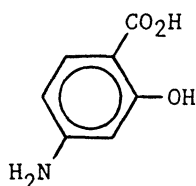
Metal ion	Equilibrium	Log K 25°, 0.1	Log K 25°, 1.0	Log K 25°, 0	ΔH 25°, 0	ΔS 25°, 0
Al ³⁺	ML.H/M.HL	0.4 -0.1 0.31 ^b			(+5) ^s	(19) ^a
	ML ₂ .H ² /M.(HL) ²	-1.9 ^h +0.1 -1.74 ^b				
Ga ³⁺	ML.H/M.HL	0.83				
	ML ₂ .H ² /M.(HL) ²	-0.9				

^a25°, 0.1; ^b25°, 0.5; ^h20°, 0.3; ^s15-40°, 0.1;

Bibliography: H⁺ 82C, 83NC, 84RH;

Mg²⁺-Ba²⁺ 82HN; Ni²⁺ 80MS; Cu²⁺ 80MPa; B(III) 78MB; Al³⁺ 63NA, 67AM, 85CDB; Ga³⁺ 80LM;

Other references: 65PP, 75VD, 77FB, 77PT, 79CPa, 80BL, 80CS, 81DT, 81GSS, 81VS, 82ASb, 82DB, 83MSK, 83SGS, 84Ac, 85SA



C₇H₇O₃N

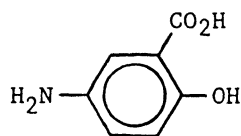
4-Amino-2-hydroxybenzoic acid

H₂L

(Other values in Vol.3, p.194 and other reference in Vol.5, p.471)

Metal ion	Equilibrium	Log K 20°, 0.1
B(III)	M(OH) ₂ L/M(OH) ₃ .HL	1.31

Bibliography: 78MB



C₇H₇O₃N

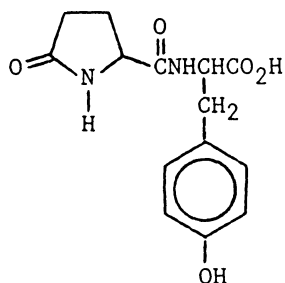
5-Amino-2-hydroxybenzoic acid

H₂L

Metal ion	Equilibrium	Log K 25°, 0.5
H ⁺	HL/H.L	11.54
	H ₂ L/HL.H	5.60
	H ₃ L/H ₂ L.H	2.28
Be ²⁺	ML/M.L	10.77
	ML ₂ /M.L ²	17.53
	MHL/ML.H	5.35
	ML/MOHL.H	7.02
	M ₂ L/ML ³ M	4.80
	M ₃ L ₂ /M ³ .L ²	28.2

Bibliography: 79LK;

Other reference: 83MSK

L-Pyroglutamyl-L-tyrosineH₂LC₁₄H₁₆O₅N₂

Metal

Log K

22°, 0.1ionEquilibriumH⁺

HL/H.L

10.25

H₂L/HL.H

3.60

Cu²⁺

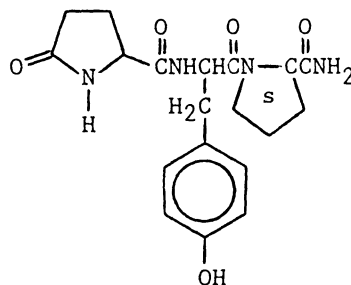
ML/M.L

5.0

ML/M(H₁L).H

6.6

Bibliography: 83FB

L-Pyroglutamyl-L-tyrosyl-L-proline amide

HL

C₁₉H₂₄O₅N₄

Metal

Log K

22°, 0.1ionEquilibriumH⁺

HL/H.L

9.82

Cu²⁺

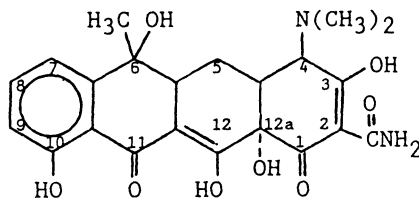
ML/M.L

5.0

ML/M(H₁L).H

6.6

Bibliography: 83FB

TetracyclineH₂LC₂₂H₂₄O₈N₂

(Other reference in Vol.5, p.462)

Metal

Log K

Log K

Log K

25°, 0.137°, 0.1525°, 0ionEquilibriumH⁺

HL/H.L

9.07

9.05

9.69

H₂L/HL.H

7.52

7.27

7.68

H₃L/H₂L.H

3.42

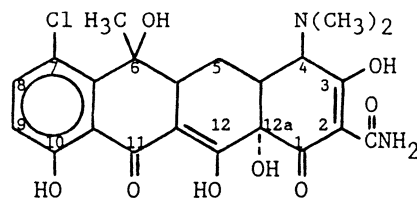
3.17

3.30

Tetracycline (continued)

Metal ion	Equilibrium	Log K 25°, 0.1	Log K 37°, 0.15	Log K 25°, 0
Mg ²⁺	ML/M.L	5.42		
	ML ₂ /M.L ²		8.70	
	MHL/M.HL	3.82	3.61	
	M(HL) ₂ /M.(HL) ²		7.18	
	M(HL) ₂ /MHL ₂ .H		7.68	
	M ₂ L/M ² .L		7.74	
Ca ²⁺	ML/M.L	5.63		
	ML ₂ /M.L ²		8.73	
	M(HL) ₂ /M.(HL) ²		7.44	
	M(HL) ₂ /MHL ₂ .H		7.92	
	M ₂ L/M ² .L		8.67	
Sr ²⁺	ML/M.L	4.08		
Ba ²⁺	ML/M.L	3.12		
Mn ²⁺	MHL/M.HL	4.05		
	MHL/ML.H	7.05		
Co ²⁺	MHL/M.HL	5.54		
	MHL/ML.H	6.57		
Ni ²⁺	MHL/M.HL	5.81		
	MHL/ML.H	5.88		
Cu ²⁺	MHL/M.HL	7.58		
	MHL/ML.H	4.42		
Zn ²⁺	MHL/M.HL	4.55	4.47	
	MHL/ML.H	6.47		
	M(HL) ₂ /M.(HL) ²		9.1	
	MH ₂ L/MHL.H		4.73	
	MH ₃ L ₂ /M(HL) ₂ .H		5.0	
Cd ²⁺	MHL/M.HL	3.32		
	MHL/ML.H	7.21		

Bibliography: H⁺ 56SM, 72DD, 81BBb; Ca²⁺ 72DD, 81BBb; Mg²⁺ 72DD, 83BB;
 Sr²⁺-Cu²⁺, Cd²⁺ 72DD; Zn²⁺ 72DD, 85BL;
 Other references: 56AR, 63DM, 80SGc, 83SCG, 83SSC, 83VJ, 84AJ, 84HV, 85BJ

C₂₂H₂₃O₈N₂Cl

7-Chlorotetracycline (chlorotetracycline)

H₂L

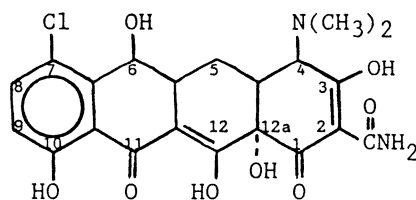
Metal ion	Equilibrium	Log K 25°, 0.1	Log K 37°, 0.15	Log K 25°, 0
H ⁺	HL/H.L	8.77	8.70	9.27
	H ₂ L/HL.H	7.20	7.02	7.44
	H ₃ L/H ₂ L.H	3.26	3.08	3.30

Chlorcycline (continued)

Metal ion	Equilibrium	Log K 25°, 0.1	Log K 37°, 0.15	Log K 25°, 0
Mg ²⁺	ML/M.L	4.68		
	MHL/M.HL	3.34	2.8	
	M(HL) ₂ /M.(HL) ₂		6.60	
Ca ²⁺	ML/M.L	5.94		
	MHL/M.HL	3.82		
	M(HL) ₂ /M.(HL) ₂		7.83	
	MH ₂ L/M.H ₂ L		2.27	
Sr ²⁺	ML/M.L	3.81		
	MHL/M.HL	2.38		
Ba ²⁺	ML/M.L	3.07		
	MHL/M.HL	2.68		
Mn ²⁺	ML/M.L	5.78		
	MHL/M.HL	3.84		
Co ²⁺	ML/M.L	8.24		
	MHL/M.HL	4.62		
Ni ²⁺	ML/M.L	8.87		
	MHL/M.HL	5.36		
Cu ²⁺	ML/M.L	10.71		
	MHL/M.HL	7.46		
Zn ²⁺	ML/M.L	7.09		
	MHL/M.HL	4.33	3.92	
	M(HL) ₂ /M.(HL) ₂		8.63	
Cd ²⁺	ML/M.L	5.12		

Bibliography: H⁺ 56SM, 72DD, 84AJ, 85LBB; Ca²⁺, Mg²⁺ 72DD, 85LBB; Sr²⁺-Cu²⁺, Cd²⁺ 72DD; Zn²⁺ 72DD, 85BL;

Other references: 53A, 56AR, 63DM, 80SGc, 83SCG, 83SSC



C₂₁H₂₂O₈N₂Cl 7-Chloro-6-demethyltetracycline (demethylchlorcycline)

H₂L

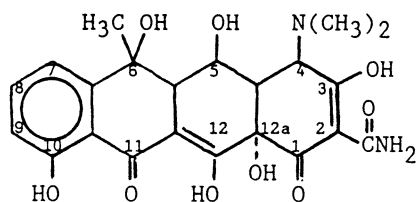
Metal ion	Equilibrium	Log K 25°, 0.1	Log K 37°, 0.15
H ⁺	HL/H.L	8.96	8.70
	H ₂ L/HL.H	6.96	6.64
	H ₃ L/H ₂ L.H	3.46	3.14
Mg ²⁺	ML/M.L	5.15	
	MHL/M.HL	3.47	3.15
	M(HL) ₂ /M.(HL) ₂		6.19
	M(HL) ₂ /MHL ₂ .H		8.2
	M ₂ L/M ² .L		7.61

Demethylchlorcycline (continued)

Metal ion	Equilibrium	Log K 25°, 0.1	Log K 37°, 0.15
Ca ²⁺	ML/M.L	5.52	4.57
	MHL/M.HL	3.29	
	M(HL) ₂ /M.(HL) ₂		6.88
	M(HL) ₂ /MHL ₂ .H		7.92
	M ₂ L/M ² .L		8.34
Sr ²⁺	ML/M.L	4.1	
Ba ²⁺	ML/M.L	3.11	
Mn ²⁺	ML/M.L	6.33	
	MHL/M.HL	3.88	
Co ²⁺	ML/M.L	8.49	
	MHL/M.HL	5.02	
Ni ²⁺	ML/M.L	9.26	
	MHL/M.HL	5.76	
Cu ²⁺	ML/M.L	12.14	
	MHL/M.HL	7.66	
Zn ²⁺	ML/M.L	7.56	
	MHL/M.HL	4.48	3.89
	M(HL) ₂ /M.(HL) ₂		8.02
	M ₂ L/M ² .L		9.92
Cd ²⁺	ML/M.L	4.84	
	MHL/M.HL	3.07	

Bibliography: H⁺ 72DD,84AJ,85LBB; Mg²⁺,Ca²⁺ 72DD,85LBB; Sr²⁺-Cu²⁺,Cd²⁺ 72DD;
Zn²⁺ 72DD,85BL;

Other references: 63DM,80SGc,83SCG,83SSC,85BJ



C₂₂H₂₄O₉N₂

5-Hydroxytetracycline (oxycycline)

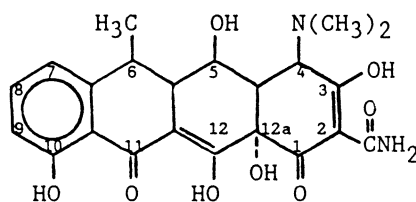
H₂L

Metal ion	Equilibrium	Log K 25°, 0.1	Log K 37°, 0.15	Log K 25°, 0
H ⁺	HL/H.L	8.73	8.67	9.11
	H ₂ L/HL.H	7.25	7.11	7.32
	H ₃ L/H ₂ L.H	3.26	3.22	3.27
Mg ²⁺	ML/M.L	5.19	4.9	
	ML ₂ /M.L ²		9.56	
	M(HL) ₂ /M.(HL) ₂		6.76	
	M(HL) ₂ /MHL ₂ .H		6.67	
	M ₂ L/M ² .L		8.35	
	M ₂ HL/M ₂ L.H		6.62	

Oxycycline (continued)

Metal ion	Equilibrium	Log K 25°, 0.1	Log K 37°, 0.15	Log K 25°, 0
Ca ²⁺	ML/M.L	4.92	4.5	
	ML ₂ /M.L ²		8.39	
	M(HL) ₂ /M.(HL) ²		7.30	
	M(HL) ₂ /MHL ₂ .H		7.98	
	M ₂ L/M ² .L		7.88	
Sr ²⁺	ML/M.L	3.99		
Mn ²⁺	ML/M.L	5.76		
	MHL/M.HL	4.16		
Co ²⁺	ML/M.L	8.02		
	MHL/M.HL	5.01		
Ni ²⁺	ML/M.L	8.50		
	MHL/M.HL	5.69		
Cu ²⁺	ML/M.L	11.85		
	MHL/M.HL	7.83		
Zn ²⁺	ML/M.L	6.69		
	MHL/M.HL	4.73	4.41	
	M(HL) ₂ /M.(HL) ²		8.45	
	MH ₂ L/MHL.H		4.57	
	M(HL) ₂ /MHL ₂ .H		7.12	
	MHL ₂ /ML ₂ .H		8.9	
Cd ²⁺	ML/M.L	4.81		
	MHL/M.HL	3.30		

Bibliography; H⁺ 56SM,72DD,81BBb; Mg²⁺ 72DD,83BB; Ca²⁺ 72DD,81BBb;
 Sr²⁺-Cu²⁺,Cd²⁺ 72DD; Zn²⁺ 72DD,85BL;
 Other references: 53A,56AR,63DM,83SCG,83SSC,84AJ,85BJ

C₂₂H₂₄O₈N₂

6-Deoxy-5-β-hydroxytetracycline (doxycycline)

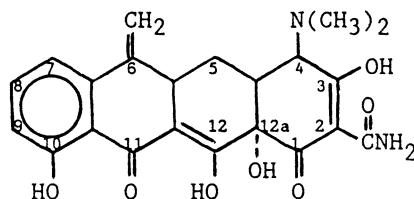
H₂L

Metal ion	Equilibrium	Log K 25°, 0.1	Log K 37°, 0.15
H ⁺	HL/H.L	8.94	8.68
	H ₂ L/HL.H	7.62	7.41
	H ₃ L/H ₂ L.H	3.11	3.10
Mg ²⁺	ML/M.L	6.00	
	MHL/M.HL	3.93	4.31
	M(HL) ₂ /M.(HL) ²		8.20
	M(HL) ₂ /MHL ₂ .H		8.14
	M ₂ L/M ² .L		8.5

Doxycycline (continued)

Metal ion	Equilibrium	Log K 25°, 0.1	Log K 37°, 0.15
Ca ²⁺	ML/M.L		5.60
	MHL/M.HL		5.38
	M(HL) ₂ /M.(HL) ₂		7.91
	M ₂ L/M ² .L		8.9
Sr ²⁺	ML/M.L	4.07	
Ba ²⁺	ML/M.L	2.89	
Mn ²⁺	ML/M.L	6.46	
	MHL/M.HL	4.23	
Co ²⁺	ML/M.L	9.24	
	MHL/M.HL	6.08	
Ni ²⁺	ML/M.L	10.76	
	MHL/M.HL	6.87	
Cu ²⁺	ML/M.L	14.10	
	MHL/M.HL	8.93	
Zn ²⁺	ML/M.L	7.81	7.9
	MHL/M.HL	5.43	
	M(HL) ₂ /M.(HL) ₂		9.81
	M(HL) ₂ /MHL ₂ .H		7.8
	MH ₂ L/M.H ₂ L		2.13
	M(H ₂ L) ₂ /M.(H ₂ L) ₂		4.5
Cd ²⁺	ML/M.L	5.25	

Bibliography: H⁺, Ca²⁺ 72DD, 81BBb; Mg²⁺ 72DD, 83BB; Sr²⁺-Cu²⁺, Cd²⁺ 72DD; Zn²⁺ 72DD, 85BL



Metacycline

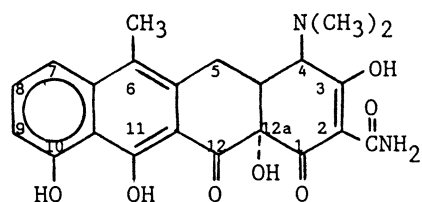
H₂LC₂₂H₂₃O₇N₂

Metal ion	Equilibrium	Log K 25°, 0.1
H ⁺	HL/H.L	8.83
	H ₂ L/HL.H	7.29
	H ₃ L/H ₂ L.H	3.17
Mg ²⁺	ML/M.L	6.00
	MHL/M.HL	3.93
Sr ²⁺	ML/M.L	4.08
Ba ²⁺	ML/M.L	2.86
Mn ²⁺	ML/M.L	6.52
	MHL/M.HL	3.81
Co ²⁺	ML/M.L	9.01
	MHL/M.HL	5.88

Metacycline (continued)

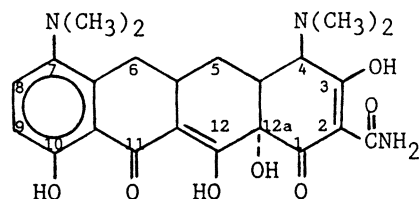
Metal ion	Equilibrium	Log K 25°, 0.1
Ni ²⁺	ML/M.L	10.27
	MHL/M.HL	6.62
Cu ²⁺	MHL/M.HL	8.08
Zn ²⁺	ML/M.L	7.77
	MHL/M.HL	5.31
Cd ²⁺	ML/M.L	5.19

Bibliography: 72DD

AnhydrocyclineC₂₃H₂₄O₈N₂H₂L

Metal ion	Equilibrium	Log K 25°, 0.1
H ⁺	HL/H.L	8.37
	H ₂ L/HL.H	6.21
	H ₃ L/H ₂ L.H	4.08
Mn ²⁺	ML/M.L	4.94
	MHL/M.HL	3.79
Co ²⁺	MHL/M.HL	4.98
Ni ²⁺	MHL/M.HL	5.9
Cu ²⁺	MHL/M.HL	6.8
Zn ²⁺	ML/M.L	5.72
	MHL/M.HL	4.26

Bibliography: 72DD

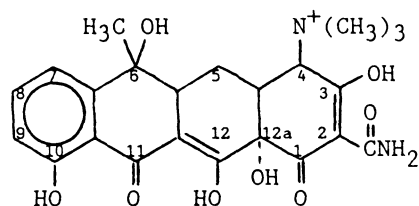
6-Demethyl-6-deoxy-7-(dimethylamino)tetracycline (minocycline)C₂₃H₂₉O₇N₃H₂L

Metal ion	Equilibrium	Log K 37°, 0.15
H ⁺	HL/H.L	8.97
	H ₂ L/HL.H	7.42
	H ₃ L/H ₂ L.H	4.88
	H ₄ L/H ₃ L.H	3.02

Minocycline (continued)

Metal ion	Equilibrium	Log K 37°, 0.15
Mg^{2+}	ML/M.L	5.89
	MHL/M.HL	4.12
	$\text{M}(\text{HL})_2/\text{M}(\text{HL})^2$	8.79
	$\text{MH}_3\text{L}_2/\text{M}(\text{HL})_2\cdot\text{H}$	5.59
	$\text{M}(\text{HL})_2/\text{MHL}^2\cdot\text{H}$	8.72
	$\text{MH}_2\text{L}/\text{M}_2\text{H}_2\text{L}$	2.00
	$\text{M}_2\text{HL}/\text{M}^2\cdot\text{HL}$	6.85
Ca^{2+}	ML/M.L	6.0
	MHL/M.HL	5.21
	$\text{M}(\text{HL})_2/\text{M}(\text{HL})^2$	9.30
Zn^{2+}	MHL/M.HL	5.30
	$\text{M}(\text{HL})_2/\text{M}(\text{HL})^2$	10.29
	$\text{MH}_3\text{L}_2/\text{M}(\text{HL})_2\cdot\text{H}$	5.57
	$\text{MH}_2\text{L}/\text{M}_2\text{H}_2\text{L}$	2.78
	$\text{M}_2\text{HL}/\text{M}^2\cdot\text{HL}$	7.8

Bibliography: H^+ , Ca^{2+} 81BBb; Mg^{2+} 83BB; Zn^{2+} 85BL



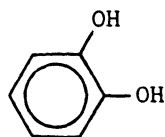
$\text{C}_{23}\text{H}_{25}\text{O}_8\text{N}_2\text{I}^+$

4-N-Methyltetracycline iodide

H_2L^+

Metal ion	Equilibrium	Log K 25°, 0.1
H^+	HL/H.L	7.50
	$\text{H}_2\text{L}/\text{HL}\cdot\text{H}$	3.64
Mg^{2+}	ML/M.L	3.78
	$\text{ML}_2/\text{M}\cdot\text{L}^2$	6.36
Ca^{2+}	ML/M.L	4.0
Mn^{2+}	ML/M.L	4.00
	$\text{ML}_2/\text{M}\cdot\text{L}^2$	7.98
Ni^{2+}	ML/M.L	5.88
Cu^{2+}	ML/M.L	8.02
Zn^{2+}	ML/M.L	4.71
	$\text{ML}_2/\text{M}\cdot\text{L}^2$	9.28

Bibliography: 79DD; Other reference: 85BJ

 $C_6H_6O_2$

1,2-Dihydroxybenzene (catechol)
(Other values in Vol.3, p.200 and Vol.5, p.340)

 H_2L

Metal ion	Equilibrium	Log K <u>25°, 0.1</u>	Log K <u>25°, 1.0</u>	Log K <u>25°, 0</u>	ΔH <u>25°, 0.1</u>	ΔS <u>25°, 0.1</u>
H^+	HL/H.L	(13.3) ± 0.3	13.1 ± 0.0		(-5) ^r	(44)
	$H_2L/HL.H$	9.30 ± 0.10	9.29 ± 0.06	9.45 ± 0.00	-6.0	22
			9.20 ^b ± 0.01	9.46 ^{e,v}		
Th^{4+}	$ML.H^2/M.H_2L$	-4.39				
	$MHL/ML.H$	2.70				
Mn^{2+}	$ML.H^2/M.H_2L$	-14.70 ± 0.05	-14.81			
	$ML_2.H^2/ML.H_2L$	-17.1 ± 0.7	-17.0			
Fe^{2+}	$ML.H^2/M.H_2L$	-14.3	-14.33			
	$ML_2.H^2/ML.H_2L$		-16.7			
	$M_2HL_2.H/M^2.(HL)^2$	10.9				
Co^{2+}	$ML.H^2/M.H_2L$	-13.72 ± 0.05	-13.96			
	$ML_2.H^2/ML.H_2L$	-16.1 ± 0.3	-15.9			
V^{3+}	$ML.H^2/M.H_2L$			(-3.79) ^{e,v}		
	$ML_2.H^4/M.(H_2L)^2$			-12.10 ^{e,v}		
	$MHL.H/M.H_2L$			-1.53 ^{e,v}		
	$MHL_2/ML_2.H$			3.7 ^{e,v}		
	$MH_2L_2/MHL_2.H$			4.1 ^{e,v}		
VO^{2+}	$ML.H^2/M.H_2L$	-5.4 ^h		-5.16		
	$ML_2.H^4/M.(H_2L)^2$	-12.6 ^h		-12.92		
Fe^{3+}	$ML.H^2/M.H_2L$	-2.2	-1.36		(+1) ^s	(-7)
	$ML_2.H^2/ML.H_2L$	-7.53				
	$ML_3.H^2/ML_2.H_2L$	-13.16				
Pb^{2+}	$ML.H^2/M.H_2L$	-2.22				
$B(III)$	$M(OH)_2L.H/M(OH)_3.H_2L$	-5.1 ± 0.1			(+1) ^t	(-20)
	$ML_2.H/M(OH)_3.(H_2L)^2$	-4.8			(+1) ^t	(-19)
$CH_3B(III)$	$MOHL.H/M(OH)_2.H_2L$	-5.8				
$C_6H_5B(III)$	$MOHL.H/M(OH)_2.H_2L$	-4.3				
Al^{3+}	$ML.H^2/M.H_2L$	-6.0 ± 0.2	-6.34 ^b			
	$ML_2.H^2/ML.H_2L$	-9.10 ± 0.08	-9.10 ^b			
	$ML_3.H^2/ML_2.H_2L$	-13.61 ± 0.10	-13.18 ^b			
	$MHL_2/ML_2.H$	6.05 ± 0.02				
	$MHL_3/ML_3.H$	8.05 ± 0.05	8.01 ^b			
	$M_3(OH)_3L_3.H^9/M^3.(H_2L)^3$		(-29.91) ^b			

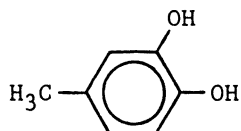
^b25°, 0.5; ^e25°, 3.0; ^h20°, 0.1; ^r15-25°, 0.1; ^s20-30°, 1.0; ^t0-45°, 0.1;

^vK⁺ salt used as background electrolyte.

Catechol (continued)

Bibliography:

H^+ 59MV, 65BL, 70B, 79FL, 79ST, 81AMM, 82PTa, 83OSb, 84BG, 84KMP, 84MM;
 Th^{4+} 70Bc; Pd^{2+} 81CM;
 Mn^{2+}, Co^{2+} 83KGa; B(III), $C_6H_5B(III)$ 77PB;
 V^{3+} 84BG; $CH_3B(III)$ 80BP;
 VO^{2+} 73HMP;
 Fe^{2+} 82PTa; Al^{3+} 83OSb, 84MM, 85KP;
 Other references: 42TC, 57YN, 59LE, 78K, 78MS, 79YK, 80Ca, 80NKL, 81BDb, 82HO, 83RV, 84VSL, 85RRb, 85VS

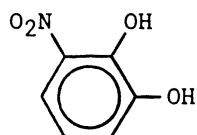
 $C_7H_8O_2$

4-Methyl-1,2-dihydroxybenzene
 (Other values in Vol.5, p.341)

 H_2L

Metal ion	Equilibrium	Log K 25°, 0.1	Log K 20°, 0.1
H^+	HL/H.L	(13.8)	(14.0)
	$H_2L/HL.H$	9.40 $\pm$ 0.02	9.56
B(III)	$M(OH)_2L.H/M(OH)_3.H_2L$	-5.2	
$C_6H_5B(III)$	$MOHL.H/M(OH)_2.H_2L$	-4.5	
3- $NO_2-C_6H_5B(III)$	$MOHL.H/M(OH)_2.H_2L$	-3.3	

Bibliography: H^+ 77PB, 77Sa, 84KMP; B(III), $C_6H_5B(III)$ 77PB; 3- $NO_2-C_6H_5B(III)$ 80BP;
 Other reference: 80NKL

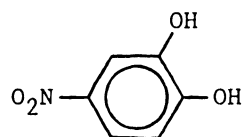
 $C_6H_5O_4N$

3-Nitro-1,2-dihydroxybenzene
 (Other reference in Vol.3, p.350 and other value in Vol.5, p.341)

 H_2L

Metal ion	Equilibrium	Log K 25°, 0.1
H^+	HL/H.L	11.83 -0.4
	$H_2L/HL.H$	6.48 $\pm$ 0.01
Mn^{2+}	ML/M.L	7.22
	$ML_2/M.L^2$	12.5
	$MHL/ML.H$	6.1
Cu^{2+}	ML/M.L	12.30
	$ML_2/M.L^2$	22.33
Zn^{2+}	ML/M.L	8.64
	$ML_2/M.L^2$	15.80

Bibliography: 85Ha;
 Other reference: 59MV

 $C_6H_5O_4N$ 4-Nitro-1,2-dihydroxybenzene H_2L

(Other values in Vol.3, p.203 and Vol.5, p.342)

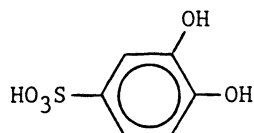
Metal ion	Equilibrium	Log K <u>25°, 0.1</u>	Log K <u>25°, 0.5</u>	Log K <u>25°, 0</u>	ΔH <u>25°, 0.1</u>	ΔS <u>25°, 0.1</u>
H^+	HL/H.L	10.85 ± 0.05	10.68	11.24		
	$H_2L/HL.H$	6.69 ± 0.03	6.68	6.88	-5.7	11
Be^{2+}	ML/M.L	10.36				
	$ML_2/M.L^2$	18.3				
Mg^{2+}	ML/M.L	5.21				
	$ML_2/M.L^2$	8.85				
Ca^{2+}	ML/M.L	5.79				
	$ML_2/M.L^2$	6.4				
Sr^{2+}	ML/M.L	2.81				
	$ML_2/M.L^2$	5.18				
Ba^{2+}	ML/M.L	2.6				
	$ML_2/M.L^2$	4.9				
Mn^{2+}	ML/M.L	6.83	6.51 ^P			
	$ML_2/M.L^2$	11.72	11.25 ^P			
Co^{2+}	ML/M.L	7.48	7.48 ^P			
	$ML_2/M.L^2$	12.72	12.79 ^P			
	$ML_3/M.L^3$		15.9 ^P			
Ni^{2+}	ML/M.L	7.90 ± 0.01	7.82 ^P			
	$ML_2/M.L^2$	13.3 ± 0.1	13.1 ^P			
	$ML_3/M.L^3$		16.9 ^P			
Cu^{2+}	ML/M.L	11.69 ± 0.02	11.65 ^P			
	$ML_2/M.L^2$	21.0 ± 0.1	20.9 ^P			
Fe^{3+}	ML/M.L	15.53				
	$ML_2/M.L^2$	28.6				
Zn^{2+}	ML/M.L	8.25	8.20 ^P			
	$ML_2/M.L^2$	14.8	15.0 ^P			
Cd^{2+}	ML/M.L	6.50				
	$ML_2/M.L^2$	11.28				
B(III)	$M(OH)_2L.H/M(OH)_3.H_2L$	-3.9 ± 0.1				
		-4.0 ^h				
$CH_3B(III)$	$MOHL.H/M(OH)_2.H_2L$	-4.4				
$C_6H_5B(III)$	$MOHL.H/M(OH)_2.H_2L$	-3.0				
3- NO_2 - $C_6H_5B(III)$	$MOHL.H/M(OH)_2.H_2L$	-1.8				

 $^h_{20^\circ, 0.1}; ^P_{30^\circ, 0.1}$

4-Nitro-1,2-dihydroxybenzene (continued)

Metal ion	Equilibrium	Log K 25°, 0.1	Log K 25°, 0.5	Log K 25°, 0	ΔH 25°, 0.1	ΔS 25°, 0.1
Al ³⁺	ML/M.L	13.74				
	ML ₂ /M.L ₂	25.4				
	ML ₃ /M.L ₃	34.3				

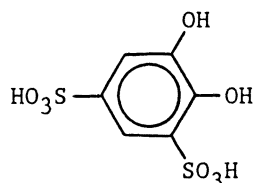
Bibliography: H⁺ 59MV,84H; Be²⁺,Cd²⁺,Al³⁺ 84Hb; Mg²⁺-Ba²⁺ 85H; Mn²⁺-Ni²⁺,Fe³⁺ 84Ha;
Cu²⁺,Zn²⁺ 84H; B(III),C₆H₅B(III) 77PB; CH₃B(III),3-NO₂-C₆H₅B(III) 80BP;
Other references: 80NKL,81BD



C₆H₆O₅S 1,2-Dihydroxybenzene-4-sulfonic acid H₃L
(Other values in Vol.3, p.204)

Metal ion	Equilibrium	Log K 20°, 0.1	Log K 30°, 0.1
H ⁺	HL/H.L	(12.8)	(12.16)
	H ₂ L/HL.H	8.50	8.26
Th ⁴⁺	ML.H ² /M.H ₂ L	-3.50	
	MHL/ML.H	2.13	

Bibliography: 70B



C₆H₆O₈S₂ 1,2-Dihydroxybenzene-3,5-disulfonic acid (tiron) H₄L
(Other values in Vol.3, p.205 and Vol.5, p.342)

Metal ion	Equilibrium	Log K 25°, 0.1	Log K 25°, 1.0	Log K 25°, 0	ΔH 25°, 0.1	ΔS 25°, 0.1
H ⁺	HL/H.L	(12.5) ±0.1	11.7 ±0.1	(13.3)		
		11.8 ^b ±0.1	11.6 ^d			
	H ₂ L/HL.H	7.62 ±0.07 7.26 ^b ±0.05	7.15 ±0.1 7.15 ^d	8.31	-5.0	18
Mn ²⁺	ML.H ² /M.H ₂ L	-11.78	(-11.88)	-11.58		
	ML ₂ .H ₂ ² /ML.H ₂ L	-14.6	(-12.5)			
	ML ₃ .H ₂ ² /ML ₂ .H ₂ L	-20.3	(-15.5)			
	MHL/ML.H	7.00	6.68	7.40		
Co ²⁺	ML.H ² /M.H ₂ L	-10.76 ±0.05 -10.77 ^h	-10.57	-10.56		
	ML ₂ .H ₂ ² /ML.H ₂ L	-13.4	-12.5			
	MHL/ML.H	6.28 ±0.0 6.19 ^h		6.68		

^b25°,0.5; ^d25°,2.0; ^h20°,0.1

Tiron (continued)

Metal ion	Equilibrium	Log K 25°, 0.1	Log K 25°, 1.0	Log K 25°, 0	ΔH 25°, 0.1	ΔS 25°, 0.1
Ni ²⁺	ML.H ² /M.H ₂ L	-10.33 ±0.01 -10.30 ^h	-10.20	-10.13		
	ML ₂ .H ² /ML.H ₂ L	-13.1	-12.4			
	MHL/ML.H	5.80 5.64 ^h	5.3	6.20		
Cu ²⁺	ML.H ² /M.H ₂ L	-5.87 ±0.09 (-5.73) ^h	-6.00	-5.67		
	ML ₂ .H ² /ML.H ₂ L	-8.9 ±0.4	-7.8			
	MHL/ML.H	3.27 (3.55) ^h		3.67		
Fe ³⁺	ML.H ² /M.H ₂ L	+0.15 ±0.08 +0.54 ^h 0.0 ^b	+0.10 ±0.06			
	ML ₂ .H ² /ML.H ₂ L	-5.3 ±0.1 -5.0 ^h -4.4 ^b	-4.1 ±0.0			
	ML ₃ .H ² /ML ₂ .H ₂ L	-10.1 ±0.2 -9.2 ^h -8.1 ^b	-7.4 ±0.2			
	MHL/ML.H	9.7 9.4 ^h 9.1 ^b	9.1			
Zn ²⁺	ML.H ² /M.H ₂ L	-9.88 ±0.07 -9.85 ^h -9.88 ^b	-9.76	-9.68		
	ML ₂ .H ² /ML.H ₂ L	-11.7 ±0.3 -11.2 ^b	-10.8			
	MHL/ML.H	5.63 ±0.07 5.49 ^h		6.03		
Cd ²⁺	ML.H ² /M.H ₂ L	-11.30 ±0.02 -11.34 ^b	-11.07	-11.10		
	ML ₂ .H ² /ML.H ₂ L	-14.1 -13.4 ^b	-13.2			
	MHL/ML.H	6.61		7.01		
Ga ³⁺	ML.H ² /M.H ₂ L	-0.93 -1.18 ^b			(+2) ^s	(1) ^b
	ML ₂ .H ² /ML.H ₂ L	-4.51				
	ML ₃ .H ² /ML ₂ .H ₂ L	-9.47				

^b25°, 0.5; ^h20°, 0.1; ^s15-35°, 0.5

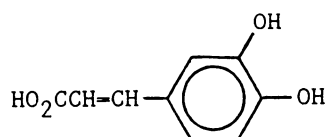
Bibliography:

H⁺ 80IM, 80LR, 85BCa;

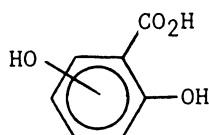
Mn²⁺-Cu²⁺, Zn²⁺, Cd²⁺ 83OZ, 84BSa, 85BCa;

Ga³⁺ 80LM, 84YI;

Other references: 69K, 74RD, 79BM, 80BDa, 80BDb, 80Ca, 81NN, 84KJ, 84PGb, 85LY



$C_9H_8O_4$		<u>trans-3-(3,4-Dihydroxyphenyl)propenoic acid (caffeic acid)</u>		H_3L
		(Other reference in Vol.3, p.350)		
Metal ion	Equilibrium	Log K 25°, 0.1	Log K 25°, 0	
H^+	$H_2L/HL.H$	8.69 ± 0.03	9.07	
	$H_3L/H_2L.H$	4.43 ± 0.02	4.62	
Cu^{2+}	$ML.H^2/M.H_2L$	-7.61		
	$ML_2.H^2/ML.H_2L$	-10.57	-12.1	
	$MHL/ML.H$	4.98		
Bibliography: H^+ 85BCa, 85LV; Cu^{2+} 85BCa				



C ₇ H ₆ O ₄		Hydroxysalicylic acid				H ₃ L
(Other values in Vol.3, p.208-209 and Vol.5, p.345-346)						
Isomer	Metal ion	Equilibrium	Log K 25°, 0.1	Log K 25°, 0	ΔH 25°, 0	ΔS 25°, 0.1
3-Hydroxy- (2-pyrocatechuic acid)	H ⁺	HL/H.L	(13.1)			
		H ₂ L/HL.H	10.06			
		H ₃ L/H ₂ L.H	2.70		-0.57	10
4-Hydroxy- (β-resorcylic acid)	H ⁺	HL/H.L		(13.37) ^b		
		H ₂ L/HL.H	8.60	8.56 ^b	-6.9 ^b	16 ^b
		H ₃ L/H ₂ L.H	3.13 ±0.03	3.12 ^b	-0.45	13
				3.19 ^c		
5-Hydroxy- (gentisic acid)	H ⁺	HL/H.L		(12.74) ^b		
		H ₂ L/HL.H	10.30 ^h	10.00 ^b		
		H ₃ L/H ₂ L.H	2.70	2.73 ^b	-0.39	11
6-Hydroxy- (γ-resorcylic acid)	H ⁺	HL/H.L		(13.28) ^b		
		H ₂ L/HL.H		12.57 ^b		
		H ₃ L/H ₂ L.H	(1.1)	(1.2) ^b	-0.14	4
				(1.0) ^c		
	Fe ³⁺	MHL.H/M.H ₂ L	2.76	2.35 ^c		
	M(HL) ₂ .H ² /M.(H ₂ L) ₂	4.0				

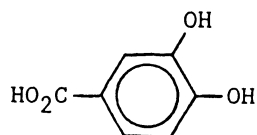
^b25°, 0.5; ^c25°, 1.0; ^h20°, 0.1

Bibliography:

H^+ 80LSP, 82MSc, 84RC, 84RCa, 84RCb, 85RTO;

Fe^{3+} 82MSc;

Other references: 66DK, 67MI, 82DJ, 82HO, 85CDB

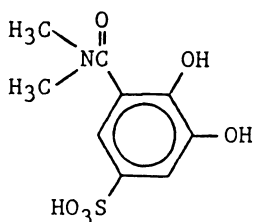
 $C_7H_6O_4$ 3,4-Dihydroxybenzoic acid (protocatechuic acid) H_3L

(Other values in Vol.3, p.209 and other references in Vol.5, p.347)

Metal ion	Equilibrium	Log K 25°, 0.1	Log K 25°, 1.0	ΔH 25°, 0.1	ΔS 25°, 0.1
H^+	HL/H.L	(13.0) ± 0.1	(12.8)	(-9) ^s	(29)
	H ₂ L/HL.H	8.79 ± 0.07	8.68	(-7) ^s	(17)
	H ₃ L/H ₂ L.H	4.35 ± 0.05	4.34		
Fe^{3+}	ML.H ² /M.H ₂ L	-2.33			
	ML ₂ .H ² /ML.H ₂ L	-7.51			
	ML ₃ .H ² /ML ₂ .H ₂ L	-13.13			
	ML/MOHL.H	4.86			
	ML ₂ /MOHL ₂ .H	8.1			
	MHL/ML.H	4.70			
	MH ₂ L/MHL.H	(2.1)			
Al^{3+}	ML.H ² /M.H ₂ L	-4.96			
	ML ₂ .H ² /ML.H ₂ L	-8.82			
	ML ₃ .H ² /ML ₂ .H ₂ L	-13.07			
	ML/MOHL.H	5.77			
	ML ₂ /MOHL ₂ .H	8.39			
	MHL/ML.H	4.66			
	MH ₂ L/MHL.H	(3.2)			

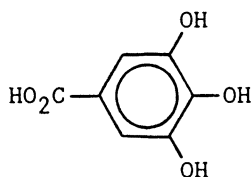
^s1-45°, 0.1Bibliography: H^+ 77Sa, 84KMP; Fe^{3+} , Al^{3+} 85KP;

Other references: 67MI, 80NKL, 81AMM, 81CP, 81CPa, 82HO, 82PTa, 85CDB

 $C_9H_{11}O_6NS$ N,N-Dimethyl-2,3-dihydroxy-5-sulfobenzamide H_3L

Metal ion	Equilibrium	Log K 25°, 0.1
H^+	H ₂ L/HL.H	7.26
Fe^{3+}	ML.H/M.HL	7.23
	ML ₂ .H/ML.HL	1.81
	ML ₃ .H/ML ₂ .HL	-3.2
Ga^{3+}	ML.H/M.HL	4.0
	ML ₂ .H/ML.HL	2.0
	ML ₃ .H/ML ₂ .HL	-2.3
In^{3+}	ML.H/M.HL	3.5
	ML ₂ .H/ML.HL	1.4
	ML ₃ .H/ML ₂ .HL	-2.6

Bibliography: H^+ , Fe^{3+} 81HR; Ga^{3+} , In^{3+} 82PW

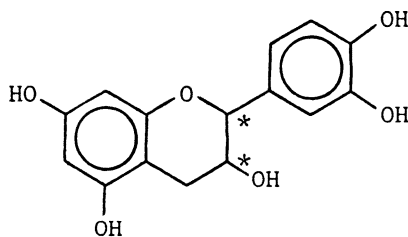
 $C_7H_6O_5$ 3,4,5-Trihydroxybenzoic acid (gallic acid) H_4L

(Other values in Vol.3, p.213 and other references in Vol.5, p.472)

Metal ion	Equilibrium	Log K 25°, 0.1	Log K 25°, 1.0	Log K 25°, 0
H^+	$H_2L/HL.H$	11.38		
		$11.45^h \pm 0.0$	11.08^b	
	$H_3L/H_2L.H$	8.64 ± 0.09	8.52	9.11
		$8.69^h \pm 0.01$	$8.47^b \pm 0.03$	
Fe^{2+}	$H_4L/H_3L.H$	$4.27 - 0.1$	4.25	4.43
		4.26^h	$4.18^b \pm 0.03$	
	$MHL/M.HL$	7.00		
Al^{3+}	$M_2HL_2.H/M^2.(HL)^2$	9.0		
	$MHL/M.HL$		14.24^b	
	$M(HL)_2/M.(HL)^2$		25.36^b	
	$M(HL)_3/M.(HL)^3$		33.32^b	
	$MH_2L/MHL.H$		4.50^b	
	$M_2(HL)_3/M(HL)_3.M$		9.88^b	
	$M_2(H_2L)(HL)_2/M_2(HL)_3.H$		5.16^b	
	$M_2(HL)_3/M_2(HL)_2L.H$		5.06^b	
	$M_2(HL)_2L/M_2(HL)_2L.H$		6.69^b	
	$M_3(OH)_4H_2L.H^4/M^3.H_2L$		-8.37^b	
	$M_4L_3/M^4.L^3$		50.77^b	
	$M.L/ML.4H_2O(s)$		-17.5^b	

 $^b_{25^\circ, 0.6}$; $^h_{20^\circ, 0.1}$ Bibliography: H^+ 77Sa, 81OS, 82PTa; Fe^{2+} 82PTa; Al^{3+} 81OS, 82OS;

Other references: 80NKL, 81AMM, 84EF, 85SCa

 $C_{15}H_{14}O_6$ 2-(3,4-Dihydroxyphenyl)-2H-1-benzopyran-3,5,7-triol H_4L

Isomer	Metal ion	Equilibrium	Log K 25°, 0.1	Log K 20°, 0.1
2R,3S- (catechin) (Other reference in Vol.5, p.361)	H^+	$HL/H.L$	(13.26)	(13.25)
		$H_2L/HL.H$	11.26	11.18
		$H_3L/H_2L.H$	9.41	9.44
		$H_4L/H_3L.H$	8.64	8.79
	Al^{3+}	$MH_2L/M.H_2L$	17.10	
		$M(H_2L)_2/M.(H_2L)^2$	30.99	
		$M(H_2L)_3/M.(H_2L)^3$	40.92	
		$MH_2L/M(OH)H_2L.H$	5.98	
		$M(H_2L)_2/M(OH)(H_2L)_2.H$	8.22	

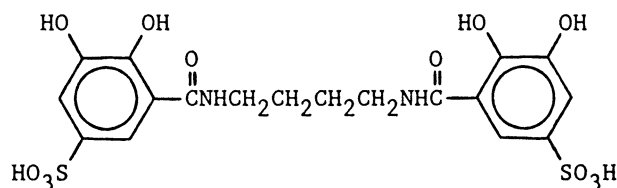
2-(3,4-Dihydroxyphenyl)-2H-1-benzopyran-3,5,7-triol (continued)

<u>Isomer</u>	<u>Metal ion</u>	<u>Equilibrium</u>	<u>Log K</u> <u>25°, 0.1</u> <u>(13.40)</u>	<u>Log K</u> <u>20°, 0.1</u>
2R,3R- (epicatechin)	H^+	HL/H.L	(13.40)	
		$H_2L/HL.H$	11.23	
		$H_3L/H_2L.H$	9.49	
		$H_4L/H_3L.H$	8.72	
Epicatechin dimer ($4\beta \rightarrow 8$) ($C_{30}H_{26}O_{12}$)	H^+	$H_6L/H_5L.H$	9.61	
		$H_7L/H_6L.H$	9.52	
		$H_8L/H_7L.H$	8.59	
H_8L	Al^{3+}	$MH_6L.H^2/M_2H_8L$	-5.54	
		$M(H_6L)_2.H^2/MH_6L.H_8L$	-8.40	
		$MH_6L/M(OH)H_6L.H$	6.13	

Bibliography:

 H^+ 77Sa, 84KMP, 85KPa; Al^{3+} 85KP, 85KPa;

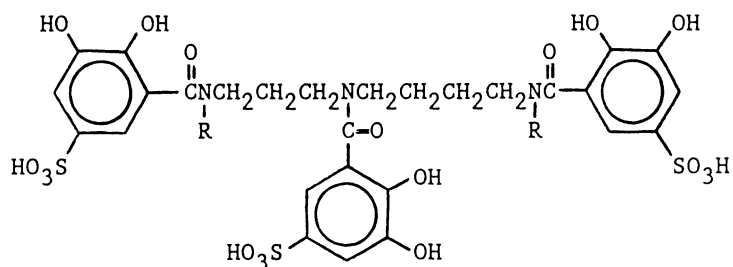
Other reference: 85CDB



$C_{18}H_{20}O_{12}N_2S_2$ 1,6-Bis(2,3-dihydroxy-5-sulfobenzoyl)-1,6-diazahexane (4-LICAMS) H_6L

<u>Metal ion</u>	<u>Equilibrium</u>	<u>Log K</u> <u>25°, 0.1</u>
H^+	$H_3L/H_2L.H$	6.61
	$H_4L/H_3L.H$	5.96
Co^{2+}	$ML.H^2/M.H_2L$	-9.4
Ni^{2+}	$ML.H^2/M.H_2L$	-9.0
Cu^{2+}	$ML.H^2/M.H_2L$	-1.8
Fe^{3+}	$ML.H^2/M.H_2L$	4.4
	$MHL_2/ML.HL$	13.7
	$MH_2L_2/MHL_2.H$	7.2
	$M_2L_3.H^6/M^2.(H_2L)^3$	7
Zn^{2+}	$ML.H^2/M.H_2L$	-7.37

Bibliography: 82KRB

 $C_xH_yO_zN_3S_q$

1,10-Disubstituted-1,5,10-tris(2,3-dihydroxy-5-sulfo-4-oxobenzoyl)-1,5,10-triazadecane

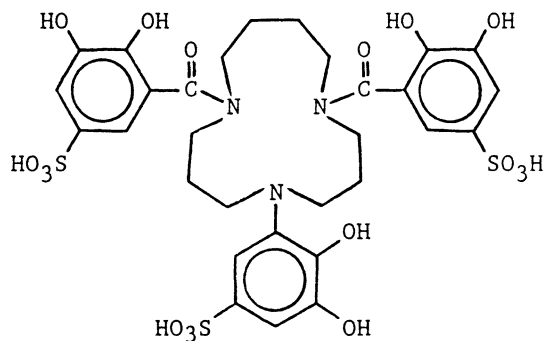
 H_9L

Ligand	Metal ion	Equilibrium	Log K 25°, 0.1
R= H	H^+	$H_4L/H_3L.H$	8.28
1,5,10-Tris-		$H_5L/H_4L.H$	7.07
		$H_6L/H_5L.H$	6.11
(3,4-LIGAMS)	Fe^{3+}	$ML.H^3/M.H_3L$	6.4
		$MHL/ML.H$	5.85
$(C_{27}H_{31}O_{18}N_3S_3)$		$MH_2L/MHL.H$	5.32
		$MH_3L/MH_2L.H$	3.05
	Ga^{3+}	$ML.H^3/M.H_3L$	3.6
		$MH_2L/ML.H^2$	10.2
	In^{3+}	$ML.H^3/M.H_3L$	4.3
		$MHL/ML.H$	5.66
		$MH_2L/MHL.H$	5.29
R= $CH(CH_3)_2$	H^+	$H_4L/H_3L.H$	8.50
1,10-Di-2-propyl-		$H_5L/H_4L.H$	7.78
		$H_6L/H_5L.H$	7.13
$(C_{33}H_{43}O_{18}N_3S_3)$	Fe^{3+}	$ML.H^3/M.H_3L$	5.4
		$MH_2L/ML.H^2$	12.66
	Ga^{3+}	$ML.H^3/M.H_3L$	(1)
		$MH_2L/ML.H^2$	12.1
R= C_6H_{11}	H^+	$H_4L/H_3L.H$	8.49
1,10-Dicyclohexyl-		$H_5L/H_4L.H$	7.77
		$H_6L/H_5L.H$	7.05
$(C_{39}H_{51}O_{18}N_3S_3)$	Fe^{3+}	$ML.H^3/M.H_3L$	4.9
		$MHL/ML.H$	6.68
		$MH_2L/MHL.H$	6.02
		$MH_3L/MH_2L.H$	3.62
	Ga^{3+}	$ML.H^3/M.H_3L$	(0)
		$MH_2L/ML.H^2$	12.0
R= $CH_2C_6H_4SO_3H$	H^+	$H_4L/H_3L.H$	8.51
1,10-Bis(3-sulfo- benzyl)-		$H_5L/H_4L.H$	7.84
		$H_6L/H_5L.H$	7.03
$(C_{41}H_{45}O_{24}N_3S_5)$	Fe^{3+}	$ML.H^3/M.H_3L$	7.0
		$MHL/ML.H$	6.48
$H_{11}L$		$MH_2L/MHL.H$	4.65
		$MH_3L/MH_2L.H$	3.41

1,10-Bis(3-sulfobenzyl)-3,4-LICAMS (continued)

<u>Ligand</u>	<u>Metal ion</u>	<u>Equilibrium</u>	<u>Log K</u> <u>25°, 0.1</u>
	Ga^{3+}	$\text{ML.H}^3/\text{M.H}_3\text{L}$	(1)
		$\text{MHL}/\text{ML.H}$	6.6
		$\text{MH}_2\text{L}/\text{MHL.H}$	4.8
		$\text{MH}_3\text{L}/\text{MH}_2\text{L.H}$	3.3

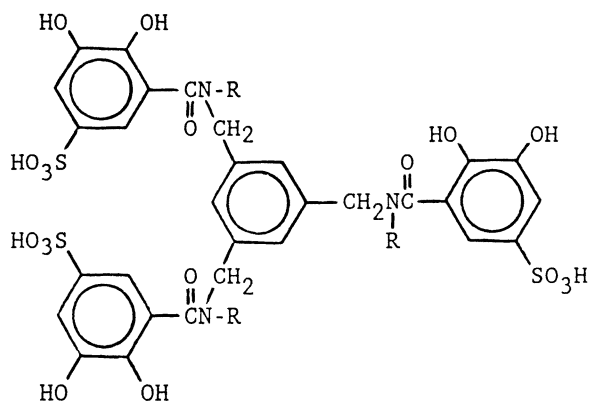
Bibliography: H^+ , Fe^{3+} 81HR, 85KPR; Ga^{3+} 82PW, 85KPR; In^{3+} 82PW



$\text{C}_{31}\text{H}_{35}\text{O}_{18}\text{N}_3\text{S}_3$ 1,5,9-Tris(2,3-dihydroxy-5-sulfobenzoyl)-1,5,9-triazacyclotridecane H_9L
(3,3,4-CYCAMS)

<u>Metal ion</u>	<u>Equilibrium</u>	<u>Log K</u> <u>25°, 0.1</u>
H^+	$\text{H}_4\text{L}/\text{H}_3\text{L.H}$	8.56
	$\text{H}_5\text{L}/\text{H}_4\text{L.H}$	7.80
	$\text{H}_6\text{L}/\text{H}_5\text{L.H}$	7.01
Fe^{3+}	$\text{ML.H}^3/\text{M.H}_3\text{L}$	3.4
	$\text{MHL}/\text{ML.H}$	6.78
	$\text{MH}_2\text{L}/\text{MHL.H}$	5.74
	$\text{MH}_3\text{L}/\text{MH}_2\text{L.H}$	5.54
	$\text{MH}_4\text{L}/\text{MH}_3\text{L.H}$	2.3

Bibliography: 81HR



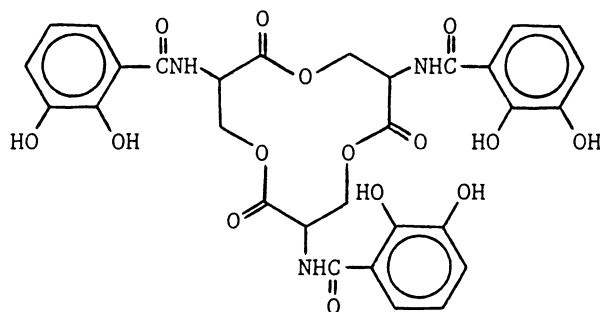
$\text{C}_x\text{H}_y\text{O}_z\text{N}_3\text{S}_3$ 1,3,5-Tris(N-substituted-2,3-dihydroxy-5-sulfobenzoylaminomethyl)benzene H_9L

<u>Ligand</u>	<u>Metal ion</u>	<u>Equilibrium</u>	<u>Log K</u> <u>25°, 0.1</u>
$\text{R} = \text{H}$	H^+	$\text{H}_4\text{L}/\text{H}_3\text{L.H}$	7.26
(MECAMS)		$\text{H}_5\text{L}/\text{H}_4\text{L.H}$	6.44
$(\text{C}_{30}\text{H}_{27}\text{O}_{18}\text{N}_3\text{S}_3)$		$\text{H}_6\text{L}/\text{H}_5\text{L.H}$	5.88

MECAMS (continued)

Ligand	Metal ion	Equilibrium	Log K 25°, 0.1
R= CH ₃ N-methyl- (C ₃₃ H ₃₃ O ₁₈ N ₃ S ₃)	Mg ²⁺	MH ₂ L.H/M.H ₃ L	-6.6
		MH ₂ L/MHL.H	5.6
	Co ²⁺	MH ₂ L.H/M.H ₃ L	-0.6
		MH ₂ L/MHL.H	7.6
	Ni ²⁺	MH ₂ L.H/M.H ₃ L	-0.33
		MH ₂ L/MHL.H	7.7
	Cu ²⁺	MH ₂ L.H/M.H ₃ L	7.71
		MH ₂ L/MHL.H	6.33
	Fe ³⁺	ML.H ³ /M.H ₃ L	6.8
		MHL/ML.H	5.74
		MH ₂ L/MHL.H	4.10
		MH ₃ L/MH ₂ L.H	3.46
	Zn ²⁺	MH ₂ L.H/M.H ₃ L	2.41
		MH ₂ L/MHL.H	6.8
	Ga ³⁺	ML.H ³ /M.H ₃ L	3.5
		MHL/ML.H	5.7
		MH ₂ L/MHL.H	4.9
	In ³⁺	ML.H ³ /M.H ₃ L	4.7
		MHL/ML.H	4.92
		MH ₂ L/MHL.H	4.70
R= CH(CH ₃) ₂ N-2-propyl- (C ₃₉ H ₄₅ O ₁₈ N ₃ S ₃)	H ⁺	H ₄ L/H ₃ L.H	8.52
		H ₅ L/H ₄ L.H	7.57
		H ₆ L/H ₅ L.H	6.72
	Fe ³⁺	ML.H ³ /M.H ₃ L	5.21
		MHL/ML.H	6.61
		MH ₂ L/MHL.H	5.80
	Ga ³⁺	H ₄ L/H ₃ L.H	8.61
		H ₅ L/H ₄ L.H	7.85
		H ₆ L/H ₅ L.H	6.60
		ML.H ³ /M.H ₃ L	4.2
		MHL/ML.H	7.85
		MH ₂ L/MHL.H	6.07
		MH ₃ L/MH ₂ L.H	3.84
R= C(CH ₃) ₃ N-acetyl- (C ₃₆ H ₃₃ O ₂₁ N ₃ S ₃)	H ⁺	ML.H ³ /M.H ₃ L	(-1)
		MHL/ML.H	7.20
		MH ₂ L/MHL.H	5.8
	Fe ³⁺	MH ₃ L/MH ₂ L.H	3.1
		H ₄ L/H ₃ L.H	9.3
		H ₅ L/H ₄ L.H	8.4
		H ₆ L/H ₅ L.H	7.7
	Fe ³⁺	ML.H ³ /M.H ₃ L	4.0
		MH ₂ L/ML.H ²	14.48

Bibliography; H⁺, Fe³⁺ 81HR, 81PW, 85KPc;
Mg²⁺-Cu²⁺, Zn²⁺ 82KRb; Ga³⁺ 82PW, 85KPc; In³⁺ 82PW

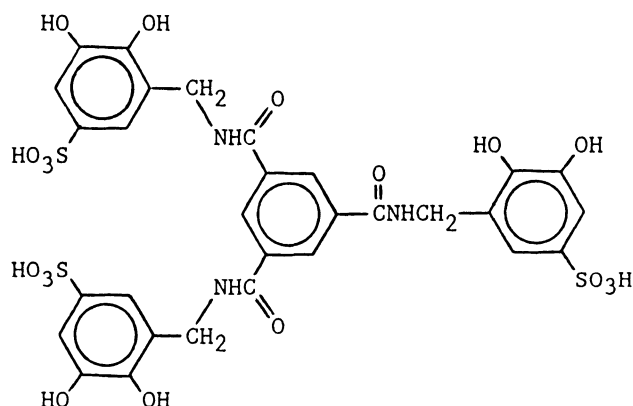
 $C_{30}H_{33}O_{15}N_3$

N,N',N''-Tris(2,3-dihydroxybenzoyl)cyclo(serylserylseryl)
(enterobactin)

 H_6L

Metal ion	Equilibrium	Log K 25°, 0.1	Log K 22°, 0.4
Fe^{2+}	ML.H ⁶ /M.H ₆ L		-39.5
	MHL/ML.H		10.4
	MH ₃ L/MHL.H ²		14.6
Fe^{3+}	ML.H ⁶ /M.H ₆ L	-9.7	
	MHL/ML.H	4.80	
	MH ₂ L/MHL.H	3.15	

Bibliography: Fe^{2+} 85LE; Fe^{3+} 79HCC

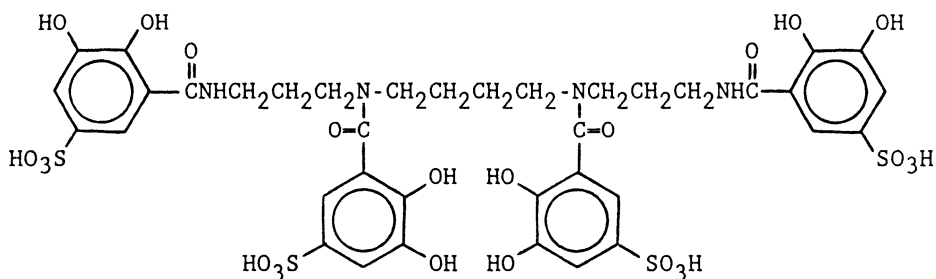
 $C_{30}H_{27}O_{18}N_3S_3$

1,3,5-Tris(2,3-dihydroxy-5-sulfobenzylaminocarbonyl)benzene
(TRIMCAMS)

 H_9L

Metal ion	Equilibrium	Log K 25°, 0.1
H^+	H ₄ L/H ₃ L.H	8.72
	H ₅ L/H ₄ L.H	8.16
	H ₆ L/H ₅ L.H	7.53
Fe^{3+}	ML.H ³ /M.H ₃ L	4.4
	MH ₂ L/ML.H ²	13.66

Bibliography: 81HR

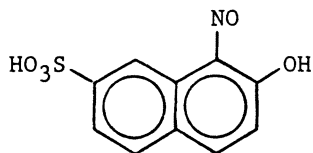
C₃₈H₄₂O₂₄N₄S₄

1,5,10,14-Tetrakis(2,3-dihydroxy-5-sulfobenzoyl)-
1,5,10,14-tetraazatetradecane (3,4,3-LICAMS)

H₁₂L

Metal ion	Equilibrium	Log K 25°, 0.1
H ⁺	H ₅ L/H ₄ L.H	8.26
	H ₆ L/H ₅ L.H	7.62
	H ₇ L/H ₆ L.H	6.69
	H ₈ L/H ₇ L.H	6.13
Mg ²⁺	MH ₄ L/M.H ₄ L	4.5
	MH ₄ L/MH ₃ L.H	8.0
	MH ₃ L/MH ₂ L.H	8.2
	M ₂ L.H ⁴ /M ² .H ₄ L	-26.1
Ca ²⁺	MH ₄ L/M.H ₄ L	2.89
	MH ₄ L/MH ₃ L.H	9.03
	MH ₃ L/MH ₂ L.H	9.74
	M ₂ L.H ⁴ /M ² .H ₄ L	-29.8
Co ²⁺	MH ₄ L/M.H ₄ L	7.24
	MH ₄ L/MH ₃ L.H	8.0
	MH ₃ L/MH ₂ L.H	7.5
	M ₂ L.H ⁴ /M ² .H ₄ L	-18.1
Ni ²⁺	MH ₄ L/M.H ₄ L	7.42
	MH ₄ L/MH ₃ L.H	8.0
	MH ₃ L/MH ₂ L.H	7.5
	M ₂ L.H ⁴ /M ² .H ₄ L	-17.8
Cu ²⁺	MH ₄ L/M.H ₄ L	14.8
	MH ₄ L/MH ₃ L.H	8.1
	MH ₃ L/MH ₂ L.H	6.7
	M ₂ L.H ⁴ /M ² .H ₄ L	-2.2
Zn ²⁺	MH ₄ L/M.H ₄ L	8.75
	MH ₄ L/MH ₃ L.H	7.9
	MH ₃ L/MH ₂ L.H	7.0
	M ₂ L.H ⁴ /M ² .H ₄ L	-4.2

Bibliography: 82KRb; Other reference: 85KNR

C₁₀H₇O₅NS

1-Nitroso-2-naphthol-7-sulfonic acid
 (Other values in Vol.3, p.227)

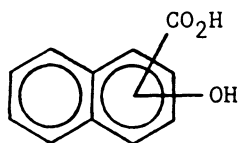
H₂L

Metal ion	Equilibrium	Log K 25°, 0.1
H ⁺	HL/H.L	7.31

1-Nitroso-2-naphthol-7-sulfonic acid (continued)

Metal ion	Equilibrium	Log K 25°, 0.1
Y ³⁺	ML/M.L	4.28
La ³⁺	ML/M.L	3.75
	ML ₂ /M.L ²	7.23
Ce ³⁺	ML/M.L	4.09
	ML ₂ /M.L ²	7.76
Pr ³⁺	ML/M.L	4.32
	ML ₂ /M.L ²	7.98
Nd ³⁺	ML/M.L	4.49
	ML ₂ /M.L ²	8.10
Sm ³⁺	ML/M.L	4.60
	ML ₂ /M.L ²	8.29
Eu ³⁺	ML/M.L	4.56
	ML ₂ /M.L ²	8.23
Gd ³⁺	ML/M.L	4.43
	ML ₂ /M.L ²	7.98
Tb ³⁺	ML/M.L	4.42
Dy ³⁺	ML/M.L	4.36
Ho ³⁺	ML/M.L	4.32
Er ³⁺	ML/M.L	4.30
Tm ³⁺	ML/M.L	4.26
Yb ³⁺	ML/M.L	4.39
Lu ³⁺	ML/M.L	4.33

Bibliography: 79LSM

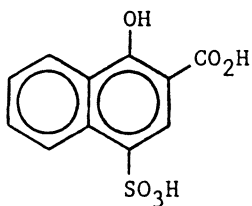


C₁₁H₈O₃ Hydroxynapthoic acid H₂L
 (Other values in Vol.3, p.232 and other references in Vol.3, p.362)

Ligand	Metal ion	Equilibrium	Log K 25°, 0.1	Log K 25°, 0
1-Hydroxy-2-	B(III)	M(OH) ₂ L/M(OH) ₃ .HL	1.31 ^h	
2-Hydroxy-1-	B(III)	M(OH) ₂ L/M(OH) ₃ .HL	1.83 ^h	
2-Hydroxy-3-	H ⁺	HL/H.L	(12.48)	(12.84)
			(12.37) ^b	(12.39) ^c
		H ₂ L/HL.H	2.54	2.75 ± 0.04
			2.41 ^b	2.41 ^c
	B(III)	M(OH) ₂ L/M(OH) ₃ .HL	1.29 ^h	

^b25,0.5; ^c25,1.0; ^h20,0.1

Bibliography: 78MB; Other reference: 80GGS

 $C_{11}H_8O_6S$

1-Hydroxy-4-sulfo-2-naphthoic acid
(Other reference in Vol.3, p.352)

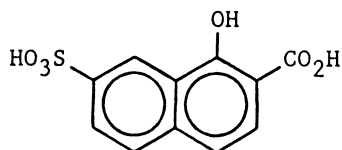
 H_3L

Metal ion	Equilibrium	Log K 25°, 0.1	Log K 25°, 0.5	Log K 25°, 0
H^+	HL/H.L	11.87 -0.2	11.53	12.51
	$H_2L/HL.H$	2.54 ± 0.04	2.41	2.97
Be^{2+}	ML/M.L	11.41		
	$ML_2/M.L^2$	20.50		
La^{3+}	ML/M.L	7.30		
	$ML_2/M.L^2$	12.58		
	MHL/ML.H	1.46		
Ce^{3+}	ML/M.L	7.56		
	$ML_2/M.L^2$	12.90		
	MHL/ML.H	1.41		
Pr^{3+}	ML/M.L	7.63		
	$ML_2/M.L^2$	13.00		
	MHL/ML.H	1.69		
Nd^{3+}	ML/M.L	7.66		
	$ML_2/M.L^2$	13.04		
	MHL/ML.H	2.12		
Sm^{3+}	ML/M.L	8.50		
	$ML_2/M.L^2$	14.75		
	MHL/ML.H	2.21		
Eu^{3+}	ML/M.L	8.91		
	$ML_2/M.L^2$	15.37		
	MHL/ML.H	2.56		
Gd^{3+}	ML/M.L	8.68		
	$ML_2/M.L^2$	15.21		
	MHL/ML.H	2.51		
Tb^{3+}	ML/M.L	9.03		
	$ML_2/M.L^2$	15.40		
	MHL/ML.H	2.34		
Dy^{3+}	ML/M.L	9.09		
	$ML_2/M.L^2$	15.59		
	MHL/ML.H	2.19		
Ho^{3+}	ML/M.L	9.04		
	$ML_2/M.L^2$	15.61		
	MHL/ML.H	2.10		
Er^{3+}	ML/M.L	9.10		
	$ML_2/M.L^2$	15.91		
	MHL/ML.H	2.01		

1-Hydroxy-4-sulfo-2-naphthoic acid (continued)

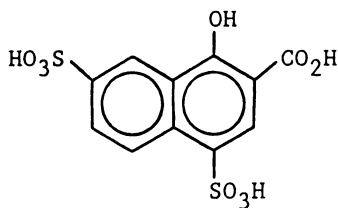
Metal ion	Equilibrium	Log K 25°, 0.1	Log K 25°, 0.5	Log K 25°, 0
Tm ³⁺	ML/M.L	9.08		
	ML ₂ /M.L ²	15.96		
	MHL/ML.H	1.88		
Yb ³⁺	ML/M.L	9.05		
	ML ₂ /M.L ²	16.12		
	MHL/ML.H	1.83		
Lu ³⁺	ML/M.L	9.03		
	ML ₂ /M.L ²	16.12		
	MHL/ML.H	1.82		
Cu ²⁺	ML/M.L	10.06		
	ML ₂ /M.L ²	16.95		
Fe ³⁺	ML/M.L	14.26		
	ML ₂ /M.L ²	25.45		
	ML ₃ /M.L ³	33.01		

Bibliography: H⁺, Be²⁺, Cu²⁺ 78L; La³⁺-Lu³⁺ 79LE; Fe³⁺ 79LPR

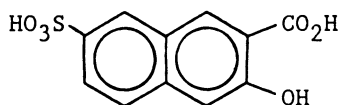
C₁₁H₈O₆S1-Hydroxy-7-sulfo-2-naphthoic acidH₃L

Metal ion	Equilibrium	Log K 25°, 0.1
H ⁺	HL/H.L	(12.37)
	H ₂ L/HL.H	2.37
Be ²⁺	ML/M.L	12.23
	ML ₂ /M.L ²	20.85
Cu ²⁺	ML/M.L	10.71
	ML ₂ /M.L ²	16.88
	ML ₂ /MOHL ₂ .H	9.01
Fe ³⁺	ML/M.L	15.85
	ML ₂ /M.L ²	27.43
	ML ₃ /M.L ³	34.11

Bibliography: H⁺, Be²⁺, Cu²⁺ 80LH; Fe³⁺ 81Lab

 $C_{11}H_8O_9S_2$ 1-Hydroxy-4,7-disulfo-2-naphthoic acid H_4L

Metal <u>ion</u>	<u>Equilibrium</u>	<u>Log K</u> <u>25°, 0.1</u>	<u>Log K</u> <u>25°, 0.5</u>
H^+	HL/H.L	11.12	10.79
	$H_2L/HL.H$	2.21	2.23
Be^{2+}	ML/M.L		10.50
	$ML_2/M.L^2$		18.70
Cu^{2+}	ML/M.L		9.39
	$ML_2/M.L^2$		15.79
Fe^{3+}	ML/M.L	14.69	
	$ML_2/M.L^2$	24.74	

Bibliography: H^+ 78LT,81Lab; Be^{2+}, Cu^{2+} 78LT; Fe^{3+} 81Lab $C_{11}H_8O_6S$ 3-Hydroxy-7-sulfo-2-naphthoic acid H_3L

(Other values in Vol.5, p.352)

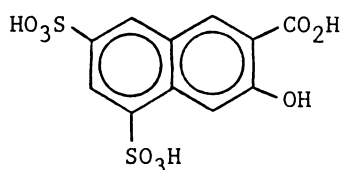
Metal <u>ion</u>	<u>Equilibrium</u>	<u>Log K</u> <u>25°, 0.1</u>	<u>Log K</u> <u>25°, 1.0</u>	<u>Log K</u> <u>25°, 0</u>
H^+	HL/H.L	11.92 -0.2	11.61 ^v	12.53
		11.61 ^b	11.50 ^u	
	$H_2L/HL.H$	2.53 ±0.1 2.33 ^b	2.3 ±0.1	2.93
Nd^{3+}	ML/M.L	6.82		
	MHL/M.HL	2.07		
Sm^{3+}	ML/M.L	7.44		
	MHL/M.HL	2.31		
Eu^{3+}	ML/M.L	7.79		
	MHL/M.HL	2.65		
Gd^{3+}	ML/M.L	7.73		
	MHL/M.HL	2.62		
Tb^{3+}	ML/M.L	7.71		
	MHL/M.HL	2.44		
Dy^{3+}	ML/M.L	7.68		
	MHL/M.HL	2.32		
Ho^{3+}	ML/M.L	7.62		
	MHL/M.HL	2.21		

^b25°,0.5; ^uNaClO₄ used as background electrolyte, ^vKCl used as background electrolyte.

3-Hydroxy-7-sulfo-2-naphthoic acid (continued)

Metal ion	Equilibrium	Log K 25°, 0.1	Log K 25°, 1.0	Log K 25°, 0
Fe ³⁺	ML/M.L	14.57		
	ML ₂ /M.L ²	25.24		
	ML ₂ /M.L ³	33.58		
Al ³⁺	ML/M.L	11.89		
	ML ₂ /M.L ²	21.14		
	ML ₃ /M.L ³	29.06		

Bibliography: H⁺, Al³⁺ 80LP; Nd³⁺-Ho³⁺ 76ML; Fe³⁺ 81LAa

C₁₁H₈O₉S₂

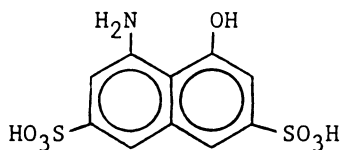
3-Hydroxy-5,7-disulfo-2-naphthoic acid
(Other values in Vol.3, p.233 and Vol.5, p.353)

H₄L

Metal ion	Equilibrium	Log K 25°, 0.1	Log K 25°, 1.0	Log K 25°, 0
H ⁺	HL/H.L	11.28	10.81	12.03
		10.91 ^b		
	H ₂ L/HL.H	2.37	2.18	2.98
		2.14 ^b		
Fe ³⁺	ML/M.L	14.05		
	ML ₂ /M.L ²	23.77		
	ML ₃ /M.L ³	32.03		

^b25°, 0.5

Bibliography: Fe³⁺ 81LAa

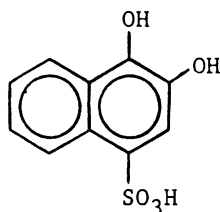
C₁₀H₉O₇NS₂

8-Amino-1-naphthol-3,6-disulfonic acid (H-acid)
(Other reference in Vol.3, p.362)

H₃L

Metal ion	Equilibrium	Log K 20°, 0.1
B(III)	M(OH) ₂ L/M(OH) ₃ .HL	-0.07

Bibliography: 78MB

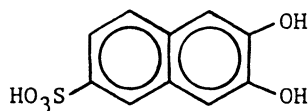
 $C_{10}H_8O_5S$

1,2-Dihydroxynaphthalene-4-sulfonic acid
(Other reference in Vol.5, p.450)

 H_3L

Metal ion	Equilibrium	Log K 25°, 0.1	Log K 25°, 0.6
H^+	HL/H.L	(12.66)	
	$H_2L/HL.H$	8.14	7.80
Al^{3+}	$ML.H^2/M.H_2L$		-5.34
	$ML_2.H^2/ML.H_2L$		-7.79
	$ML_3.H^2/ML_2.H_2L$		-11.36
	$ML/MOHL.H$		5.90
	$ML_2/MOHL_2.H$		8.04

Bibliography: 83OSI

 $C_{10}H_8O_5S$

2,3-Dihydroxynaphthalene-6-sulfonic acid
(Other values in Vol.3, p.234 and Vol.5, p.354)

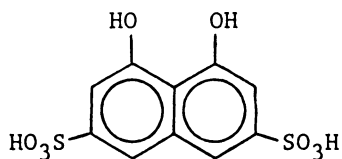
 H_3L

Metal ion	Equilibrium	Log K 25°, 0.1	Log K 25°, 1.0	Log K 25°, 0	ΔH 35°, 0.2	ΔS 25°, 0.1
H^+	HL/H.L	(12.1) ± 0.3 (12.2) ^h	11.64 11.73 ^b	(12.7)	(-5) ^s	(39)
	$H_2L/HL.H$	8.13 ± 0.04 8.19 ^h	8.04 ± 0.01 8.02 ^b	8.46	(-5) ^s	(20)
Mg^{2+}	$ML.H/M.HL$	-5.08				
	$ML_2.H^2/M.(HL)^2$	-13.27				
Ca^{2+}	$ML.H/M.HL$	-7.19				
	$ML_2.H^2/M.(HL)^2$	-16.9				
La^{3+}	$ML.H/M.HL$	-2.53				
	$ML_2.H^2/M.(HL)^2$	-7.88				
Th^{4+}	$ML.H/M.HL$	4.99				
	$ML_2.H^2/M.(HL)^2$	7.9				
	$ML_3.H^3/M.(HL)^3$	1.9				
Co^{2+}	$ML.H/M.HL$	-2.96				
	$ML_2.H^2/M.(HL)^2$	-9.03				
Ni^{2+}	$ML.H/M.HL$	-2.53	-3.34 ^b			
	$ML_2.H^2/M.(HL)^2$	-6.55	-9.36 ^b			
	$ML_3.H^3/M.(HL)^3$		-17.9 ^b			
Cu^{2+}	$ML.H/M.HL$	1.42 ± 0.06	1.08 ^b			
	$ML_2.H^2/M.(HL)^2$	0.02 ± 0.02	-0.16 ^b			

^b25°, 0.5; ^h20°, 0.1; ^s25-45°, 0.2

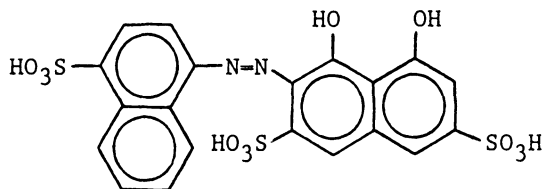
2,3-Dihydroxynaphthalene-6-sulfonic acid (continued)

Metal ion	Equilibrium	Log K 25°, 0.1	Log K 25°, 1.0	Log K 25°, 0	ΔH 35°, 0.2	ΔS 25°, 0.1
Fe^{3+}	ML.H/M.HL	7.7				
		$7.72^h_{-0.3}$				
	ML ₂ .H/ML.L	2.0				
		$2.31^h_{-0.1}$				
	ML ₃ .H/ML ₂ .L	-2.4				
		$-2.29^h_{\pm 0.0}$				
VO^{2+}	ML.H/M.HL	4.17	3.97^b	4.60		
	ML ₂ .H ² /M.(HL) ²	6.66	5.44^b	7.22		
Cd^{2+}	ML.H/M.HL	-3.87				
	ML ₂ .H ² /M.(HL) ²	-11.01				
Al^{3+}	ML.H/M.HL	4.04	4.0^b			
	ML ₂ .H ² /M.(HL) ²	4.94	5.7^b			
	ML ₃ .H ³ /M.(HL) ³	1.80				

^b25°, 0.5; ^h20°, 0.1;Bibliography: H^+ 79LP, 80NSK, 81AM, 84NH; Mg^{2+} - Cu^{2+} , Cd^{2+} 84NH; Fe^{3+} 69ZS, 80NSK; VO^{2+} 79LP; Al^{3+} 84NH, 85CDB; Other reference: 79MS

$C_{10}H_8O_8S_2$ 1,8-Dihydroxynaphthalene-3,6-disulfonic acid (chromotropic acid) H_4L
 (Other values in Vol.3, p.235 and Vol.5, p.356)

Metal ion	Equilibrium	Log K 25°, 0.1	Log K 25°, 1.0	Log K 25°, 0	ΔH 25°, 0.1	ΔS 25°, 0.1
H^+	$H_2L/HL.H$	$5.35_{\pm 0.05}$	$5.10_{-0.05}$	$5.98_{-0.01}$	-3.3	13
Al^{3+}	ML.H ² /M.H ₂ L	-3.87				
		-3.78^h				
		$-4.25^b_{\pm 0.08}$				
	ML ₂ .H ² /ML.H ₂ L	-8.25^h				
Ga^{3+}	ML.H ² /M.H ₂ L	-2.73				
	ML ₂ .H ² /ML.H ₂ L	-5.9				

^b25°, 0.5; ^h20°, 0.1Bibliography: H^+ , Ga^{3+} 80LM; Al^{3+} 85CDB; Other references: 78MB, 80Ca, 80LR, 81BMA

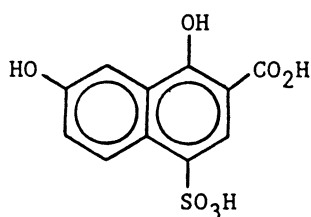
$C_{20}H_{14}O_{11}N_2S_3$ 2-(4-Sulfo-1-naphthylazo)chromotropic acid (Chromotrope 8B) H_5L

Metal ion	Equilibrium	Log K 25°, 0.1
H^+	$H_2L/HL.H$	9.04

Chromotrope 8B (continued)

Metal ion	Equilibrium	Log K 25°, 0.1
Ce ³⁺	MHL/M.HL	5.60
Pr ³⁺	MHL/M.HL	5.63
Nd ³⁺	MHL/M.HL	5.73
Sm ³⁺	MHL/M.HL	5.96
Eu ³⁺	MHL/M.HL	6.05
Gd ³⁺	MHL/M.HL	6.03
Tb ³⁺	MHL/M.HL	6.27
Dy ³⁺	MHL/M.HL	6.27
Ho ³⁺	MHL/M.HL	6.26
Er ³⁺	MHL/M.HL	6.31
Tm ³⁺	MHL/M.HL	6.31
Yb ³⁺	MHL/M.HL	6.24
Th ⁴⁺	MHL/M.HL	9.55

Bibliography: H⁺, Th⁴⁺ 79PL; Ce³⁺-Yb³⁺ 79PLa



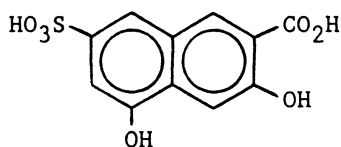
C₁₁H₈O₇S

1,7-Dihydroxy-4-sulfo-2-naphthoic acid

H₄L

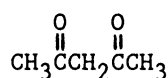
Metal ion	Equilibrium	Log K 25°, 0.5
H ⁺	HL/H.L	(12.25)
	H ₂ L/HL.H	8.81
	H ₃ L/H ₂ L.H	2.68
Be ²⁺	ML/M.L	14.43
	ML ₂ /M.L ²	20.85
	MHL/ML.H	5.90
	MHL ₂ /ML ₂ .H	9.26
	MH ₂ L ₂ /MHL ₂ .H	8.65
Cu ²⁺	ML/M.L	11.79
	ML ₂ /M.L ²	17.42
	MHL/ML.H	6.79
	MHL ₂ /ML ₂ .H	9.64
	MH ₂ L ₂ /MHL ₂ .H	8.50
Al ³⁺	ML/M.L	14.95
	ML ₂ /M.L ²	22.14
	ML ₃ /M.L ³	28.21
	MHL/ML.H	5.05
	MHL ₂ /ML ₂ .H	8.66

Bibliography: 82LKa

 $C_{11}H_8O_7S$ 3,5-Dihydroxy-7-sulfo-2-naphthoic acid H_4L

Metal ion	Equilibrium	Log K <u>25°, 0.5</u>
H^+	HL/H.L	(12.36)
	$H_2L/HL.H$	8.45
	$H_3L/H_2L.H$	2.50
Be^{2+}	ML/M.L	13.64
	$ML_2/M.L^2$	20.79
	MHL/ML.H	6.36
	$MHL_2/ML_2.H$	9.06
	$MH_2L_2/MHL_2.H$	8.15
Cu^{2+}	ML/M.L	10.21
	$ML_2/M.L^2$	15.89
	MHL/ML.H	7.60
	$MHL_2/ML_2.H$	8.72
	$MH_2L_2/MHL_2.H$	8.56
Al^{3+}	ML/M.L	16.00
	$ML_2/M.L^2$	24.09
	$ML_3/M.L^3$	30.85
	MHL/ML.H	4.65
	$MHL_2/ML_2.H$	8.35

Bibliography: 82La

 $C_5H_8O_2$ Pentane-2,4-dione (acetylacetone)

HL

(Other values in Vol.3, p.244 and Vol.5, p.357)

Metal ion	Equilibrium	Log K <u>25°, 0.1</u>	Log K <u>25°, 1.0</u>	Log K <u>25°, 0</u>	ΔH <u>25°, 0</u>	ΔS <u>25°, 0</u>
H^+	HL/H.L	8.80 ± 0.06	8.79 ± 0.09	9.00 ± 0.03	$-3.4^a \pm 0.2$	29^a
Be^{2+}	ML/M.L	7.49 ± 0.05	7.55	7.90 ± 0.06	$(-2)^r$	(30)
	$ML_2/M.L^2$	14.08 ± 0.02	14.35	14.59 ± 0.09	$(-9)^r$	(35)
Mg^{2+}	ML/M.L	3.35 ± 0.02		3.65	-1.0^u	12
	$ML_2/M.L^2$	5.88 ± 0.06		6.30	-4.3^u	12
Ca^{2+}	ML/M.L	2.32				
Sr^{2+}	ML/M.L	1.75				
Ba^{2+}	ML/M.L	1.70				
Sc^{3+}	ML/M.L	7.77		8.0^t		
	$ML_2/M.L^2$			15.2^t		

 $^a 25^\circ, 0.1$; $^r 10-40^\circ, 0$; $^t 30^\circ, 0$; $^u 25^\circ, 0.05$

Acetylacetone (continued)

Metal ion	Equilibrium	Log K 25°, 0.1	Log K 25°, 1.0	Log K 25°, 0	ΔH 25°, 0	ΔS 25°, 0
La ³⁺	ML/M.L	4.94 ±0.02		5.1 ^t	-0.1 ^a ±0.0	22 ^a
	ML ₂ /M.L ²	8.42		9.0 ^t	-0.6 ^u	37 ^a
	ML ₃ /M.L ³	10.9		(11.9) ^t	-1.4 ^u	45 ^a
Pr ³⁺	ML/M.L	5.35 ±0.08		5.4 ^t	-0.3 ^a ±0.1	23 ^a
	ML ₂ /M.L ²	9.2		9.5 ^t	-1.4 ^u	37 ^a
	ML ₃ /M.L ³	12.4		12.5 ^t	-4 ^u	43 ^a
Nd ³⁺	ML/M.L	5.36 ±0.06		5.6 ^t	-0.5 ^a ±0.2	23 ^a
	ML ₂ /M.L ²	9.4		9.9 ^t	-1.4 ^u	38 ^a
	ML ₃ /M.L ³	12.6		13.1 ^t	-4 ^u	44 ^a
Sm ³⁺	ML/M.L	5.67 ±0.07		5.9 ^t	-0.8 ^a ±0.0	23 ^a
	ML ₂ /M.L ²	10.05		10.4 ^t	-2.8 ^u	37 ^a
	ML ₃ /M.L ³	13.0		13.6 ^t	-5 ^u	43 ^a
Gd ³⁺	ML/M.L	5.90 ±0.01			-1.1 ^a ±0.1	23 ^a
	ML ₂ /M.L ²	10.42			-3.1 ^u	37 ^a
	ML ₃ /M.L ³	13.9			-6 ^u	43 ^a
Tb ³⁺	ML/M.L	6.02 ±0.01			-1.2 ^a ±0.1	24 ^a
	ML ₂ /M.L ²	10.67			-3.1 ^u	38 ^a
	ML ₃ /M.L ³	14.1			-7 ^u	41 ^a
Dy ³⁺	ML/M.L	6.06 ±0.02			-1.2 ^a ±0.1	24 ^a
	ML ₂ /M.L ²	10.75			-3.6 ^u	37 ^a
	ML ₃ /M.L ³	14.1			-7 ^u	41 ^a
Ho ³⁺	ML/M.L	6.07 ±0.01			-1.1 ^a ±0.0	24 ^a
	ML ₂ /M.L ²	10.77			-3.3 ^u	38 ^a
	ML ₃ /M.L ³	14.2			-7 ^u	42 ^a
Dy ³⁺	ML/M.L	6.08 ±0.08			-1.1 ^a ±0.1	24 ^a
	ML ₂ /M.L ²	10.71			-3.6 ^u	37 ^a
	ML ₃ /M.L ³	14.2			-7 ^u	42 ^a
Yb ³⁺	ML/M.L	6.18 ±0.01			-1.0 ^a ±0.0	25 ^a
	ML ₂ /M.L ²	11.08			-3.1 ^u	40 ^a
	ML ₃ /M.L ³	14.7			-7 ^u	44 ^a
Lu ³⁺	ML/M.L	6.15 ±0.05			-0.9 ^a ±0.0	25 ^a
	ML ₂ /M.L ²	11.03			-2.6 ^u	42 ^a
	ML ₃ /M.L ³	14.7			-5 ^u	51 ^a
Th ⁴⁺	ML/M.L	7.9 ±0.1		8.8 ^t		
	ML ₂ /M.L ²	15.4 ±0.1		16.2 ^t		
	ML ₃ /M.L ³	21.3 ±0.2		22.5 ^t		
	ML ₄ /M.L ⁴	26.3 ±0.3		26.7 ^t		
U ⁴⁺	ML/M.L	9.0				
	ML ₂ /M.L ²	17.1				
	ML ₃ /M.L ³	23.8				
	ML ₄ /M.L ⁴	29.7				
UO ₂ ²⁺	ML/M.L	7.1 ±0.3		7.7		
	ML ₂ /M.L ²	13.4 ±0.3		14.1		

^a25°, 0.1; ^r10-40°, 0; ^t30°, 0; ^u25°, 0.05

Acetylacetone (continued)

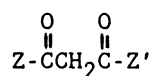
Metal ion	Equilibrium	Log K 25°, 0.1	Log K 25°, 1.0	Log K 25°, 0	ΔH 25°, 0	ΔS 25°, 0
Mn ²⁺	ML/M.L	3.9 ±0.1	(3.9)	4.21	-1.4 ^a ±0.1	13 ^a
	ML ₂ /M.L ²	6.81 ±0.01	(6.8)	7.30	-4.4 ^u	16 ^a
Co ²⁺	ML/M.L	5.08 ±0.01		5.40	-2.8 ^u	14 ^a
	ML ₂ /M.L ²	9.06 ±0.02		9.54	-8.1 ^u	14 ^a
Ni ²⁺	ML/M.L	5.70 ±0.04		5.99	-3.7 ^a ±0.3	14 ^a
	ML ₂ /M.L ²	10.2 ±0.6		10.58	-8.4 ^a ±0.8	18 ^a
Cu ²⁺	ML/M.L	8.0 ±0.1	8.1 ±0.1	8.25	-4.6 ^a ±0.2	21 ^a
	ML ₂ /M.L ²	14.7 ±0.1	14.6 ±0.2	15.05	-10.3 ^a ±0.3	33 ^a
Fe ³⁺	ML/M.L	9.3 ^P		9.8 ^t		
	ML ₂ /M.L ²	18.0 ^P		18.8 ^t		
	ML ₃ /M.L ³	25.3 ^P		26.2 ^t		
VO ²⁺	ML/M.L	8.40	8.53	8.7	(-2) ^r	(30)
	ML ₂ /M.L ²	15.40		15.9	(-9) ^r	(40)
Zn ²⁺	ML/M.L	4.69 ±0.01	4.60 ±0.03	5.05	-1.6 ^a ±0.2	16 ^a
	ML ₂ /M.L ²	8.1 ±0.2	8.2 ±0.4	9.00	-4.1 ^a ±0.7	23 ^a
Cd ²⁺	ML/M.L	3.50 ±0.02	(3.7)	3.83	-0.8 ^u	13 ^a
	ML ₂ /M.L ²	6.20 ±0.06	(6.5)	6.65	-2.8 ^u	19 ^a
Pb ²⁺	ML/M.L	4.57				
	ML ₂ /M.L ²	7.28				
Al ³⁺	ML/M.L	8.1 ^P		8.6 ^t		
	ML ₂ /M.L ²	15.7 ^P		16.5 ^t		
	ML ₃ /M.L ³	21.4 ^P		22.3 ^t		
Ga ³⁺	ML/M.L	8.9 ^P	(9.1)	9.4 ^t		
	ML ₂ /M.L ²	17.0 ^P	(17.1)	17.8 ^t		
	ML ₃ /M.L ³	22.8 ^P	(23.5)	23.7 ^t		
In ³⁺	ML/M.L	7.6 ±0.1		8.0 ^t	(-4) ^s	(20) ^a
	ML ₂ /M.L ²	14.5 ±0.0		15.1 ^t	(-17) ^s	(10) ^a

^a25°, 0.1; ^P30°, 0.1; ^r10-40°, 0; ^s25-45°, 0.2; ^t30°, 0; ^u25°, 0.05

Bibliography:

H⁺ 70KO, 77MB, 78PK;
 Be²⁺, Mg²⁺, UO₂²⁺ 79SK, 82SL;
 Ca²⁺, Ba²⁺ 82HN;
 Sc³⁺ 84II;
 La³⁺-Lu³⁺ 78PK;
 Th⁴⁺ 50R, 58PZ, 60R;
 U⁴⁺, Pu⁴⁺ 60R
 Mn²⁺-Ni²⁺ 74PKL, 78PK, 79SK, 82SL;
 Other references: 58RS, 59KF, 61PP, 61R, 63JB, 74KI, 74LR, 76SSP, 80KJb, 81KC, 83J, 83SDK, 84KCS, 85II

Cu²⁺ 69LS, 71KO, 78PK, 79SK, 80BN, 82SL;
 Fe³⁺, Al³⁺ 82SL;
 VO²⁺ 80HO;
 Zn²⁺ 69LS, 71SI, 78PK, 79SK, 82SL;
 Cd²⁺ 74PKL, 79SK, 82SL;
 Pb²⁺ 79SK;
 Ga³⁺ 72LV, 82SL;
 In³⁺ 77Sma, 82SL;

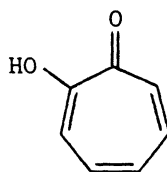
 $\text{C}_x\text{H}_y\text{O}_2\text{F}_z\text{S}_q$ 1,3-Disubstituted-propane-1,3-dione

HL

<u>Ligand</u>	<u>Metal ion</u>	<u>Equilibrium</u>	<u>Log K</u> <u>25°, 0.1</u>	<u>Log K</u> <u>25°, 1.0</u>
Z= CF ₃ , Z'= CH ₃	H ⁺	HL/H.L	6.11 ±0.02	6.09
1,1,1-Trifluoro- pentane-2,4-dione	Ni ²⁺	ML/M.L ML ₂ /M.L ²		3.74 6.68
(C ₅ H ₅ O ₂ F ₃) (Other references in Vol.3, p.363 and other values in Vol.5, p.358)	VO ²⁺	ML/M.L		5.13
Z= Z'= CF ₃	H ⁺	HL/H.L	4.35 ^h +0.1	4.34
1,1,1,5,5,5- Hexafluoro- pentane-2,4-dione	Ni ²⁺	ML/M.L ML ₂ /M.L ²		1.9 3.1
(C ₅ H ₂ O ₂ F ₆) (Other values in Vol.3, p.247 and Vol.5, p.358)				
Z= C ₆ H ₅ , Z'= CH ₃	H ⁺	HL/H.L	8.41 ±0.02	8.4 ±0.1 8.72 ^o
1-Phenylbutane- 1,3-dione (benzoyl- acetone) (C ₁₀ H ₁₀ O ₂)	Ni ²⁺	ML/M.L ML ₂ /M.L ²		4.41 9.86
(Other values in Vol.3, p.247 and Vol.5, p.359)	Hg ²⁺	ML/M.L ML ₂ /M.L ²		12.08 23.69
Z= C ₆ H ₅ , Z'= CF ₃	H ⁺	HL/H.L	6.03 +0.3	6.01 +0.2 6.23 ^e
1-Phenyl-4,4,4- trifluorobutane- 1,3-dione	Ni ²⁺	ML/M.L ML ₂ /M.L ₂		3.60 6.68
(C ₁₀ H ₇ O ₂ F ₃) (Other values in Vol.3, p.248 and Vol.5, p.360)	Hg ²⁺	ML/M.L ML ₂ /M.L ²		8.65 15.10
Z= C ₄ H ₃ S, Z= CF ₃	H ⁺	HL/H.L	6.28 ±0.05	6.28 +0.2 6.50 ^e
1-(2-Thienyl)- 4,4,4-trifluoro- butane-1,3-dione	VO ²⁺	ML/M.L		5.79
(thenoyltrifluoro- acetone) (C ₈ H ₅ O ₂ SF ₃) (Other values in Vol.3, p.249 and Vol.5, p.361)				

^e25°, 3.0; ^h20°, 0.1; ^o25°, 0Bibliography: Ni²⁺ 77SI; VO²⁺ 80HO; Hg²⁺ 81MIS;

Other references: 63LC, 67KF, 67ST, 72MBa, 81MSb, 82SI, 84MY, 85II

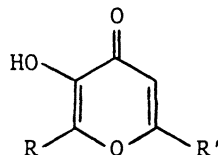


$C_7H_6O_2$ 1-Hydroxycyclohepta-3,5,7-trien-2-one (tropolone) HL
(Other values in Vol.3, p.250)

Metal	Equilibrium	Log K 25°, 0.1	Log K 25°, 0.5	Log K 25°, 0	ΔH 25°, 0	ΔS 25°, 0
<u>ion</u>	<u>HL/H.L</u>					
H^+		6.70 ± 0.02	6.63 ± 0.02	6.89 ± 0.01	-2.5	23
			6.75 ^j		-2.8 ^a	21 ^a
	$H_2L/HL.H$		-0.5 ± 0.0	0.0 ^e	(0) ^s	(-2) ^b
			-0.3 ^c			
Si(IV)	$ML_3/M(OH)_4.H.(HL)^3$		7.08			

^a25°, 0.1; ^b25°, 0.5; ^c25°, 1.0; ^e25°, 3.0; ^j20°, 1.0; ^s15-35°, 0.5

Bibliography: H^+ 84YI, 85SI, 85SRS; Si(IV) 85SI



$C_xH_yO_zBr_qCl_rI_s$	<u>2,6-Disubstituted-hydroxy-4-pyrone</u>					HL
<u>Ligand</u>	Metal <u>ion</u>	<u>Equilibrium</u>	Log K 25°, 0.1	Log K 25°, 0	ΔH 25°, 2.0	ΔS 25°, 2.0
R= CH_3 , R'= H	H^+	HL/H.L	8.49 ± 0.02	8.70	(-5) ^s ± 0	(22)
2-Methyl-			8.51 ^h ± 0.00	8.45 ^c		
3-hydroxy-			8.42 ^b ± 0.03	8.49 ^j		
4-pyrone			8.44 ⁱ	8.50 ^d ± 0.10		
(maltol)	Mn^{2+}	ML/M.L		4.19 ^d	(-2) ^s	(12)
		$ML_2/M.L^2$		7.49 ^d	(-4) ^s	(21)
($C_6H_6O_3$)		$ML_3/M.L^3$		9.32 ^d	(-6) ^s	(23)
(Other values	Co^{2+}	ML/M.L		5.12 ^d	(-3) ^s	(13)
in Vol.3, p.256		$ML_2/M.L^2$		9.19 ^d	(-7) ^s	(19)
and Vol.5, p.362)		$ML_3/M.L^3$		11.59 ^d	(-12) ^s	(13)
	Ni^{2+}	ML/M.L	5.60	5.42 ^d ± 0.02	(-3) ^s	(15)
		$ML_2/M.L^2$		9.67 ^d ± 0.04	(-7) ^s	(21)
		$ML_3/M.L^3$		12.25 ^d ± 0.10	(-12) ^s	(16)
	Cu^{2+}	ML/M.L		7.89 ^d	(-3) ^s	(26)
		$ML_2/M.L^2$		14.44 ^d	(-8) ^s	(39)
	Fe^{3+}	ML/M.L		11.10 ^d		
		$ML_2/M.L^2$		20.4 ^d		
		$ML_3/M.L^3$		28.5 ^d		
		ML/MOHL.H		3.8 ^d		
		$(ML)^2/M_2(OH)_2L_2.H^2$		3.9 ^d		

^b25°, 0.5; ^c25°, 1.0; ^d25°, 2.0; ^h20°, 0.1; ⁱ20°, 0.5; ^j20°, 1.0; ^s20-40°, 2.0

2,6-Disubstituted-hydroxy-4-pyrone (continued)

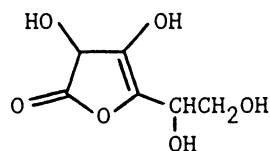
Ligand	Metal ion	Equilibrium	Log K 25°, 0.1	Log K 25°, 0	ΔH 25°, 2.0	ΔS 25°, 2.0
	V(V)	$MO_2L_2/MO_3.L^2$	7.31 ⁱ			
		$HMO_2L_2/MO_2L_2.H$	2.77 ⁱ			
		$H_2MO_2L_2/HMO_2L_2.H$	1.12 ⁱ			
	Zn ²⁺	ML/M.L	5.72	5.56 ^d	(-3) ^s	(15)
		$ML_2/M.L^2$		10.31 ^d	(-6) ^s	(27)
		$ML_3/M.L^3$		12.58 ^d	(-13) ^s	(14)
R= H, R'= CH ₃ 2-Methyl- 5-hydroxy- (allomaltol) (C ₆ H ₆ O ₃) (Other values in Vol.3, p.255)	H ⁺	HL/H.L	8.02 7.96 ^b ±0.02	8.24 7.99 ^c		
	Ni ²⁺	ML/M.L	5.26			
	Zn ²⁺	ML/M.L	5.38			
R= H, R'= CH ₂ Cl 2-Chloromethyl- 5-hydroxy- (chlorokojic acid) (C ₆ H ₅ O ₃ Cl) (Other values in Vol.3, p.258)	H ⁺	HL/H.L	7.46 7.43 ^p	7.65 7.45 ^c		
	Ni ²⁺	ML/M.L	4.79 7.41 ^b -0.01			
R= H, R'= CH ₂ I 2-Iodomethyl- 5-hydroxy- (iodokojic acid) (C ₆ H ₅ O ₃ I) (Other values in Vol.3, p.255)	H ⁺	HL/H.L	7.54 7.49 ^b ±0.01	7.74 7.53 ^c		
	Ni ²⁺	ML/M.L	4.92			
R= H, R'= CH ₂ OH 2-Hydroxymethyl- 5-hydroxy- (kojic acid) (C ₆ H ₆ O ₄) (Other values in Vol.3, p.259 and Vol.5, p.362)	H ⁺	HL/H.L	7.66 ±0.05 7.62 ^b ±0.04	7.90 ±0.02 7.67 ^c ±0.01 7.8 ^d ±0.1	-3.5 ^a (-5) ^s	23 ^a (19)
	Mn ²⁺	ML/M.L		3.67 ^d	(-5) ^s	(0)
		$ML_2/M.L^2$		6.67 ^d	(-15) ^s	(-20)
		$ML_3/M.L^3$		8.49 ^d	(-26) ^s	(-48)
	Ni ²⁺	ML/M.L	5.01 -0.1	4.86 ^d	(-2) ^s	(16)
		$ML_2/M.L^2$	9.06 -0.4	8.81 ^d	(-5) ^s	(24)
		$ML_3/M.L^3$	12.30	11.62 ^d	(-9) ^s	(23)
	Cu ²⁺	ML/M.L		6.6 ^d		
		$ML_2/M.L^2$		11.7 ^d		
	Zn ²⁺	ML/M.L	5.13 -0.2 4.94 ^b	5.57 4.91 ^c 5.01 ^d	(-2) ^s	(16)
		$ML_2/M.L^2$	9.1 ^h 8.95 ^b	9.20 ^d	(-5) ^s	(25)
		$ML_3/M.L^3$		11.98 ^d	(-12) ^s	(14)

^b25°,0.5; ^c25°,1.0; ^d25°,2.0; ^h20°,0.1; ⁱ20°,0.5; ^p30°,0.1; ^s20-40°,2.0

2,6-Disubstituted-hydroxy-4-pyrone (continued)

<u>Ligand</u>	<u>Metal ion</u>	<u>Equilibrium</u>	<u>Log K</u> <u>25°, 0.1</u>	<u>Log K</u> <u>25°, 0</u>	<u>ΔH</u> <u>25°, 2.0</u>	<u>ΔS</u> <u>25°, 2.0</u>
R= CH ₃ , R'= CH ₂ OH 6-Methylkojic acid (C ₇ H ₈ O ₄)	H ⁺	HL/H.L	8.49 8.43 ^b	8.69 8.45 ^c		
	Ni ²⁺	ML/M.L	5.56			
	Zn ²⁺	ML/M.L	5.68			
R= Br, R'= CH ₂ OH 6-Bromokojic acid (C ₆ H ₅ O ₄ Br)	H ⁺	HL/H.L	6.33 6.25 ^b	6.54 6.26 ^c		
	Ni ²⁺	ML/M.L	4.48			
	Zn ²⁺	ML/M.L	4.59			
R= I, R'= CH ₂ OH 6-Iodokojic acid (C ₆ H ₅ O ₄ I)	H ⁺	HL/H.L	6.52 6.43 ^b	6.73 6.44 ^c		
	Ni ²⁺	ML/M.L	4.61			
	Zn ²⁺	ML/M.L	4.67			
R= R'= CH ₂ OH 6-Hydroxymethyl- kojic acid (C ₇ H ₇ O ₅)	H ⁺	HL/H.L	7.73 7.65 ^b	7.94 7.67 ^c		
	Ni ²⁺	ML/M.L	5.12 4.93 ^b	5.53 4.86 ^c		
	Zn ²⁺	ML/M.L	5.23 5.03 ^b	5.62 4.94 ^c		
R= H, R'= CO ₂ H 2-Carboxy- 5-hydroxy- (comenic acid) (C ₆ H ₆ O ₅), H ₂ L (Other values in Vol.3, p.256)	H ⁺	HL/H.L	7.46 7.32 ^b	7.84 7.32 ^c		
	Ni ²⁺	ML/M.L	5.03			
	Zn ²⁺	ML/M.L	5.26 4.91 ^b	5.94 4.71 ^c		

^b25°, 0.5; ^c25°, 1.0;
Bibliography: H⁺ 78GH, 79MBd, 83BS, 85Pa, 85Pb; Mn²⁺, Co²⁺ 78GH; Ni²⁺ 78GH, 85PR; Cu²⁺ 82GH; Fe³⁺ 80GH; V(V) 83BS; Zn²⁺ 78GH, 85Pc; Other reference: 85KN

C₆H₇O₆L-Ascorbic acidH₂L

(Other values in Vol.3, p.264 and Vol.5, p.366)

<u>Metal ion</u>	<u>Equilibrium</u>	<u>Log K</u> <u>25°, 0.1</u>	<u>Log K</u> <u>25°, 1.0</u>	<u>Log K</u> <u>25°, 0</u>	<u>ΔH</u> <u>25°, 1.0</u>	<u>ΔS</u> <u>25°, 1.0</u>
H ⁺	HL/H.L	11.34		11.34 ^e -0.01		
	H ₂ L/HL.H	4.03 ± 0.01	3.95 4.10 ^d		(-4) ^s	(5)
		3.98 ^b		4.37 ^e ±0.01		

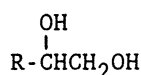
^b25°, 0.5; ^d25°, 2.0; ^e25°, 3.0; ^s10-30°, 1.0

L-Ascorbic acid (continued)

Metal ion	Equilibrium	Log K 25°, 0.1	Log K 25°, 1.0	Log K 25°, 0	ΔH 25°, 1.0	ΔS 25°, 1.0
Ni ²⁺	MHL/M.HL MHL/ML.H		0.18 ^d 5.54 ^d	1.1		
Cu ²⁺	MHL/M.HL MH ₂ L/MHL.H	1.57 ^t	1.61 3.10			

^d25°, 2.0; ^t0°, 0.1Bibliography: H⁺ 76JB, 81BH, 82KYY; Ni²⁺ 81BH; Cu²⁺ 84Da;

Other references: 70MD, 81MO, 83MOa, 85MO

C_xH_yO_z

Polyols

L

(Other values in Vol.3, pp.266,268,270,271 and Vol.5, p.367
and other references in Vol.5, p.474)

Ligand	Metal ion	Equilibrium	Log K 25°, 1.0	ΔH 25°, 0	ΔS 25°, 0.1
R= H	B(III)	M(OH) ₂ (H ₂ L).H/M(OH) ₃ .L	-8.62	+2.3 ^c	-32 ^c
Ethane-1,2-diol (ethylene glycol) (C ₂ H ₆ O ₂)		M(H ₂ L) ₂ /M(OH) ₃ .L ₂	(-8.53) ^a -9.70		
R= CH ₃	B(III)	M(OH) ₂ (H ₂ L).H/M(OH) ₃ .L	-8.39	+1.5 ^c	-33 ^c
Propane-1,2-diol (propylene glycol) (C ₃ H ₈ O ₂)		M(H ₂ L) ₂ /M(OH) ₂ (H ₂ L).L	-8.5 ^h -8.74	-7.8 ^c	-66 ^c
R= CH ₂ OH	B(III)	M(OH) ₂ (H ₂ L).H/M(OH) ₃ .L	-7.55	+1.3 ^c	-30 ^c
Propane-1,2,3- triol (glycerol) (C ₃ H ₈ O ₃)		M(H ₂ L) ₂ /M(OH) ₃ .L ²	-7.41 ^a -7.6 ^h -7.37	-5.6 ^c	-53 ^c
			-7.06 ^a ±0.08		
	As(III)	M(OH) ₂ (H ₂ L).H/M(OH) ₃ .L	-8.92 ^h		
		M(OH)(H ₂ L)/M(OH) ₂ (H ₂ L).H	8.22 ^h		
	Ge(IV)	MOH(H ₂ L) ₂ .H/M(OH) ₄ .L ²	-7.15 ^h		
HO OH R= CHCHCH ₂ OH D-Ribitol (D-adonitol) (C ₅ H ₁₂ O ₅)	B(III)	M(H ₂ L) ₂ .H/M(OH) ₃ .L ²	-5.48 ^h		
	As(III)	M(OH) ₂ (H ₂ L).H/M(OH) ₃ .L	-8.38 ^h		
		M(OH)(H ₂ L)/M(OH) ₂ (H ₂ L).H	8.70 ^h		
	Ge(IV)	MOH(H ₂ L) ₂ .H/M(OH) ₄ .L ²	-5.43 ^h		
		M(H ₂ L) ₃ .H/MOH(H ₂ L) ₂ .L	-10.6 ^h		
	As(V)	M(H ₂ L) ₃ /M(OH) ₆ .L ³	-0.52 ^h		

^a25°, 0.1; ^c25°, 1.0; ^h20°, 0.1

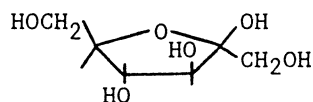
Polyols (continued)

Ligand	Metal ion	Equilibrium	Log K	ΔH	ΔS
			25°, 1.0	25°, 0	25°, 0.1
$\begin{array}{c} \text{OH} \\ \\ \text{R}-\text{CHCHCHCH}_2\text{OH} \\ \quad \\ \text{HO} \quad \text{OH} \end{array}$	V(V)	$\text{M}_2\text{O}_4(\text{H}_2\text{L})_2/(\text{MO}_3)_2^2\text{L}^2$ $\text{M}_4\text{O}_{10}(\text{H}_2\text{L})_2/(\text{MO}_3)_4\text{L}^2$	6.87 ⁱ 13.87 ⁱ		
	B(III)	$\text{M}(\text{OH})_2(\text{H}_2\text{L})\cdot\text{H}/\text{M}(\text{OH})_3\cdot\text{L}$	-5.80	-1.0	-30
			-5.95 ^a ±0.2	-1.0 ^c	-31 ^c
		$\text{M}(\text{H}_2\text{L})_2/\text{M}(\text{OH})_3\cdot\text{L}^2$	(-4.30)	-5.9 ±0.0	-40
D(-)-Mannitol			-4.0 ^a ±0.1	(-6.6) ^c	(-40) ^c
(C ₆ H ₁₄ O ₆)	C ₆ H ₅ B(III)	$\text{MOH}(\text{H}_2\text{L})\cdot\text{H}/\text{M}(\text{OH})_2\cdot\text{L}$	-5.28 ^a		
	As(III)	$\text{M}(\text{OH})_2(\text{H}_2\text{L})\cdot\text{H}/\text{M}(\text{OH})_3\cdot\text{L}$	-8.20 ^a		
			-8.20 ^h		
		$\text{M}(\text{OH})(\text{H}_2\text{L})/\text{M}(\text{OH})_2(\text{H}_2\text{L})\cdot\text{H}$	8.44 ^a 8.40 ^h		
	As(V)	$\text{M}(\text{H}_2\text{L})_3/\text{M}(\text{OH})_6\cdot\text{L}^3$	1.08 ^h		
$\begin{array}{c} \text{OH} \\ \\ \text{R}-\text{CHCHCHCH}_2\text{OH} \\ \quad \\ \text{HO} \quad \text{OH} \end{array}$	B(III)	$\text{M}(\text{H}_2\text{L})_2/\text{M}(\text{OH})_3\cdot\text{L}^2$	-3.9 ^a -4.0 ^h		
	As(III)	$\text{M}(\text{OH})_2(\text{H}_2\text{L})\cdot\text{H}/\text{M}(\text{OH})_3\cdot\text{L}$ $\text{M}(\text{OH})(\text{H}_2\text{L})/\text{M}(\text{OH})_2(\text{H}_2\text{L})\cdot\text{H}$	-8.30 ^h 8.60 ^h		
	Ge(IV)	$\text{MOH}(\text{H}_2\text{L})_2\cdot\text{H}/\text{M}(\text{OH})_4\cdot\text{L}^2$ $\text{M}(\text{H}_2\text{L})_3\cdot\text{H}/\text{MOH}(\text{H}_2\text{L})_2\cdot\text{L}$	-3.88 ^h -10.0 ^h		
	As(V)	$\text{M}(\text{H}_2\text{L})_3/\text{M}(\text{OH})_6\cdot\text{L}^3$	1.0 ^h		
$\begin{array}{c} \text{OH} \quad \text{OH} \\ \quad \\ \text{R}-\text{CHCHCHCH}_2\text{OH} \\ \\ \text{OH} \end{array}$	V(V)	$\text{M}_2\text{O}_4(\text{H}_2\text{L})_2/(\text{MO}_3)_2^2\text{L}^2$ $\text{M}_4\text{O}_{10}(\text{H}_2\text{L})_2/(\text{MO}_3)_4\text{L}^2$	3.86 ⁱ 14.47 ⁱ		
	B(III)	$\text{M}(\text{H}_2\text{L})\cdot\text{H}/\text{M}(\text{OH})_3\cdot\text{L}^2$	-3.8 ^a ±0.3 -3.81 ^h		
	As(III)	$\text{M}(\text{OH})_2(\text{H}_2\text{L})\cdot\text{H}/\text{M}(\text{OH})_3\cdot\text{L}$ $\text{M}(\text{OH})(\text{H}_2\text{L})/\text{M}(\text{OH})_2(\text{H}_2\text{L})\cdot\text{H}$	-7.96 ^h 8.32 ^h		
	As(V)	$\text{M}(\text{H}_2\text{L})_3/\text{M}(\text{OH})_6\cdot\text{L}^3$	1.90 ^h		
D(-)-Sorbitol					
(D-glucitol)					
(C ₆ H ₁₄ O ₆)					

^a25°, 0.1; ^c25°, 1.0; ^h20°, 0.1; ⁱ20°, 0.5

Bibliography: V(V) 83PS; B(III) 49RC, 52T, 68N, 73SB, 76Pa, 77EF, 80MBb, 85A; C₆H₅B(III) 77PB; As(III), As(V) 80MBb; Ge(IV) 73SB, 80MBb;

Other references: 32V, 42TC, 49DO, 56SL, 56SR, 59LE, 79H, 80DMb

C₆H₁₂O₆

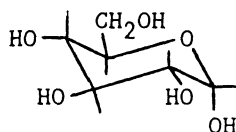
D(-)-Fructose
(Other values in Vol.3, p.274)

L

Metal ion	Equilibrium	Log K
		25°, 0.1
B(III)	$\text{M}(\text{OH})_2(\text{H}_2\text{L})\cdot\text{H}/\text{M}(\text{OH})_3\cdot\text{L}$ $\text{M}(\text{H}_2\text{L})_2/\text{M}(\text{OH})_3\cdot\text{L}^2$	-5.9 ±0.3 -4.05 ±0.00
C ₆ H ₅ B(III)	$\text{M}(\text{OH})(\text{H}_2\text{L})\cdot\text{H}/\text{M}(\text{OH})_2\cdot\text{L}$	-4.90

Bibliography: B(III) 52T, 63SM; C₆H₅B(III) 57T;

Other references: 32V, 42TC, 59LE, 85KPb

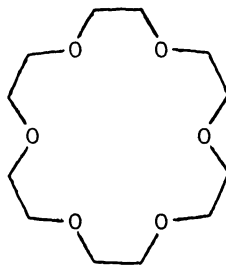
 $C_6H_{12}O_6$

α -D(+)-Glucose
(Other values in Vol.3, p.275)

L

Metal ion	Equilibrium	Log K <u>25°, 0.1</u>	Log K <u>20°, 0.1</u>
B(III)	$M(OH)_2(H_2L) \cdot H / M(OH)_3 \cdot L$ $M(H_2L)_2 / M(OH)_3 \cdot L^2$	-6.95 -6.34 -0.1	-6.33
As(III)	$M(OH)_2(H_2L) \cdot H / M(OH)_3 \cdot L$ $M(OH)(H_2L) / M(OH)_2(H_2L) \cdot H$		-9.21 8.25
Ge(IV)	$MOH(H_2L)_2 \cdot H / M(OH)_4 \cdot L^2$ $M(H_2L)_3 \cdot H / MOH(H_2L)_2 \cdot L$	-5.12	-6.33 -10.6

Bibliography: B(III) 80MBb,81P; As(III),Ge(IV) 80MBb;
Other references: 57LE,80DMb,82DMA,83HD

 $C_{12}H_{24}O_6$

1,4,7,10,13,16-Hexaoxacyclooctadecane (18-crown-6)
(Other values in Vol.5, p.369)

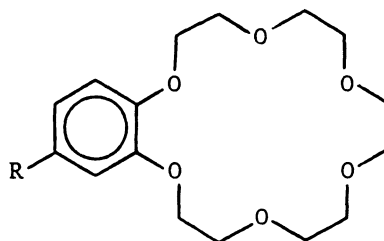
L

Metal ion	Equilibrium	Log K <u>25°, 0.1</u>	Log K <u>25°, 0</u>	ΔH <u>25°, 0.1</u>	ΔS <u>25°, 0.1</u>
Na^+	ML/M.L	0.81 $\pm$ 0.01		-2.3	-4
K^+	ML/M.L	2.05 $\pm$ 0.03		-6.2	-11
Cs^+	ML/M.L	0.99 -0.01		-3.8	-8
NH_4^+	ML/M.L	1.23	1.22	-2.3	-2
$CH_3NH_3^+$	ML/M.L		1.13		
$CH_3CH_2NH_3^+$	ML/M.L		0.99		
$CH_3(CH_2)_3NH_3^+$	ML/M.L		0.94		
$(CH_3CH_2)_2NH_2^+$	ML/M.L		0.9		
$(CH_3CH_2)_3NH^+$	ML/M.L		0.7		
Ca^{2+}	ML/M.L	0.48			
Sr^{2+}	ML/M.L	2.76 $\pm$ 0.04		-3.6	0
Ba^{2+}	ML/M.L	3.80 $\pm$ 0.07		-7.6	-8

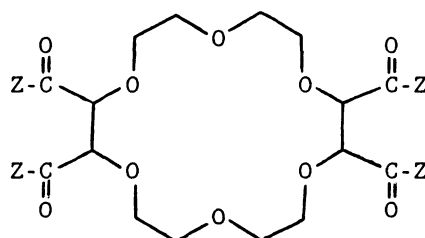
$^Z(CH_3)_4NBr$ used as background electrolyte.

Bibliography: Na^+ , Cs^+ , Ca^{2+} 79HRB; K^+ 79HRB,85GLa; NH_4^+ -(CH_3CH_2) $_3NH^+$ 79RM;
 Sr^{2+} , Ba^{2+} 85GL;

Other references: 71F,81LP,82DG,82MRa,85BFL,85LA,85SKS



$C_xH_yO_z$	<u>Substituted-benzo-1,4,7,10,13,16-hexaoxacyclooctadecane</u>			L
<u>Ligand</u>	<u>Metal ion</u>	<u>Equilibrium</u>	<u>Log K</u> <u>20°, 0.1</u>	
R= H ($C_{16}H_{24}O_6$)	Ba ²⁺	ML/M.L	2.28	
R= CH ₂ OH	K ⁺	ML/M.L	1.83	
3'-Hydroxymethyl- ($C_{17}H_{26}O_7$)	Sr ²⁺	ML/M.L	1.89	
	Ba ²⁺	ML/M.L	2.73	
Bibliography: 85Ga				



$C_xH_yO_zN_q$	<u>(2R,3R,11R,12R)-2,3,11,12-Tetrakis(substituted)-1,4,7,10,13,16-hexaoxacyclooctadecane</u>			
<u>Ligand</u>	<u>Metal ion</u>	<u>Equilibrium</u>	<u>Log K</u> <u>25°, 0.1</u>	
Z= NHCH ₃ -(N-methyl-carbamoyl)- ($C_{20}H_{40}O_{10}N_4$), L	K ⁺	ML/M.L	1.30	
Z= N(CH ₃) ₂ -(N,N-dimethyl-carbamoyl)- ($C_{24}H_{48}O_{10}N_4$), L	K ⁺	ML/M.L	1.88	
Z= NHCH ₂ COCH ₃ -(N-methoxy-carbonylmethyl-carbamoyl)- ($C_{28}H_{48}O_{18}N_4$), L	K ⁺	ML/M.L	1.30	
Z= NHC ₁₀ H ₆ SO ₃ H	K ⁺	ML/M.L	3.00	
-(N-(6-sulfo-2-naphthyl)-carbamoyl)- ($C_{56}H_{56}O_{22}N_4S_4$), H ₄ L	NH ₄ ⁺	ML/M.L	1.70	

(2R,3R,11R,12R)-2,3,11,12-Tetrakis(substituted)-1,4,7,10,13,16-hexaoxacyclooctadecane
(continued)

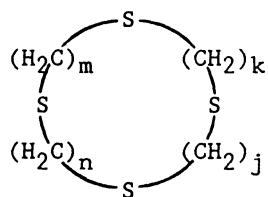
<u>Ligand</u>	<u>Metal ion</u>	<u>Equilibrium</u>	<u>Log K</u> <u>25°, 0.1</u>
Z= OH	K ⁺	ML/M.L	5.48
-Tetracarboxy-	NH ₄ ⁺	ML/M.L	3.53
(C ₁₆ H ₂₈ O ₁₄), H ₄ L	CH ₃ NH ₃ ⁺	ML/M.L	2.88
Z= NHCH ₂ CO ₂ H	K ⁺	ML/M.L	2.81
- (N-(carboxy-methyl)carbamoyl)-	NH ₄ ⁺	ML/M.L	1.48
(C ₂₄ H ₄₀ O ₁₈ N ₄), H ₄ L			
CO ₂ H Z= NHCHCHC ₆ H ₅	NH ₄ ⁺	ML/M.L	2.18
- (N-((1S)-1-carboxy-2-phenylethyl)-carbamoyl)-			
(C ₅₂ H ₆₄ O ₁₈ N ₄), H ₄ L			
Z= NHC ₁₀ H ₆ CO ₂ H	K ⁺	ML/M.L	3.23
- (N-(3-carboxy-2-naphthyl)-carbamoyl)-			
(C ₆₀ H ₅₆ O ₁₈ N ₄), H ₄ L			
CO ₂ H Z= NHCHCH ₂ CH ₂ CO ₂ H	K ⁺	ML/M.L	4.43
- (N-((1S)-1,3-dicarboxypropyl)-carbamoyl)-	NH ₄ ⁺	ML/M.L	2.40
(C ₃₆ H ₅₂ O ₂₆ N ₄), H ₈ L			
CO ₂ H ⁺ NH ₂ Z=NHCH(CH ₂) ₃ NHCNH ₂	K ⁺	ML/M.L	2.58
- (N-((1S)-1-carboxy-4-guanidinio-butyl)carbamoyl)-			
(C ₄₀ H ₇₆ O ₁₈ N ₁₆ ⁴⁺), H ₄ L ⁴⁺			
CO ₂ H Z= NHCHCH ₂ C ₈ H ₆ N	K ⁺	ML/M.L	4.74
- (N-((1S)-1-carboxy-2-(3-indole)ethyl)-carbamoyl)-	NH ₄ ⁺	ML/M.L	2.64
(C ₆₀ H ₆₈ O ₁₈ N ₈), H ₄ L	CH ₃ NH ₃ ⁺	ML/M.L	2.00

(2R,3R,11R,12R)-2,3,11,12-Tetrakis(substituted)-1,4,7,10,13,16-hexaoxacyclooctadecane
(continued)

<u>Ligand</u>	<u>Metal ion</u>	<u>Equilibrium</u>	<u>Log K 25°, 0.1</u>
Z= NC ₄ H ₇ CO ₂ H - (N-((2S)- 2-carboxy- 1-pyrrolidiny)- carbonyl)- (C ₃₆ H ₅₆ O ₁₈ N ₄), H ₄ L	NH ₄ ⁺	ML/M.L	1.70
Z= NHCH ₂ CH ₂ NH ₂ - (N-(2-aminoethyl)- carbamoyl)- (C ₂₄ H ₅₆ O ₆ N ₈), L	K ⁺	ML/M.L	1.30
Z=NHCH ₂ CH ₂ NC ₅ H ₄ ^O ₂ CNH ₂ - (N-2-(3-carbamoyl- 1-pyridyl)ethyl)- carbamoyl)- (C ₄₈ H ₇₂ O ₁₄ N ₁₂), L	K ⁺	ML/M.L	0.7
Bibliography: 82BLV (Values are given for other substituted ammonium complexes with some of these ligands.)			

		CH ₃ SCH ₃		
C ₂ H ₆ S			<u>Dimethylsulfide</u>	L
Metal			Log K	
<u>ion</u>	<u>Equilibrium</u>	<u>34°, 0.1</u>		
Ag ⁺	ML/M.L	3.7		
Bibliography: 80SSR				

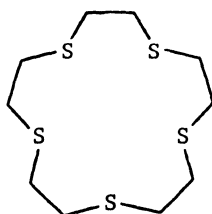
CH ₃ (CH ₂) _n SCH ₂ CH ₂ SCH ₂ CH ₂ SCH ₂ CH ₂ S(CH ₂) _n CH ₃					
C _x H _{2x+2} S ₄			Tetrathiaalkane		
				L	
<u>Ligand</u>	<u>Metal ion</u>	<u>Equilibrium</u>	<u>Log K 25°, 0.1</u>	<u>ΔH 25°, 0.1</u>	<u>ΔS 25°, 0.1</u>
n= 0 2,5,9,12-tetra- thiatridecane (C ₉ H ₂₀ S ₄)	Cu ²⁺	ML/M.L	1.97	(-4.3) ^s	(-5)
n= 1 3,6,10,13-tetra- thiapentadecane (C ₁₁ H ₂₄ S ₄)	Cu ²⁺	ML/M.L	2.18	(-3.7) ^s	(-3)
^s 5-35°, 0.1 Bibliography: 81SO					

 $C_xH_{2x}S_4$ Tetrathiacycloalkane

L

<u>Ligand</u>	<u>Metal ion</u>	<u>Equilibrium</u>	<u>Log K</u> <u>25°, 0.1</u>	<u>Log K</u> <u>25°, 0</u>	<u>ΔH</u> <u>25°, 0.1</u>	<u>ΔS</u> <u>25°, 0.1</u>
j = k = m = n = 2 1,4,7,10-Tetrathiacyclododecane ([12]aneS ₄) (C ₈ H ₁₆ S ₄)	Cu ²⁺	ML/M.L	3.39		(+0.1) ^s	(16)
j = 3, k = m = n = 2 1,4,7,10-Tetrathiacyclotridecane ([13]aneS ₄) (C ₉ H ₁₈ S ₄)	Cu ²⁺	ML/M.L	3.44		(-2.4) ^s	(8)
j = m = 3, k = n = 2 1,4,8,11-Tetrathiacyclotetradecane ([14]aneS ₄) (C ₁₀ H ₂₀ S ₄)	Cu ²⁺	ML/M.L	4.34	4.04	(-4.2) ^s	(6)
j = k = m = 3, n = 2 1,4,8,12-Tetrathiacyclopentadecane ([15]aneS ₄) (C ₁₁ H ₂₂ S ₄)	Cu ²⁺	ML/M.L	3.17		(-3.3) ^s	(4)
j = k = m = n = 3 1,5,9,13-Tetrathiacyclohexadecane ([16]aneS ₄) (C ₁₂ H ₂₄ S ₄)	Cu ²⁺	ML/M.L	2.20		(-1.4) ^s	(5)

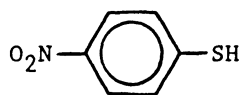
^s5-35°, 0.1
Bibliography: 81SO

 $C_{10}H_{20}S_5$ 1,4,7,10,13-Pentathiacyclopentadecane ([15]aneS₅)

L

<u>Metal ion</u>	<u>Equilibrium</u>	<u>Log K</u> <u>25°, 0.1</u>	<u>ΔH</u> <u>25°, 0.1</u>	<u>ΔS</u> <u>25°, 0.1</u>
Cu ²⁺	ML/M.L	4.18	(-3.0) ^s	(9)

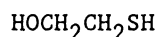
^s5-35°, 0.1
Bibliography: 81SO



$C_6H_5O_2NS$ 4-Nitrobenzenethiol (p-nitrothiophenol) HL
(Other references in Vol.3, p.356)

Metal ion	Equilibrium	Log K 20°, 0.1	Log K 25°, 1.0	Log K 25°, 0
H^+	HL/H.L		4.50	4.715
CH_3Hg^+	ML/M.L	12.3		

Bibliography: 73GE



C_2H_6OS 2-Mercaptoethanol HL
(Other values in Vol.3, p.280 and Vol.5, p.375)

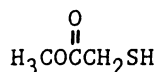
Metal ion	Equilibrium	Log K 25°, 0.1	Log K 25°, 1.0	Log K 25°, 0	ΔH 25°, 0	ΔS 25°, 0
H^+	HL/H.L	9.40 ± 0.04	9.40	9.72	-6.21	23.7
			9.34 ^b		-6.5 ^h	21 ^a
CH_3Hg^+	ML/M.L	15.91 ± 0.05			-18.9 ^h	9 ^a
	$M_2L/ML.M$	6.27 ^h				
$(CH_3)_3Pb^+$	ML/M.L	5.96				
	$ML_2/M.L^2$	7.11				
Cd^{2+}	ML/M.L	6.1				
	$ML_2/M.L^2$	12.41				
	$M_4L_5/M^4.L^5$	44.29	43.99 ^b			
Pb^{2+}	ML/M.L	6.7				
	$M_2L/M^2.L$	8.7	8.94 ^b			
	$M_3L_4/M^3.L^4$	33.31	32.65 ^b			
	$M_3L_5/M_3L_4.L$	6.57	5.85 ^b			
Bi^{3+}	ML/M.L		13.77			
	$ML_2/M.L^2$		25.10			
	$ML_3/M.L^3$		35.58			

^b25°, 0.5; ^h20°, 0.1

Bibliography: H^+ 82JH, 84JH;

CH_3Hg^+ 83AC; $(CH_3)_3Pb^+$ 81BR; Cd^{2+} 74DV, 82J; Pb^{2+} 82JH; Bi^{3+} 84JH;

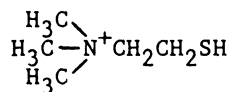
Other reference: 81SKa



$C_3H_6O_2S$ Mercaptoacetic acid methylester HL

Metal ion	Equilibrium	Log K 25°, 0.1
H^+	HL/H.L	7.99
CH_3Hg^+	ML/M.L	14.98

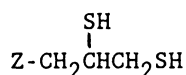
Bibliography: 83AC



$\text{C}_5\text{H}_{14}\text{NS}^+$ 2-Mercaptoethyltrimethylammonium perchlorate (thiocholine) HL^+

Metal		Log K
<u>ion</u>	<u>Equilibrium</u>	<u>25°, 0.1</u>
H^+	HL/H.L	7.88
CH_3Hg^+	ML/M.L	14.60

Bibliography: 83AC;
Other reference: 83BV

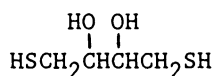


$\text{C}_3\text{H}_8\text{O}_x\text{S}_y$ Substituted-2,3-dimercaptopropane

Ligand	Metal	Equilibrium	Log K	Log K
	<u>ion</u>		<u>25°, 0.1</u>	<u>20°, 0.1</u>
$\text{Z} = \text{SO}_3\text{H}$	H^+	HL/H.L	11.38	
2,3-Dimercapto-		$\text{H}_2\text{L}/\text{HL.H}$	8.69	8.56^n
propanesulfonic	CH_3Hg^+	ML/M.L	21.01	
acid (unithiol)		$\text{ML}_2/\text{M.L}^2$	31.27	
$\text{H}_3\text{L} (\text{C}_3\text{H}_8\text{O}_3\text{S}_3)$		MHL/ML.H	7.56	
(Other references				
in Vol.3, p.364				
and Vol.5, p.474)				
$\text{Z} = \text{OH}$	H^+	HL/H.L	10.68 -0.06	10.78
2,3-Dimercapto-			10.60 ^P ±0.01	
propanol (BAL)		$\text{H}_2\text{L}/\text{HL.H}$	8.65 -0.07	8.76
$\text{H}_2\text{L} (\text{C}_3\text{H}_8\text{OS}_2)$			8.60 ^P ±0.02	
(Other values	CH_3Hg^+	ML/M.L	19.56	
in Vol.3, p.283		$\text{ML}_2/\text{M.L}^2$	30.02	
and Vol.5, p.375		MHL/ML.H	7.40	

ⁿ37°, 0.15; ^P30°, 0.1

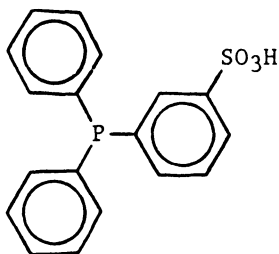
Bibliography: H^+ 84JC, 85AC; CH_3Hg^+ 85AC;
Other references: 80CJ, 81BCJ



$\text{C}_4\text{H}_{10}\text{O}_2\text{S}_2$ erythro-1,4-Dimercaptobutane-2,3-diol (dithioerythritol) H_2L

Metal		Log K
<u>ion</u>	<u>Equilibrium</u>	<u>25°, 0.3</u>
H^+	HL/H.L	9.99
	$\text{H}_2\text{L}/\text{HL.H}$	9.21
CH_3Hg^+	ML/M.L	17.0
	MHL/ML.H	9.6

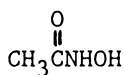
Bibliography: 85AC



$C_{18}H_{15}O_3SP$ 3-(Diphenylphosphino)benzenesulfonic acid (3-sulfotriphenylphosphine) HL
(Other values in Vol.3, p.298 and Vol.5, p.377)

Metal		Log K
<u>ion</u>	<u>Equilibrium</u>	<u>20°, 0.1</u>
CH_3Hg^+	ML/M.L	9.15

Bibliography: 73GE;
Other reference: 77SB



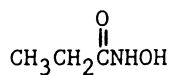
$C_2H_5O_2N$ Acetohydroxamic acid HL
(Other values in Vol.3, p.301 and Vol.5, p.379)

Metal		Log K	Log K	Log K	ΔH	ΔS
<u>ion</u>	<u>Equilibrium</u>	<u>25°, 0.1</u>	<u>25°, 1.0</u>	<u>25°, 2.0</u>	<u>25°, 2.0</u>	<u>25°, 2.0</u>
H^+	HL/H.L	9.33 ± 0.01	9.01	9.02	$(-4)^t$	(27)
Ni^{2+}	ML/M.L	5.30				
		5.3 ^h				
	$ML_2/M.L^2$	9.24				
		9.3 ^h				
	$ML_3/M.L^3$	11.4				
Fe^{3+}	ML/M.L	11.40	10.95 ± 0.1	10.84		
		11.39 ^h				
	$ML_2/M.L^2$	21.1 ^h		19.8		
	$ML_3/M.L^3$	28.3 ^h		26.9		

^h20°, 0.1; ^t20-35°, 2.0

Bibliography: H^+ 78BC, 80BKP, 80MCA; Ni^{2+} 83BR; Fe^{3+} 80BKP, 85BBK, 85BK;

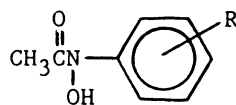
Other references: 82BN, 84BKP



$C_3H_7O_2N$ Propanohydroxamic acid HL

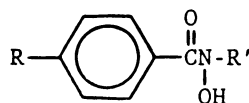
Metal		Log K
<u>ion</u>	<u>Equilibrium</u>	<u>25°, 0.1</u>
H^+	HL/H.L	9.44
Ni^{2+}	ML/M.L	5.30
	$ML_2/M.L^2$	9.20
	$ML_3/M.L^3$	11.4

Bibliography: 83BR



$C_xH_yO_zN_qX$	<u>N-(Substituted-phenyl)acetohydroxamic acid</u>				HL
<u>Ligand</u>	<u>Metal ion</u>	<u>Equilibrium</u>	<u>Log K</u> <u>25°, 2.0</u>	<u>ΔH</u> <u>25°, 2.0</u>	<u>ΔS</u> <u>25°, 2.0</u>
R= H	H ⁺	HL/H.L	8.33 ±0.02	(-11) ^S ±0	(1)
N-Phenyl- (C ₈ H ₉ O ₂ N) (Other references in Vol.5, p.379)	Fe ³⁺	ML/M.L	10.58	(-10) ^S -1	(15)
R= CH ₃	H ⁺	HL/H.L	8.70	(-8) ^S	(14)
N-(4-Methyl- phenyl)- (C ₉ H ₁₁ O ₂ N)	Fe ³⁺	ML/M.L	11.70	(-4) ^S	(38)
R= CN	H ⁺	HL/H.L	8.15	(-9) ^S	(8)
N-(3-Cyano- phenyl)- (C ₉ H ₈ O ₂ N ₂)	Fe ³⁺	ML/M.L	10.11	(-5) ^S	(30)
R= CN	H ⁺	HL/H.L	8.14	(-7) ^S	(14)
N-(4-Cyano- phenyl)- (C ₉ H ₈ O ₂ N ₂)	Fe ³⁺	ML/M.L	9.87	(0) ^S	(45)
R= Cl	H ⁺	HL/H.L	8.26	(-6) ^S	(17)
N-(4-Chloro- phenyl)- (C ₈ H ₈ O ₂ N ₂ Cl)	Fe ³⁺	ML/M.L	10.34	(-3) ^S	(37)
R= I	H ⁺	HL/H.L	8.20	(-6) ^S	(16)
N-(3-Iodo- phenyl)- (C ₈ H ₈ O ₂ NI)	Fe ³⁺	ML/M.L	10.42	(-1) ^S	(44)
R= I	H ⁺	HL/H.L	8.18	(-6) ^S	(18)
N-(4-Iodo- phenyl)- (C ₈ H ₉ O ₂ NI)	Fe ³⁺	ML/M.L	10.45	(-1) ^S	(44)
R= $\begin{array}{c} O \\ \\ CCH_3 \end{array}$	H ⁺	HL/H.L	8.23	(-8) ^S	(11)
N-(3-Aceto- phenyl)- (C ₁₀ H ₁₁ O ₃ N)	Fe ³⁺	ML/M.L	10.25	(-4) ^S	(34)

^S20-40°, 2.0Bibliography: H⁺ 80Mca, 82BCa; Fe³⁺ 84BCa

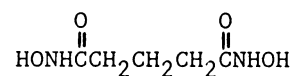
 $C_xH_yO_zN$ N-Alkyl-4-substituted-benzohydroxamic acid

HL

<u>Ligand</u>	<u>Metal ion</u>	<u>Equilibrium</u>	<u>Log K</u> <u>25°, 2.0</u>	<u>ΔH</u> <u>25°, 2.0</u>	<u>ΔS</u> <u>25°, 2.0</u>
R= H, R' = CH ₃	H ⁺	HL/H.L	8.17 -0.3	(-2) ^s -2	(30)
N-Methyl- (C ₈ H ₉ O ₂ N) (Other reference in Vol.5, p.379)	Fe ³⁺	ML/M.L	9.91 -0.3	(-1) ^s	(41)
R= R' = CH ₃	H ⁺	HL/H.L	8.39	(-2) ^s	(33)
N-Methyl-4-methyl- (C ₉ H ₁₁ O ₂ N)	Fe ³⁺	ML/M.L	11.55	(-1) ^s	(49)
R= NO ₂ , R' = CH ₃	H ⁺	HL/H.L	7.83	(-1) ^s	(32)
N-Methyl-4-nitro- (C ₈ H ₈ O ₄ N ₂)	Fe ³⁺	ML/M.L	10.30	(0) ^s	(47)
R= OCH ₃ , R' = CH ₃	H ⁺	HL/H.L	8.56	(-1) ^s	(35)
N-Methyl- 4-methoxy- (C ₉ H ₁₁ O ₃ N)	Fe ³⁺	ML/M.L	11.75	(+2) ^s	(60)
R= OCH ₃ , R' = H	H ⁺	HL/H.L	8.65	(-6) ^s	(20)
4-Methoxy- (C ₈ H ₉ O ₃ N)	Fe ³⁺	ML/M.L	11.05	(-3) ^s	(42)

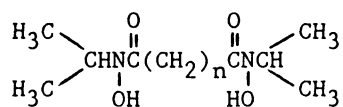
^s20-40°, 2.0Bibliography: H⁺ 85BFC; Fe³⁺ 84BC, 85FC;

Other reference: 80Af

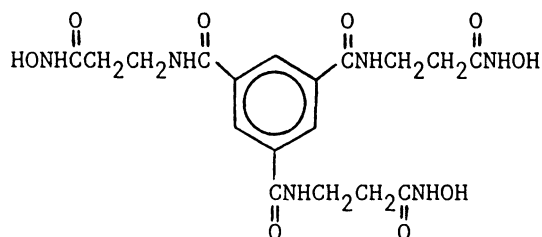
 $C_5H_{10}O_4N_2$ Trimethylenodihydroxamic acid (glutarodihydroxamic acid)H₂L

<u>Metal ion</u>	<u>Equilibrium</u>	<u>Log K</u> <u>20°, 0.1</u>
H ⁺	HL/H.L	10.66
	H ₂ L/HL.H	8.91
Fe ³⁺	MHL/M.HL	11.61
	M ₂ OHL ₂ /M ² .OH.L ²	56.74
	M ₂ (HL) ₂ L ₂ /M ² .(HL) ₂ .L ²	66.34
	M ₂ (HL) ₂ L ₂ /M ₂ L ₄ .H ²	16.9

Bibliography: H⁺ 80KJ; Fe³⁺ 81KJ

 $\text{C}_x\text{H}_y\text{O}_4\text{N}_2$ N,N'-Di-2-propylpolymethylenodihydroxamic acid H_2L

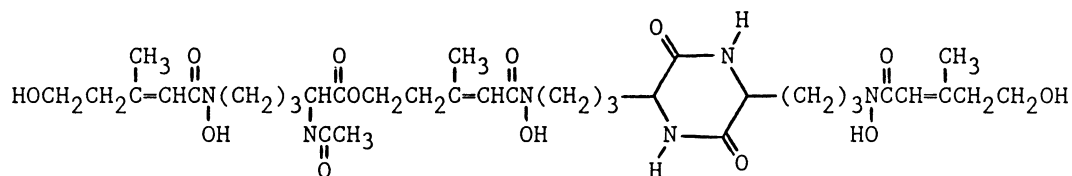
<u>Ligand</u>	<u>Metal ion</u>	<u>Equilibrium</u>	<u>Log K</u> <u>25°, 0.1</u>
n= 3	H^+	HL/H.L	10.79
-trimethyleno-		$\text{H}_2\text{L}/\text{HL.H}$	7.74
$(\text{C}_{11}\text{H}_{22}\text{O}_4\text{N}_2)$	Fe^{3+}	ML/M.L	22.84
		$\text{M}_2\text{L}_3/\text{M}^2.\text{L}^3$	62.1
n= 4	H^+	HL/H.L	9.79
-tetramethyleno-		$\text{H}_2\text{L}/\text{HL.H}$	9.10
$(\text{C}_{12}\text{H}_{24}\text{O}_4\text{N}_2)$	Fe^{3+}	ML/M.L	22.83
		$\text{M}_2\text{L}_3/\text{M}^2.\text{L}^3$	62.6
n= 5	H^+	HL/H.L	9.83
-pentamethyleno-		$\text{H}_2\text{L}/\text{HL.H}$	9.16
$(\text{C}_{13}\text{H}_{26}\text{O}_4\text{N}_2)$	Fe^{3+}	ML/M.L	22.76
		$\text{M}_2\text{L}_3/\text{M}^2.\text{L}^3$	62.4
n= 6	H^+	HL/H.L	9.78
-hexamethyleno-		$\text{H}_2\text{L}/\text{HL.H}$	9.21
$(\text{C}_{14}\text{H}_{28}\text{O}_4\text{N}_2)$	Fe^{3+}	ML/M.L	22.63
		$\text{M}_2\text{L}_3/\text{M}^2.\text{L}^3$	62.3
Bibliography: 84BH			

 $\text{C}_{18}\text{H}_{24}\text{O}_9\text{N}_6$ N,N'N''-Tris[2-(N-hydroxycarbamoyl)ethyl]-1,3,5-benzenetricarboxamide H_3L

<u>Metal ion</u>	<u>Equilibrium</u>	<u>Log K</u> <u>25°, 0.1</u>
H^+	HL/H.L	10.04
	$\text{H}_2\text{L}/\text{HL.H}$	9.33
	$\text{H}_3\text{L}/\text{H}_2\text{L.H}$	8.48
Co^{2+}	ML/M.L	9.95
	MHL/ML.H	8.95
	$\text{MH}_2/\text{MHL.H}$	4.77
Ni^{2+}	ML/M.L	10.55
	MHL/ML.H	8.81
	$\text{MH}_2\text{L}/\text{MHL.H}$	5.06

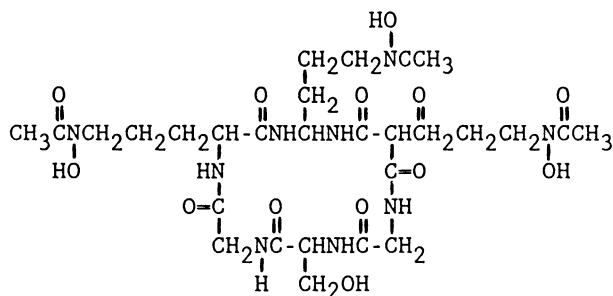
Metal <u>ion</u>	<u>Equilibrium</u>	Log K <u>25°, 0.1</u>
Cu ²⁺	MHL/M.HL	23.48
	MH ₂ L/MHL.H	3.48
Fe ³⁺	ML/M.L	26.32
Zn ²⁺	ML/M.L	10.40
	MHL/ML.H	9.17
	MH ₂ L/MHL.H	4.77
Al ³⁺	ML/M.L	21.85

Bibliography: 83YMa


$$H_3L$$

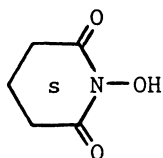
Metal		Log K
<u>ion</u>	<u>Equilibrium</u>	<u>25°, 0.1</u>
H ⁺	HL/H.L	9.16
	H ₂ L/HL.H	8.86
	H ₃ L/H ₂ L.H	7.63
Fe ³⁺	ML/M.L	30.2
	MHL/ML.H	0.50

Bibliography: 83WKR


$$H_3L$$

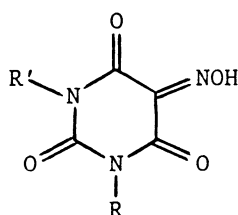
Metal ion	Equilibrium	Log K 25°, 0.1
Fe ³⁺	ML.H ³ /M.H ₃ L	3.3
	MHL/ML.H	0.53

Bibliography: 83WKR

 $C_5H_7O_3N$ N-Hydroxyglutarimide

HL

Metal	Equilibrium	Log K
<u>ion</u>		<u>20°, 0.1</u>
H^+	HL/H.L	7.65
Fe^{3+}	ML/M.L	8.19
	$ML_2/M.L^2$	14.67
	$ML_3/M.L^3$	19.34

Bibliography: H^+ 80KJ; Fe^{3+} 81KJ $C_xH_yO_4N_3$ 1,3-Disubstituted-2,4,5,6-tetraoxypyrimidine 5-oxime

Ligand	Metal	Equilibrium	Log K	Log K	ΔH	ΔS
<u>ion</u>	<u>ion</u>		<u>25°, 0.5</u>	<u>25°, 0</u>	<u>25°, 0.1</u>	<u>25°, 0.1</u>
$R=R'=H$	H^+	HL/H.L		(14.1)		
(violuric acid)		$H_2L/HL.H$	9.35 ± 0.1	$(13.2)^c \pm 0.2$		
$(C_4H_3O_4N_3), H_3L$			9.62 ^a ± 0.03	9.31 ^c	-7.96	17.3
				9.43 ^d		
(Other references in Vol.2, p.343 and Vol.5, p.382)		$H_3L/H_2L.H$	4.25 ± 0.1	5.58 ± 0.03	-4.09	6.2
			4.35 ^a ± 0.00	4.26 ^c		
				4.37 ^d		
	Fe^{2+}	$M(H_2L)_3/M.(H_2L)^3$	8.65 ± 0.05			
	Co^{2+}	$MH_2L/M.H_2L$	(2.0) ± 0.4			
		$M(H_2L)_2/M.(H_2L)^2$	5.00 ± 0.3			
	Ni^{2+}	$MH_2L/M.H_2L$	3.56 ± 0.1			
		$M(H_2L)_2/M.(H_2L)^2$	6.35 ± 0.05			
	Cu^{2+}	$MH_2L/M.H_2L$	4.25 ± 0.05			
		$M(H_2L)_2/M.(H_2L)^2$	7.29 ± 0.1			
$R=CH_3, R'=H$	H^+	HL/H.L	9.93			
1-Methyl-			10.12 ^a		-7.82	20.1
		$H_2L/HL.H$	(4.23)			
$(C_5H_5O_4N_3), H_2L$			4.48 ^a		-3.97	7.2
	Fe^{2+}	$M(HL)_3/M.(HL)^3$	9.38			
	Co^{2+}	$MHL/M.HL$	(2.08)			
		$M(HL)_2/M.(HL)^2$	5.03			

^a25°,0.1; ^c25°,1.0; ^d25°,2.0

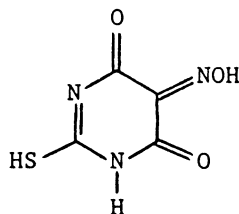
1,3-Disubstituted-2,4,5,6-tetraoxypyrimidine 5-oxime (continued)

<u>Ligand</u>	<u>Metal ion</u>	<u>Equilibrium</u>	<u>Log K</u> <u>25°, 0.5</u>	<u>Log K</u> <u>25°, 0</u>	<u>ΔH</u> <u>25°, 0.1</u>	<u>ΔS</u> <u>25°, 0.1</u>
	Ni ²⁺	MHL/M.HL	3.49			
		M(HL) ₂ /M.(HL) ²	6.57			
	Cu ²⁺	MHL/M.HL	4.40			
		M(HL) ₂ /M.(HL) ²	7.48			
R = CH ₂ CH ₃ , R' = H	H ⁺	HL/H.L	9.85			
1-Ethyl-		H ₂ L/HL.H	4.31			
(C ₆ H ₇ O ₄ N ₃), H ₂ L	Cu ²⁺	MHL/M.HL	4.42			
		M(HL) ₂ /M.(HL) ²	7.54			

R = R' = CH ₃	H ⁺	HL/H.L	(4.42)	4.81	-3.63	8.9
1,3-Dimethyl-			4.60 ^a ±0.02			
(C ₆ H ₇ O ₄ N ₃), HL	Fe ²⁺	ML ₂ /M.L ²	5.52			
(Other values in Vol.5, p.382 and other reference on p.453)		ML ₃ /M.L ³	10.25			

^a25°, 0.1

Bibliography: H⁺ 81DDD, 81SGa, 84HNV, 85MPJ; Fe²⁺ 78VN, 81DDD, 84HNV; Co²⁺-Cu²⁺ 78VN, 84HNV;
Other references: 83RSL, 84ASG

C₄H₃O₃N₃S

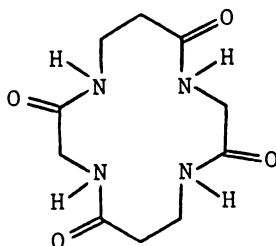
2-Mercapto-4,5,6-trioxypyrimidine 5-oxime
(2-thiovioluric acid)
(Other value in Vol.5, p.383)

H₃L

<u>Metal ion</u>	<u>Equilibrium</u>	<u>Log K</u> <u>25°, 0.1</u>	<u>Log K</u> <u>25°, 0.5</u>	<u>Log K</u> <u>25°, 0</u>
H ⁺	HL/H.L		(13.3) ^c	
	H ₂ L/HL.H	8.71	8.60	9.09
	H ₃ L/H ₂ L.H	3.84	3.64	4.04
Fe ²⁺	M(H ₂ L) ₃ /M.(H ₂ L) ³	9.04	8.60	
Co ²⁺	MH ₂ L/M.H ₂ L	2.61	2.58	
	M(H ₂ L) ₂ /M.(H ₂ L) ²	4.77	4.77	
Ni ²⁺	MH ₂ L/M.H ₂ L		3.51	
	M(H ₂ L) ₂ /M.(H ₂ L) ²		5.89	
Cu ²⁺	MH ₂ L/M.H ₂ L		3.90	
	M(H ₂ L) ₂ /M.(H ₂ L) ²		7.00	
	M.H ₂ L/MH ₂ L(s)		-10.19	

^c25°, 1.0

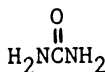
Bibliography: 84HNV; Other references: 81DDD, 81SGb, 81SGc



$C_{10}H_{16}O_4N_4$ 3,7,10,14-Tetraoxo-1,4,8,11-tetraazacyclotetradecane L
(cyclo- β -alanylglycyl- β -alanylglycyl)

Metal		Log K
<u>ion</u>	<u>Equilibrium</u>	<u>25°, 0.2</u>
Cu^{2+}	$M(H_4L) \cdot H^4 / M \cdot L$	-25.1

Bibliography: 8ORM



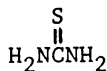
CH_4ON_2 Carbamide (urea) L
(Other values in Vol.3, p.313 and other reference in Vol.5, p.477)

Metal		Log K	Log K	Log K
<u>ion</u>	<u>Equilibrium</u>	<u>25°, 0.1</u>	<u>20°, 2.7</u>	<u>25°, 0</u>
H^+	HL/H.L	0.1 ^h		0.1
Tl^+	ML/M.L		-0.3	
Cd^{2+}	ML/M.L	0.85		
	$ML_2/M \cdot L^2$	1.36		
	$ML_3/M \cdot L^3$	1.64		
	$ML_4/M \cdot L^4$	1.94		

$h_{21^\circ, 0.1}$

Bibliography: Tl^+ 79Fb; Cd^{2+} 84C;

Other references: 80MCb, 85MCa



CH_4N_2S Thiocarbamide (thiourea) L
(Other values in Vol.3, p.313 and Vol.5, p.384)

Metal		Log K	Log K	Log K	ΔH	ΔS
<u>ion</u>	<u>Equilibrium</u>	<u>25°, 0.1</u>	<u>25°, 1.0</u>	<u>25°, 0</u>	<u>25°, 0.5</u>	<u>25°, 0.5</u>
H^+	HL/H.L	1.18 0.85 ^d	0.97 0.75 ^e	1.44 0.66 ^f	-1.2 ^f	-1 ^f
Cu^{2+}	ML/M.L		0.8			
	$ML_2/M \cdot L^2$		0.9			
	$ML_3/M \cdot L^3$		1.0			
	$ML_4/M \cdot L^4$		1.1			

$d_{25^\circ, 2.0}$; $e_{25^\circ, 3.0}$; $f_{25^\circ, 4.0}$;

Thiourea (continued)

Metal ion	Equilibrium	Log K 25°, 0.1	Log K 25°, 1.0	Log K 25°, 0	ΔH 25°, 0.5	ΔS 25°, 0.5
Ag ⁺	ML/M.L	7.11 ^b ±0.07	7.69	6.46 ^t	-19 ^t	-34 ^t
	ML ₂ /M.L ²	10.61 ^b -0.01	10.47	10.90 ^t	(-2.6) ^b	(24) ^b
	ML ₃ /M.L ³	12.73 ^b ±0.02	12.88	12.88 ^t	-27 ^t	-41 ^t
	ML ₄ /M.L ⁴	13.57 ^b ±0.08			-21.9 ^b	-25 ^b
	M ₂ L ₃ /M ² .L ³			20.7 ^t	-30 ^t	-40 ^t
Au(I)	ML/M.L	4.52 ^b			-23.1 ^b	-19 ^b
	ML ₂ /M.L ²	5.76 ^b			-52 ^t	-80 ^t
	ML ₃ /M.L ³	6.10 ^b			-32.0 ^b	-45 ^b
Sn ²⁺	ML/M.L	0.68	0.80	0.71	(-30) ^s	(-80) ^b
	ML ₂ /M.L ²	(0.94) ^d	0.90 ^e	0.94 ^f	(-23) ^s	(-51) ^b
	ML ₃ /M.L ³	(1.04) ^d	1.22	0.79	(-30) ^s	(-73) ^b
	ML ₄ /M.L ⁴	1.2	1.3	1.1		
		(1.4) ^d	1.8 ^e	1.9 ^f		
		1.3	1.3	1.1		
		(1.6) ^d	2.0 ^e	2.0 ^f		

^b25°, 0.5; ^d25°, 2.0; ^e25°, 3.0; ^f25°, 4.0; ^s18-35°, 0.5; ^t25°, 0.02

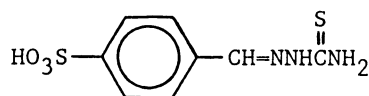
Bibliography:

H⁺ 82VRD;Cu²⁺ 80KP;Ag⁺ 74BD;

Au(I) 80ZY;

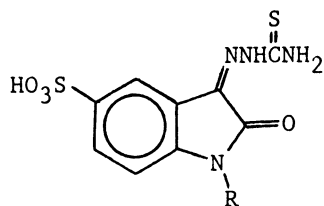
Cd²⁺ 80BV, 81DBD, 81DD, 82TP, 84C, 84D;Sn²⁺ 80FG;

Other references: 77SB, 80DB, 80DDa, 81TMV, 81VSK, 82MC, 83BDD, 73MC, 84DBC, 84PK, 84VRS

C₈H₉O₃N₃S₂4-Sulfobenzaldehyde thiosemicarbazoneH₂L

Metal ion	Equilibrium	Log K 37°, 0.15
H ⁺	HL/H.L	10.80
Cu ⁺	MHL/M.HL	7.9
	M(HL) ₂ /M.(HL) ²	12.37
	M(HL) ₂ /M(HL)L.H	6.4
	M(HL)L/ML ₂ .H	8.0

Bibliography: 81Sc


 $C_xH_yO_4N_4S_2$
1-Alkyl-5-sulfoisatin-3-thiosemicarbazone
 H_2L

<u>Ligand</u>	<u>Metal ion</u>	<u>Equilibrium</u>	<u>Log K</u> <u>37°, 0.15</u>
R= H	H ⁺	HL/H.L	8.43
5-Sulfo- (C ₉ H ₈ O ₄ N ₄ S ₂)	Fe ²⁺	ML/M.L	4.3
		ML ₂ /M.L ²	8.91
	Cu ⁺	ML ₂ /M.L ²	17.9
		MHL ₂ /ML ₂ .H	7.2
		M(HL) ₂ /MHL ₂ .H	5.8
	Zn ²⁺	ML/M.L	5.68
ML ₂ /M.L ²		11.31	
R= CH ₃	H ⁺	HL/H.L	8.48
1-Methyl- (C ₁₀ H ₁₀ O ₄ N ₄ S ₂)	Fe ²⁺	ML/M.L	4.1
		ML ₂ /M.L ²	8.98
	Cu ⁺	ML ₂ /M.L ²	18.5
		MHL ₂ /ML ₂ .H	7.0
	Zn ²⁺	ML/M.L	5.57
		ML ₂ /M.L ²	11.36

Bibliography:

H⁺ 81Sb;Fe²⁺, Zn²⁺ 82Sa;Cu⁺ 81Sc

OH⁻HO⁻

Hydroxide ion

L⁻

(Other values in Vol.4, p.1 and Vol.5, p.393)

Metal ion	Equilibrium	Log K 25°, 0.5	Log K 25°, 1.0	Log K 25°, 0	ΔH 25°, 0	ΔS 25°, 0
H ⁺	HL/H.L	13.74 ±0.02 13.78 ^a ±0.01 13.96 ^d ±0.01 13.95 ^h	13.79 ±0.02 13.42 ⁿ 14.18 ^e ±0.04	13.997 ±0.003 13.544 ^p	-13.34 ±0.01 -13.54 ^b ±0.05 -13.08 ^e ±0.03 -12.67 ^p ±0.06	19.3 17.7 ^b 21.0 ^e
Na ⁺	ML/M.L	-0.1 ^a -0.3		0.1 -0.3	(+1) ^r	(4)
K ⁺	ML/M.L	0.0 ^a				
Be ²⁺	ML/M.L ML ₂ /M.L ²	8.3 ^h 16.5 16.2 ^a ±0.0 16.7 ^h	16.3 17.4 ^e ±0.2	8.6 (14.4)		
	ML ₃ /M.L ³ ML ₄ /M.L ⁴ M ₂ L/M ² .L	10.54 10.82 ^a 10.68 ^d	10.56	18.8 18.6		
	M ₃ L ₃ /M ³ .L ³	32.41 32.54 ^a -0.01 32.98 ^d	32.50 10.98 ^e ±0.04 33.88 ^e ±0.00	33.1	-9.0 ^e ±0.1 -24.8 ^e ±0.0 (-58) ^s	20 ^e 105 ^e (200)
Mg ²⁺	M.L ² /ML ₂ (s, active) M.L ² /ML ₂ (s, brucite)		-9.38 -11.14 ^e	-9.2 -11.15 ±0.2		
Ca ²⁺	ML/M.L	1.0 ^a	0.7 ^e ±0.1	1.3 ±0.1	+2.0	13
Sc ³⁺	ML/M.L	9.0 9.1 ^a ±0.2 9.0 ^h	8.7 ±0.0	9.7	(+2) ^t	(47) ^c
	ML ₂ /M.L ² ML ₃ /M.L ³ ML ₄ /M.L ⁴ M ₂ L ₂ /M ² .L ²	17.2 ^h 24.6 ^h 21.40 21.50 ^a ±0.04	17.4 21.45 ±0.02	18.3 25.9 30 22.0	(-12) ^t	(58) ^c
	M ₃ L ₅ /M ³ .L ⁵	51.4 51.6 ^a ±0.3	51.5 ±0.0	53.8	(-28) ^t	(142) ^c
La ³⁺	ML/M.L M ₂ L ₂ /M ² .L ² M ₅ L ₉ /M ⁵ .L ⁹	4.67 ^u 10.62 ^e (56.2) ^e	3.8 ^e ±0.3 (56.2) ^e	5.5 (38.4)		
Pr ³⁺	ML/M.L M ₂ L ₂ /M ² .L ²	5.18 ^u 4.9 ^d 12.52 ^d	4.6 ^e 12.05 ^e			

^a25°,0.1; ^b25°,0.5; ^c25°,1.0; ^d25°,2.0; ^e25°,3.0; ^h20°,0.1; ⁿ37°,0.15; ^p40°,0;
^r15-40°,0-1.0; ^s0-60°,1.0 molal; ^t10-40°,1.0 molal; ^u25°,0.3;

Hydroxide ion (continued)

Metal ion	Equilibrium	Log K 25°, 0.5	Log K 25°, 1.0	Log K 25°, 0	ΔH 25°, 0	ΔS 25°, 0
Sm ³⁺	ML/M.L	5.39 ^u	5.0 ^e		(-5) ^s	(6) ^e
	M ₂ L ₂ /M ² .L ²		14.10 ^e		(-6) ^s	(44) ^e
Er ³⁺	ML/M.L	5.74 ^u	5.2 ^e			
	M ₂ L ₂ /M ² .L ²		14.64 ^e			
Yb ³⁺	ML/M.L	5.81 ^u	5.6 ^e	6.6		
	M ₂ L ₂ /M ² .L ²		15.04 ^e			
Np ³⁺	ML/M.L	6.3 ^u				
NpO ₂ ⁺	ML/M.L	4.16 ^a	4.7			
	M.L/ML(s)	-8.85 ^a	-8.81			
UO ₂ ²⁺	ML/M.L	7.6	7.8	8.1	(-2) ^t	(28) ^b
		7.7 ^a ±0.0	8.1 ^e			
	M ₂ L ₂ /M ² .L ²	21.50 ±0.06	21.59 ±0.08	22.4		
		21.67 ^a ±0.06	22.37 ^e ±0.06		-16.7 ^e	46 ^e
		21.79 ^d				
	M ₃ L ₄ /M ³ .L ⁴	(41.8)	(42.4)			
		(42.7) ^a ±0.1	(43.1) ^e		(-34) ^e	(83) ^e
	M ₃ L ₅ /M ³ .L ⁵	51.92	52.60 ±0.08	54.4		
		52.7 ^a ±0.1	54.50 ^e ±0.06		-41 ^e	112 ^e
	M ₄ L ₆ /M ⁴ .L ⁶	(63.5)	(66.1) ^e		(-54) ^e	(121) ^e
V ²⁺	M ₄ L ₇ /M ⁴ .L ⁷	(73.7) ^a			(-54) ^e	(121) ^e
	ML/M.L			7.51	(+1) ^r	(38)
Cr ²⁺	ML/M.L		8.5			
Fe ²⁺	ML/M.L	4.2 ^a	4.3	4.6 ±0.1	(0) ^r	(21)
	ML ₂ /M.L ²			(7.5)	(+2) ^r	(41)
	ML ₃ /M.L ³			13	(-10) ^r	(26)
	ML ₄ /M.L ⁴			10		
Co ²⁺	ML/M.L		4.0 ±0.1	4.3 ±0.1		
			4.0 ^e			
	ML ₂ /M.L ²		8.7	9.2		
	ML ₃ /M.L ³		9.9	10.5		
	ML ₄ /M.L ⁴			9.7		
	M ₂ L/M ² .L		4 ^e	3		
	M ₄ L ₄ /M ⁴ .L ⁴		27.4 ^e ±0.0	25.5		
Ni ²⁺	ML/M.L	3.6 ^a	3.7	4.1	(-1) ^r	(15)
	ML ₂ /M.L ²			9		
	ML ₃ /M.L ³			12		
	M ₂ L/M ² .L		4.7 ±0.2			
			28.5 ^c	28.3		
	M ₄ L ₄ /M ⁴ .L ⁴		29.4 ^e ±0.0		-12.8 ^e	92 ^e

^a25°,0.1; ^b25°,0.5; ^c25°,1.5; ^d25°,2.0; ^e25°,3.0; ⁿ37°,0.15; ^rtemp.var.,0;

^s0-60°,1.0 molal; ^t25-95°,0.5; ^u25°,0.3

Hydroxide ion (continued)

Metal ion	Equilibrium	Log K 25°, 0.5	Log K 25°, 1.0	Log K 25°, 0	ΔH 25°, 0	ΔS 25°, 0
Cu ²⁺	ML/M.L	6.1 ^a ±0.0	5.8 ⁿ (6.8) ^e ±0.2	6.5 ±0.0	-4.9 ^a	11 ^a
	ML ₂ /M.L ₂ ²	10.8 ^q		11.8 ±0.1		
	ML ₃ /M.L ₃ ³		14.5			
	ML ₄ /M.L ₄ ⁴		15.6			
	M ₂ L ₂ /M ² .L ²	16.8 ^a ±0.2	17.0 16.5 ⁿ 17.6 ^e ±0.2	17.4 ±0.2	-8.4 ^a -10.4 ^e	49 ^a 46 ^e
	M ₂ L/M ² .L M ₃ L ₄ /M ³ .L ⁴	33.5 ^a ±0.2	8.2 ^e ±0.2	35.2	(-6) ^v -28 ^a	(17) ^e 59 ^a
Ti ³⁺	ML/M.L	11.8	11.7 11.5 ^e ±0.1 25.3 ^e ±0.2	12.7		
	M ₂ L ₂ /M ² .L ²					
Cr ³⁺	ML/M.L	9.41 ⁱ 9.77 ^h ±0.03	9.45 ±0.05	10.04 ±0.05	-1.0	43
	ML ₂ /M.L ₂ ²	17.3 ^h	17.2		(+4.5)	(95) ^a
	M ₂ L ₂ /M ² .L ²	24.6 ^d	24.0 ±0.1			
	M ₃ L ₄ /M ³ .L ⁴		37.0			
	M ₄ L ₄ /M ⁴ .L ⁴	50.7 ^d				
	M ₄ L ₆ /M ⁴ .L ⁶	(72.8) ^d	(80.2)			
Fe ³⁺	ML/M.L	11.10 ±0.03 11.27 ^a ±0.01 11.22 ^d	11.10 ±0.1 11.08 ^q ±0.04 11.21 ^e ±0.08	11.81 ±0.03	(-3) ^r -3.4 ^a -2.1 ^e	(44) 40 ^a 44 ^e
	ML ₂ /M.L ₂ ²	21.7	22.0 ±0.1 22.1 ^e	23.3		
	M ₂ L ₂ /M ² .L ²	24.8 25.2 ^d	25.0 ±0.1 25.4 ^e ±0.1	25.1 ±0.0	(-13) ^r -16.2 ^e	(71) 62 ^e
	M ₃ L ₄ /M ³ .L ⁴		51.0 ^e	49.7	-38.0 ^e	106 ^e
	ML/M.L		7.7 7.9 ^e	8.3		
	ML ₂ /M.L ₂ ² M ₂ L ₂ /M ² .L ²	20.6 ^p	18.3 ^e 21.0 28.3 ^e	21.3	(-14) ^t	(47) ^p
OsO ₃	ML/M.L	5.29				
	ML ₂ /M.L ₂ ²	8.68				
OsO ₄	ML/M.L	1.58 ±0.01	1.3			
(CH ₃) ₂ Au ⁺	M ₂ L ₂ /M ² .L ²		18.57 ^e			
(CH ₃) ₂ Ga ⁺	ML/M.L	8.31 ^p				
	M ₂ L ₂ /M ² .L ²	19.19 ^p				
Zn ²⁺	ML/M.L	4.6 ^a	(4.7)	5.0 ±0.0	(0) ^u	(23)
	ML ₂ /M.L ₂ ²		8.3 ^e	(10.2)		
	ML ₃ /M.L ₃ ³		13.7 ^e	13.9		
	ML ₄ /M.L ₄ ⁴		18.0 ^e	15.5 ±0.1		
	M ₂ L/M ² .L		5.5 ^e ±0.0		(+2) ^s	(32) ^e
	M ₄ L ₄ /M ⁴ .L ⁴		27.9 ^e			

^a25°, 0.1; ^d25°, 2.0; ^e25°, 3.0; ^h20°, 0.1; ⁱ20°, 0.5; ⁿ37°, 0.15; ^p40°, 0.3; ^q25°, 0.7;
^rtemp. var., 0; ^s25-100°, 3.0; ^t4-46°, 0.3; ^u15-42°, 0; ^v25-50°, 3.0

Hydroxide ion (continued)

Metal ion	Equilibrium	Log K 25°, 0.5	Log K 25°, 1.0	Log K 25°, 0	ΔH 25°, 0	ΔS 25°, 0
Pb ²⁺	ML/M.L	6.0 ^u	6.3 ^e ±0.1	6.4 ±0.1		
		6.0 ^a -0.1				
		6.0 ^d				
	ML ₂ /M.L ²	10.3 ^u	10.9 ^e	10.9		
	ML ₃ /M.L ³	13.3 ^u	13.7 ^e	13.9 ±0.0		
	M ₂ L ₂ /M ² .L		7.8 ^e	7.6		
	M ₃ L ₄ /M ³ .L ⁴	31.7 ^u	34.0 ^e ±0.1	32.1	-25.9 ^e	69 ^e
	M ₄ L ₄ /M ⁴ .L ⁴	35.2	37.5 ^e ±0.1	36.0	-32.3 ^e	63 ^e
		35.1 ^u				
		35.5 ^a				
Sn ²⁺		36.5 ^d				
	M ₆ L ₈ /M ⁶ .L ⁸	67.4 ^u	71.3 ^e ±0.0	68.4	-55.4 ^e	140 ^e
	ML/M.L	10.1 ⁱ	10.4 ^e ±0.1	10.6		
	ML ₂ /M.L ²	19.9 ⁱ		20.9		
	ML ₃ /M.L ³	24.0 ⁱ	24.6 ^e	25.4		
	M ₂ L ₂ /M ² .L ²		23.9 ^e	23.2		
	M ₃ L ₄ /M ³ .L ⁴		52.25 ^e ±0.02	49.1		
	ML/M.L	8.21 ±0.0	8.31	9.01 ±0.04	(-1) ^r	(40)
		8.47 ^a ±0.02				
	ML ₂ /M.L ²	16.8 ^a ±0.1		17.8		
Al ³⁺	ML ₃ /M.L ³	24.7 ^a		25.5		
	ML ₄ /M.L ⁴	31.5 ±0.1		33.4 ±0.4		
	M ₂ L ₂ /M ² .L ²		20.0	20.3	(-9) ^t	(60) ^c
	M ₃ L ₄ /M ³ .L ⁴	41.4	42.5	42.1	(-19) ^t	(130) ^c
		42.0 ^a				
	M ₁₃ O ₄ L ₂₄ /M ¹³ .L ³²	330.2	336.5	349.2	(-156) ^t	(1020) ^c
	ML/M.L	10.8 ±0.0		11.4 ^o	(-8) ^w	(23) ^b
		11.0 ^a ±0.1				
	ML ₂ /M.L ²	21.2 ^a ±0.2		22.1 ^o		
	ML ₃ /M.L ³	30.7 ^a ±0.3		31.7		
Ga ³⁺	ML ₄ /M.L ⁴			39.4		
	ML/M.L	9.5 ^a	9.9 ^e ±0.1	10.1 ±0.1	-8.2 ^e	18 ^e
	ML ₂ /M.L ²	18.2 ^a	19.8 ^e ±0.1	20.2 ±0.0	-13 ^e	47 ^e
	ML ₃ /M.L ³			29.5		
	ML ₄ /M.L ⁴			33.8		
	M ₂ L ₂ /M ² .L ²		23.2 ^e		-16.0 ^e	52 ^e
	M ₄ L ₄ /M ⁴ .L ⁴	47.8 ^a				
	M ₄ L ₆ /M ⁴ .L ⁶		43.1 ^e			
	ML/M.L	12.5	12.7	13.4 ±0.0	(-11) ^s	(23) ^e
		12.8 ^a	13.1 ^e ±0.0			
Tl ³⁺	ML ₂ /M.L ²	25.2	25.4	26.6 ±0.2		
		25.2 ^a	25.8 ^e ±0.0			
	ML ₃ /M.L ³	37.5 ^a		38.7		
	ML ₄ /M.L ⁴		39.4 ^e	41.0		

^a25°, 0.1; ^b25°, 0.5; ^c25°, 1.0; ^d25°, 2.0; ^e25°, 3.0; ⁱ20°, 0.5; ^o18°, 0; ^r0-40°, 0; ^s25-40°, 3.0; ^t63-153°, 1.0 molal; ^u25°, 0.3; ^w15-45°, 0.5;

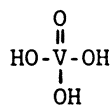
Hydroxide ion (continued)

Metal ion	Equilibrium	Log K 25°, 0.5	Log K 25°, 1.0	Log K 25°, 0	ΔH 25°, 0	ΔS 25°, 0
Sb(III)	ML ₂ /ML.L (in HNO ₃)			15.5 ^g		
	ML ₃ /ML ₂ .L		13.0 ^e	12.8		
	ML ₄ /ML ₃ .L			2.2		
	M ₂ L ₂ /(ML ₂) ² .H ² (in HClO ₄)			0.7 ^g		
Bi ³⁺	ML/M.L	12.3 ⁱ	12.2	12.9		
		12.4 ^a	12.6 ^e		-9 ^e	27 ^e
	ML ₃ /M.L ³	31.9 ^a		33.0 ±0.1		
	ML ₄ /M.L ⁴			34.8		
	M ₆ L ₁₂ /M ⁶ .L ¹²		165.3 ±0.4			
			170.3 ^e		-125 ^e	360 ^e
	M ₉ L ₂₀ /(M ₆ L ₁₂) ^{1.5} .L ²					
		23.9 ^a ±0.2				
	M ₉ L ₂₁ /M ₉ L ₂₀ .L	10.6 ^a ±0.0				
	M ₉ L ₂₂ /M ₉ L ₂₁ .L	11.1 ^a ±0.1				

^a25°, 0.1; ^e25°, 3.0; ^g25°, 5.0, assuming HL/H.L = 14.6; ⁱ20°, 0.4

Bibliography:

H⁺ 61BBS, 62LL, 64HD, 70LG, 72FB, 73FJ, 73KPG, 78AB, 80DR, 80FO, 80MFA, 80SV, 81BI, 81MFA, 81OO, 81SN, 81VSB, 82BB, 82OL, 83BMS, 83BSV, 83DR, 83PR, 83SHN, 84DSR, 84SA, 84VKc, 85MPJ, 85MPS, 85P, 85RDS, 85SM;
Na⁺ 84DSR; Fe³⁺ 68RR, 69VS, 71MS, 71NP, 72KP, 72WE, 74PB, 74VB, 75GS, 79ZK, 80GH, 80ZK, 81BK, 81SM, 82YS, 85MEK;
K⁺ 84DO; Ti³⁺ 83TM;
Be²⁺ 75VG, 83BEb; VO²⁺ 70LW, 73HMP, 82NF;
Mg²⁺ 81E; OsO₃ 83GZC;
Ca²⁺ 73FJ, 84DSR; OsO₄ 72La, 78LD, 83GZC;
Ba²⁺ 39D; (CH₃)₂Au⁺ 69HT;
Sc³⁺ 83BEa; CH₃Hg⁺ 83AC;
La³⁺, Yb³⁺ 82BBP; (CH₃)₂Ga⁺ 70PT;
Pr³⁺ 82BBP, 83LSD; Zn²⁺ 85BBP;
Sm³⁺ 83BBc; Cd²⁺ 74MO;
Er³⁺ 75BL; Hg²⁺ 83P;
Np³⁺ 74MK;
NpO₂⁺ 83Ma, 85BTC, 85LT;
UO₂²⁺ 68OC, 79LPa, 79ME, 82M, 82OL, 82MSa, 83CCa; Pb²⁺ 74V, 80SB, 80KI, 81IO, 81KO;
PuO₂²⁺ 75Sc; Sn²⁺ 76BM, 81PMB;
V²⁺ 64PP; Al³⁺ 42H, 81OF, 84CDD, 84CMS, 84TZ, 85BSB;
Cr²⁺ 83MDN; Ga³⁺ 28FM, 84YI;
Fe²⁺ 70SB, 71Mb, 79MMM; In³⁺ 75KZ, 81YR, 81YRB, 82BE, 82BF, 83Ta;
Ni²⁺ 69KK, 71OB, 78BK, 80MBV; Tl³⁺ 61RW, 80YU, 82YR;
Cu²⁺ 79SH, 80PK, 82BBS, 84GL, 84Nb, 85RDS; Sb(III) 74SM;
Cr³⁺ 83SM; Bi³⁺ 72DNa, 82LKb, 85SSM;
Other references: 28P, 28YW, 48KN, 53SS, 54DS, 55D, 57M, 58TS, 63D, 64DS, 64LT, 65BB, 65WD, 65WS, 66MI, 67BN, 67CE, 67HR, 67M, 67SBa, 67ST, 67SW, 67YK, 68CG, 68LV, 68SK, 69CB, 69CT, 69DR, 69GF, 69H, 69L, 69MGA, 69SB, 69ZP, 70Ba, 70BSa, 70DG, 70FW, 70GD, 70GF, 70GT, 70HK, 71BB, 71G, 71GT, 71MA, 71Nab, 71PL, 71PP, 71PR, 72CM, 72GKS, 72HK, 72IY, 72LH, 72MGA, 72SI, 72SS, 72TS, 73BC, 73BL, 73C, 73CM, 73CP, 73Ha, 73Hb, 73HM, 73KB, 73LB, 73Ma, 73MC, 73VR, 74DN, 74FRc, 74Gb, 74IL, 74Mb, 74MC, 74NS, 74RL, 74Sb, 74SP, 74VVK, 75BB, 75FG, 75SV, 76J, 76SKc, 76ZB, 77Bb, 77BG, 77BMO, 77GB, 77MMJ, 77Ndb, 77SB, 77SB, 77VM, 78BBC, 78HL, 78MS, 78SSc, 79HH, 79MFM, 79MM, 79SG, 80AD, 80BMG, 80CSM, 80DG, 80DL, 80KDa, 80MT, 80Nb, 80TL, 80TS, 80YPa, 81BKa, 81BM, 81C, 81CCM, 81EK, 81FT, 81HS, 81LM, 81Mc, 81TC, 82CC, 82CD, 82DEK, 82HS, 82KD, 82L, 82MSb, 82MV, 82NC, 82RC, 82SM, 83AC, 83BE, 83CC, 83DE, 83DV, 83EK, 83Ka, 83KD, 83KDa, 83KKA, 83LRS, 83MOP, 83RSM, 83Sd, 83SL, 83SO, 83SSd, 83VKa, 83VN, 83WK, 83YS, 84ABO, 84AO, 84CL, 84CP, 84DDa, 84FM, 84GD, 84IBa, 84KD, 84KKG, 84MBa, 84MBH, 84MD, 84NG, 84PT, 84R, 84SN, 85BB, 85CE, 85CFR, 85CTa, 85IYN, 85KTP, 85LL, 85MD, 85MMN, 85RRA, 85SGb, 85TzB

 $\text{H}_3\text{O}_4\text{V}$

Hydrogen vanadate (vanadic acid)
(Other values in Vol.4, p.15 and Vol.5, p.397)

 H_3L

Metal ion	Equilibrium	Log K 25°, 0.5	Log K 25°, 1.0	Log K 25°, 0	ΔH 25°, 0	ΔS 25°, 0
H^+	HL/H.L	13.34 ^u 13.40 ^v	13.28 ^u +0.01 13.37 ^v 13.15 ^{d,u} 13.35 ^{d,v}	14.3 ±0.1 13.10 ^{e,u} +0.1 13.33 ^{e,v}		
	$\text{H}_2\text{L}/\text{HL.H}$	7.89 ±0.04 8.31 ^{h,z} 8.23 ^h	7.98 ^u +0.10 8.04 ^v	8.55 7.9 ^{e,u}	(0) ^t	(36) ^e
	$\text{H}_3\text{L}/\text{H}_2\text{L.H}$	3.78 (3.45) ^a (3.4) ^h	3.8	4.0	(0) ^s	(17) ^c
	$\text{VO}_2/\text{H}_3\text{L.H}$ $\text{VO}_2/(\text{V}_2\text{O}_5)^{0.5}(\text{s}).\text{H}$	(3.20) 3.35 ^a	(3.7)	3.3 -0.68	(0) ^s +4.2	(17) ^c 11
	$\text{H}_2\text{V}_2\text{O}_7/(\text{H}_2\text{L})^2$ $\text{H}_2\text{V}_2\text{O}_7/\text{HV}_2\text{O}_7.\text{H}$ $\text{HV}_2\text{O}_7/\text{V}_2\text{O}_7.\text{H}$	2.77 ^u 8.02 ^u 9.92 ^u		10.57		
	$\text{H}_2\text{V}_4\text{O}_{13}/(\text{H}_2\text{L})^4$	10.00 ^u -0.1 10.15 ^{i,v} 9.7 ^h	10.2 ^u	8.6 10.5 ^{e,u} +0.1	(-21) ^t	(-22) ^e
	$\text{H}_2\text{V}_4\text{O}_{13}/\text{V}_4\text{O}_{13}.\text{H}^2$ $\text{HV}_4\text{O}_{13}/\text{V}_4\text{O}_{13}.\text{H}$	18.88 ^u (9.1) ^u				
	$\text{V}_5\text{O}_{15}/(\text{H}_2\text{L})^5$	12.25 ^u				
	$\text{H}_2\text{V}_{10}\text{O}_{28}.\text{H}^{14}/(\text{VO}_2^+)^{10}$	-7.7 ^u	-6.75 ^u	-10.7 -5.5 ^{e,u}		
	$\text{H}_3\text{V}_{10}\text{O}_{28}/\text{H}_2\text{V}_{10}\text{O}_{28}.\text{H}$	1.6				
	$\text{H}_2\text{V}_{10}\text{O}_{28}/\text{HV}_{10}\text{O}_{28}.\text{H}$	3.74 (3.9) ^{h,u} 4.34 ^{h,v} 4.45 ^{h,z}	3.65 ^u +0.05 (3.1) ^v	3.5 ^{e,u}		
	$\text{HV}_{10}\text{O}_{28}/\text{V}_{10}\text{O}_{28}.\text{H}$	6.00 6.9 ^{h,u} (6.4) ^{h,v} 7.5 ^{h,z}	6.0 ^u ±0.2 (5.5) ^v			

^a25°,0.1; ^c25°,1.0; ^d25°,2.0; ^e25°,3.0; ^h20°,0.1; ⁱ20°,0.5; ^s15-35°,1.0; ^t10-40°,3.0;
^u Na^+ salt used as background electrolyte; ^v K^+ salt used as background electrolyte;
^z $(\text{CH}_3)_4\text{NCl}$ used as background electrolyte.

Bibliography: H^+ 60BC,60Ca,73R,74IG,83BS,83PH,85IK,85PH;
 Other references: 77BMS,80IS,81AI,81HH,83TMa

H_2CrO_4

H_2O_4Cr		<u>Hydrogen chromate (chromic acid)</u>				H_2L
		(Other values in Vol.4, p.17 and Vol.5, p.398)				
Metal ion	Equilibrium	Log K 25°, 0.5	Log K 25°, 1.0	Log K 25°, 0	ΔH 25°, 0	ΔS 25°, 0
H^+	HL/H.L	5.81	5.74	6.50 ± 0.02	+0.7	32
		$6.09^a \pm 0.04$		$5.92^{e,u} \pm 0.02$	+1.1 ^e	31 ^e
	$H_2L/HL.H$	$(-0.7)^i$ $(-0.6)^h$	$(-0.7) \pm 0.1$	$(-0.2)^o$ $(-0.6)^{e,u}$	$(+9)^s$	$(27)^c$
	$Cr_2O_7/(HL)_2$	1.84 $1.72^a \pm 0.02$	1.97 ± 0.03	1.53 ± 0.02 $2.17^{e,u} \pm 0.03$	-4.7 -4.8 ^e	-9 -6 ^e
Ag^+	$M^2.L/ML_2(s)$			-11.59 ± 0.03	+15 +1	-3

^a25°,0.1; ^c25°,1.0; ^e25°,3.0; ^h20°,0.1; ⁱ20°,0.5; ^o20°,0; ^s15-35°,1.0;

^uNa⁺ salt used as background electrolyte.

Bibliography: H^+ 70GH,70Ka,74HH,79HH; Ag^+ 23B,57HN,71JL,81DP

Other references: 69EH,70DE,74F,74FG

 H_2MoO_4

H_2O_4Mo		<u>Hydrogen molybdate (molybdic acid)</u>				H_2L
		(Other values in Vol.4, p.18 and Vol.5, p.399)				
Metal ion	Equilibrium	Log K 25°, 0.1	Log K 25°, 1.0	Log K 25°, 0	ΔH 25°, 0.1	ΔS 25°, 0.1
H^+	HL/H.L	3.78 ± 0.04	$3.52^u \pm 0.05$	4.24^o $3.89^{e,u}$	$(+5)^s$ +14 ^e	(34) 65 ^e
	$H_2L/HL.H$	3.77	$3.70^u \pm 0.05$	4.00^o $3.61^{e,u}$	$(-12)^s$	(-23)
	$Mo_7O_{24}/H^8.L^7$	52.98	$52.80^u \pm 0.01$	$57.74^{e,u}$	-56.0 ^e	76 ^e
	$HMo_7O_{24}/Mo_7O_{24}.H$	5.10	$4.63^u \pm 0.06$	$4.40^{e,u}$	+2.6 ^e	29 ^e
	$H_2Mo_7O_{24}/HMo_7O_{24}.H$	3.71	$3.60^u \pm 0.04$	$3.54^{e,u}$	+0.8 ^e	19 ^e
	$H_3Mo_7O_{24}/H_2Mo_7O_{24}.H$		$2.43^u \pm 0.05$	$2.53^{e,u}$	-0.6 ^e	10 ^e
	$Mo_{19}O_{59}/H^{34}.L^{19}$			$196.3^{e,u}$		

^e25°,3.0; ^o20°,0; ^s10-40°,0.1; ^uNa⁺ salt used as background electrolyte.

Bibliography: H^+ 80Cb,83KMa,84JJ;

Other references: 59SL,64Sc,71NS,74FG,80GS,80KVa,81JJ,83TB,85TB

 H_2WO_4

H_2O_4W		<u>Hydrogen wolframate (tungstic acid)</u>				H_2L
		(Other values in Vol.4, p.19 and Vol.5, p.399)				
Metal ion	Equilibrium	Log K 25°, 0.5	Log K 25°, 1.0	Log K 25°, 0	ΔH 25°, 0	ΔS 25°, 0
H^+	HL/H.L	3.0		3.6	$(+1)^s$	$(17)^b$
		$3.2^a + 0.3$		$2.7^{e,u} + 1$		
	$H_2L/H^2.L$	$(8.1)^h$	$(11.30)^u$	(5.8)		
	$HW_6O_{21}/H^7.L^6$	62.77 63.23^a	62.53^u	63.83 $60.76^{e,u}$ $8.30^{e,u}$	-57 -62.5 ^e -5 ^e	101 68 ^e 21 ^e
	$HW_6O_{21}/W_6O_{21}.H$					

^a25°,0.1; ^b25°,0.5; ^e25°,3.0; ^h20°,1.0; ^s25-300°,1.0;

^uNa⁺ salt used as background electrolyte.

Hydrogen wolframate (continued)

Metal ion	Equilibrium	Log K 25°, 0.5	Log K 25°, 1.0	Log K 25°, 0	ΔH 25°, 0.1	ΔS 25°, 0.1
(H ⁺)	W ₁₂ O ₄₁ /H ¹⁴ .L ¹²			123.2 ^{e,u}	-127 ^e	138 ^e
	HW ₁₂ O ₄₁ /W ₁₂ O ₄₁ .H	6.28 ^h	5.0 ^{j,u}			
	H ₂ W ₁₂ O ₄₁ /HW ₁₂ O ₄₁ .H	5.27 ^h	4.3 ^{j,u}			
	H ₃ W ₁₂ O ₄₁ /H ₂ W ₁₂ O ₄₁ .H	3.6 ^h				
Ag ⁺	M ² .L/M ₂ L(s)	-11.05 -11.44 ^a	-10.79	-11.26	+14.7	-2

^a25°,0.1; ^e25°,3.0; ^h20°,0.1; ^j20°,1.0; ^uNa⁺ salt used as background electrolyte.

Bibliography: H⁺ 82JB,84WD; Ag⁺ 80JB,82JB

Other references: 61Se,62SF,64VS,70TG,71GW,80GS,80KVa,81AI,81DP,81IA

H₂Fe(CN)₆²⁻

C ₆ H ₂ N ₆ Fe ²⁻		<u>Hydrogen hexacyanoferrate (II) ion</u>			H ₂ L ²⁻
(Other values in Vol.4, p.21 and other references in Vol.5, p.477)					
Metal		Log K	Log K	ΔH	ΔS
<u>ion</u>	<u>Equilibrium</u>	<u>25°, 0.1</u>	<u>25°, 0</u>	<u>25°, 0</u>	<u>25°, 0</u>
H ⁺	HL/H.L	3.69	4.33 ±0.08	+0.5	22
	H ₂ L/HL.H	(1.9)	2.5 ±0.2	+1	15
K ⁺	ML/M.L	1.6 ±0.1	2.35 ±0.05	+1.0	14
Mg ²⁺	ML/M.L		3.81	+2.9	27
Ca ²⁺	ML/M.L		3.77 -0.1	+2.8 -0.7	27
	M ₂ L/ML.M		1.43		

Bibliography: H⁺,K⁺ 84DR; Mg²⁺,Ca²⁺ 81HWA;

Other references: 70LM,83FI

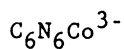
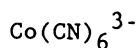
Fe(CN)₆³⁻

C ₆ H ₆ Fe ³⁻		Hexacyanoferrate (III) ion				L ³⁻
(Other values in Vol.4, p.22 and Vol.5, p.400)						
Metal		Log K	Log K	Log K	ΔH	ΔS
<u>ion</u>	<u>Equilibrium</u>	<u>25°, 0.5</u>	<u>25°, 1.0</u>	<u>25°, 0</u>	<u>25°, 0</u>	<u>25°, 0</u>
K ⁺	ML/M.L	-0.24 0.85 ^a	0.18 ^d 0.30 ^e	1.44 ±0.04	+0.5	8
Mg ²⁺	ML/M.L	1.44 ^a	0.04 ^e	2.79	+0.8 ^a	9 ^a
Ca ²⁺	ML/M.L	1.48 ^a	0.15 ^e	2.83	+0.6 ^a	9 ^a
Sr ²⁺	ML/M.L	1.50 ^a	0.23 ^e	2.85	+0.3 ^a	8 ^a
Ba ²⁺	ML/M.L	1.53 ^a		2.88	+0.4 ^a	8 ^a
Mn ²⁺	M ³ .L ² /M ₃ L ₂ (s)	-14.3 -15.1 ^a	-14.3 -15.2 ^d -16.5 ^e	-18.2 -18.6 ^f		
Fe ³⁺	ML/M.L	1.61 ±0.07	1.35 ±0.05		(+18) ^s	68 ^b

^a25°,0.1; ^b25°,0.5; ^d25°,2.0; ^e25°,3.0; ^f25°,4.0; ^s9-25°,0.5

Bibliography: K⁺ 76LL; Mg²⁺-Ba²⁺ 82Aa; Mn²⁺ 74FR; Fe³⁺ 82MSd;

Other references: 72Fb,73BCM,83KL,83MAK

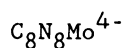
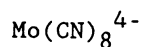


Hexacyanocobaltate (III) ion
(Other values in Vol.4, p.24)

L³⁻

<u>Metal ion</u>	<u>Equilibrium</u>	<u>Log K</u> <u>25°, 0.3</u>	<u>Log K</u> <u>25°, 0.5</u>	<u>Log K</u> <u>25°, 1.0</u>
Fe ³⁺	ML/M.L	2.21	1.81	1.65

Bibliography: 82MSd



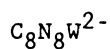
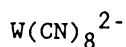
Octacyanomolybdate (IV) ion

L⁴⁻

<u>Metal ion</u>	<u>Equilibrium</u>	<u>Log K</u> <u>25°, 0.3</u>
Fe ³⁺	ML/M.L	4.06
	M ₂ L/ML.M	5.15

Bibliography: 82MSd;

Other references: 61MA, 73MH



Octacyanowolframate (VI) ion

L²⁻

<u>Metal ion</u>	<u>Equilibrium</u>	<u>Log K</u> <u>25°, 3.0</u>
Na ⁺	ML/M.L	1.08
K ⁺	ML/M.L	1.36
Rb ⁺	ML/M.L	1.57
Cs ⁺	ML/M.L	1.71

Bibliography: 76LL



Hydrogen borate (boric acid)
(Other references in Vol.4, p.25 and Vol.5, p.400)

HL

<u>Metal ion</u>	<u>Equilibrium</u>	<u>Log K</u> <u>25°, 0.5</u>	<u>Log K</u> <u>25°, 1.0</u>	<u>Log K</u> <u>25°, 0</u>	<u>ΔH</u> <u>25°, 0</u>	<u>ΔS</u> <u>25°, 0</u>
H ⁺	HL/H.L	8.97 ^a ±0.03	8.85 ^u ±0.00	9.236 ±0.001	-3.4 ±0.0	31
		8.85 ^{q,u} ±0.00	(8.88) ^v	8.98 ^{e,u} ±0.02	-4.0 ^d ±0.1	28 ^d
		(9.00) ^{q,v}	8.98 ^{d,v} ±0.03			
	HL ₂ /L.HL		-0.17 ^v	-0.12		
				0.67 ^{e,u}		
	H ₂ L ₃ /HL ₂ .HL		2.30 ^v	2.33		
				1.37 ^{e,u}		
	H ₂ L ₄ /H ₂ L ₃ .L		0.72 ^v	-0.04		
				0.69 ^{e,u}		
Na ⁺	ML/M.L	-0.24 ^q		0.24		

^a25°, 0.1; ^d25°, 2.0; ^e25°, 3.0; ^q25°, 0.7; ^uNa⁺ salt used as background electrolyte;
^vK⁺ salt used as background electrolyte.

Boric acid (continued)

Metal ion	Equilibrium	Log K 25°, 0.5	Log K 25°, 1.0	Log K 25°, 0	ΔH 25°, 0	ΔS 25°, 0
Mg ²⁺	ML/M.L	0.90 ^q		1.63	(0) ^r	(7)
Ca ²⁺	ML/M.L	1.11 ^q		1.80 0.99 ^{e,u}	(0) ^r	(8)
Sr ²⁺	ML/M.L			1.55	(0) ^r	(7)
Ba ²⁺	ML/M.L			1.49	(0) ^r	(7)
Fe ³⁺	ML/M.L	10.85 ^q				
	ML ₂ /M.L ²	22.4 ^q				
Ag ⁺	ML/M.L			1.20 0.45 ^{e,u} 4.5 ^{e,u}		
	M.(HL) ² /H.MHL ₂ (s)					

^a25°, 0.1; ^d25°, 2.0; ^e25°, 3.0; ^q25°, 0.7; ^r10-50°, 0; ^uNa⁺ salt used as background electrolyte; ^vK⁺ salt used as background electrolyte.

Bibliography: H⁺ 67BH, 69SHY, 72MBS, 73H, 73Ha, 74BK, 76BM, 78AB, 78BJ, 80Bb, 80DMb, 81P; Na⁺-Ba²⁺ 74BK, 76R, 80Bb; Fe³⁺ 80EK; Ag⁺ 80Bb;

Other references: 59JD, 74I, 78MSK, 80CCF, 83Se, 83TV

HCN

CHN Hydrogen cyanide (hydrocyanic acid) HL
(Other values in Vol.4, p.26 and Vol.5, p. 400)

Metal ion	Equilibrium	Log K 25°, 0.1	Log K 25°, 0.5
Cu ⁺	ML ₂ /M.L ²	21.7 ^a	
	ML ₃ /M.L ³	26.8 ^a	
	ML ₄ /M.L ⁴	(27.9) ^a	
CH ₃ Hg ⁺	ML/M.L		14.1

^aIonic strength varied from 0.11 to 0.035.

Bibliography: Cu⁺ 72HF, 76HF; CH₃Hg⁺ 73GE;

Other references: 61S, 67GG, 69BH, 70DG, 76HE, 77SB, 81BPU, 81Ca, 81KY, 82BC, 82GB

HNCS

CHNS Hydrogen thiocyanate (thiocyanic acid) HL
(Other values in Vol.4, p.29 and Vol.5, p.401)

Metal ion	Equilibrium	Log K 25°, 0.5	Log K 25°, 1.0	Log K 25°, 0	ΔH 25°, 0	ΔS 25°, 0
H ⁺	HL/H.L		(-0.9) ^d	(-1.1) (-0.8) ^f		
NpO ₂ ⁺	ML/M.L		0.32 ^d	0.86 ^g		
	ML ₂ /M.L ²			1.05 ^g		
UO ₂ ²⁺	ML/M.L		0.73	0.93 0.71 ^f	-0.8 ^c	1 ^c
	ML ₂ /M.L ²	0.72 ^v				
	ML ₃ /M.L ³		0.94 0.7		-1.5 ^c -2 ^c	0 ^c 1 ^c

^c25°, 1.0; ^f25°, 4.0; ^g25°, 5.0; ^v23°, 2.5

Hydrogen thiocyanate (continued)

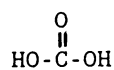
HL

Metal ion	Equilibrium	Log K 25°, 0.5	Log K 25°, 1.0	Log K 25°, 0	ΔH 25°, 0	ΔS 25°, 0
Co ²⁺	ML/M.L	1.11 $\pm$ 0.04 1.38 ^a	0.98 $\pm$ 0.03 0.84 ^d 1.27 ^e	1.72 $\pm$ 0.2	-1.6	3
	ML ₂ /M.L ²	2.02 ^a	1.32 1.46 ^d			
Cu ²⁺	ML/M.L	1.75 1.90 ^a	1.75 $\pm$ 0.01 1.91 ^e	2.33	-3.0 -2.9 ^c	1 -4 ^c
	ML ₂ /M.L ²	3.00 ^a	2.72	3.65	-6.2 ^c	-8 ^c
Fe ³⁺	ML/M.L	2.15 $\pm$ 0.05 2.40 ^a $\pm$ 0.05	2.11 $\pm$ 0.03 2.30 ^z 2.12 ^d $\pm$ 0.05 2.25 ^e $\pm$ 0.05	3.02 $\pm$ 0.02 2.38 ^f 2.56 ^g	-1.3 ^c -0.6 ^d	5 ^c 8 ^d
	ML ₂ /M.L ²	3.3 $\pm$ 0.2 3.6 ^a	3.3 $\pm$ 0.3 4.0 ^z 3.7 ^e $\pm$ 0.1 4.4 ^z	4.6 ^o		
	ML ₃ /M.L ³		5.1 ^e $\pm$ 0.1 6.4 ^e $\pm$ 0.1			
	ML ₄ /M.L ⁴		1.2	-0.6		
	MOHL/ML.OH	-1.2 -1.1 ^a				
VO ²⁺	ML/M.L		1.38 ^u	2.32	(-4) ^r	(-3)
	ML ₂ /M.L ²		2.24 ^u	3.68	(-1) ^r	(13)
	ML ₃ /M.L ³		3.08 ^u			
C ₆ H ₅ Hg ⁺	ML/M.L		6.66			
Cd ²⁺	ML/M.L	1.36 $\pm$ 0.02 1.60 ^a $\pm$ 0.03 1.33 ^d $\pm$ 0.07	1.31 $\pm$ 0.03 1.39 ^e $\pm$ 0.03	1.89 $\pm$ 0.2	-2.2 ^b -2.3 ^c -1.9 ^e	-1 ^b -2 ^c 0 ^e
	ML ₂ /M.L ²	2.05 $\pm$ 0.01 2.33 ^a $\pm$ 0.06 2.09 ^d $\pm$ 0.05	1.99 $\pm$ 0.01 2.24 ^e $\pm$ 0.2 2.1 $\pm$ 0.1	2.78 $\pm$ 0.2	-4.7 ^b -4.2 ^c -3.7 ^e	-6 ^b -5 ^c -2 ^e
	ML ₃ /M.L ³	2.1 2.2 ^d $\pm$ 0.1	2.1 $\pm$ 0.1 2.5 ^e $\pm$ 0.1	2.9	-6.4 ^c -5.3 ^e	-12 ^c -6 ^e
	ML ₄ /M.L ⁴	2.0 2.1 ^d $\pm$ 0.1	1.9 2.5 ^e $\pm$ 0.0	2.3	-6.3 ^e	-10 ^e
Sn ²⁺	ML/M.L		0.83 0.90 ^e			
	ML ₂ /M.L ²		1.1 1.4 ^e			
	ML ₃ /M.L ³		1.5 ^e			
Ga ³⁺	ML/M.L	1.25 $\pm$ 0.07	1.48 ^m	2.04		
	ML ₂ /M.L ²		2.72 ^m			

^a25°,0.1; ^b25°,0.5; ^c25°,1.0; ^d25°,2.0; ^e25°,3.0; ^f25°,4.0; ^g25°,5.0; ^m20°,6.0; ^r10-40°,0;
^u30°,3.0; ^zNaO₃SCF₃ used as background electrolyte.

Bibliography:

H⁺ 82NAC; NpO₂²⁺ 77MM,78MM; UO₂²⁺ 70SW; Co²⁺ 61DS,85VN; Ni²⁺ 61DS,69SCF,74DH;
 Cu²⁺ 85CTa; Fe³⁺ 62Va,69CEa,73MM,83KNa,85B,85ME; VO²⁺ 70LN; CH₃Hg⁺ 73GE;
 C₆H₅Hg⁺ 81SKB; Cd²⁺ 69MO,82TP,85VN; Hg²⁺ 70CGM,70SI,84VK; Sn²⁺ 80FB; Ga³⁺ 85CTa,85KB;
 Other references: 60TD,61S,62FL,64SK,67Sa,69D,69FS,69G,69MM,69NB,69Pc,70CK,70M,70ZM,
 71KN,71MC,72TS,73SS,74CS,74HS,74KI,74NB,76J,77SB,77VP,80DB,80KJa,80KMa,80L,80MTa,81Ca,
 81DDa,81TM,82RD,82TMD,82TRM,82TT,83BH,83D,84DBC,84DBF,85IYO,85RRS



CH_2O_3		<u>Hydrogen carbonate (carbonic acid)</u>				H_2L
		(Other values in Vol.4, p.37 and Vol.5, p.403)				
Metal ion	Equilibrium	Log K $25^\circ, 0.5$	Log K $25^\circ, 1.0$	Log K $25^\circ, 0$	ΔH $25^\circ, 0$	ΔS $25^\circ, 0$
H^+	HL/H.L	9.8 ± 0.0 9.93 ^a ± 0.02	9.57 ± 0.03 9.63 ^e ± 0.01 9.54 ^d ± 0.01	10.329 ± 0.01	-3.50 ± 0.01 -4.5 ^c	35.5 29 ^c
	$\text{H}_2\text{L}/\text{HL.H}$	6.00 ± 0.02 6.14 ^a ± 0.02	5.99 ± 0.05 6.44 ^e ± 0.03 5.98 ^d ± 0.02	6.352 ± 0.01	-2.19 ± 0.02 -2.4 ^b	21.7 19 ^b
	$\text{H}_2\text{L}/\text{CO}_2(\text{g})$	-1.53 ± 0.02 -1.52 ^a ± 0.06	-1.53 ± 0.02 -1.56 ^e ± 0.01 -1.55 ^d	-1.466 ± 0.002	-4.72	-22.6
	Ca^{2+} ML/M.L			3.15 ± 0.07	(+4) ^s	(28)
	MHL/M.HL			1.26 ± 0.03		
	M.L/ML(s, calcite)		-6.35 ^d ± 0.03	-8.48 ± 0.02	(-2) ^r	(-46)
Sr^{2+}	M.L/ML(s, aragonite)		-6.10 ^d ± 0.09	-8.30 ± 0.02	(-3) ^r	(-48)
	M.L/ML(s, vaterite)			-7.91	(-4) ^r	(-50)
	M.L/ML(s, monohydrocalcite)			-7.60		
	ML/M.L			-2.81	(+5) ^r	(30)
	MHL/M.HL			1.21 ± 0.03	(+6) ^r	(26)
	M.L/ML(s)			-9.27 -0.01	(0) ^r	(-42)
Ba^{2+}	ML/M.L			2.22		
	M.L/ML(s)			-8.69	(+3) ^t	(-30)
Y^{3+}	ML/M.L		5.93 6.03 ^e	8.2		
	MHL/M.HL		1.29 1.30 ^e	2.4		
	$\text{M}_2\text{L}/\text{M}^2.\text{L}$		6.89 6.99 ^e	8.06		
	ML/M.L		5.6 ^e			
	MHL/M.HL		1.41 ^e			
	$\text{M}_2\text{L}/\text{M}^2.\text{L}$		6.92 ^e			
Ce^{3+}	ML/M.L		6.33 ^e			
	$\text{ML}_2/\text{M}.\text{L}^2$		11.2 ^e			
	$\text{ML}_3/\text{M}.\text{L}^3$		12.6 ^e			
	$\text{ML}_4/\text{M}.\text{L}^4$		13.7 ^e			
	$\text{M}^2.\text{L}^3/\text{M}_2\text{L}_3(\text{s})$		-31.09 ^e			
	U^{4+} $\text{ML}_5/\text{M}.\text{L}^5$		57.7 ^e		-4.8 ^e	248 ^e
UO_2^+	$\text{ML}_3/\text{M}.\text{L}^3$		13.3 ^e			
NpO_2^+	ML/M.L	4.13 ^a	4.49			
	$\text{ML}_2/\text{M}.\text{L}^2$	7.06 ^a	7.11			
	$\text{ML}_3/\text{M}.\text{L}^3$		8.53			
	M.L/ML(s)		-10.14			

^a $25^\circ, 0.1$; ^b $25^\circ, 0.5$; ^c $25^\circ, 1.0$; ^e $25^\circ, 3.0$; ^d $25^\circ, 0.7$; ^r $0-90^\circ, 0$; ^s $10-50^\circ, 0$; ^t $25-40^\circ, 0$

Hydrogen carbonate (continued)

Metal ion	Equilibrium	Log K 25°, 0.5	Log K 25°, 1.0	Log K 25°, 0	ΔH 25°, 0	ΔS 25°, 0
UO ₂ ²⁺	ML/M.L	8.3	8.3 ^e	9.5		
	ML ₂ /M.L ²	15.4	16.2 ^e	16.6		
		16.2 ^a -0.1				
	ML ₃ /M.L ³	21.5	22.6 ^e	21.3	-8.6 ^e	75 ^e
		21.5 ^a ±0.1				
	M ₃ L ₆ /M ³ .L ⁶	53.7	56.2 ^e	53.4	-36.8 ^e	134 ^e
	M ₂ (OH) ₃ L.H ³ /M ² .L	-0.95 ^a				
NpO ₂ ²⁺	M.L/ML(s)	-13.21	-13.94 ^e	-14.4		
	MOHL.H/M.L	4.10 ^a				
	ML ₂ /M.L ²		16.51			
	ML ₃ /M.L ³		21.2			
PuO ₂ ²⁺	M ₂ (OH) ₃ L.H ³ /M ² .L		-1.49			
	MOHL/M(OH) ₂ .HL	2.67 ^a			-0.3 ^a	11 ^a
	ML ₂ /M(OH) ₂ .(HL) ²	4.4 ^a			-13 ^a	-24 ^a
Eu ³⁺	ML/M.L		5.93	7.11		
	ML ₂ /M.L ²		10.72	10.6		
Am ³⁺	ML/M.L		5.81			
	ML ₂ /M.L ²		9.72			
Mn ²⁺	MHL/M.HL		0.45 ^e	1.27	(+1) ^r	(9)
	M.L/ML(s)	-8.49	-9.68 ^e	-10.59		
Fe ²⁺	MHL/M.HL			1.10		
	M.L/ML(s)		-9.7	-10.2	(-5) ^r	(-64)
Co ²⁺	ML/M.L	3.15	3.17 ^q			
	MHL/M.HL		1.39 ^q			
	M.L/ML(s)		-9.52 ^q	-9.98		
Ni ²⁺	ML/M.L		3.57 ^q			
	MHL/M.HL		1.59 ^q			
	M.L/ML(s)		-5.5 ^q	-6.87		
Cu ²⁺	ML/M.L	6.0 ^a	5.73	6.77 ±0.05		
	ML ₂ /M.L ²	(10.0) ^a	9.32	10.2 ±0.4		
	MHL/M.HL		1.0	1.8		
	M.L/ML(s)	-10.7 ^a		-11.5		
	M ² .(OH) ² .L ² /M ₂ (OH) ₂ L ₂ (s, malachite)					
		-31.4 ^a	-32.0 ^q	-33.3 ±0.2	(+45) ^s	(5)
	M ³ .(OH) ² .L ² /M ₃ (OH) ₂ L ₂ (s, azurite)					
		-42.1 ^a		-44.9		
Tl ⁺	ML/M.L		0.51 ^l			
Zn ²⁺	ML/M.L		4.16 ^e	5.1		
	MHL/M.HL		0.30 ^e	0.7		
Cd ²⁺	ML/M.L	3.49 ^h				
	ML ₂ /M.L ²	6.37 ^h				
	MHL/M.HL	2.02 ^h				

^a25°, 0.2; ^e25°, 3.0; ^h20°, 0.05; ^l20°, 3.4; ^q25°, 0.7; ^r5-55°, 0; ^s5-25°, 0.7

Hydrogen carbonate (continued)

Metal ion	Equilibrium	Log K 25°, 0.5	Log K 25°, 1.0	Log K 25°, 0	ΔH 25°, 0	ΔS 25°, 0
Hg ²⁺	ML/M.L	11.0	11.0 ^e			
	ML ₂ /M.L ²	14.5				
	MHL/M.HL	5.4	5.4 ^e			
	ML/MOHL.H	6.6	6.6 ^e			
	M ³ .CO ₂ (g)/H ⁶ .M ₃ O ₂ L(s)	5.4	7.2 ^e ±0.1	7.0		
Pb ²⁺	ML/M.L	5.40 ^u				
	ML ₂ /M.L ²	8.86 ^u				
	M.L/ML(s)	-12.00 ^a	-11.01	-13.13 -0.01		
		-12.15 ^u				
	M ³ . (OH) ² .L ² /M ₃ (OH) ₂ L ₂ (s)	-43.8 ^u				
	M ¹⁰ .L ⁶ /H ⁸ .M ₁₀ L ₆ (OH) ₆ O(s)			-8.76		
Al ³⁺	M ₂ (OH) ₂ L.H ³ /M ² .HL	-7.87				
	M ₃ (OH) ₄ HL.H ⁴ /M ³ .HL	-10.20				

^a25°, 0.1; ^e25°, 3.0; ^u25°, 0.3

Bibliography:

H ⁺	45HB, 68SRG, 69ZJ, 71OP, 72HS, 73Ha, 73Hb, 74W, 76HH, 78BV, 81OF, 82L, 82M, 82BS, 82PB, 82PSB, 82RG, 82TM, 83Ma, 83BHM, 83MT, 84GF, 84PBM;	
Mg ²⁺	69RG, 81Ba, 83MT;	NpO ₂ ²⁺ 84M;
Ca ²⁺	72N, 73HT, 73IC, 74MV, 80PJ, 80PPc, 81Ba, 82PB, 82PSa, 83LD, 83SMM;	PuO ₂ ²⁺ 82SW;
Sr ²⁺	39HJ, 69NR, 84BPP;	Mn ²⁺ 82Jb;
Ba ²⁺	39HJ;	Fe ²⁺ 70SS, 81RJ;
Y ³⁺	85S;	Co ²⁺ 76ZB;
La ³⁺	81CF;	Ni ²⁺ 76ZB;
Ce ³⁺	83FGH;	Cu ²⁺ 71Sg, 76BHS, 79SH, 81RJ, 84GL, 84SK, 85BMa;
Eu ³⁺ , Am ³⁺	82L;	Tl ⁺ 80FPB;
U ⁴⁺	83CF, 84GSO;	Zn ²⁺ 85FG;
UO ₂ ⁺	83FGS;	Cd ²⁺ 85SGB;
NpO ₂ ⁺	83Ma, 85BTC;	Hg ²⁺ 80BMG;
UO ₂ ²⁺	81CFa, 81FG, 82M, 84GF, 84GSO;	Pb ²⁺ 77BM, 81HWb, 82BS;
Other references:	61BN, 68B, 69FF, 69M, 69SHV, 71L, 71Ma, 71MV, 72C, 72Ka, 72MB, 73AG, 74Ga, 75EA, 78WM, 79DB, 79DBa, 79HH, 79MP, 79SG, 80Aj, 80MCA, 80SM, 81KS, 82B, 82CMK, 83BM, 83DY, 83FS, 83KLB, 83M, 83ZK, 84MD, 84MMb, 85IT, 85LD, 85POa, 85RRa, 85SK	Al ³⁺ 81OF;

NH₃

Metal ion	Equilibrium	Log K 25°, 0.5	Log K 25°, 1.0	Log K 25°, 0	ΔH 25°, 0	ΔS 25°, 0
H ⁺	HL/H.L	9.33 ±0.04	9.43 ±0.05	9.244 ±0.005	-12.43 ±0.05	0.6
		9.26 ^a ±0.05	9.354 ^q		-12.7 ^b ±0.1	1 ^b
		9.63 ^d ±0.08	9.8 ^e ±0.1	10.0 ^f ±0.2	-12.9 ^c ±0.1	0 ^c
				10.2 ^g ±0.3	-13.8 ^e ±0.2	-1 ^e

^a25°, 0.1; ^b25°, 0.5; ^c25°, 1.0; ^d25°, 2.0; ^e25°, 3.0; ^f25°, 4.0; ^g25°, 5.0;

^q25°, 0.67 synthetic seawater.

Ammonia (continued)

Metal ion	Equilibrium	Log K 25°, 0.5	Log K 25°, 1.0	Log K 25°, 0	ΔH 25°, 0	ΔS 25°, 0
Mn ²⁺	ML/M.L	(1.27) ^a (1.00) ^k				
	ML ₂ /M.L ²	1.54 ^k				
	ML ₃ /M.L ³	1.70 ^k				
	ML ₄ /M.L ⁴	1.3 ^k				
Co ²⁺	ML/M.L	2.08 ^a		1.99 ^o	-3.2 ^d	-1 ^d
		2.10 ^u ±0.02				
	ML ₂ /M.L ²	3.67 ^u ±0.07		3.50 ^o		
	ML ₃ /M.L ³	4.78 ^u ±0.01		4.43 ^o		
	ML ₄ /M.L ⁴	5.53 ^u ±0.02		5.07 ^o		
	ML ₅ /M.L ⁵	5.75 ^u ±0.02		5.13 ^o		
Ni ²⁺	ML ₆ /M.L ⁶	5.14 ^u ±0.03		4.39 ^o		
	ML/M.L	2.73 ^a ±0.01	2.80 ±0.03	2.72	-3.6	0
		2.81 ^d ±0.04			-3.9 ^d ±0.1	0 ^d
	ML ₂ /M.L ²	4.89 ^a	4.99	4.89		
		5.08 ^d ±0.06			-7.8 ^d ±0.2	-3 ^d
	ML ₃ /M.L ³	6.85 ^d ±0.07	6.72	6.55	-12.1 ^d ±0.1	-9 ^d
Ag ⁺	ML ₄ /M.L ⁴	8.12 ^d ±0.05	7.84	7.67	-15.6 ^d ±0.4	-15 ^d
	ML ₅ /M.L ⁵	8.93 ^d ±0.02		8.34	-19 ^d ±1	-22 ^d
	ML ₆ /M.L ⁶	9.08 ^d ±0.04		8.31	-24 ^d ±1	-39 ^d
	ML/M.L	3.31 ±0.05	3.35 ±0.08	3.31 ±0.06	-4.9	-1
		3.40 ^d ±0.1	3.45 ^e ±0.2	3.5 ^f ±0.3	-5.7 ^e	-3 ^e
	ML ₂ /M.L ²	7.31 ±0.07	7.4 ±0.1	7.22 ±0.01	-13.4 ±0.1	-12
Pb ²⁺		7.5 ^d ±0.2	7.6 ^e ±0.3	7.8 ^f ±0.4	-14.1 ^e	-13 ^e
	ML/M.L			1.98 [#]		

^a25°,0.1; ^b25°,0.5; ^c25°,1.0; ^d25°,2.0; ^e25°,3.0; ^f25°,4.0; ^g25°,5.0; ^k20°,2.0; ^o20°,0;
^q25°,0.67 synthetic seawater; ^u30°,2.0; [#]increased by 0.3 to adjust from the utilized
protonation constant to the listed one.

Bibliography:

H⁺ 71RM, 71RMS, 72FB, 73P, 74BEa, 77KCB, 80TS, 81S, 81SSK, 82Ra, 82SS, 83MN, 84ND, 85CT, 85MMN;
Mn²⁺ 82SS;
Co²⁺ 81BKS;
Ni²⁺ 71MR, 71RM, 81BKS, 82VB;
Cu²⁺ 69V, 80BA, 84ND, 85CT;
Cr³⁺ 58JB;
Ag⁺ 69KL, 83K, 83MN;
Pb²⁺ 85MMN;

Other references: 57BP, 64GC, 70EA, 71GT, 71MB, 77SB, 79HH, 80NW, 80SF, 82RM, 83DN, 83YW, 84BD,
84CS, 84DBF, 84KM, 85KP, 85MMA

H₂NNH₂H₄N₂

Hydrazine

L

(Other values in Vol.4, p.43 and other references in Vol.5, p.477)

Metal ion	Equilibrium	Log K 25°, 0.5	Log K 25°, 1.0	Log K 25°, 0	ΔH 25°, 0	ΔS 25°, 0
H ⁺	HL/H.L	8.06 ±0.02 8.07 ^a	8.18 8.48 ^d	7.98 ±0.01	-9.7	4
	H ₂ L/HL.H			(-0.9) ^o		

^a25°,0.1; ^d25°,2.0; ^o20°,0

Hydrazine (continued)

Metal ion	Equilibrium	Log K 25°, 0.5	Log K 25°, 1.0	Log K 25°, 0	ΔH 25°, 0	ΔS 25°, 0
Ni ²⁺	ML/M.L	2.76 ⁱ				
		2.4 ^a				
	ML ₂ /M.L ²	5.20 ⁱ				
	ML ₃ /M.L ³	7.35 ⁱ				
	ML ₄ /M.L ⁴	9.20 ⁱ				
	ML ₅ /M.L ⁵	10.75 ⁱ				
	ML ₆ /M.L ⁶	11.99 ⁱ				
Cu ²⁺	ML/M.L	4.2 ^a				

^a25°, 0.1; ⁱ20°, 0.5 N₂H₅BF₄

Bibliography: H⁺, Cu²⁺ 68EF; Ni²⁺ 82Hc;

Other references: 72AKK, 72RK, 74AK, 80AMK, 83KMa, 84KCM

HONH₂

		<u>Hydroxylamine</u>				L
		(Other values in Vol.4, p.44)				
Metal ion	Equilibrium	Log K 25°, 0.5	Log K 25°, 1.0	Log K 25°, 0	ΔH 25°, 0	ΔS 25°, 0
H ⁺	L/(H ₁ L).H			13.74		
	HL/H.L	6.00	6.06	5.96 ± 0.02	-9.3 ± 0.1	-4
		5.96 ^a ± 0.02	(6.21) ^d			
Ni ²⁺	ML/M.L	1.47 ⁱ				
		1.4 ^a				
Cu ²⁺	ML/M.L	(2.42) ⁱ				
		(2.8) ^a				
	ML ₂ /M.L ²	4.1 ⁱ				

^a25°, 0.1; ^d25°, 2.0; ⁱ20°, 0.5

Bibliography: H⁺ 57BP, 68EF, 71HN, 74I; Ni²⁺ 82Hc; Cu²⁺ 68EF;

Other references: 72TA, 81II, 83KMa, 84KCM

HN₃

		<u>Hydrogen azide (hydrazoic acid)</u>				HL
		(Other values in Vol.4, p.45 and Vol.5, p.405)				
Metal ion	Equilibrium	Log K 25°, 0.5	Log K 25°, 1.0	Log K 25°, 0	ΔH 25°, 0	ΔS 25°, 0
H ⁺	HL/H.L	4.38	4.44 ± 0.00	4.65 ± 0.02	-3.6	9
		4.45 ^a	4.78 ^e	4.99 ^f	-3.1 ^c	10 ^c
La ³⁺	ML/M.L		0.62			
			0.65 ^e			
Ce ³⁺	ML/M.L		0.64 ^e			
Nd ³⁺	ML/M.L		0.58			
Er ³⁺	ML/M.L		0.59			
Th ⁴⁺	ML/M.L		3.1 ^e			
	ML ₂ /M.L ²		6.37 ^e			

^a25°, 0.1; ^c25°, 1.0; ^e25°, 3.0; ^f25°, 4.0

Hydrogen azide (continued)

Metal ion	Equilibrium	Log K 25°, 0.5	Log K 25°, 1.0	Log K 25°, 0	ΔH 25°, 0	ΔS 25°, 0
NpO ₂ ⁺	ML/M.L			1.08 ^g		
	ML ₂ /M.L ²			1.85 ^g		
	ML ₃ /M.L ³			2.23 ^g		
UO ₂ ²⁺	ML/M.L	2.14 ^d				
	ML ₂ /M.L ²	3.92 ^d				
	ML ₃ /M.L ³	5.69 ^d				
	ML ₄ /M.L ⁴	5.85 ^d				
Mn ²⁺	ML/M.L		0.61 ± 0.03			
	ML ₂ /M.L ²		0.6			
Co ²⁺	ML/M.L	0.76 ^d	0.74 ± 0.02			
	ML ₂ /M.L ²	1.28 ^d	1.1			
Ni ²⁺	ML/M.L		0.86 ± 0.02		-0.2 ^c	3 ^c
		0.88 ^d	1.04 ^e			
	ML ₂ /M.L ²		1.3		-1.0 ^c	2 ^c
	ML ₃ /M.L ³		1.3		-3.5 ^c	-6 ^c
	M ₂ L/ML.M	0.63 ^d				
Cu ²⁺	ML/M.L	2.44 ^h	2.21	2.86		
				2.56 ^f		
	ML ₂ /M.L ²			4.53		
				4.48 ^f		
	ML ₃ /M.L ³			6.23		
				6.11 ^f		
	ML ₄ /M.L ⁴			6.65		
				7.82 ^f		
	M.L ² /ML ₂ (s)			-7.75	+3.6	-23
Mn ³⁺	ML/M.L			6.9 ^f		
Fe ³⁺	ML/M.L	4.60 ^a	4.51	5.26	-3.1 ^c	10 ^c
	ML ₂ /M.L ²		7.48		-3.3 ^c	23 ^c
	ML ₃ /M.L ³		9.58		-5.0 ^c	27 ^c
	ML ₄ /M.L ⁴		10.95		-6.2 ^c	29 ^c
	ML ₅ /M.L ⁵		11.8		(-11) ^c	(16) ^c
Ga ³⁺	ML/M.L		3.5		-5.5 ^c	-2 ^c
In ³⁺	ML/M.L		3.19		-1.8 ^c	9 ^c
	ML ₂ /M.L ²		5.61		-2.8 ^c	16 ^c
	ML ₃ /M.L ³		7.26		-5.2 ^c	16 ^c
	ML ₄ /M.L ⁴		8.46		-7.4 ^c	14 ^c

^a25°, 0.1; ^c25°, 1.0; ^f25°, 4.0; ^g25°, 5.0; ^h20°, 0.1

Bibliography:

La³⁺-Er³⁺ 73MPR, 82GA;

Th⁴⁺ 73MR;

NpO₂⁺ 78MM;

UO₂²⁺ 83CN;

Mn²⁺ 80Ah, 80GA;

Co²⁺ 79NT, 80Ah;

Other references: 69CEa, 69FT, 69SF, 78A, 78B, 80MMF, 81ABD, 81Ca

Ni²⁺ 83SN;

Cu²⁺ 71SN, 80NOS;

Mn³⁺ 69DKK;

Fe³⁺ 80Ai;

Ga³⁺, In³⁺ 82Ac;

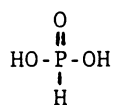
		NO ₃ ⁻				
O ₃ N ⁻		<u>Nitrate ion</u>			L ⁻	
		(Other values in Vol.4, p.48 and Vol.5, p.406)				
<u>Metal ion</u>	<u>Equilibrium</u>	<u>Log K</u> <u>25°, 0.5</u>	<u>Log K</u> <u>25°, 1.0</u>	<u>Log K</u> <u>25°, 0</u>	<u>ΔH</u> <u>25°, 0</u>	<u>ΔS</u> <u>25°, 0</u>
Na ⁺	ML/M.L			(-0.55)±0.0		
K ⁺	ML/M.L	-0.37 ^a -0.10 ^d	-0.05 ^e	(-0.19)±0.08 0.04 ^f	(-3) ^r	(-11)
Rb ⁺	ML/M.L			(-0.08)±0.01		
Cs ⁺	ML/M.L			(0.02)±0.01		
Be ²⁺	ML/M.L	0.20 ^d	-0.9	-0.6 ^f	(0) ^s	(-4) ^c
Ca ²⁺	ML/M.L	-0.1 ±0.1	-0.2 ±0.1 -0.1 ^e ±0.1	0.5 ±0.2	-1.3 -1.5 ^c	-2 -6 ^c
Sr ²⁺	ML/M.L	0.0 ±0.1	-0.1 ±0.1	0.6 ±0.2 0.0 ^f ±0.1	-2.4 ^b	-8 ^b
Ba ²⁺	ML/M.L	0.1 ±0.1	0.0 ±0.1	0.7 ±0.2 0.1 ^f ±0.1	-3.2 ^b	-10 ^b
Eu ³⁺	ML/M.L	0.44 ±0.05 0.26 ^d	0.31 ±0.01	1.22 ±0.02 0.2 ^f -0.6 ^f	-1.1 ^b ±0.4 -0.5 ^c ±0.1	-2 ^b 0 ^c
	ML ₂ /M.L ²		0.0 ^p			
Am ³⁺	ML/M.L	0.20 ^d	0.25 ±0.02			
Cm ³⁺	ML/M.L		0.34			
Cf ³⁺	ML/M.L		0.40			
Ag ⁺	ML/M.L	-0.34 ^d		(-0.1) ±0.1		
Tl ⁺	ML/M.L		-0.21 -0.48 ^e	0.33 ±0.00 -0.43 ^f	-0.7	-1

^a25°,0.1; ^b25°,0.5; ^c25°,1.0; ^d25°,3.0; ^e25°,3.0; ^f25°,4.0; ^p30°,1.0 ^r25-39°,0; ^s15-35°,1.0
 Bibliography: Na⁺-Cs⁺ 71JBJ; K⁺ 69Ga,71HP,71JB,80FSD; Rb⁺ 71JB,74MWK; Be²⁺ 81MCA;
 Ca²⁺ 85VB; Eu³⁺ 67CK,71KN,81MK; Am³⁺ 71KN; Cm³⁺,Cf³⁺ 80KM; Ag⁺ 69BJ,69Ga,71HP;
 Tl⁺ 70Bb,79Fb; Cd²⁺ 69MO,81FN; Pb²⁺ 84RBF,85RRS;
 Other references: 67OM,68OM,68SRL,69GE,69Ma,69PS,70H,70HK,71DC,71JC,71KKM,71NI,72BH,72DC,
 72OD,72SSA,74BRM,80BH,83BH,83HHS,85MZ,85OK

		$\begin{array}{c} \text{O} \\ \\ \text{H}-\text{P}-\text{OH} \\ \\ \text{H} \end{array}$				
$\text{H}_3\text{O}_2\text{P}$		<u>Hydrogen hypophosphite (hypophosphorous acid)</u>				HL
		(Other values in Vol.4, p.54 and other reference in Vol.5, p.478)				
Metal ion		Log K	Log K	Log K	ΔH	ΔS
	<u>Equilibrium</u>	<u>25°, 0.1</u>	<u>25°, 1.0</u>	<u>25°, 0</u>	<u>25°, 0</u>	<u>25°, 0</u>
H^+	HL/H.L	(1.1)	(1.0) ± 0.1	(1.3) ± 0.1	+1.6	11
Na^+	ML/M.L		-0.04 ^z			
Fe^{3+}	ML/M.L		3.18			
VO_2^+	ML/M.L		1.22			

^z(CH₃)₄N⁺ salt used as background electrolyte.

Bibliography: H⁺ 40GMT,69ED,69KM,69Pc,69SHV,70C; Na⁺ 83TT; Fe³⁺ 69ED; VO₂⁺ 71CH
 Other references: 72SGa,84MMc



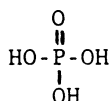
$\text{H}_3\text{O}_3\text{P}$ Hydrogen phosphite (phosphorous acid) H_2L
(Other values in Vol.4, p.55)

Metal ion	Equilibrium	Log K 25°, 0.1	Log K 25°, 1.0	Log K 25°, 0	ΔH 25°, 0	ΔS 25°, 0
H^+	HL/H.L	6.34 ^u 6.36 ^v 6.08 ^{b,u} 6.14 ^{b,v}	6.01 ^u 6.09 ^v 6.00 ^{d,u} 6.12 ^{d,v}	6.78 ± 0.05 6.20 ^{e,v}	(+2.2)	(39)
	$\text{H}_2\text{L}/\text{HL.H}$		(1.1) ^{q,v}	(1.5) ± 0.1	+2.2	14
Na^+	ML/M.L		0.61 ^z	1.05 ^o		

^b25°, 0.5; ^d25°, 2.0; ^e25°, 3.0; ^o20°, 0; ^q25°, 0.6; ^u NaClO_4 used as background electrolyte;
^v KCl used as background electrolyte; ^z $(\text{CH}_3)_4\text{NCl}$ used as background electrolyte.

Bibliography: Na^+ 83TT;

Other references: 69ED, 69EE, 69KM, 690a, 69SHV, 85GGG



$\text{H}_3\text{O}_4\text{P}$ Hydrogen phosphate (phosphoric acid) H_3L
(Other values in Vol.4, p.56 and Vol.5, p.407)

Metal ion	Equilibrium	Log K 25°, 0.1	Log K 25°, 1.0	Log K 25°, 0	ΔH 25°, 0	ΔS 25°, 0
H^+	HL/H.L	11.74 ^u ± 0.08 11.79 ^v 11.96 ^z ± 0.08	10.99 ^{q,u} ± 0.05 11.25 ^{q,v} 11.72 ^{q,z}	12.375 ± 0.01 10.79 ^{e,u} ± 0.07	-3.8 ± 0.3 -4.2 ^a ± 0.3 -4.7 ^q	43.9 40 ^a 35 ^q
	$\text{H}_2\text{L}/\text{HL.H}$	6.71 ^u ± 0.06 6.75 ^v ± 0.04 6.91 ^z ± 0.05 6.47 ^{b,u} ± 0.02 6.59 ^{b,v} ± 0.04 6.83 ^{b,z}	6.30 ^u ± 0.07 6.44 ^v - 0.01 6.78 ^z 6.39 ^{q,u} ± 0.02 6.52 ^{q,v} ± 0.04 6.82 ^{q,z}	7.198 ± 0.002 6.26 ^{e,u} ± 0.02	-0.9 ± 0.1 -1.1 ^a ± 0.1 -1.0 ^c	29.9 27 ^a 25 ^c
	$\text{H}_3\text{L}/\text{H}_2\text{L.H}$	(1.9) ± 0.1 (1.9) ^b ± 0.1	(1.7) ± 0.0 (1.9) ^q ± 0.1	2.148 ± 0.01 (1.9) ^e ± 0.1	+1.9 ± 0.2 +2.1 ^a +2.1 ^q	16.2 16 ^a 15 ^q
Li^+	ML/M.L MHL/M.HL $\text{MH}_2\text{L}/\text{M.H}_2\text{L}$	0.64 ^z	0.95 ^{n,z} 0.79 ^{n,z} 0.2 ^{p,z}		(+6) ^s	(23) ^a
Na^+	ML/M.L MHL/M.HL $\text{MH}_2\text{L}/\text{M.H}_2\text{L}$	0.49 ^z	0.86 ^z 0.75 ^{n,z} 0.82 ^{i,z} 0.65 ^{n,z} 0.61 ^{i,z} 0.1 ^{p,z} 0.2 ^{i,z}	0.85	(+8) ^s	(29) ^a

^a25°, 0.1; ^b25°, 0.5; ^c25°, 1.0; ^e25°, 3.0; ⁱ20°, 0.7; ⁿ37°, 0.15; ^p37°, 0.3; ^q25°, 0.7;

^s0-25°, 0.2; ^u Na^+ salt used as background electrolyte;

^v K^+ salt used as background electrolyte; ^z $(\text{CH}_3)_4\text{N}^+$ salt used as background electrolyte.

Hydrogen phosphate (continued)

Metal ion	Equilibrium	Log K 25°, 0.1	Log K 25°, 1.0	Log K 25°, 0	ΔH 25°, 0	ΔS 25°, 0
K^+	ML/M.L	0.54 ^{b,z}	0.6 ^{n,z} 0.47 ^{i,z}			
	MHL/M.HL	0.35 ^z	0.48 ^{n,z}		(+7) ^s	(25) ^a
		0.36 ^{b,z}	0.40 ^{i,z}			
	MH ₂ L/M.H ₂ L	0.2 ^{b,z}	-0.2 ^{p,z} 0.0 ^{i,z}			
NH_4^+	MHL/M.HL		0.8 ^{n,z}			
	MH ₂ L/M.H ₂ L		-0.1 ^{n,z}			
Mg^{2+}	MHL/M.HL	1.86	2.08 ⁿ	2.81 ± 0.10 1.42 ^{e,u}	+2.9	23
	MH ₂ L/M.H ₂ L		1.19 ⁿ	1.66 ^o 0.16 ^{e,u}		
	M.HL/MHL(H ₂ O) ₃ (s)			-5.80 ± 0.03 -4.5 ^e		
	M ³ .L ² /M ₃ L ₂ (s)			-23.28		
Ca^{2+}	MHL/M.HL		1.90 ⁿ ± 0.04	2.66 ± 0.08	(+3) ^r	(22)
	MH ₂ L/M.H ₂ L		1.06 ⁿ	1.41 1.52 ^o	(+3) ^r	(17)
	M ₃ HL/MHL(H ₂ O) ₂ (s)			-6.58 ± 0.03	(+1) ^t	(-27)
	M ³ .L ² /M ₃ L ₂ (s, β)			-28.92 -29.55 ^o -49.3 ^o	-13.2	-177
UO_2^{2+}	M ⁴ .HL.L ² /M ₄ HL ₃ (H ₂ O) _{2.5} (s)					
	MH ₂ L/M.H ₂ L			3.65		
	M(H ₂ L)/M.(H ₂ L) ²		4.54	5.60		
	M(H ₃ L)(H ₂ L) ₂ .H ² /M.(H ₃ L) ³		2.30	2.30		
	MH ₃ L/M.H ₃ L			1.3		
	M ₃ HL/MHL(s)			-12.33		
	M ³ .L ² /M ₃ L ₂ (s)			-49.0		
Mn^{3+}	MHL/M.HL			9.6 ^{e,w}		
	MH ₂ L/M.H ₂ L			3.2 ^{e,w}		
	M(H ₂ L) ₂ /M.(H ₂ L) ²			6.6 ^{e,w}		
Ag^+	M ³ .L/M ₃ L(s)			-17.59 ± 0.04		
CH_3Hg^+	MHL/M.HL	5.03 ^{h,v}	4.56 ^u			
Zn^{2+}	M ³ .L ² /M ₃ L ₂ (H ₂ O) ₄ (s)			-35.42 ± 0.1 -35.74 ^o		
Cd^{2+}	MHL/M.HL	2.91		2.68 ^{e,u}		
	MH ₂ L/M.H ₂ L			0.78 ^{e,u}		
	M ⁵ .(HL) ⁴ /H ² .M ₅ H ₂ L ₄ (H ₂ O) ₄ (s)			-25.4 ^{e,u}		

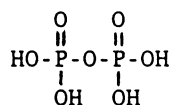
^a25°, 0.1; ^b25°, 0.5; ^e25°, 3.0; ⁱ20°, 0.7; ⁿ37°, 0.15; ^o37°, 0; ^p37°, 0.3; ^r25-37°, 0; ^s0-25°, 0.2;

^t18-37°, 0; ^uNa⁺ salt used as background electrolyte;

^vK⁺ salt used as background electrolyte; ^z(CH₃)₄N⁺ salt used as background electrolyte;

^wLiClO₄ used as background electrolyte but H⁺ values from NaClO₄.

Bibliography: H⁺ 40GM, 44A, 45BA, 52TM, 56Ba, 57Ta, 58Mc, 61BBS, 61BN, 65PT, 65PZ, 67KPB, 69BS, 72FS, 76Tb, 78AB, 78MD, 80BML, 81BKS, 81Ca, 81VSB, 81WP, 83AH, 83DG, 83ISa, 84RG; Li⁺-K⁺ 74PG, 83DG, 83TT; NH₄⁺ 81AD; Mg²⁺ 43TH, 53GC, 60MB, 60MBa, 68RS, 70Ma, 72FS, 74GM, 74PG, 81KN, 82DRb, 83SP, 84VD; UO₂²⁺ 83MPb; Ni²⁺ 80TF; Mn³⁺ 81CPB; Ag⁺ 81DP; CH₃Hg⁺ 74IL; Zn²⁺ 84PN; Cd²⁺ 73HS, 74RM; Other references: 49DD, 62CI, 63WT, 66B, 67GM, 67M, 69Ma, 69SHV, 76W, 78FK, 78LK, 79HH, 79LF, 79MP, 80DL, 80Fa, 80FP, 80GGP, 81EKa, 82GZ, 83LK, 83LKa, 84RD, 84SN, 85Hd, 85ITa, 85LL, 85WP



$\text{H}_4\text{O}_7\text{P}_2$		<u>Hydrogen diphosphate (pyrophosphoric acid)</u>				H_4L
		(Other values in Vol.4, p.59 and Vol.5, p.408)				
Metal ion	Equilibrium	Log K 25°, 0.1	Log K 25°, 1.0	Log K 25°, 0	ΔH 25°, 0	ΔS 25°, 0
H^+	HL/H.L	8.22 ^u	7.44 ^u ±0.05	9.42 ±0.10	-0.4 ±0.0	42
		8.40 ^v ±0.05	7.74 ^v ±0.01		-0.5 ^c	32 ^c
		8.91 ^z ±0.04	8.75 ^z ±0.04			
		7.44 ^{b,u} ±0.05	7.32 ^{d,u}	7.17 ^{e,u}		
		7.87 ^{b,v} ±0.02	7.73 ^{d,v}	7.69 ^{e,v}		
	$\text{H}_2\text{L}/\text{HL.H}$	5.93 ^u	5.41 ±0.05	6.69 ±0.01	-0.1 ±0.0	30
		6.03 ^v ±0.05	5.57 ^v ±0.05		-0.2 ^c	24 ^c
		6.12 ^z ±0.02	5.99 ^z ±0.02			
		5.53 ^{b,u} ±0.06	5.37 ^{d,u}	5.29 ^{e,u}		
		5.63 ^{b,v} ±0.06	5.60 ^{d,v} ±0.05	5.57 ^{e,v}		
		5.97 ^{b,z}				
	$\text{H}_3\text{L}/\text{H}_2\text{L.H}$	1.85 ^u ±0.05	1.45 ^u ±0.05	2.31 ±0.05	+0.7	13
		1.85 ^v	1.50 ^v		+0.6 ^c	9 ^c
		1.97 ^z ±0.05	1.71 ^z ±0.04			
		1.89 ^{b,z}	1.46 ^{d,u}	1.39 ^{e,u}		
			1.49 ^{d,v} ±0.03	1.39 ^{e,v}		
	$\text{H}_4\text{L}/\text{H}_3\text{L.H}$	(0.8)	(0.8) ±0.0	(0.9)	+1.3	8
				(0.9) ^e	+1.2 ^c	8 ^c
Li^+	ML/M.L		2.39 ^z	3.1	+0.6	16
					+0.3 ^c	12 ^c
	MHL/M.HL		1.03 ^z		+0.3	
					+0.2 ^c	5 ^c
Na^+	ML/M.L	1.4 ^z ±0.1	1.0 ^z	2.29 ±0.07	+0.8	13
		1.0 ^{b,z}			+0.5 ^c	6 ^c
	MHL/M.HL	0.9 ^z ±0.2		1.4 ±0.1		
		0.5 ^{b,z}				
K^+	ML/M.L	1.4 ^z ±0.1	0.8 ^z	2.3	+1.3	15
					+0.7 ^c	6 ^c
	MHL/M.HL	0.8 ^z ±0.2				
		0.5 ^{b,z}				
Be^{2+}	ML/M.L	10.08 ^v				
	MHL/M.HL	5.98 ^v				
	$\text{M}_2\text{L}/\text{ML.M}$	5.37 ^v				
Mn^{3+}	MHL/M.HL			11.7 ^{e,w}		
	$\text{MH}_2\text{L}/\text{M.H}_2\text{L}$			7.1 ^{e,w}		
	$\text{M}(\text{H}_2\text{L})_2/\text{M}(\text{H}_2\text{L})^2$			10.8 ^{e,w}		
	$\text{M}(\text{H}_2\text{L})(\text{H}_3\text{L})/\text{M.H}_2\text{L.H}_3\text{L}$			9.9 ^{e,w}		

^b25°,0.5; ^c25°,1.0; ^d25°,2.0; ^e25°,3.0; ^u Na^+ used as background electrolyte; ^v K^+ salt used as background electrolyte; ^w LiClO_4 used as background electrolyte but H^+ values from NaClO_4 ; ^z(alkyl)₄ N^+ salt used as background electrolyte.

Bibliography:

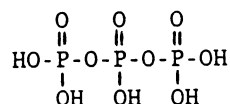
H^+ 28M, 79DH, 82DNH, 82WH, 85DRa;

Be^{2+} 68DMa;

$\text{Li}^+ - \text{K}^+$ 79DH, 82DNH, 85DRa;

Mn^{3+} 83CPa;

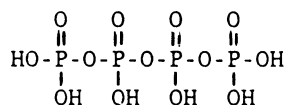
Other references: 63WT, 68BU, 71W, 73DV, 73EF, 73PT, 79MF, 79MFa, 80KS, 80MY, 81KKV, 83Ba, 84TV, 85KKb, 85PSb



$\text{H}_5\text{O}_{10}\text{P}_3$		<u>Hydrogen triphosphate (triphosphoric acid)</u>				H_5L
		(Other values in Vol.4, p.63 and Vol.5, p.408)				
Metal ion	Equilibrium	Log K $25^\circ, 0.1$	Log K $25^\circ, 1.0$	Log K $25^\circ, 0$	ΔH $25^\circ, 0$	ΔS $25^\circ, 0$
H^+	HL/H.L	$7.8^{\text{u}} \pm 0.1$	6.86^{u}	$9.52 - 0.3$	-0.1^{h}	35^{a}
		$7.98^{\text{v}} \pm 0.1$	7.22^{v}		-0.1^{q}	
		$8.75^{\text{z}} \pm 0.1$	$8.66^{\text{z}} \pm 0.10$			
	$\text{H}_2\text{L}/\text{HL.H}$	$5.39^{\text{u}} \pm 0.2$	4.71^{u}	6.54 ± 0.07	$+1.4 \pm 0.1$	35
		$5.49^{\text{v}} \pm 0.06$	4.82^{v}			
		$5.91^{\text{z}} \pm 0.05$	$5.69^{\text{z}} \pm 0.03$			
	$\text{H}_3\text{L}/\text{H}_2\text{L.H}$	$2.12^{\text{z}} \pm 0.08$	$2.0^{\text{z}} \pm 0.1$	2.79		
	$\text{H}_4\text{L}/\text{H}_3\text{L.H}$	$(1.2)^{\text{z}}$	$(1.1)^{\text{z}} \pm 0.2$			
	$\text{H}_5\text{L}/\text{H}_4\text{L.H}$	$(0.7)^{\text{z}}$	$(0.4)^{\text{z}} \pm 0.2$			
Li^+	ML/M.L		$2.8^{\text{z}} \pm 0.1$	3.9		
	MHL/M.HL		$1.7^{\text{z}} \pm 0.2$			
Na^+	ML/M.L	1.9^{z}	$1.7^{\text{z}} \pm 0.1$	2.7 ± 0.1	$(0)^{\text{r}}$	(12)
	MHL/M.HL	1.4^{z}	$0.9^{\text{z}} - 0.1$			
K^+	ML/M.L	$1.7^{\text{z}} \pm 0.1$	$1.4^{\text{z}} \pm 0.0$	2.8	$(0)^{\text{r}}$	(13)
	MHL/M.HL	1.3^{z}	0.8^{z}			
Mg^{2+}	ML/M.L	$5.73^{\text{u}} \pm 0.03$	$5.85^{\text{z}} \pm 0.05$	8.6	$+4.3^{\text{h}}$	41^{a}
		$5.86^{\text{v}} \pm 0.00$				
		$6.47^{\text{z}} \pm 0.07$				
	MHL/M.HL	3.85^{u}	$(3.35)^{\text{z}} \pm 0.01$		$(+2)^{\text{s}}$	$(24)^{\text{a}}$
		4.05^{v}				
		4.47^{z}				
Ca^{2+}	ML/M.L	4.86^{u}	$(5.40)^{\text{z}} \pm 0.04$	7.8	$+3.3^{\text{h}}$	33^{a}
		4.99^{v}				
		$(6.38)^{\text{z}} \pm 0.03$				
	MHL/M.HL	3.2^{u}	$3.2^{\text{z}} \pm 0.2$		$(+2)^{\text{s}}$	$(21)^{\text{a}}$
		$3.2^{\text{v}} \pm 0.1$				
		$3.9^{\text{z}} \pm 0.1$				
Sr^{2+}	ML/M.L	3.83^{u}	$(5.0)^{\text{z}}$	7.2	$+3.2^{\text{h}}$	28^{a}
		$4.07^{\text{v}} \pm 0.07$				
		$(5.45)^{\text{z}} \pm 0.05$				
	MHL/M.HL	2.8^{u}	$(3.5)^{\text{z}}$			
		2.9^{v}				
		$3.6^{\text{z}} - 0.1$				
Ba^{2+}	ML/M.L	3.0^{v}		6.3		
	MHL/M.HL	1.8^{v}				
VO_2^+	MHL/M.HL		8.11			
	$\text{M}(\text{HL})_2/\text{M} \cdot (\text{HL})^2$		12.9			
	$\text{MH}_2\text{L}/\text{M} \cdot \text{H}_2\text{L}$		4.6			

$^{\text{h}}20^\circ, 0.1$; $^{\text{q}}25^\circ, 0.65$; $^{\text{r}}25-40^\circ, 0$; $^{\text{s}}2-45^\circ, 0.1$; $^{\text{u}}\text{Na}^+$ salt used as background electrolyte; $^{\text{v}}\text{K}^+$ salt used as background electrolyte; $^{\text{z}}(\text{CH}_3)_4\text{N}^+$ salt used as background electrolyte.

Bibliography: H^+ 70MT, 82WH, 85DRa, 85RA; $\text{Li}^+ - \text{K}^+$ 85DRa; $\text{Mg}^{2+} - \text{Ba}^{2+}$ 81DM, 85RA; VO_2^+ 84IK; Other references: 69GM, 69IK, 73EF, 80MY, 81BKO

 $\text{H}_6\text{O}_{13}\text{P}_4$

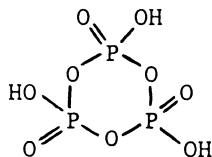
Hydrogen tetrphosphate (tetrphosphoric acid)
 (Other values in Vol.4, p.66 and other references in Vol.5, p.477)

 H_6L

Metal ion	Equilibrium	Log K 25°, 0.1	Log K 25°, 1.0	Log K 25°, 0
H^+	HL/H.L	7.43 ^u 8.38 ^z ±0.03	6.36 ^u ±0.02 6.78 ^v 8.20 ^z	9.11
	$\text{H}_2\text{L}/\text{HL.H}$	5.84 ^u 6.58 ^z	4.82 ^u ±0.01 5.08 ^v 6.49 ^z	7.38
	$\text{H}_3\text{L}/\text{H}_2\text{L.H}$		(1.2) ^u 2.09 ^z	
	$\text{H}_4\text{L}/\text{H}_3\text{L.H}$		(1.2) ^z	
Mg^{2+}	ML/M.L	6.53 ^z	6.04 ^z	
	MHL/M.HL		3.74 ^z	
	$\text{M}_2\text{L}/\text{ML.M}$		2.19 ^z	

^u Na^+ salt used as background electrolyte; ^v K^+ salt used as background electrolyte;
^z $(\text{CH}_3)_4\text{N}^+$ salt used as background electrolyte.

Bibliography: H^+ 82WH; Mg^{2+} 81OM

 $\text{H}_3\text{O}_9\text{P}_3$

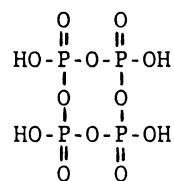
Hydrogen trimetaphosphate (trimetaphosphoric acid)
 (Other values in Vol.4, p.68)

 H_3L

Metal ion	Equilibrium	Log K 25°, 0.1	Log K 25°, 1.0	Log K 25°, 0
H^+	HL/H.L	(1.4) ^h	(0.7) ^z	2.05
Na^+	ML/M.L	0.88 ^z		1.40
NH_4^+	ML/M.L	0.97 ^z		
Mg^{2+}	ML/M.L	1.80	1.50 ^z	3.31
Ca^{2+}	ML/M.L	2.06	1.64 ^z ±0.00	3.47 ±0.02
Sr^{2+}	ML/M.L	1.97 ±0.06		3.35
Zn^{2+}	ML/M.L	2.00 1.94 ^h		
Cd^{2+}	ML/M.L	2.21		

^h20°, 0.1; ^z(alkyl)₄N⁺ used as background electrolyte.

Bibliography: Na^+ , NH_4^+ , Sr^{2+} - Cd^{2+} 72Kb; Mg^{2+} , Ca^{2+} 72Kb, 82TW;
 Other references: 81MIY, 83GG

 $\text{H}_4\text{O}_{12}\text{P}_4$

Hydrogen tetrametaphosphate (tetrametaphosphoric acid)
 (Other values in Vol.4, p.69)

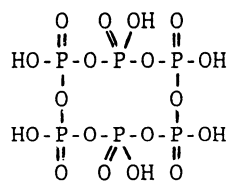
 H_4L

Metal ion	Equilibrium	Log K 25°, 0.1	Log K 25°, 1.0	Log K 25°, 0
H^+	HL/H.L		1.53 ^Z	2.76 ±0.02
Na^+	ML/ML	1.42 ^Z	0.81 ^{P,Z}	2.10 ±0.05
	$\text{M}_2\text{L}/\text{ML.M}$	1.13 ^Z		
K^+	ML/M.L	1.26 ^Z		
	$\text{M}_2\text{L}/\text{ML.M}$	0.92 ^Z		
NH_4^+	ML/M.L	1.62 ^Z		
	$\text{M}_2\text{L}/\text{ML.M}$	1.29 ^Z		
Mg^{2+}	ML/M.L	3.44 ±0.04		5.17
	$\text{M}_2\text{L}/\text{ML.M}$	2.00		
Ca^{2+}	ML/M.L		3.07 ^Z ±0.03	5.37
	$\text{M}_2\text{L}/\text{ML.M}$			2.60
Sr^{2+}	ML/M.L			5.12
	$\text{M}_2\text{L}/\text{ML.M}$			2.46

$\text{P}^{30^\circ, 1.0}$; $^Z(\text{CH}_3)_4\text{N}^+$ salt used as background electrolyte.

Bibliography: $\text{Na}^+-\text{NH}_4^+, \text{Ca}^{2+}, \text{Sr}^{2+}$ 72Kb; Mg^{2+} 72Kb, 810M

Other references: 81MIY, 83GG

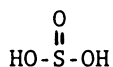
 $\text{H}_6\text{O}_{18}\text{P}_6$

Hydrogen hexametaphosphate

 H_6L

Metal ion	Equilibrium	Log K 25°, 0.1
Mg^{2+}	ML/M.L	5.50

Bibliography: 810M



$\text{H}_2\text{O}_3\text{S}$ Hydrogen sulfite (sulfurous acid) H_2L
(Other values in Vol.4, p.78 and Vol.5, p.410)

Metal ion	Equilibrium	Log K 25°, 0.1	Log K 25°, 1.0	Log K 25°, 0	ΔH 25°, 0	ΔS 25°, 0
H^+	HL/H.L	6.80	6.36 6.43 ^e	7.19 ±0.01	+0.87 ±0.01	35.9
	$\text{H}_2\text{L}/\text{HL.H}$	1.62	1.40 ±0.02 1.79 ^e	1.86 ±0.03	+4.26 ±0.10 +3.4 ^d	22.8
	$\text{S}_2\text{O}_5/(\text{HL})^2$		1.06	1.49	(+1) ^r	(8) ^c
	$\text{H}_2\text{L}/\text{SO}_2(\text{g})$		0.03 0.06 ^e	0.09 ±0.01	-6.5 ±0.2	-21.4
Tl^+	ML/M.L		0.04 ^l			
	$\text{ML}_2/\text{M.L}^2$		-0.9 ^l			

^c25°, 1.0; ^d25°, 2.0; ^e25°, 3.0; ^l20°, 3.0; ^r25-55°, 2.1

Bibliography: H^+ 69ZJ, 72HT, 72T, 81AL, 82CT, 82Mb, 83BHM, 83DH, 84AT, 85GPa; Tl^+ 79Fb

Other references: 70CK, 72JJ, 72KB, 79HH, 79MP, 82MR, 83RM, 83Rma, 85RD



HO_4S^- Hydrogen sulfate ion (sulfuric acid) HL^-
(Other values in Vol.4, p.79 and Vol.5, p.411)

Metal ion	Equilibrium	Log K 25°, 0.5	Log K 25°, 1.0	Log K 25°, 0	ΔH 25°, 0	ΔS 25°, 0
H^+	HL/H.L	1.32 ±0.06 1.01 ^d ±0.07 1.55 ^a ±0.05	1.10 ±0.08 0.91 ^e ±0.02 1.79 ⁿ	1.99 ±0.01 1.53 ^g 1.53 ^g	+5.4 ±0.2 +5.5 ^c ±0.1 +6.2 ^e	27 24 ^c 25 ^e
Li^+	ML/M.L		(0.77) ⁿ	(0.64 ±0.1)	0	(4)
Na^+	ML/M.L	(0.40 ±0.00) 0.40 ^d (0.58 ^a ±0.1)	(0.30 ^q ±0.04) 0.40 ⁿ	0.72 ±0.1	+0.3 ±0.8	4
K^+	ML/M.L	0.43 ^a	0.53 ⁿ ±0.02	0.85 ±0.1 0.26 ^q	+1.8 ±0.8	10
Rb^+	ML/M.L		0.60 ⁿ	(0.60)		
Cs^+	ML/M.L		0.70 ⁿ	(0.3)		
NH_4^+	ML/M.L		0.92 ⁿ	1.0 ±0.1		
Mg^{2+}	ML/M.L	1.07 ±0.07 1.46 ^a	0.8 ±0.1 1.59 ⁿ	2.23 ±0.02 0.95 ^q ±0.1	+1.4 ±0.1 +0.5 ^q	15
Ca^{2+}	ML/M.L	1.12 1.51 ^a ±0.02 0.94 ^d	1.63 ⁿ	2.30 ±0.02 1.03 ^q 0.86 ^v	+1.6 ±0.1	16
Sr^{2+}	ML/M.L	1.41 ^a		2.2 ±0.1	(+2) ^r	(17)

^a25°, 0.1; ^c25°, 1.0; ^d25°, 2.0; ^e25°, 3.0; ^g25°, 5.0; ⁿ37°, 0.15(CH₃CH₂)₄NI; ^q25°, 0.7;
^r10-60°, 0; ^v25°, 5.9m

Hydrogen sulfate ion (continued)

Metal ion	Equilibrium	Log K 25°, 0.5	Log K 25°, 1.0	Log K 25°, 0	ΔH 25°, 0	ΔS 25°, 0
Ba ²⁺	ML/M.L		0.66	2.2 ±0.1		
Ce ³⁺	ML/M.L	1.75 ±0.03 2.35 ^a 1.24 ^d ±0.01	1.51	3.62 ±0.03	+4.6 +4.3 ^d	32 20 ^d
Pu ³⁺	ML/M.L	1.53 ^d	1.65		(+4) ^s	(20) ^d
Pu ⁴⁺	ML/M.L	3.80 ^d ±0.05			(+10) ^s	(51) ^d
Mn ²⁺	ML/M.L	0.77 0.60 ^d	(0.57) 0.56 ^e	2.26 ±0.06 0.72 ^f	+2.1 ±0.1 (+2.3) ^e	17 (10) ^e
Co ²⁺	ML/M.L		0.7 ±0.0 (0.23) ^e	2.34 ±0.07	+1.5 ±0.2 +0.6 ^e	16 (3) ^e
Ni ²⁺	ML/M.L	1.0 ^a	0.7 ±0.1 (0.26) ^e	2.34 ±0.06	+1.4 ±0.1 +0.6 ^e	15 (3) ^e
Cu ²⁺	ML/M.L	0.6 ^d ±0.0	0.8 ±0.2 0.5 ^e ±0.2	2.34 ±0.06 0.7 ^g ±0.2	+2.1 ±0.4 +1.2 ^e	18 6 ^e
Fe ³⁺	ML/M.L	2.24 ±0.1	2.02 ±0.1 1.93 ^e -0.01	4.04 ±0.1	(+6) ^w	(29) ^b
	ML ₂ /M.L ² MHL/M.HL		2.11 ^e 0.6 ^e	5.38	(0) ^x	(3) ^e
Zn ²⁺	ML/M.L	0.93 0.76 ^d	0.89 -0.2 0.70 ^e	2.34 ±0.04	+1.5 ±0.1 +0.7 ^e	16 6 ^e
Pb ²⁺	ML/M.L M.L/ML(s)	2.07 ^a -7.03 ^a	(0.74) ^e -6.20	2.69 ±0.07 -7.79 ±0.02	(+3) ^r	(-26)

^a25°,0.1; ^b25°,0.5; ^d25°,2.0; ^e25°,3.0; ^f25°,4.0; ^g25°,5.0; ^r0-50°,0; ^s0-35°,2.0;
^w1-35°,0.5; ^x25-55°,2.67

Bibliography:

H⁺ 40GM, 57K, 61LS, 64DN, 65CD, 77SP,
 82LM, 83DR, 85NKM;
 Li⁺, Rb⁺, Cs⁺ 82DRa;
 Na⁺ 74MV, 77SP, 79EF, 80JPW, 82DRa,
 83IL, 84IL;
 K⁺ 68TH, 70KP, 82DRa;
 NH₄⁺ 81AD;
 Mg²⁺ 71HP, 72DB, 80ELA, 80JPW, 82DM;
 Ca²⁺ 63MO, 67NR, 68RD, 70LN, 72BA, 73KY,
 74MV, 82DM;
 Sr²⁺ 83Ra;
 Ba²⁺ 71HP;

Ce³⁺ 83FD;
 Pr³⁺-Ho³⁺ 73FPa, 73RSa;
 Pu³⁺ 83NCb;
 Pu⁴⁺ 83Nca;
 Mn²⁺ 71BW, 71HP, 74BRM;
 Co²⁺, Ni²⁺ 74BRM, 76ZB;
 Cu²⁺ 48F, 70SW, 71HP, 71KV, 74BRM, 77KF;
 Fe³⁺ 77SP;
 Zn²⁺ 71HP, 74BRM;
 Cd²⁺ 85SGB;
 Pb²⁺ 69Dla;

Other references: 58PW, 67F, 67M, 68MM, 68SR, 68YM, 69C, 69H, 69Ma, 69MMP, 69MU, 69Pc, 69RC, 69SHV,
 69SG, 69SM, 69SMa, 69V, 69VS, 69ZL, 70BM, 70BSa, 70HP, 70KP, 70MG, 70MKG, 70N, 70SP, 70SPa, 70SW, 71JP,
 71KB, 71KKP, 71KM, 72M, 72YM, 73ES, 73S, 74Ga, 74KF, 74MC, 74N, 74Q, 74Sa, 78SKF, 79MP, 80BKa, 80KM,
 80NOK, 80Tmc, 81Ac, 81Pmb, 81Tmc, 81TPa, 82CD, 82LM, 82R, 82RD, 82HO, 83HU, 83KL, 83PG, 84DSF, 84PG,
 85ITa, 85LD



Hydrogen thiosulfate (thiosulfuric acid)
(Other values in Vol.4, p.86 and Vol.5, p.413)

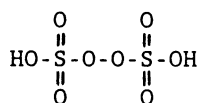


Metal ion	Equilibrium	Log K 25°, 0.5 (1.0) (1.3) ^a	Log K 25°, 1.0 (0.8)	Log K 25°, 0 (1.6) ±0.1	ΔH 25°, 1.0	ΔS 25°, 1.0
H ⁺	HL/H.L					
	H ₂ L/HL.H			(0.6)		
Ag ⁺	ML/M.L		(9.23)	(8.82) ^o (7.36) ^f	(-14) ^s	(-5)
	ML ₂ /M.L ²	12.78 ^d	12.5 ±0.1	13.5 ±0.1	(-19) ^s	(-7)
	ML ₃ /M.L ³	13.1 ^d	12.8	12.72 ^f 14.2 ^o 13.5 ^f 26.3 ^f 39.8 ^f 78.6 ^f		
	M ₂ L ₄ /M ₃ .L ⁴ M ₃ L ₅ /M ₃ .L ⁵ M ₆ L ₈ /M ₆ .L ⁸					
Tl ⁺	ML/M.L		0.79 ^l	0.86 ^f		
	ML ₂ /M.L ²		1.11 ^l	0.72 ^f		
	ML ₃ /M.L ³			0.2 ^f		
	M ₂ L ₄ /M ² .L ⁴			2.54 ^f		
	M ² .L/M ₂ L(s)			-4.54 ^f		

^a25°, 0.1; ^d25°, 2.0; ^f25°, 4.0; ^l20°, 2.7; ^o20°, 0; ^s10-30°, 1.0

Bibliography: Ag⁺ 74BD, 80DB; Tl⁺ 79Fb;

Other references: 69b, 69M, 69PG, 70BP, 70V, 71Mc, 72MH, 72NE, 77SB, 82TM, 83BD, 83GH, 84DBC, 84DBF



Hydrogen peroxydisulfate (peroxydisulfuric acid)
(Other references in Vol.4, p.89)



Metal ion	Equilibrium	Log K 25°, 0.1	Log K 25°, 0.5	Log K 25°, 0	ΔH 25°, 0	ΔS 25°, 0
Na ⁺	ML/M.L	0.09		0.59	(+4) ^r	(16)
K ⁺	ML/M.L	0.52		0.91 ±0.2	(+2) ^s +2	(11)
Rb ⁺	ML/M.L	0.73		1.17	(+1) ^r	(9)
Cs ⁺	ML/M.L	0.97		1.41	(-1) ^r	(3)
NH ₄ ⁺	ML/M.L			(1.2)	(+5) ^t	(22)
Co ²⁺	ML/M.L		(1.4)	(2.7)	(+1.0) ^b	(10) ^b
Cu ²⁺	ML/M.L		1.4	2.7	+0.3 ^b	7 ^b

^b25°, 0.5; ^r25-37°, 0; ^s25-39°, 0; ^t25-35°, 0

Bibliography: Na⁺, Rb⁺, Cs⁺ 71CL; K⁺, NH₄⁺ 77ASb; Co²⁺, Cu²⁺ 77ASc, 81Ac

HF

HF

Hydrogen fluoride (hydrofluoric acid)
(Other values in Vol.4, p.96 and Vol.5, p.415)

HL

Metal ion	Equilibrium	Log K 25°, 0.5	Log K 25°, 1.0	Log K 25°, 0	ΔH 25°, 0	ΔS 25°, 0
H ⁺	HL/H.L	2.93 ±0.03	2.97 ±0.03	3.17 ±0.02	+3.20 ±0.02	25.3
		2.94 ^a ±0.04	3.00 ⁿ	3.79 ^g	+2.89 ^c ±0.03	23.3 ^c
		3.12 ^d ±0.02	3.31 ^e ±0.03	3.54 ^f ±0.00	+2.37 ^e	23.1 ^e
		4.06 ^v	4.32 ^w	4.60 ^x		
	HL ₂ /HL.L	0.57 ±0.1	0.59 ±0.1	0.58 ±0.05	+1.0	6
		0.84 ^d	0.84 ^e ±0.1	1.05 ^f	+0.8 ^c ±0.1	5 ^c
Li ⁺	ML/M.L		0.07	0.23	(+1) ^s	(4) ^c
Na ⁺	ML/M.L	-0.79 ^q	-0.48	-0.2 ±0.2	(+3) ^s	(8) ^c
K ⁺	ML/M.L		-1.2			
Mg ²⁺	ML/M.L	1.32 ±0.02	1.34 ±0.04	2.05	+3.2 ^c	17 ^c
	M.L ² /ML ₂ (s)			-8.13 ±0.06	(-2) ^r	(-44)
Ca ²⁺	ML/M.L		0.63 ±0.05		+3.5 ^c	15 ^c
	M.L ² /ML ₂ (s)			-10.50 ±0.05	(+2) ^r ±1	(-41)
Sr ²⁺	ML/M.L		0.14 ±0.05		+4 ^c	14 ^c
	M.L ² /ML ₂ (s)			-8.58 ±0.04	(+1) ^r	(-36)
Ba ²⁺	ML/M.L		-0.20 ±0.05		(+4) ^t	(13) ^c
	M.L ² /ML ₂ (s)			-5.82 ±0.06	(+1) ^r	(-23)
Sc ³⁺	ML/M.L	6.18 ±0.01		7.1	(0) ^u	(33) ^b
	ML ₂ /M.L ²	11.48 ±0.04		12.9	(-1) ^u	(56) ^b
	ML ₃ /M.L ³	15.5 ±0.3		17.4	(-2) ^u	(73) ^b
	ML ₄ /M.L ⁴	18.4 ±0.1		20.3		
	M ₂ L ₃ /M ² .L ³	19.0				
La ³⁺	ML/M.L	2.83 -0.1	2.67	3.85	+4.0 ^c	26 ^c
		3.21 ^a				
	M.L ³ /ML ₃ (s)	-18.9 ^a +1				
Ce ³⁺	ML/M.L	3.07 ±0.06	2.81	4.19	+4.8 ^c	29 ^c
		3.45 ^a				
	M.L ³ /ML ₃ (s)	-19.2 ^a		-19.1		
Pr ³⁺	ML/M.L	3.23	3.01	4.25	+5.7 ^c	33 ^c
		3.61 ^a				
	M.L ³ /ML ₃ (s)	-18.9 ^a				
Nd ³⁺	ML/M.L	3.32	3.09	4.34	+6.8 ^c	37 ^c
		3.70 ^a				
	M.L ³ /ML ₃ (s)	-18.6 ^a		-20.3		
Sm ³⁺	ML/M.L	3.37	3.12	4.39	+9.4 ^c	46 ^c
		3.75 ^a				
	M.L ³ /ML ₃ (s)	-17.9 ^a				
Eu ³⁺	ML/M.L	3.43 -0.04	3.19	4.45	+9.2 ^c	45 ^c
		3.81 ^a				
	M.L ³ /ML ₃ (s)	-17.2 ^a		-21.9		

^a25°,0.1; ^b25°,0.5; ^c25°,1.0; ^d25°,2.0; ^e25°,3.0; ^f25°,4.0; ^g25°,5.0; ⁿ37°,0.15;
^q25°,1.0 NaCl; ^r1-40°,0; ^s15-35°,1.0; ^t15-60°,1.0; ^u15-35°,0.5; ^v25°,6.0; ^w25°,7.0;
^x25°,8.0

Hydrogen fluoride (continued)

Metal ion	Equilibrium	Log K 25°, 0.5	Log K 25°, 1.0	Log K 25°, 0	ΔH 25°, 0	ΔS 25°, 0
Gd ³⁺	ML/M.L	3.56 -0.2 3.93 ^a	3.31	4.57	+8.9 ^c	45 ^c
	M.L ³ /ML ₃ (s)	-16.8 ^a				
Tb ³⁺	ML/M.L	3.65 4.02 ^a	3.42	4.66	+7.5 ^c	41 ^c
	M.L ³ /ML ₃ (s)	-16.7 ^a				
Dy ³⁺	ML/M.L	3.68 4.05 ^a	3.46	4.69	+7.0 ^c	39 ^c
	M.L ³ /ML ₃ (s)	-16.3 ^a				
Ho ³⁺	ML/M.L	3.71 4.10 ^a	3.52	4.74	+7.3 ^c	40 ^c
	M.L ³ /ML ₃ (s)	-15.8 ^a				
Er ³⁺	ML/M.L	3.73 4.12 ^a	3.54	4.76	+7.4 ^c	41 ^c
	M.L ³ /ML ₃ (s)	-15.5 ^a		-18.0		
Tm ³⁺	ML/M.L	3.75 4.14 ^a	3.56	4.78	+8.7 ^c	45 ^c
	M.L ³ /ML ₃ (s)	-15.8 ^a				
Yb ³⁺	ML/M.L	3.78 4.16 ^a	3.58	4.80	+9.6 ^c	48 ^c
	M.L ³ /ML ₃ (s)	-15.0 ^a				
Lu ³⁺	ML/M.L	3.80 4.19 ^a	3.61	4.83	+9.5 ^c	48 ^c
	M.L ³ /ML ₃ (s)	-15.0 ^a				
Mn ²⁺	ML/M.L	0.9 ^d	0.8 ±0.2 1.0 ^e		+2.9 ^b ±0.5 +3.6 ^e	13 ^c 17 ^e
Co ²⁺	ML/M.L	0.7 ^d	0.6 ±0.2 0.8 ^e		+2.2 ^b ±0.4 +2.8 ^e	10 ^c 13 ^e
Ni ²⁺	ML/M.L	0.7 ^d	0.6 ±0.2 0.8 ^e		+1.8 ^b ±0.2 (+1.7) ^e	9 ^c 9 ^e
Cu ²⁺	ML/M.L	1.0 ^d	0.9 ±0.1 1.1 ^e		+3.3 ^b ±0.3 +3.5 ^e	15 ^c 17 ^e
V ³⁺	ML/M.L		5.00			
Mn ³⁺	ML/M.L	5.65 ^d	5.9 ^e			
	ML ₂ /M.L ²		11.0 ^e			
	ML ₃ /M.L ³		14.9 ^e			
Hf ⁴⁺	ML/M.L		9.04 ^f	9.03 ^m		
	ML ₂ /M.L ²			16.58 ^m		
	ML ₃ /M.L ³			23.1 ^m		
	ML ₄ /M.L ⁴		30.2 ⁿ	28.8 ^m		
	ML ₅ /M.L ⁵		40.5 ⁿ	34.0 ^m		
	ML ₆ /M.L ⁶			38.0 ^m		
Zn ²⁺	ML/M.L	0.75 ±0.06	0.75 ±0.05 0.9 ^e		+2.8 ^b ±0.3 (+2.2) ^e	13 ^b 12 ^e

^a25°,0.1; ^b25°,0.5; ^c25°,1.0; ^d25°,2.0; ^e25°,3.0; ^f25°,4.0; ^m20°,4.0 H⁺; ⁿ37°,0.15

Hydrogen fluoride (continued)

Metal ion	Equilibrium	Log K 25°, 0.5	Log K 25°, 1.0	Log K 25°, 0	ΔH 25°, 0	ΔS 25°, 0
B(III)	M(OH) ₃ L/M(OH) ₃ .L		-0.3 ±0.1			
	M(OH) ₂ L ₂ /M(OH) ₃ .H.L ²		7.3 ±0.2			
	M(OH)L ₃ /M(OH) ₃ .H ² .L ³		13.5 ±0.2			
	ML ₄ /M(OH) ₃ .H ³ .L ⁴		19.3 ±0.3			
Al ³⁺	MOH.L ² /MOHL ₂ (s)			-13.59		
Si(IV)	M(OH) ₂ L ₂ /M(OH) ₄ .H ² .L ²		11.09			
	ML ₆ /M(OH) ₄ .H ⁴ .L ⁶	29.48 ^a	29.96 ±0.02	30.10 ±0.08		
		30.88 ^d	32.33 ^e			

^a25°, 0.1; ^d25°, 2.0; ^e25°, 3.0

Bibliography:

H⁺ 68V, 80HM, 82Hb, 84Ga, 84Hc, 84Hd, 85IW;Li⁺-K⁺ 84CTH, 84HC;Mg²⁺-Ba²⁺ 72K, 76GN, 82MS;Sc³⁺, V³⁺ 80HM;La³⁺-Lu³⁺ 73DO, 83AAB;Pu³⁺, Pu⁴⁺, PuO₂²⁺ 83F;Mn²⁺-Cu²⁺, Zn²⁺ 69V, 81KBM, 83SBB;

Other references: 59RD, 64YP, 68BU, 68L, 68M, 68MM, 68SR, 69D, 69FT, 69RHa, 70BM, 71B, 71W, 72CM, 74P, 79HH, 79MK, 79MMA, 79Sb, 80Ba, 80BK, 81GN, 82BK, 82KMK, 82Ma, 82RD, 83CP, 83F, 84FM, 84NC, 84VSK, 85BBa, 85ITa, 85M, 85TZB, 85VRB

Cl⁻Cl⁻

Chloride ion

L⁻

(Other values in Vol.4, p.104 and Vol.5, p.418)

Metal ion	Equilibrium	Log K 25°, 0.5	Log K 25°, 1.0	Log K 25°, 0	ΔH 25°, 0	ΔS 25°, 0
Na ⁺	ML/M.L	-0.7 -0.4 ^a	-0.7			
Mg ²⁺	ML/M.L	0.1 0.2 ^a	-0.10 ±0.03 -1.0 ^e		(+1) ^s +1	(3) ^c
Ca ²⁺	ML/M.L		-0.14 ±0.03		(+1) ^s ±1	(3) ^c
Sr ²⁺	ML/M.L		-0.23 ±0.05		(+3) ^s ±1	(9) ^c
Ba ²⁺	ML/M.L		-0.44 ±0.04		(+5) ^s ±1	(15) ^c
Sm ³⁺	ML/M.L ML ₂ /M.L ²		-0.39 ¹ -0.6 ¹			
Eu ³⁺	ML/M.L ML ₂ /M.L ²		-0.1 ±0.0 -0.28 ¹ -0.5 ¹ -0.7 ¹	-0.15 ^f	(0) ^s	(0) ^c
Gd ³⁺	ML/M.L ML ₂ /M.L ²		-0.25 ¹ -0.7 ¹			
Tb ³⁺	ML/M.L ML ₂ /M.L ²		-0.35 ¹ -0.6 ¹			

^a25°, 0.1; ^c25°, 1.0; ^e25°, 3.0; ^f25°, 4.0; ¹20°, 3.0; ^s15-45°, 1.0;

Chloride ion (continued)

Metal ion	Equilibrium	Log K 25°, 0.5	Log K 25°, 1.0	Log K 25°, 0	ΔH 25°, 0	ΔS 25°, 0
Ac ³⁺	ML/M.L		-0.1 -0.36 ¹	-0.04 ^f		
	ML ₂ /M.L ²		-0.6 -0.5 ¹	-0.7 ^f		
Am ³⁺	ML/M.L		-0.1 ^j ±0.1 -0.26 ¹	(-1.0) ^f		
	ML ₂ /M.L ²		-0.7 ¹	-0.7 ^f		
Cm ³⁺	ML/M.L		-0.25 ¹			
	ML ₂ /M.L ²		-0.7 ¹			
Bk ³⁺	ML/M.L		-0.02 ¹			
	ML ₂ /M.L ²		-0.23 ¹			
Cf ³⁺	ML/M.L		-0.6 -0.21 ¹			
	ML ₂ /M.L ²		-0.6 ¹			
Pu ³⁺	ML/M.L		-0.1			
Pu ⁴⁺	ML/M.L	0.15 ^d	0.14	0.22 ^f ±0.08		
Co ²⁺	ML/M.L	0.0 -0.1 ^d ±0.0	0.0 ±0.1 -0.2 ^e -0.1		+0.5 ^d +0.9 ^e	1 ^d 2 ^e
Ni ²⁺	ML/M.L	-0.2 ^d ±0.1	0.0 ±0.1 -0.6 ^e ±0.1		+0.5 ^d +2.3 ^e	1 ^d 5 ^e
Cu ²⁺	ML/M.L	-0.2 ±0.1 -0.1 ^d ±0.1 0.27 ^v	-0.2 ±0.1 0.0 ^e ±0.0 -0.2 ^q ±0.1 -0.4 ^e -0.1 -0.5 ^q	0.2 ±0.1 0.11 ^f 0.17 ^g ±0.02 -0.22 ^g ±0.02	+2.0 ^d -0.4 +2.2 ^e +2.9 ^g +5.5 ^g	6 ^d 7 ^e 11 ^g 17 ^g
	ML ₂ /M.L ²			-0.22 ^g ±0.02	+5.5 ^g	
	ML ₃ /M.L ³			-1.5 ^g ±0.5	+2.6 ^g	2 ^g
	ML ₄ /M.L ⁴			-2.5 ^g ±0.0		
Fe ³⁺	ML/M.L	0.64 0.7 ^d ±0.1 0.78 ^a	0.63 ±0.06 0.8 ^e ±0.1	1.48 ±0.00 1.0 ^f ±0.1	+5.6 +4.3 ^c	26 17 ^c
	ML ₂ /M.L ²		0.75 ±0.5	2.13		
	ML ₃ /M.L ³		-0.7			
Co ³⁺	ML/M.L	1.5	1.42 ^e		(+4) ^t	(20) ^b
Ag ⁺	ML/M.L	3.08 ^a	3.36 3.45 ^m	3.31 ±0.1 3.70 ^g	(-3) ^r	(5)
	ML ₂ /M.L ²	5.08 ^a	5.20 5.67 ^m	5.25 ±0.1 5.62 ^g	(-4) ^r	(11)
	ML ₃ /M.L ³			5.20 ±0.1		
	ML ₄ /M.L ⁴		6.0 ^m 6.0 ^m	6.4 ^g 6.1 ^g		
CH ₃ Hg ⁺	ML/M.L	5.18 ^a -0.01	5.41 ±0.10	5.50 ^u	-6.0 ^h	4 ^a
CH ₃ CH ₂ Hg ⁺	ML/M.L		5.32			
C ₆ H ₅ Hg ⁺	ML/M.L		5.77			

a_{25°}, 0.1; c_{25°}, 1.0; d_{25°}, 2.0; e_{25°}, 3.0; f_{25°}, 4.0; g_{25°}, 5.0; h_{20°}, 0.1; j_{20°}, 1.0; l_{20°}, 3.0; m_{20°}, 4.0; q_{25°}, 0.7; r_{15-35°}, 0; t_{2-13°}, 0.5; u_{25°}, 2.5; v_{25°}, 6.0

Chloride ion (continued)

Metal ion	Equilibrium	Log K 25°, 0.5	Log K 25°, 1.0	Log K 25°, 0	ΔH 25°, 0	ΔS 25°, 0
Tl ⁺	M.L/ML(s)	-3.31 -3.12 ^d	-3.21 -3.08 ^e	-3.74 ±0.02 -3.04 ^f ±0.00	(+10) ^r (+8) ^s	(16) (12) ^c
(C ₂ H ₅) ₃ Pb ⁺	ML/M.L M.L/ML(s)		0.57	1.08 ^o -2.86 ^o		
(C ₃ H ₇) ₃ Pb ⁺	ML/M.L M.L/ML(s)			0.85 ^o -4.00 ^o		
(C ₄ H ₉) ₃ Pb ⁺	ML/M.L M.L/ML(s)			0.4 ^o -5.69 ^o		
Hg ²⁺	ML/M.L	6.74 ±0.1	6.72	7.30	-5.5 ^b ±0.2 -5.8 ^e	12 ^b 13 ^e
	ML ₂ /M.L ²	13.22 ±0.2	13.23	14.00	-12.6 ^b ±0.2 -12.3 ^e	18 ^b 23 ^e
	ML ₃ /M.L ³	14.2 ±0.1 14.7 ^d	14.2 ±0.0 15.1 ^e -0.4	15.0	-13.0 ^b -0.6 -13.3 ^e	21 ^b 24 ^e
	ML ₄ /M.L ⁴	15.2 ±0.1 15.7 ^d	15.3 ±0.0 16.1 ^e ±0.0	15.6	-14.6 ^b ±0.5 -14.8 ^e	21 ^b 24 ^e
Pb ²⁺	ML/M.L	0.87 ±0.04 1.00 ^d ±0.08 1.08 ^a	0.90 ±0.06 1.12 ^e ±0.08 0.86 ^q	1.55 ±0.07 1.23 ^f ±0.08	+2.1	14
	ML ₂ /M.L ²	1.2 ±0.1 1.3 ^d ±0.1 1.4 ^a	1.2 ±0.1 1.6 ^e ±0.1 1.2 ^q	2.2 ±0.1 1.8 ^f ±0.2	(+3) ^r	(20)
	ML ₃ /M.L ³	1.1 1.4 ^d ±0.1 1.3 ^a	1.1 ±0.1 1.9 ^e ±0.1 1.1 ^q	1.8 ±0.1 2.2 ^f ±0.2	(+1) ^r	(12)
	ML ₄ /M.L ⁴	0.7 ^d ±0.2	1.0 ^e ±0.2	1.1 ±0.3 1.4 ^f ±0.2		
Sb ³⁺	ML/M.L			2.30 ^w		
	ML ₂ /M.L ²			4.0 ^w		
	ML ₃ /M.L ³			5.8 ^w		
	ML ₄ /M.L ⁴			6.8 ^w		

^a25°, 0.1; ^b25°, 0.5; ^c25°, 1.0; ^d25°, 2.0; ^e25°, 3.0; ^f25°, 4.0; ^o20°, 0; ^q25°, 0.7; ^r25-50°, 0;
^s5-45°, 1.0; ^w30°, 5.0

Bibliography:

Na⁺ 84BM;
 (CH₃)₄N⁺, (C₄H₉)₄N⁺ 72AG;
 Mg²⁺-Ba²⁺ 82MS, 84BM;
 Sm³⁺-Ce³⁺ 82FK;
 Pu³⁺, Pu⁴⁺ 83F;
 Co²⁺ 64GL, 74BRM, 82CD;
 Ni²⁺ 64GL, 74BRM;
 Cu²⁺ 53N, 64GL, 71MK, 73L, 74BRM, 74BRS, ;
 76KF, 77KF, 81AH, 82AP, 83BW, 83RF;
 Fe³⁺ 69MW, 72ST, 81BK;
 Co³⁺ 70MMH;
 Cu⁺ 80F;

Ag⁺ 75IPa, 76S, 85F;
 CH₃Hg⁺-C₆H₅Hg⁺ 73GE, 78SKP;
 Tl⁺ 83EI, 83IFa;
 (C₂H₅)₃Pb⁺-(C₄H₉)₃Pb⁺ 69PF;
 Pd²⁺ 64BS, 80K;
 Cd²⁺ 69MMP, 77HH, 80L, 81DB, 83GS, 85GN, 85SGB;
 Hg²⁺ 70SI, 80VKM, 82VKM;
 Pb²⁺ 80Lba, 80PPb, 81BYM, 82BMS, 82R, 82BM,
 84MB, 84S;
 Tl³⁺ 67WD;
 Bi³⁺ 59DP, 70BW, 70K;
 Sb³⁺ 70BW;

Chloride ion (continued)

Other references: 41ES, 56WW, 57NH, 60KP, 66HP, 67GG, 67OM, 67OMa, 68MM, 68OM, 68SY, 69C, 69G, 69H, 69MK, 69PS, 69VS, 69VV, 70BM, 70BP, 70H, 70M, 70RS, 71HP, 71JP, 71KN, 71PL, 71WB, 71ZM, 72CM, 72GP, 72MG, 72TS, 73BR, 74G, 74KI, 75BZ, 75ZS, 76KB, 76SF, 76SS, 77SB, 78SB, 78SK, 80F, 80FB, 80HS, 80KM, 80TGI, 80TK, 80X, 81AS, 81DB, 81PMB, 81RM, 81SH, 81STU, 81SV, 81VR, 81YS, 82FK, 82MMR, 82NN, 82RD, 82TT, 82WL, 83BH, 83HH, 83MAK, 83SC, 84F, 84Fa, 84GA, 84HS, 84LSC, 84MA, 84PE, 84SN, 84VSR, 84W, 85AB, 85MC, 85PB, 85PBa

Chlorate ion

(Other values in Vol.4, p.113 and Vol.5, p.421)

Metal ion	Equilibrium	Log K 25°, 0
Na^+	ML/M.L	(-0.7) $\pm$ 0.2
K^+	ML/M.L	(-0.19) $\pm$ 0.04
Rb^+	ML/M.L	(-0.12) $\pm$ 0.02
Cs^+	ML/M.L	(-0.06)

Bibliography: 70BJ;

Other references: 69Pc, 81MT

Perchlorate ion

(Other values in Vol.4, p.114 and Vol.5, p.421)

Metal ion	Equilibrium	Log K 25°, 0.5	Log K 25°, 1.0	Log K 25°, 0	ΔH 25°, 0	ΔS 25°, 0
K^+	ML/M.L			(-0.04) $\pm$ 0.04		
	M.L/M.L(s)	-1.6	-1.9	-1.94 $\pm$ 0.09	(+9) ^r	(21)
		-1.9 ^d	-2.1 ^e	-2.4 ^f		
Rb^+	ML/M.L			(-0.15) $\pm$ 0.02		
Cs^+	ML/M.L			(0.23)		
Fe^{3+}	ML/M.L	0.4 ^h $\pm$ 0.1	0.70	1.15		
Tl^+	ML/M.L		-0.5	0.0 $\pm$ 0.2		

^d25°, 2.0; ^e25°, 3.0; ^f25°, 4.0; ^h20°, 0.15; ^r15-35°, 0

Bibliography:

K^+ 68HR, 69Ga, 70BJ, 74DD, 80FSD, 82CGa;

Rb^+ , Cs^+ 70BJ;

Other references: 72CJ, 81Lma, 85NL

Fe^{3+} 73MH;

Tl^+ 70Bb;

		Br ⁻				L ⁻	
		Bromide ion					
		(Other values in Vol.4, p.115 and Vol.5, p.421)					
Metal ion	Equilibrium	Log K 25°, 0.5	Log K 25°, 1.0	Log K 25°, 0	ΔH 25°, 0	ΔS 25°, 0	
Sm ³⁺	ML/M.L		-0.5 ¹				
Eu ³⁺	ML/M.L		-0.2 ¹ -0.4 ¹				
Gd ³⁺	ML/M.L		-0.4 ¹				
Tb ³⁺	ML/M.L		-0.4 ¹				
Ac ³⁺	ML/M.L		-0.2 ¹ -0.4 ¹				
Am ³⁺	ML/M.L		-0.5 ¹				
Cm ³⁺	ML/M.L		-0.4 ¹				
Bk ³⁺	ML/M.L		(-0.8) ¹				
Cf ³⁺	ML/M.L		-0.5 ¹				
Co ²⁺	ML/M.L	-0.13 ^q (-0.11) ^d	-0.7 ^e		+0.1 ^d +2.2 ^e	0 ^d 4 ^e	
	ML ₂ /M.L ²	-0.4 ^q					
Ni ²⁺	ML/M.L	(-0.12) ^d	-0.8 ^e		+0.1 ^d +2.8 ^e	0 ^d 6 ^e	
Cu ²⁺	ML/M.L	-0.07 ^d	-0.05 ^e ±0.1	-0.03	+0.9 ^d +3.0 ^e	3 ^d 10 ^e	
Fe ³⁺	ML/M.L		-0.2 ±0.1 -0.3 ^e	0.6 ±0.0 -0.2 ^f ±0.1	(+6) ^r ±0	(23)	
	ML ₂ /M.L ²	-0.4 ^d	-0.5 ±0.1				
C ₆ H ₅ Hg ⁺	ML/M.L		6.62				
Cd ²⁺	ML/M.L	1.55 ±0.05 1.63 ^d ±0.05 1.79 ^a ±0.1	1.56 ±0.02 1.78 ^e ±0.05	2.17 ±0.06	-0.8 ^b -1.0 ^e ±0.0	4 ^b 5 ^e	
	ML ₂ /M.L ²	2.1 ±0.1 2.2 ^d ±0.1 2.5 ^a ±0.1	2.1 ±0.1 2.6 ^e -0.1	3.0 ±0.0	-0.8 ^b -1.6 ^e -0.9	7 ^b 7 ^e	
	ML ₃ /M.L ³	2.3 -0.1 2.6 ^d ±0.1	2.4 ±0.1 3.1 ^e ±0.1	3.1 ±0.1	0.0 ^b +0.2 ^e -1.0	11 ^b 15 ^a	
	ML ₄ /M.L ⁴	3.1 ^d ±0.2	2.7 ±0.1 3.8 ^e ±0.1	2.9 ±0.0	+0.5 ^e -1	19 ^e	
Hg ²⁺	ML/M.L	9.00 ±0.06			-10.1 ^b ±0.1 -9.6 ^e	7 ^b 11 ^e	
	ML ₂ /M.L ²	17.1 ±0.2	9.40 ^e 18.0 ^e		-20.7 ^b ±0.3 -19.2 ^e	9 ^b 18 ^e	
	ML ₃ /M.L ³	19.4 ±0.2	20.7 ^e		-23.5 ^b ±0.4 -21.8 ^e	11 ^b 22 ^e	
	ML ₄ /M.L ⁴	21.0 ±0.2			-27.3 ^b ±0.6 -25.2 ^e	4 ^b 17 ^e	
	ML/MOHL.H	3.37	22.2 ^e 3.50 ^e				

^a25°,0.1; ^b25°,0.5; ^d25°,2.0; ^e25°,3.0; ^f25°,4.0; ¹20°,3.0; ^q20°,0.7; ^r5-50°,0;

Bromide ion (continued)

Metal ion	Equilibrium	Log K 25°, 0.5	Log K 25°, 1.0	Log K 25°, 0	ΔH 25°, 0	ΔS 25°, 0
Pb ²⁺	ML/M.L	1.02 ± 0.07	1.10 ± 0.06	1.77 ± 0.1		
		1.25 ^d ± 0.05	1.32 ^e ± 0.04	1.48 ^f ± 0.03	(-1) ^s	(3) ^e
	ML ₂ /M.L ²	1.5 ± 0.2	1.6 ± 0.2	2.6 - 0.1		
		1.8 ^d ± 0.4	2.1 ^e ± 0.2	2.5 ^f ± 0.2	(-1) ^s	(6) ^e
	ML ₃ /M.L ³	2.1 - 0.1	2.1 ± 0.1	3.0 - 0.1		
		2.4 ^d ± 0.1	2.9 ^e ± 0.1	3.4 ^f ± 0.1	(-1) ^s	(10) ^e
	ML ₄ /M.L ⁴		1.8 ± 0.2	2.3 - 0.1		
		2.3 ^d ± 0.3	2.9 ^e ± 0.1	3.4 ^f ± 0.1	(-4) ^s	(0) ^e

^d25°, 2.0; ^e25°, 3.0; ^f25°, 4.0; ^s5-65°, 3.0

Bibliography:

(CH₃)₄N⁺-(C₄H₉)₄N⁺ 72AG;

Sm³⁺-Cf³⁺ 82FK;

Co²⁺-Cu²⁺ 74BRM;

Fe³⁺ 69MW, 70KV, 72ST;

Ag⁺ 74G, 80JP;

CH₃Hg⁺ 73GE;

C₆H₅Hg⁺ 81SKB;

Tl⁺ 81GL;

Pd²⁺ 64BS;

Cd²⁺ 74R, 83NF, 83R, 84TMA;

Hg²⁺ 70SI, 77EK, 80VKM, 84GA, 84VKb;

Pb²⁺ 82BY;

Other references: 55WW, 67GG, 68MM, 69CE, 69G, 70BP, 70M, 71HP, 72GP, 72K, 72LR, 73BR, 74KI, 77KF, 77SB, 79Sa, 80X, 81DB, 81Hha, 81Pmb, 81PP, 81RM, 81STU, 82BY, 82RD, 82TT, 82WL, 83F, 83MC, 84W

BrO₃⁻O₃Br⁻

Bromate ion

L⁻

(Other values in Vol.4, p.121 and Vol.5, p.423)

Metal ion	Equilibrium	Log K 25°, 0
Na ⁺	ML/M.L	(-0.7) ± 0.2
K ⁺	ML/M.L	(-0.33) ± 0.0
Rb ⁺	ML/M.L	(-0.23)
Cs ⁺	ML/M.L	(0.00)

Bibliography: 69Ga, 71LBJ; Other references: 69FO, 70H, 81MT

I⁻I⁻

Iodide ion

L⁻

(Other values in Vol.4, p.122 and Vol.5, p.423)

Metal ion	Equilibrium	Log K 25°, 0.5	Log K 25°, 1.0	Log K 25°, 0	ΔH 25°, 0	ΔS 25°, 0
K ⁺	ML/M.L			(-0.4) ± 0.2	(+1) ^t	(2)
CH ₃ Hg ⁺	ML/M.L	8.50 ^a				
		8.60 ^h				
	ML ₂ /M.L ²	8.86 ^h				
C ₆ H ₅ Hg ⁺	ML/M.L		8.82			
Tl ⁺	M.L/ML(s)	-6.90	-6.83	-7.23 ± 0.04	+18 ^s	27
			-6.75 ^e	-6.73 ^f		

^a25°, 0.1; ^e25°, 3.0; ^f25°, 4.0; ^h20°, 0.1; ^r5-55°, 0; ^s10-26°, 0

Bibliography: K⁺ 74DD; C₆H₅Hg⁺ 81SKB; (CH₃)₄N⁺-(C₄H₉)₄N⁺ 72AG; Tl⁺ 83IF;

CH₃Hg⁺ 73GE, 83AC; Hg²⁺ 70SI;

Other references: 55WW, 67GG, 68MM, 69G, 70BP, 70M, 71HP, 72CM, 72LR, 73BR, 77SB, 80X, 81DB, 81STU, 82TT, 83NF, 83T, 84DBC, 84GA, 84TMA, 84W, 85BTM



HO_3I		Hydrogen iodate (iodic acid)				HL	
		(Other values in Vol.4, p.126 and Vol.5, p.424)					
Metal ion	Equilibrium	Log K 25°, 0.5	Log K 25°, 1.0	Log K 25°, 0	ΔH 25°, 0	ΔS 25°, 0	
H^+	HL/H.L		(0.3)	(0.8) ± 0.0	+0.7 +1	6	
Na^+	ML/M.L			(-0.4) ± 0.1			
K^+	ML/M.L M.L/ML(s)			(-0.27) ± 0.04 -1.64			
Rb^+	ML/M.L			(-0.19)			
Cs^+	ML/M.L			(-0.11)			
Ca^{2+}	$\text{M.L}^2/\text{ML}_2(\text{H}_2\text{O})_6(\text{s})$	-5.07 -4.70 ^d	-4.89 -4.84 ^e	-6.15 ± 0.02 -5.06 ^f	+20 ± 1	39	
Sr^{2+}	$\text{M.L}^2/\text{ML}_2(\text{H}_2\text{O})(\text{s})$	-5.40 -5.29 ^d	-5.29 -5.30 ^e	-6.45 ± 0.03 -5.37 ^f	+9	1	
Ba^{2+}	$\text{M.L}^2/\text{ML}_2(\text{H}_2\text{O})(\text{s})$	-7.76 -7.43 ^d	-7.60 -7.35 ^e	-8.81 ± 0.01 -7.39 ^f	+14	9	
Co^{2+}	$\text{M.L}^2/\text{ML}_2(\text{H}_2\text{O})(\text{s})$	-4.77 -5.03 ^a -4.78 ^d	-4.71 -4.96 ^e	-5.84 -5.36 ^f			
Ni^{2+}	$\text{M.L}^2/\text{ML}_2(\text{H}_2\text{O})_3(\text{s})$	-4.17 -4.41 ^a -4.25 ^d	-4.16 -4.42 ^e	-5.23 -4.84 ^f			
Cu^{2+}	ML/M.L $\text{M.L}^2/\text{ML}_2(\text{H}_2\text{O})(\text{s})$	-6.11 -6.34 ^a -6.23 ^d	-6.09 ± 0.02 -6.47 ^e	0.35 ^g -7.13 ± 0.01 -6.80 ^f -6.72 ^g	+1 ^g +7 +1 ^g	5 ^g -9 -27 ^g	
Ag^+	M.L/ML(s)			-7.51 ± 0.01	+13 ± 1	9	
Tl^+	M.L/ML(s)	-4.66 ^k		-5.51 ± 0.00	+12.7 ± 0.6	17	
Zn^{2+}	$\text{M.L}^2/\text{ML}_2(\text{H}_2\text{O})_2(\text{s})$	-4.40 -4.57 ^a -4.49 ^d	-4.37 -4.75 ^e	-5.39 ± 0.04 -5.23 ^f	+7	-1	
Cd^{2+}	ML/M.L $\text{ML}_2/\text{M.L}^2$ $\text{M.L}^2/\text{ML}_2(\text{s})$		0.51 ± 0.00 0.51 ^e 1.52 -7.16 -7.42 ^e		+1 ^e -7.64 +3.2 ^e	6 ^e -23 ^e	

^a25°, 0.1; ^d25°, 2.0; ^e25°, 3.0; ^f25°, 4.0; ^g25°, 5.0; ^k20°, 2.4

Bibliography:

H^+ 73GG, 74GB, 79HH, 84RP;

Na^+ - Cs^+ 71JBJ, 73KC;

Ca^{2+} 69BM, 75DN;

Sr^{2+} , Ba^{2+} 69BM;

Co^{2+} , Ni^{2+} 73FS;

Other references: 69SHK, 70H, 72GO, 74FG, 74PM, 84DSF

Cu^{2+} 73GG, 83RF;

Ag^+ 72R, 73KC;

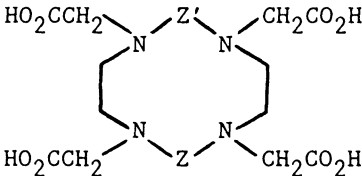
Tl^+ 74F, 84RP;

Zn^{2+} 74SU;

Cd^{2+} 81Rb, 83R;

PROTONATION CONSTANTS FOR OTHER LIGANDS

A. Aminocarboxylic acids1. 2-Aminocarboxylic acids

<u>Ligand</u>	<u>Equilibrium</u>	<u>Log K</u>	<u>ΔH</u>	<u>ΔS</u>	<u>Bibliography</u>
		<u>25°, 0</u>	<u>25°, 0</u>	<u>25°, 0</u>	
		$\begin{array}{c} \text{NH}_2 \\ \\ \text{Z-CHCO}_2\text{H} \end{array}$			
DL-2-Amino-4-mercaptoputanoic acid (homocysteine)* (C ₄ H ₉ ONS) H ₂ L (Other references in Vol.1, p.395 and Vol.5, p.455)	HL/H.L	10.44 ^P			66WS, 81RR
	H ₂ L/HL.H	8.55 ^P			
	H ₃ L/H ₂ L.H	2.15 ^a			
L-3,5-Diiodotyrosine (C ₉ H ₉ O ₃ NI ₂) H ₂ L (Other value in Vol.1, p.32)	HL/H.L	9.10 ^b			85BCP
	H ₂ L/HL.H	6.16 ^b			
					
12-Methyl-1,4,7,10-tetraazacyclotridecane-1,4,7,10-tetraacetic acid* (C ₁₈ H ₃₂ O ₈ N ₄), H ₄ L	HL/H.L	11.47 ^{h, v}			81SF
	H ₂ L/HL.H	9.63 ^h			
	H ₃ L/H ₂ L.H	4.55 ^h			
	H ₄ L/H ₃ L.H	3.80 ^h			
12-Ethyl-1,4,7,10-tetraazacyclotridecane-1,4,7,10-tetraacetic acid* (C ₁₉ H ₃₄ O ₈ N ₄), H ₄ L	HL/H.L	10.96 ^{h, v}			81SF
	H ₂ L/HL.H	9.35 ^h			
	H ₃ L/H ₂ L.H	5.12 ^h			
	H ₄ L/H ₃ L.H	3.28 ^h			
12,12-Dimethyl-1,4,7,10-tetraazacyclotridecane-1,4,7,10-tetraacetic acid* (C ₁₉ H ₃₄ O ₈ N ₄), H ₄ L	HL/H.L	10.25 ^{h, v}			81SF
	H ₂ L/HL.H	8.50 ^h			
	H ₃ L/H ₂ L.H	5.72 ^h			
	H ₄ L/H ₃ L.H	3.96 ^h			
13,13-Dimethyl-1,4,8,11-tetraazacyclotetradecane-1,4,8,11-tetraacetic acid* (C ₂₀ H ₃₆ O ₈ N ₄), H ₄ L	HL/H.L	10.00 ^{h, v}			81SF
	H ₂ L/HL.H	8.35 ^h			
	H ₃ L/H ₂ L.H	5.08 ^h			
	H ₄ L/H ₃ L.H	3.20 ^h			
6,6,13,13-Tetramethyl-1,4,8,11-tetraazacyclotetradecane-1,4,8,11-tetraacetic acid* (C ₂₂ H ₄₀ O ₈ N ₄), H ₄ L	HL/H.L	10.3 ^{h, v}			81SF
	H ₂ L/HL.H	9.0 ^h			
	H ₃ L/H ₂ L.H	4.9 ^h			
	H ₄ L/H ₃ L.H	4.1 ^h			

^a25°, 0.1; ^b25°, 0.5; ^h20°, 0.1; ^P30°, 0.1; ^vKCl used as background electrolyte;

* metal constants were also reported but are not included in the compilation of selected values.

2-Aminocarboxylic acids (continued)

<u>Ligand</u>	<u>Equilibrium</u>	Log K	ΔH	ΔS	<u>Bibliography</u>
		25°. 0	25°. 0	25°. 0	
1,4,8,12-Tetraaza-cyclopentadecane-1,4,8,12-tetraacetic acid (C ₁₉ H ₃₄ O ₈ N ₄), H ₄ L	HL/H.L	10.90 ^{a, v}			85ADF
	H ₂ L/HL.H	9.65 ^a			
	H ₃ L/H ₂ L.H	5.52 ^a			
	H ₄ L/H ₃ L.H	3.52 ^a			
	H ₅ L/H ₄ L.H	2.18 ^a			
1,4,7,10,13,16-Hexaaza-cyclooctadecane-1,4,7,10,13,16-hexaacetic acid* (C ₂₀ H ₃₈ O ₁₂ N ₆), H ₆ L	HL/H.L	12.3 ^{h, v}			81SF
	H ₂ L/HL.H	10.0 ^h			
	H ₃ L/H ₂ L.H	8.3 ^h			
	H ₄ L/H ₃ L.H	4.9 ^h			
	H ₅ L/H ₄ L.H	4.0 ^h			
	H ₆ L/H ₅ L.H	3.2 ^h			
3,6,9,15-Tetraazabicyclo-[9.3.1]pentadeca-11,13,15-trien-3,6,9-triacetic acid* (C ₁₉ H ₂₇ O ₆ N ₄), H ₃ L	HL/H.L	10.6 ^{h, v}			81SF
	H ₂ L/HL.H	7.6 ^h			
	H ₃ L/H ₂ L.H	4.4 ^h			
3,6,9,12,17-Pentaazabicyclo-[12.3.1]heptadeca-14,16,18-trien-3,6,9,12-tetraacetic acid* (C ₂₁ H ₃₁ O ₈ N ₅), H ₄ L	HL/H.L	10.4 ^{h, v}			81SF
	H ₂ L/HL.H	8.4 ^h			
	H ₃ L/H ₂ L.H	5.9 ^h			
	H ₄ L/H ₃ L.H	4.2 ^h			

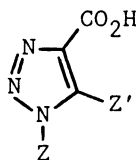
2. 3-, 5-, 6-Aminocarboxylic acids

2. 3-, 5-, 6-Aminocarboxylic acids

$$\begin{array}{c} \text{OH} \\ | \\ \text{H}_2\text{NCH}_2\text{CHCO}_2\text{H} \end{array}$$

DL-3-Amino-2-hydroxypropanoic acid (isoserine)* (C ₃ H ₇ O ₃ N), HL	HL/H.L	9.14 ^a -0.01	-10.3 ^a ±0.2	7 ^a	80BDM
(Other values in Vol.1, p.39 and other reference in Vol.5, p.428)	H ₂ L/HL.H	2.66 ^a	-0.9 ^a	9 ^a	

		$\text{CH}_3\overset{\text{O}}{\overset{\parallel}{\text{C}}}\text{NH}\overset{\text{Z}}{\text{CH}}\text{CO}_2\text{H}$				
N-Acetyl-L-histidine (C ₈ H ₁₁ O ₃ N ₃)	HL/H.L	6.96 ^a	-7.2°	8 ^a	71MB	
HL (Other values in Vol.1, p.80)						
N(2)-Acetyl-L-lysine	HL/H.L		-12.5°		71MB	
(C ₈ H ₁₆ O ₃ N ₂), HL						



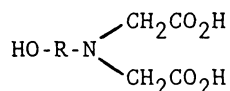
1,2,3-Triazole-4-carboxylic acid (C ₃ H ₃ O ₂ N ₃), HL	HL/H.L H ₂ L/HL.H	8.7 3.22	-5.9 -0.8	20 12	68HW
1-Phenyl-1,2,3-triazole-4- carboxylic acid (C ₉ H ₈ O ₂ N ₃), HL	HL/H.L	2.88	-0.8	11	68HW
5-Methyl-1-phenyl-1,2,3- triazole-4-carboxylic acid (C ₁₀ H ₁₀ O ₂ N ₃), HL	HL/H.L	3.73	-0.2	16	68HW

^a25°, 0.1; ^b20°, 0.1; ^c20°, ~0; ^dKCl used as background electrolyte; ^emetal constants were also reported but are not included in the compilation of selected values.

3-,5-,6-Aminocarboxylic acids (continued)

Ligand	Equilibrium	Log K	ΔH	ΔS	Bibliography
		25°, 0	25°, 0	25°, 0	
1,2,3-Triazole-4,5-dicarboxylic acid (C ₄ H ₃ O ₄ N ₃), H ₂ L	HL/H.L	9.30	-2.3	35	68HW
	H ₂ L/HL.H	5.90	0.0	27	
	H ₃ L/H ₂ L.H	1.86	-0.1	8	
1-Phenyl-1,2,3-triazole-4,5-dicarboxylic acid (C ₁₀ H ₈ O ₄ N ₃),H ₂ L	HL/H.L	4.93	-0.1	22	68HW
	H ₂ L/HL.H	2.1	+0.7	12	

3. Iminodiacetic acid derivatives



N-(3-Hydroxypropyl)iminodiacetic acid* ($C_7H_{12}O_5N$), H_2L (Other values in Vol.1, p.167 and other reference in Vol.5, p.457)	HL/H.L $H_2L/HL.H$	9.74 9.24 ^{P, v} (2.76) 2.06 ^P		75MRa
N-(4-Hydroxybutyl)iminodiacetic acid* ($C_8H_{14}O_5N$), H_2L (Other reference in Vol.5, p.457)	HL/H.L $H_2L/HL.H$	9.98 (2.69)		75MRa
N-(5-Hydroxypentyl)iminodiacetic acid* ($C_9H_{16}O_5N$), H_2L (Other reference in Vol.5, p.457)	HL/H.L $H_2L/HL.H$	10.07 (2.82)		75MRa
N-(6-Hydroxyhexyl)iminodiacetic acid* ($C_{10}H_{18}O_5N$), H_2L	HL/H.L $H_2L/HL.H$	10.09 (2.70)		75MRa
N-(2-Hydroxypropyl)iminodiacetic acid* ($C_7H_{12}O_5N$), H_2L	HL/H.L $H_2L/HL.H$	8.80 (2.58)		75MRa
N-(1-Hydroxy-2-butyl)imino-diacetic acid* ($C_8H_{14}O_5N$), H_2L	HL/H.L $H_2L/HL.H$	9.82 (2.64)		75MRa
N-(2-Hydroxy-1,1-dimethylethyl)-iminodiacetic acid* ($C_8H_{14}O_5N$), H_2L	HL/H.L $H_2L/HL.H$	8.84 (2.98)		75MRa
N-(2-Hydroxy-2-phenylethyl)-iminodiacetic acid* ($C_{12}H_{15}O_5N$), H_2L	HL/H.L $H_2L/HL.H$	8.43 (3.17)		75MRa
N-(1,3-Dihydroxy-2-propyl)imino-diacetic acid* ($C_7H_{12}O_6N$), H_2L	HL/H.L $H_2L/HL.H$	8.58 (2.65)		75MRb
N-(1,3-Dihydroxy-2-methyl-2-propyl)iminodiacetic acid* ($C_8H_{14}O_6N$), H_2L	HL/H.L $H_2L/HL.H$	8.45 (2.78)		75MRb
N-(1,3-Dihydroxy-2-ethyl-2-propyl)iminodiacetic acid* ($C_9H_{16}O_6N$), H_2L	HL/H.L $H_2L/HL.H$	8.51 (3.01)		75MRb
N-(1,3-Dihydroxy-2-phenyl-2-propyl)iminodiacetic acid* ($C_{13}H_{17}O_6N$), H_2L	HL/H.L $H_2L/HL.H$	8.64 (2.52)		75MRb

^P30°.0.1; ^vK⁺ salt used as background electrolyte; * metal constants were also reported but not included in the compilation of selected values.

Iminodiacetic acid derivatives (continued)

<u>Ligand</u>	<u>Equilibrium</u>	<u>Log K</u> <u>25°, 0</u>	<u>ΔH</u> <u>25°, 0</u>	<u>ΔS</u> <u>25°, 0</u>	<u>Bibliography</u>
$\text{CH}_3\text{O}-\text{R}-\text{N} \begin{array}{l} \nearrow \text{CH}_2\text{CO}_2\text{H} \\ \searrow \text{CH}_2\text{CO}_2\text{H} \end{array}$					
N-(2-Methoxyethyl)iminodiacetic acid* (C ₇ H ₁₂ O ₅ N), H ₂ L (Other values in Vol.1, p.170 and note in Vol.5, p.457)	HL/H.L H ₂ L/HL.H	9.25 (8.95) ^{a,v} 8.96 ^{h,v} (2.48) 2.18 ^a 2.2 ^h			75MRa
N-(3-Methoxypropyl)iminodiacetic acid* (C ₈ H ₁₄ O ₅ N), H ₂ L	HL/H.L H ₂ L/HL.H	10.02 (2.61)			75MRa
$\begin{array}{c} \text{HO}_2\text{CCHN} \begin{array}{l} \nearrow \text{CH}_2\text{CO}_2\text{H} \\ \searrow \text{CH}_2\text{CO}_2\text{H} \end{array} \\ \\ \text{HO}_2\text{CCH}_2\text{SCH}_2\text{CH}_2 \end{array}$					
DL-2-(2-Carboxymethylthioethyl)-nitrilotriacetic acid (N,N,S-tris(carboxymethyl)-methionine)* (C ₁₀ H ₁₅ O ₈ NS), H ₄ S	HL/H.L H ₂ L/HL.H H ₃ L/H ₂ L.H H ₄ L/H ₃ L.H	(11.0) ^{b,u} 7.49 ^b 2.60 ^b 2.10 ^b			84RFa
$\begin{array}{c} \text{HO}_2\text{CCH}_2 \searrow \text{N-Z-N} \nearrow \text{CH}_2\text{CO}_2\text{H} \\ \qquad \qquad \qquad \searrow \text{CH}_2\text{CO}_2\text{H} \\ \text{HO}_2\text{CCH}_2 \end{array}$					
L-1-Carboxypentamethylene-dinitrilotetraacetic acid (1-ornithine-N,N,N',N'-tetraacetic acid) (C ₁₃ H ₂₂ O ₁₀ N ₂), H ₅ L	HL/H.L H ₂ L/HL.H H ₃ L/H ₂ L.H H ₄ L/H ₃ L.H H ₅ L/H ₄ L.H	10.54 ^{a,v} 9.17 ^a 2.94 ^a 2.46 ^a (1.6) ^a			83GN
5,5'-[Bis(carboxymethyl)amino-methyl]-3,3',6'-trimethyl-4'-hydroxyfuchson-2"-sulfonic acid (Methylxlenol Blue) (C ₃₂ H ₃₃ O ₁₃ N ₂ S), H ₆ L	HL/H.L H ₂ L/HL.H H ₃ L/H ₂ L.H H ₄ L/H ₃ L.H H ₅ L/H ₄ L.H H ₆ L/H ₅ L.H	12.17 ^{a,u} 10.61 ^a 6.98 ^a ±0.03 4.3 ^a 3.4 ^a 2.0 ^a	(+3) ^s	(42)	74VV, 80NY

4. Peptides

$\text{H}_2\text{N}-\text{R}-\overset{\text{O}}{\underset{\text{R}''}{\underset{ }{\text{CN}}}}-\text{R}'-\text{CO}_2\text{H}$					
Glycylsarcosine* (C ₅ H ₁₀ O ₃ N ₂), HL (Other values in Vol.1, p.301 and Vol.5, p.95)	HL/H.L	8.50 ^a ±0.05	-10.2 ^a	5 ^a	74ER, Other references: 80ASa, 83Ab
Glycyl-L-hydroxyproline (C ₇ H ₁₂ O ₄ N ₂), HL	HL/H.L H ₂ L/HL.H	8.37 ^b 2.7 ^q			74ER

^a25°, 0.1; ^b25°, 0.5; ^h20°, 0.1; ^q25°, 0.8; ^s15-70°, 0.1;

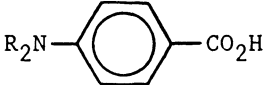
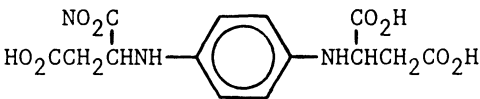
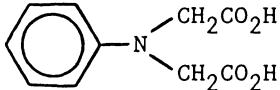
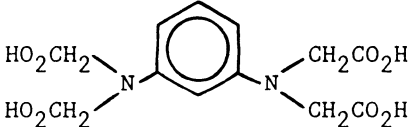
^uNaClO₄ used as background electrolyte; ^vKNO₃ used as background electrolyte; *metal constants were also reported but not included in the compilation of selected values.

Peptides (continued)

Ligand	Equilibrium	Log K	ΔH	ΔS	Bibliography
		25°, 0	25°, 0	25°, 0	
β -Alanylglycine* ($C_5H_{10}O_3N_2$), HL (Other values in Vol.1, p.306)	HL/H.L H ₂ L/HL.H	9.40 ^a ±0.07 3.18 ^a -0.01			81SP
β -Alanyl- β -alanine* ($C_6H_{12}O_3N_2$), HL (Other values in Vol.1, p.313 and Vol.5, p.105)	HL/H.L H ₂ L/HL.H	9.36 ^a ±0.07 3.95 ^a ±0.08			81SP
L-Alanyl-L-alanine ($C_6H_{12}O_3N_2$), HL (Other references in Vol.1, p.316 and other values in Vol.5, p.106)	HL/H.L H ₂ L/HL.H	8.13 ^a ±0.06 3.25 ^a ±0.06	-10.6 ^a ±0.0 -0.4 ^a ±0.6	2 ^a 14 ^a	84IB
L-Alanyl-D-alanine ($C_6H_{12}O_3N_2$), HL (Other values in Vol.1, p.317 and other references in Vol.5, p.429)	HL/H.L H ₂ L/HL.H	8.28 ^a ±0.05 3.10 ^a ±0.08	-11.3 ^a +0.6 ^a	3 ^a 16 ^a	84IB
L-Alanyl-L-leucine ($C_9H_{18}O_3N_2$), HL (Other reference in Vol.5, p.458)	HL/H.L H ₂ L/HL.H	8.03 ^a 3.34 ^a	-10.7 ^a +0.2 ^a	1 ^a 16 ^a	84IBa
D-Alanyl-L-leucine ($C_9H_{18}O_3N_2$), HL	HL/H.L H ₂ L/HL.H	8.25 ^a 3.13 ^a	-10.6 ^a +0.8 ^a	2 ^a 17 ^a	84IBa
L-Alanyl-L-phenylalanine ($C_{12}H_{16}O_3N_2$), HL (Other values in Vol.5, p.107)	HL/H.L H ₂ L/HL.H	7.90 ^a ±0.04 3.20 ^a ±0.05	-10.5 ^a +0.1 ^a	1 ^a 15 ^a	84IBa
L-Alanyl-D-phenylalanine ($C_{12}H_{16}O_3N_2$), HL (Other values in Vol.5, p.107)	HL/H.L H ₂ L/HL.H	8.13 ^a ±0.06 2.99 ^a ±0.03	-10.6 ^a +0.4 ^a	1 ^a 15 ^a	84IBa
L-Leucyl-L-phenylalanine ($C_{15}H_{22}O_3N_2$), HL (Other reference in Vol.5, p.459)	HL/H.L H ₂ L/HL.H	7.70 ^a 3.19 ^a	-10.4 ^a +0.1 ^a	0 ^a 15 ^a	84IBa
L-Leucyl-D-phenylalanine ($C_{15}H_{22}O_3N_2$), HL (Other reference in Vol.5, p.459)	HL/H.L H ₂ L/HL.H	8.15 ^a 2.89 ^a	-11.0 ^a +0.1 ^a	0 ^a 14 ^a	84IBa
L-Leucyl-D-tyrosine ($C_{15}H_{22}O_3N_2$), H ₂ L (Other values in Vol.1, p.319 and Vol.5, p.110)	HL/H.L H ₂ L/HL.H H ₃ L/H ₂ L.H	10.31 ^a ±0.08 8.29 ^a ±0.03 2.92 ^a ±0.08	-11.1 ^a +0.1 ^a	1 ^a 14 ^a	84IB
Glycylglycylsarcosine ($C_7H_{13}O_4N_3$), HL (Other values in Vol.1, p.328)	HL/H.L H ₂ L/HL.H	7.98 ^a ±0.3 2.9 ^a ±0.3			74ER
L-5-Glutamyl-3-(D-2-amino-2- carboxy-1,1-dimethylethyl- dithio)-L-alanylglycine (penicillamine-glutathione disulfide)($C_{15}H_{26}O_8N_4S_2$), H ₃ L	HL/H.L H ₂ L/HL.H	9.10 ^b 7.99 ^b			84TC

^a25°,0.1; ^b25°,0.5; ^c25°,1.0; ^d25°,0.8; *metal constants were also reported but not included in the compilation of selected values.

5. Anilinecarboxylic acids

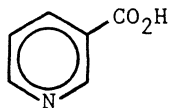
<u>Ligand</u>	<u>Equilibrium</u>	<u>Log K</u> <u>25°, 0</u>	<u>ΔH</u> <u>25°, 0</u>	<u>ΔS</u> <u>25°, 0</u>	<u>Bibliography</u>
					
4-Aminobenzoic acid (C ₇ H ₇ O ₂ N), HL (Other references in Vol.1, p.405 and Vol.5, p.459)	HL/H.L	4.87 ±0.02	-0.7	20	81GH.
	H ₂ L/HL.H	2.41 ±0.04	-5.0	-5	Other reference: 84RB
4-Dimethylaminobenzoic acid (C ₉ H ₁₁ O ₂ N), HL	HL/H.L	5.00			81GH
	H ₂ L/HL.H	2.57			
					
1,4-Phenylenediimino- dibutanedioic acid* (C ₁₄ H ₁₆ O ₈ N ₂), H ₄ L	HL/H.L	6.63 ^{b,u}			84RF
	H ₂ L/HL.H	4.62 ^b			
	H ₃ L/H ₂ L.H	3.58 ^b			
	H ₄ L/H ₃ L.H	3.03 ^b			
					
N-Phenyliminodiacetic acid (C ₁₀ H ₁₁ O ₄ N), H ₂ L (Other values in Vol.1, p.351 and other references in Vol.5, p.459)	HL/H.L	5.02 ^a ±0.03			85NKM
		4.96 ^h			
		5.06 ^p			
		5.04 ^c			
	H ₂ L/HL.H	2.40 ^a			
		2.40 ^h			
		2.40 ^p			
					
1,3-Phenylenedinitrilo- tetraacetic acid* (C ₁₄ H ₁₆ O ₈ N ₂), H ₄ L (Other values in Vol.1, p.362 and other reference in Vol.5, p.459)	HL/H.L	5.82 ^a ±0.02			84MDH
		5.51 ^b			
	H ₂ L/HL.H	5.08 ^a ±0.06			
		4.85 ^b			
	H ₃ L/H ₂ L.H	2.89 ^a ±0.06			
		2.82 ^b			
	H ₄ L/H ₃ L.H	(1.9) ^a ±0.1			
		2.0 ^b			

^a25°, 0.1; ^b25°, 0.2; ^c25°, 1.0; ^h20°, 0.1; ^p30°, 0.1;

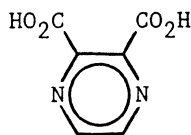
^uNaClO₄ used as background electrolyte; *metal constants were also reported but not included in the compilation of selected values.

6. Pyridinecarboxylic acids

<u>Ligand</u>	<u>Equilibrium</u>	<u>Log K</u>	<u>ΔH</u>	<u>ΔS</u>	<u>Bibliography</u>
		<u>25°, 0</u>	<u>25°, 0</u>	<u>25°, 0</u>	



Pyridine-3-carboxylic acid (nicotinic acid) ($C_6H_5O_2N$), HL (Other values in Vol.1, p.374 and other references in Vol.5, p.459)	HL/H.L	4.83 $\pm$ 0.05	-2.8 $\pm$ 0.2	13	70R, 82ABb, 84RBb, Other references: 70Ba, 77CDM, 81LZ, 81SZ, 83CPb, 83IT, 84KS
		4.66 ^a $\pm$ 0.01			
		4.66 ^b			
	H ₂ L/HL.H	2.03 $\pm$ 0.05	-0.6 $\pm$ 0.2	7	



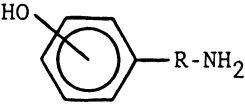
1,4-Diazine-2,3-dicarboxylic acid ($C_6H_4O_4N_2$), H ₂ L	HL/H.L	2.84 ^c			78MBC
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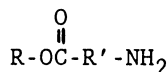
B. Amines

1. <u>Primary amines</u>	<u>R-NH₂</u>				
Cyclohexylmethylamine ($C_7H_{15}N$), L	HL/H.L	10.70 ^h			84KM
Tricyclo[3.3.1,1 ^{3,7}]decan-1- amine (amantadine) ($C_{10}H_{17}N$), L	HL/H.L	10.55	(-4) ^r	(1)	83GL
2-Phenylethylamine ($C_8H_{11}N$), L (Other references in Vol.5, p.430)	HL/H.L	9.92 ^a $\pm$ 0.04 10.06 ^c	-13.0 ^a	1.8 ^a	80JH, 82KT, 82MT, 84KM
3-Phenylpropylamine ($C_9H_{13}N$), L	HL/H.L	(10.32) ^a 10.36 ^h			82MT, 84KM
4-Phenylbutylamine ($C_{10}H_{15}N$), L	HL/H.L	10.42 ^a 10.61 ^h			82MT, 84KM
5-Phenylpentylamine ($C_{11}H_{17}N$), L	HL/H.L	10.55 ^a			82MT
2-(3,4-Dimethoxyphenyl)ethyl- amine ($C_{10}H_{15}O_2N$), L (Other reference in Vol.5, p.432)	HL/H.L	9.88 ^a $\pm$ 0.01			80JH
4-Methylaniline (p-toluidine) (C_7H_9N), L (Other references in Vol.2, p.9 and Vol.5, p.460)	HL/H.L	5.084 $\pm$ 0.00 5.09 ^a $\pm$ 0.03	-7.6 $\pm$ 0.0	-2.2	56WM, 63BK 85FCa
2,6-Dimethylaniline (2,6-xylidine) ($C_8H_{11}N$), L (Other reference in Vol.2, p.347)	HL/H.L	3.94 ^h			63BK
3-Nitroaniline ($C_6H_6O_2N$), L (Other reference in Vol.5, p.460)	HL/H.L	2.60 ^h			56WM

^a25°, 0.1; ^b25°, 1.0; ^c25°, 1.0; ^h21°, 0.1; ^r25-50°, 0; *metal constants were also reported but not included in the compilation of selected values.

Primary amines (continued)

Ligand	Equilibrium	Log K 25°, 0	ΔH 25°, 0	ΔS 25°, 0	Bibliography
4-Chloroaniline (C_6H_5NCl), L	HL/H.L	4.07 ^h			56WM
4-Methoxyaniline (p-anisidine) (C_7H_9ON), L (Other value in Vol.2, p.22)	HL/H.L	5.357 $\pm$ 0.00 5.33 ^a	-8.2 -0.1	-3.0	56WM
					
2-Aminophenol (C_6H_7ON), HL (Other references in Vol.2, p.332 and other values in Vol.5, p.133)	HL/H.L H ₂ L/HL.H	(9.97) ^o 9.87 ^a 9.67 ^c 4.70 4.74 ^a 4.89 ^c	 -6.65	 -1	83RBa Other references: 84VSL, 85DJ, 85VS
3-Aminophenol (C_6H_7ON), HL	HL/H.L H ₂ L/HL.H	9.82 ^h 4.29 ^a	 -6.69	 -3 ^a	56WM, 83RBb
4-Aminophenol (C_6H_7ON), HL	H ₂ L/HL.H		-8.00		83RB
2-(2-Hydroxyphenyl)ethylamine ($C_8H_{10}N$), HL	H ₂ L/HL.H	9.27 ^c			71RD
2-(3-Hydroxyphenyl)ethylamine ($C_8H_{11}ON$), HL (Other reference in Vol.5, p.431)	HL/H.L H ₂ L/HL.H	10.47 ^a 10.30 ^c 9.34 ^a 9.28 ^c	(-9) ^s (-6) ^s	(19) ^a (23) ^a	71RD
2-(4-Hydroxyphenyl)ethylamine (tyramine) ($C_8H_{11}ON$), HL (Other references in Vol.2, p.332 and Vol.5, p.431)	HL/H.L H ₂ L/HL.H	10.56 ^a $\pm$ 0.09 10.41 ^b 10.57 ^c 9.45 ^a $\pm$ 0.05 9.33 ^b 9.45 ^c	-11.4 ^a -7.3 ^a	10 ^a 19 ^a	71RD, 82KT
DL-2-Amino-1-(4-hydroxyphenyl)- ethanol (octopamine) ($C_8H_{11}O_3N$) HL (Other references in Vol.5, p.460)	HL/H.L H ₂ L/HL.H	9.91 ^a $\pm$ 0.03 8.89 ^a -0.09			76IH
DL-2-Amino-3-(4-hydroxyphenyl)- propanol (tyrosinol) ($C_9H_{13}O_2N$), HL	HL/H.L H ₂ L/HL.H	9.98 ^a 8.94 ^a	-7.6 ^a -10.7 ^a	20 ^a 5 ^a	82KT



Glycine ethyl ester ($C_4H_9O_2N$), L (Other values in Vol.2, p.24)	HL/H.L	7.69 ^a $\pm$ 0.02 7.78 ^b	(-11) ^s	(-2) ^a	83La
Phenylalanine methyl ester ($C_{10}H_{13}O_2N$), L (Other reference in Vol.2, p.333)	HL/H.L	7.03 ^a $\pm$ 0.03	(-11) ^t	(-5) ^a	69LAa

^a25°, 0.1; ^b25°, 0.5; ^c25°, 1.0; ^h20°, 0.1; ^o20°, 0; ^s15-35°, 0.1; ^t25-50°, 0.1

Primary amines (continued)

Ligand	Equilibrium	Log K	ΔH	ΔS	Bibliography
		25°, 0	25°, 0	25°, 0	
4-Aminobenzoic acid methyl ester (C ₇ H ₇ O ₂ N), L (Other references in Vol.2, p.333)	HL/H.L	2.465 ±0.03	-5.1	-5.8	57RB,81GH
4-Aminobenzoic acid ethyl ester (C ₈ H ₉ O ₂ N), L	HL/H.L	2.508 +0.01			57RB,81GH
4-Aminobenzoic acid propyl ester (C ₉ H ₁₁ O ₂ N), L	HL/H.L	2.487			57RB
4-Aminobenzoic acid butyl ester (C ₁₀ H ₁₃ O ₂ N), L	HL/H.L	2.472			57RB
4-Dimethylaminobenzoic acid methyl ester (C ₉ H ₁₁ O ₂ N), L	HL/H.L	2.61			81GH
β -Alaninamide* (C ₃ H ₈ ON ₂), L (Other values in Vol.2, p.27)	HL/H.L	$\begin{array}{c} \text{O} \\ \parallel \\ \text{H}_2\text{N}-\text{C}-\text{CH}_2-\text{CH}_2-\text{NH}_2 \end{array}$ 9.20 ^a ±0.01			81SP
2-Amino-2-methyl-1,3-propanediol (bis)* (C ₄ H ₁₁ O ₂ N), L (Other value in Vol.2, p.19)	HL/H.L	$\begin{array}{c} \text{NH}_2 \\ \\ \text{HOCH}_2-\text{C}-\text{CH}_2-\text{OH} \\ \\ \text{CH}_3 \end{array}$ 8.797±0.05 8.82 ^a 8.937 ^q	-11.91±0.02 -12.1 ^q	0.3 0.3 ^q	81BCb,81TB, Other references: 77KR,82RM
L-Cysteine ethyl ester (C ₅ H ₁₁ O ₂ NS), HL (Other reference in Vol.2, p.334)	HL/H.L H ₂ L/HL.H	$\begin{array}{c} \text{H}_2\text{N} \quad \text{O} \\ \quad \parallel \\ \text{HSCH}_2-\text{CH}-\text{COCH}_2\text{CH}_3 \end{array}$ 8.96 ^a ±0.02 6.55 ^a ±0.02			77ST
1,1,2,2-Tetramethylethylene- diamine (C ₆ H ₁₆ N ₂), L (Other values in Vol.2, p.43)	HL/H.L H ₂ L/HL.H	$\text{H}_2\text{N}-\text{R}-\text{NH}_2$ 9.97 ^b ±0.01 10.10 ^c 6.36 ^b ±0.05 6.46 ^c			71HL
Trimethylenediamine (1,3-propylenediamine)* (C ₃ H ₁₀ N ₂), L (Other values in Vol.2, p.51 and Vol.5, p.146)	HL/H.L H ₂ L/HL.H	10.49 ±0.02 10.56 ^a ±0.03 10.65 ^b ±0.01 10.76 ^c ±0.06 10.96 ^d ±0.1 11.11 ^e ±0.3 8.48 +0.01 8.76 ^a ±0.04 8.93 ^b ±0.06 9.10 ^c ±0.02 9.30 ^d ±0.2 9.47 ^e ±0.2	-13.0 ^a ±0.2 -13.0 ^b ±0.1 -13.2 ^c -13.6 ^d -14.0 ^e -12.2 ^a ±0.2 -12.2 ^b ±0.6 -12.3 ^c -12.6 ^d -12.8 ^e	4.7 ^a 5.1 ^b 4.9 ^c 4.5 ^d 3.8 ^e -0.9 ^a -0.1 ^b 0.3 ^c 0.3 ^d 0.4 ^e	80JH,82NDE,85DR Other references: 61KE,61KEa, 80GCG,85K, 85KA,85KZ

^a25°,0.1; ^b25°,0.5; ^c25°,1.0; ^d25°,2.0; ^e25°,3.0; ^q25°,0.67 synthetic seawater; *metal constants were also reported but not included in the compilation of selected values.

Primary amines (continued)

Ligand	Equilibrium	Log K 25°, 0	ΔH 25°, 0	ΔS 25°, 0	Bibliography
1,3-Diaminobenzene (m-phenylenediamine) (C ₆ H ₈ N ₂), L (Other reference in Vol.5, p.461)	HL/H.L H ₂ L/HL.H	5.11 ^h 2.50 ^h			56WM, Other reference: 80AM
1,4-Diaminobenzene (o-phenylenediamine) (C ₆ H ₈ N ₂), L (Other reference in Vol.5, p.461)	HL/H.L H ₂ L/HL.H	6.31 ^h 2.97 ^h			56WM, Other reference: 80AM

2. Secondary amines

R-NH-R'

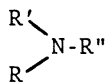
Diethylamine (C ₉ H ₁₁ N), L (Other values in Vol.2, p.72 and other references in Vol.5, p.433)	HL/H.L	10.933±0.09 10.92 ^a 10.97 ^b 11.11 ^c (11.12) ^d	-12.7 ±0.1	7.4	71RM
N-Methylaniline (C ₇ H ₉ N), L	HL/H.L	4.832	-6.0	2.0	83DF
N-Ethylaniline (C ₈ H ₁₀ N), L	HL/H.L	5.252	-6.3	2.9	83DF
N-Propylaniline (C ₉ H ₁₂ N), L	HL/H.L	5.101	-7.1	-0.5	83DF
N-2-Propylaniline (C ₉ H ₁₂ N), L	HL/H.L	5.656	-7.3	1.4	83DF
N-Butylaniline (C ₁₀ H ₁₄ N), L	HL/H.L	5.171	-7.4	-1.2	83DF
N-2-Methylpropylaniline (C ₁₀ H ₁₄ N), L	HL/H.L	4.904	-6.9	-0.7	83DF
N-1-Methylpropylaniline (C ₁₀ H ₁₄ N), L	HL/H.L	5.493	-7.7	-0.7	83DF
N-1,1-Dimethylethylaniline (C ₁₀ H ₁₄ N), L	HL/H.L	7.132	-11.1	-4.6	83DF
N-2-Pentylaniline (C ₁₁ H ₁₆ N), L	HL/H.L	5.162	-7.5	-1.6	83DF
L-erythro-2-(Methylamino)-1- phenylpropanol ((-)-ephedrine) (C ₁₀ H ₁₅ ON), L (Other references in Vol.2, p.336)	HL/H.L	9.544 9.57 ^a ±0.03 9.84 ^c	-10.8	7	71RD
Iminodi-2-propanol (diisopropanolamine)(C ₆ H ₁₅ O ₂ N), L	HL/H.L	9.16 ^c			81BBa, Other reference: 82RM
1,5,9,13-Tetraazatridecane (3,3,3-tet)(thermine) (C ₉ H ₂₄ N ₄), L (Other values in Vol.3, p.109)	HL/H.L H ₂ L/HL.H H ₃ L/H ₂ L.H H ₄ L/H ₃ L.H	10.46 ^a ±0.2 9.82 ^a ±0.10 8.54 ^a ±0.10 7.21 ^a ±0.02	-12.2 ^a -12.5 ^a -11.7 ^a -10.9 ^a	7 ^a 3 ^a 0 ^a -4 ^a	83TSN
1,5,9,14-Tetraazatetradecane (3,3,4-tet)(thermospermine) (C ₁₀ H ₂₆ N ₄), L	HL/H.L H ₂ L/HL.H H ₃ L/H ₂ L.H H ₄ L/H ₃ L.H	(11.03) ^P (10.38) ^P 9.12 ^P 7.47 ^P			83TSN

^a25°,0.1; ^b25°,0.5; ^c25°,1.0; ^d25°,2.0; ^h20°,0.1; ^P27°,0.1; * metal constants were also reported but not included in the compilation of selected values.

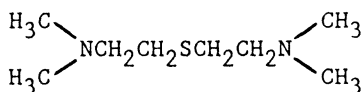
Secondary amines (continued)

Ligand	Equilibrium	Log K	ΔH	ΔS	Bibliography
		25°, 0	25°, 0	25°, 0	
1,5,10,14-Tetraazatetradecane (3,4,3-tet)(spermine)*	HL/H.L	10.80 ^a ±0.03	-31.1 ^a	5 ^a	83TSN,85TS
(C ₁₀ H ₂₆ N ₄), L	H ₂ L/HL.H	10.02 ^a ±0.08	-12.4 ^a	4 ^a	Other reference:
(Other values in Vol.5, p.168)	H ₃ L/H ₂ L.H	8.85 ^a ±0.08	-12.4 ^a	-1 ^a	84ABC
	H ₄ L/H ₃ L.H	7.96 ^a -0.10	-11.5 ^a	-2 ^a	

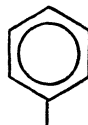
3. Tertiary amines



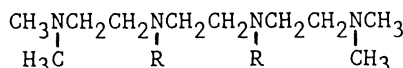
Trimethylamine (C ₃ H ₉ N), L (Other references in Vol.2, p.337 and other value in Vol.5, p.169)	HL/H.L	9.800-0.05 9.82 ^a ±0.03 9.90 ^b 9.98 ^c	-8.80±0.06	15.2	71RM
Triethylamine (C ₆ H ₁₅ N), L (Other values in Vol.2, p.112 and other reference in Vol.5, p.435)	HL/H.L	10.715 10.76 ^a ±0.01 10.77 ^b 10.82 ^c	-10.4 ±0.2	14	71RM
N,N-Bis(2-hydroxyethyl)- -2-aminoethanesulfonic acid (C ₁₆ H ₁₅ O ₅ NS), HL (Other reference in Vol.5, p.436)	HL/H.L	7.187±0.000	-5.8 ±0.0	13	77RGK



2,8-Dimethyl-5-thia- 2,8-diazanonane (C ₈ H ₂₀ N ₂ S), L	HL/H.L	9.11 ^b			81HG
	H ₂ L/HL.H	7.96 ^b			



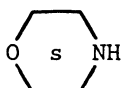
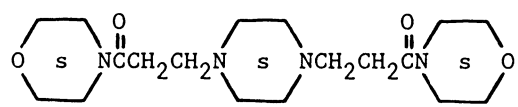
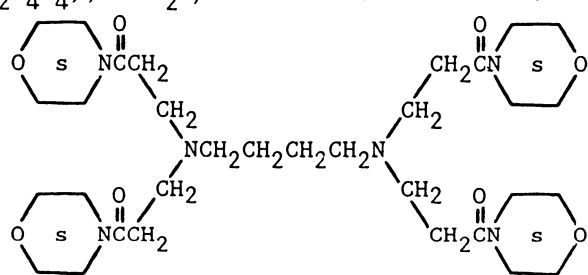
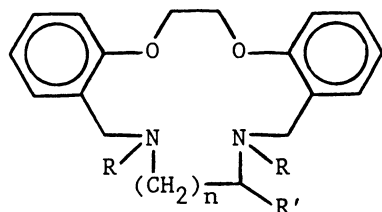
N,N''-Bis(2-hydroxybenzyl)- N'-benzyldiethylenetriamine (C ₂₇ H ₃₅ O ₂ N ₃), L	H ₂ L/HL.H	10.55 ^a			84MMN
	H ₃ L/H ₂ L.H	8.5 ^a			
	H ₄ L/H ₃ L.H	7.51 ^a			
	H ₅ L/H ₄ L.H	3.05 ^a			
N,N''-Bis(2-pyridylmethyl)- N'-benzyldiethylenetriamine (C ₂₃ H ₂₉ N ₅), L	HL/HL.H	8.45 ^a			84MMN
	H ₂ L/HL.H	7.23 ^a			
	H ₃ L/H ₂ L.H	3.18 ^a			



2,11-Dimethyl-2,5,8,11- tetraazadodecane (N,N,N'',N'''- tetramethyltriethylene- tetramine) (C ₁₀ H ₂₆ N ₄), L	HL/H.L	9.19 ^a	-7.7 ^a	16 ^a	81BBM
	H ₂ L/HL.H	8.43 ^a	-8.5 ^a	10 ^a	
	H ₃ L/H ₂ L.H	5.62 ^a	-7.8 ^a	0 ^a	
	H ₄ L/H ₃ L.H	2.73 ^a	-6.5 ^a	-10 ^a	

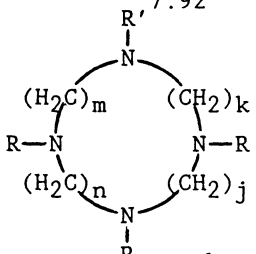
^a25°,0.1; ^b25°,0.5; ^c25°,1.0; P27°,0.1; *metal constants were also reported but not included in the compilation of selected values.

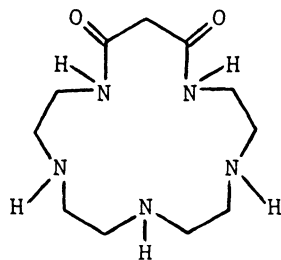
Tertiary amines (continued)

Ligand	Equilibrium	Log K 25°. 0	ΔH 25°. 0	ΔS 25°. 0	Bibliography
2,5,8,11-Tetramethyl-2,5,8,11-tetraazadodecane (N,N,N',N'',-N''',N'''-hexamethyltriethylene-tetramine) (C ₁₂ H ₃₀ N ₄), L	HL/H.L	9.11 ^a	-7.3 ^a	17 ^a	81BBM
	H ₂ L/HL.H	8.35 ^a	-7.5 ^a	13 ^a	
	H ₃ L/H ₂ L.H	5.26 ^a	-6.6 ^a	2 ^a	
	H ₄ L/H ₃ L.H	2.24 ^a	-3.8 ^a	-3 ^a	
4. <u>Cyclic amines</u>					
					
1-Oxa-4-azacyclohexane (morpholine)* (C ₄ H ₉ ON), L (Other values in Vol.2, p.81 and other reference in Vol.5, p.434)	HL/H.L	8.492	-9.3	7.7	82CDa, Other reference: 82PBa
		8.58 ^b ±0.03	-9.8 ^b	6.3 ^b	
		8.698 ^q	-9.6 ^q	7.6 ^q	
		8.74 ^c			
					
N,N'-Bis(2-sulfoethyl)-piperazine [piperazine-N,N'-bis(2-ethanesulfonic acid)] (C ₈ H ₁₈ O ₆ N ₂ S ₂), H ₂ L	HL/H.L	7.141	-2.8	23	80RG,81RG
					
N,N'-Bis[2-(morpholinocarbonyl)-ethyl]piperazine(C ₁₈ H ₃₂ O ₄ N ₄), L	HL/H.L	7.12 ^a	-5.5 ^a	14 ^a	78BBF,81BBc
	H ₂ L/HL.H	3.29 ^a	-4.0 ^a	2 ^a	
					
Tetramethylenedinitrilotetra-propanoic acid tetramorpholinamide (C ₃₂ H ₅₆ O ₈ N ₆), L	HL/H.L	8.34 ^a			82FR
	H ₂ L/HL.H	7.16 ^a			
					
9-Methyl-1,4-dioxa-8,11-diazacyclodibenzo[5,6-13,14]-tetradecane (C ₁₉ H ₂₄ O ₂ N ₂), L	HL/H.L	9.41 ^c			80AEL
	H ₂ L/HL.H	6.01 ^c			

^a25°,0.1; ^b25°,0.5; ^c25°,1.0; ^q25°,0.67 synthetic seawater; *metal constants were also reported but not included in the compilation of selected values.

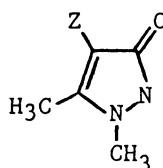
Cyclic amines (continued)

<u>Ligand</u>	<u>Equilibrium</u>	<u>Log K</u> <u>25°. 0</u>	<u>ΔH</u> <u>25°. 0</u>	<u>ΔS</u> <u>25°. 0</u>	<u>Bibliography</u>
8,12-Dimethyl-1,4-dioxo- 8,12-diazacyclodibenzo- [5.6-14,15]pentadecane (C ₂₁ H ₂₆ O ₂ N ₂), L	HL/H.L	9.64 ^a			80AEL
		10.14 ^c			
	H ₂ L/HL.H	6.61 ^a			
		7.92 ^c			
					
1-(2-Aminoethyl)-4,8,11- trimethyl-1,4,8,11-tetraaza- cyclotetradecane (C ₁₅ H ₃₅ N ₅), L	HL/H.L	10.39 ^b			83BK
	H ₂ L/HL.H	9.63 ^b			
	H ₃ L/H ₂ L.H	8.10 ^b			
	H ₄ L/H ₃ L.H	3.16 ^b			
1,4,8,12-Tetramethyl-1,4,8,12- tetraazacyclopentadecane (C ₁₅ H ₃₄ N ₄), L	HL/H.L	9.62 ^a			85ADF
	H ₂ L/HL.H	8.54 ^a			
	H ₃ L/H ₂ L.H	5.54 ^a			
	H ₄ L/H ₃ L.H	2.82 ^a			
1,5,8,12-Tetraaza- cyclohexadecane (C ₁₂ H ₂₈ N ₄), L	HL/H.L	10.73 ^a	-11.1 ^a	12 ^a	82BBb, Other reference: 80KY
	H ₂ L/HL.H	9.85 ^a	-11.4 ^a	7 ^a	
	H ₃ L/H ₂ L.H	6.83 ^a	-10.2 ^a	-3 ^a	
	H ₄ L/H ₃ L.H	3.96 ^a	-8.0 ^a	-9 ^a	
1,5,9,13-Tetraaza- cycloheptadecane (C ₁₃ H ₃₀ N ₄), L	HL/H.L	11.20 ^a	-10.4 ^a	16 ^a	82BBb, Other reference: 80KY
	H ₂ L/HL.H	10.13 ^a	-11.1 ^a	9 ^a	
	H ₃ L/H ₂ L.H	7.96 ^a	-10.9 ^a	0 ^a	
	H ₄ L/H ₃ L.H	6.30 ^a	-10.9 ^a	-8 ^a	



1,4,7,10,13-Pentaaza- cyclohexadecane-14,16-dione (C ₁₁ H ₂₇ O ₂ N ₅), L	HL/H.L	8.98 ^a	82KKY
	H ₂ L/HL.H	8.35 ^a	

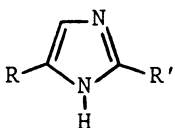
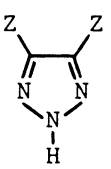
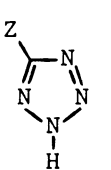
5. Azoles



4-Acetamidoantipyrine (C ₁₃ H ₁₄ O ₂ N ₃), L	HL/H.L	(0.7) ^b	80LW
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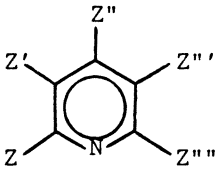
^a25°, 0.1; ^b25°, 0.5; ^c25°, 1.0

Azoles (continued)

<u>Ligand</u>	<u>Equilibrium</u>	<u>Log K</u> <u>25°, 0</u>	<u>ΔH</u> <u>25°, 0</u>	<u>ΔS</u> <u>25°, 0</u>	<u>Bibliography</u>
4-Hydroxyantipyrine (C ₁₁ H ₁₂ O ₂ N ₂), L	HL/H.L	(1.7) ^b			80LW
					
2-Methylimidazole (C ₄ H ₆ N ₂), L (Other values in Vol.2, p.148 and Vol.5, p.211)	HL/H.L	7.86 7.88 ^a -0.01 8.05 ^b 8.13 ^c	-9.3 ^a +0.1	5 ^a	71MB, 85BG
Bis(2-imidazolyl)methane* (C ₇ H ₈ N ₄), L	HL/H.L H ₂ L/HL.H	6.87 ^a 4.66 ^a			81ML
					
1,2,3-Triazole (C ₂ H ₃ N ₃), L	HL/H.L	9.26	-8.88	12.6	68HW, 70HB
4,5-Dibromo-1,2,3-triazole (C ₂ H ₂ N ₃ Br ₂), L	HL/H.L	5.37	-4.2	10	68HW
Benzotriazole (C ₆ H ₅ N ₃), L	HL/H.L	8.38	-7.5	13	68HW
					
Tetrazole (CH ₂ N ₄), L	HL/H.L	4.90	-3.1	12	70HB
5-Methyltetrazole (C ₂ H ₄ N ₄), L (Other values in Vol.5, p.218)	HL/H.L	5.63 (5.32) ^b	-3.3	15	70HB
5-Cyclopropyltetrazole (C ₄ H ₆ N ₄), L	HL/H.L	5.41	-3.7	12	70MB
5-Phenyltetrazole (C ₇ H ₆ N ₄), L	HL/H.L	4.38	-3.2	9	70HB
5-Trifluoromethyltetrazole (C ₂ HN ₄ F ₃), L	HL/H.L	(1.7)	-1.1	11	70HB
5-Hydroxytetrazole (CH ₂ ON ₄), L	HL/H.L H ₂ L/HL.H	10.26 5.40	-6.2 -3.9	26 12	70MB
5-Phenoxytetrazole (C ₇ H ₆ ON ₄), L	HL/H.L	3.49	-2.6	7	70HB
5-Methylthiotetrazole (C ₂ H ₄ N ₄ S), L	HL/H.L	4.00	-2.7	9	70HB

^a25°, 0.1; ^b25°, 0.5; ^c25°, 1.0; ^e25°, 3.0; *metal constants were also reported but not included in the compilation of selected values.

6. Azines

<u>Ligand</u>	<u>Equilibrium</u>	<u>Log K</u> <u>25°, 0</u>	<u>ΔH</u> <u>25°, 0</u>	<u>ΔS</u> <u>25°, 0</u>	<u>Bibliography</u>
					
2-Nitropyridine ($C_5H_4O_2N_2$), L	HL/H.L	2.06	+6.8	32	71BF, 72BD, 73BM
3-Nitropyridine ($C_5H_4O_2N_2$), L	HL/H.L	0.79	+2.0	10	71BF, 72BD, 73BM
4-Nitropyridine* ($C_5H_4O_2N_2$), L	HL/H.L	1.23	+1.1	9	71BF, 72BD, 73BM, Other reference: 81FS
2,6-Dimethyl-4-nitropyridine* ($C_7H_8O_2N_2$), L	HL/H.L	3.15 ^b			83BEH
2,4,6-Trimethyl-3-nitropyridine* ($C_8H_{10}O_2N_2$), L	HL/H.L	3.47 ^b			83BEH
3-Cyanopyridine ($C_6H_4N_2$), L (Other values in Vol.2, p.177 and Vol.5, p.230)	HL/H.L	1.17 (1.6) ^a	+0.7	8	73BM
4-Cyanopyridine ($C_6H_4N_2$), L (Other values in Vol.2, p.177 and Vol.5, p.440)	HL/H.L	1.48	+0.2	7	73BM, Other references: 81FS, 84ER
4-Chloro-2,6-dimethylpyridine* (C_7H_8NCl), L	HL/H.L	5.46 ^b			83BEH
3-Bromopyridine (C_5H_4NBr), L (Other references in Vol.2, p.340)	HL/H.L	2.80 ± 0.08	-1.6 ± 0.2	7	73BM
4-Bromopyridine (C_5H_4NBr), L (Other reference in Vol.2, p.340)	HL/H.L	3.68	-3.4 ± 0.1	5	73BM
4-Bromo-2,6-dimethylpyridine (C_7H_8NBr), L	HL/H.L	5.41 ^b			83BEH
3-Hydroxy-N-methylpyridinium chloride (C_6H_8ONCl), HL ⁺	HL/H.L	4.81 ^a			73MHJ, Other reference: 83H
3-Hydroxy-6-methylpyridine (C_6H_7ON), HL	HL/H.L H ₂ L/HL.H	8.96 ^a 5.44 ^a			73MHJ
3-Hydroxy-2-hydroxymethyl- pyridine ($C_6H_7O_2N$), HL	HL/H.L H ₂ L/HL.H	8.60 ^a 4.74 ^a			73MHJ

^a25°, 0.1; ^b25°, 0.5; *metal constants were also reported but not included in the compilation of selected values.

Azines (continued)

Ligand	Equilibrium	Log K	ΔH	ΔS	Bibliography
		25°, 0	25°, 0	25°, 0	
5-Deoxypyridoxine (C ₈ H ₁₁ O ₂ N), HL	HL/H.L H ₂ L/HL.H	9.34 ^a 5.36 ^a			73MHJ
3-Hydroxy-4,5-bis(hydroxy- methyl)-2-methylpyridine (pyridoxine)* (C ₈ H ₁₁ O ₃ N), HL (Other values in Vol.2, p.180 and other references in Vol.5, p.464)	HL/H.L H ₂ L/HL.H	9.04 8.81 ^a ±0.04 8.92 ^P 4.84 4.85 ^a ±0.03 4.90 ^P			71SO, 73MHJ, 84SLC, Other references: 52LM, 65PP, 80ZP, 84ABD
6-Methylpyridoxine (C ₉ H ₁₃ O ₂ N), HL	HL/H.L H ₂ L/HL.H	9.49 ^a 5.27 ^a			73MHJ
5-Deoxypyridoxal (C ₈ H ₉ O ₂ N), HL	HL/H.L H ₂ L/HL.H	8.03 ^a 4.06 ^a			55MS
3-O-Methylpyridoxal (C ₉ H ₁₁ O ₂ N), HL	HL/H.L	4.64 ^a			55MS
5-Deoxypyridoxamine (C ₈ H ₁₂ ON ₂), HL	HL/H.L H ₂ L/HL.H H ₃ L/H ₂ L.H	9.75 ^a 8.27 ^a 3.82 ^a			73MHJ
4-Aminomethyl-3-hydroxy- 5-hydroxymethyl-2-methyl- pyridine (pyridoxamine)* (C ₈ H ₁₂ O ₂ N ₂), HL (Other values in Vol.2, p.183 and other references in Vol.5, p.464)	HL/H.L H ₂ L/HL.H H ₃ L/H ₂ L.H	10.5 ^a -0.2 8.05 ^a ±0.04 3.38 ^a ±0.04			73MHJ, 77ERM, Other references: 52LM, 55MS, 66PP, 82EA, 82MEA, 83ER
Pyridoxamine-5'-(dihydrogen- phosphate) (C ₈ H ₁₃ O ₅ N ₂ P), H ₃ L (Other values in Vol.5, p.232)	HL/H.L H ₂ L/HL.H H ₃ L/H ₂ L.H	10.80 ^a -0.2 10.87 ^b -0.4 8.42 ^a ±0.07 8.26 ^b ±0.02 3.24 ^a ±0.3 3.36 ^b ±0.07			54WN, 55MS, 73MHJ
5-Aminomethyl-3-hydroxy-4- hydroxymethyl-2-methylpyridine- 4-(dihydrogen phosphate) (isopyridoxamine phosphate) (C ₈ H ₁₃ O ₅ N ₂ P), HL	HL/H.L H ₂ L/HL.H H ₃ L/H ₂ L.H H ₄ L/H ₃ L.H	10.69 ^a 8.44 ^a 5.55 ^a 3.64 ^a			73MHJ
2-(Hydroxymethyl)pyridine (C ₆ H ₇ ON), L (Other values in Vol.2, p.186 and Vol.5, p.234)	HL/H.L	4.86 4.90 ^a ±0.02 4.96 ^b 5.09 ⁱ 5.15 ^j			82MT
2-(2-Hydroxyethyl)pyridine (C ₇ H ₉ ON), L (Other references in Vol.2, p.340 and Vol.5, p.464)	HL/H.L	5.31 5.37 ^a			82MT
3-(2-Hydroxyethyl)pyridine (C ₇ H ₉ ON), L	HL/H.L	5.38 ^a			82MT

^a25°, 0.1; ^b25°, 0.6; ⁱ20°, 0.5; ^j20°, 1.0; ^P30°, 0.5; *metal constants were also reported but not included in the compilation of selected values.

Azines (continued)

Ligand	Equilibrium	Log K 25°, 0	ΔH 25°, 0	ΔS 25°, 0	Bibliography
4-(2-Hydroxyethyl)pyridine (C ₇ H ₉ ON), L (Other reference in Vol.2, p.340)	HL/H.L	5.60 5.68 ^a			82MT
2-(3-Hydroxypropyl)pyridine (C ₈ H ₁₁ ON), L (Other reference in Vol.2, p.340)	HL/H.L	5.61 5.71 ^a			82MT
4-(3-Hydroxypropyl)pyridine (C ₈ H ₁₁ ON), L (Other reference in Vol.2, p.340)	HL/H.L	5.84 5.90 ^a			82MT
2-(4-Hydroxybutyl)pyridine (C ₉ H ₁₃ ON), L	HL/H.L	5.83 ^a			82MT
3-(4-Hydroxybutyl)pyridine (C ₉ H ₁₃ ON), L	HL/H.L	5.70 ^a			82MT
4-(4-Hydroxybutyl)pyridine (C ₉ H ₁₃ ON), L	HL/H.L	6.01 ^a			82MT
2-(5-Hydroxypentyl)pyridine (C ₁₀ H ₁₅ ON), L	HL/H.L	5.93 ^a			82MT
3-(5-Hydroxypentyl)pyridine (C ₁₀ H ₁₅ ON), L	HL/H.L	5.72 ^a			82MT
4-(5-Hydroxypentyl)pyridine (C ₁₀ H ₁₅ ON), L	HL/H.L	6.04 ^a			82MT
2,2-Dimethyl-1,3-dioxano[4,5-c]- 5-hydroxymethyl-2-methyl- pyridine (isopropylidene- pyrdoxine)(C ₁₁ H ₁₃ O ₃ N), L	HL/H.L	5.07 ^a			73MHT
5-Deoxyisopropylidene- pyridoxine (C ₁₁ H ₁₃ O ₂ N), L	HL/H.L	5.98 ^a			73MHJ
Pyridine-2-carboxaldehyde (C ₆ H ₅ ON), L (Other references in Vol.2, p.191 and other values in Vol.5, p.236)	HL/H.L	3.80 ±0.04 3.92 ⁱ	-6.7 ±0.2	-5	59CC, 73BM
Pyridine-3-carboxaldehyde (C ₆ H ₅ ON), L	HL/H.L	3.70	-5.6	-2	59CC, 73BM
Pyridine-4-carboxaldehyde (C ₆ H ₅ ON), L	HL/H.L	4.53	-6.2	0	59CC, 73BM
2-Acetylpyridine (C ₇ H ₇ ON), L (Other reference in Vol.2, p.341)	HL/H.L	2.66	-3.5	0	73BM, Other reference: 74KI
3-Acetylpyridine (C ₇ H ₇ ON), L (Other reference in Vol.2, p.341)	HL/H.L	3.28	-2.6	6	73BM

^a25°, 0.1; ⁱ20°, 0.5;

Azines (continued)

<u>Ligand</u>	<u>Equilibrium</u>	<u>Log K</u> <u>25°, 0</u>	<u>ΔH</u> <u>25°, 0</u>	<u>ΔS</u> <u>25°, 0</u>	<u>Bibliography</u>
2,6-Dimethylpyridine-4-carboxylic acid ethylester* (C ₁₀ H ₁₃ O ₂ N), L	HL/H.L	5.27 ^b			83BEH
2-Pyridylacetic acid amide (C ₇ H ₈ ON ₂), L	HL/H.L	4.34 ^a			82MT
3-Pyridylacetic acid amide (C ₇ H ₈ ON ₂), L	HL/H.L	4.72 ^a			82MT
4-Pyridylacetic acid amide (C ₇ H ₈ ON ₂), L	HL/H.L	5.08 ^a			82MT
3-(2-Pyridyl)propanoic acid amide (C ₈ H ₁₀ ON ₂), L	HL/H.L	5.09 ^a			82MT
3-(3-Pyridyl)propanoic acid amide (C ₈ H ₁₀ ON ₂), L	HL/H.L	5.21 ^a			82MT
3-(4-Pyridyl)propanoic acid amide (C ₈ H ₁₀ ON ₂), L	HL/H.L	5.58 ^a			82MT
4-(2-Pyridyl)butanoic acid amide (C ₉ H ₁₂ ON ₂), L	HL/H.L	5.48 ^a			82MT
4-(3-Pyridyl)butanoic acid amide (C ₉ H ₁₂ ON ₂), L	HL/H.L	5.33 ^a			82MT
4-(4-Pyridyl)butanoic acid amide (C ₉ H ₁₂ ON ₂), L	HL/H.L	5.64 ^a			82MT
5-(2-Pyridyl)pentanoic acid amide (C ₁₀ H ₁₄ ON ₂), L	HL/H.L	5.73 ^a			82MT
5-(3-Pyridyl)pentanoic acid amide (C ₁₀ H ₁₄ ON ₂), L	HL/H.L	5.60 ^a			82MT
5-(4-Pyridyl)pentanoic acid amide (C ₁₀ H ₁₄ ON ₂), L	HL/H.L	5.92 ^a			82MT
2-Amino-5-bromopyridine (C ₅ H ₅ N ₂ Br), L	HL/H.L	4.91 ^a			80BT
2-Amino-3-nitropyridine (C ₅ H ₅ O ₂ N ₃), L	HL/H.L	2.42			71BF
2-Amino-5-nitropyridine (C ₅ H ₅ O ₂ N ₃), L	HL/H.L	2.80			71BF
3-Amino-5-nitropyridine (C ₅ H ₅ O ₂ N ₃), L	HL/H.L	0.0			71BF
4-Amino-3-nitropyridine (C ₅ H ₅ O ₂ N ₃), L	HL/H.L	5.05			71BF
2,3-Diaminopyridine (C ₅ H ₇ N ₃), L	HL/H.L H ₂ L/HL.H	6.73 0.4			71BF

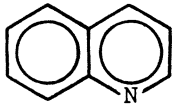
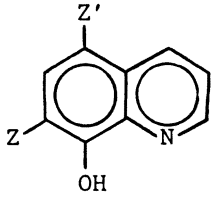
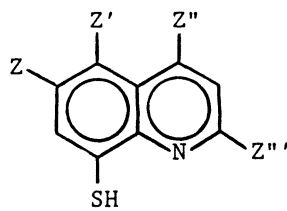
^a25°, 0.1; ^b25°, 0.5; * metal constants were also reported but not included in the compilation of selected values.

Azines (continued)

<u>Ligand</u>	<u>Equilibrium</u>	<u>Log K</u> <u>25°, 0</u>	<u>ΔH</u> <u>25°, 0</u>	<u>ΔS</u> <u>25°, 0</u>	<u>Bibliography</u>
2,5-Diaminopyridine (C ₅ H ₇ N ₃), L	HL/H.L H ₂ L/HL.H	6.46 1.97			71BF
2,6-Diaminopyridine (C ₅ H ₇ N ₃), L	HL/H.L	6.00			71BF
3,4-Diaminopyridine (C ₅ H ₇ N ₃), L	HL/H.L H ₂ L/HL.H	9.19 0.8			71BF
2-(Aminomethyl)pyridine (2-picolylamine) (C ₆ H ₈ N ₂), L (Other values in Vol.2, p.209 and other reference in Vol.5, p.465)	HL/H.L H ₂ L/HL.H	8.65 8.61 ^a ±0.04 8.74 ^b 8.91 ^c 1.96 2.00 ^a ±0.1 2.25 ^b 2.46 ^c	-10.98 ^b (-1.9)	3.2 ^b (3) 0.4 ^b	82ABS, 82MT
3-(Aminomethyl)pyridine (C ₆ H ₈ N ₂), L (Other values in Vol.5, p.241)	HL/H.L H ₂ L/HL.H	8.63 ^a 9.12 ^j 3.71 ^a 4.06 ^j			82MT
4-(Aminomethyl)pyridine (C ₆ H ₈ N ₂), L	HL/H.L H ₂ L/HL.H	8.30 ^a 4.05 ^a			82MT
2-(2-Aminoethyl)pyridine (C ₇ H ₁₀ N ₂), L (Other values in Vol.2, p.213 and Vol.5, p.241)	HL/H.L H ₂ L/HL.H	9.60 9.55 ^a ±0.04 9.70 ^b 9.84 ^c 3.75 3.92 ^a ±0.01 4.16 ^b 4.37 ^c	-12.12 ^b -4.60 ^b	3.7 ^b 3.6 ^b	82MT
3-(2-Aminoethyl)pyridine (C ₇ H ₁₀ N ₂), L	HL/H.L H ₂ L/HL.H	9.44 ^a 4.64 ^a			82MT
4-(2-Aminoethyl)pyridine (C ₇ H ₁₀ N ₂), L	HL/H.L H ₂ L/HL.H	9.37 ^a 4.98 ^a			82MT
2-(3-Aminopropyl)pyridine (C ₈ H ₁₂ N ₂), L	HL/H.L H ₂ L/HL.H	10.10 ^a 4.98 ^a			82MT
3-(3-Aminopropyl)pyridine (C ₈ H ₁₂ N ₂), L	HL/H.L H ₂ L/HL.H	10.05 ^a 5.19 ^a			82MT
4-(3-Aminopropyl)pyridine (C ₈ H ₁₂ N ₂), L	HL/H.L H ₂ L/HL.H	9.98 ^a 5.51 ^a			82MT
2-(4-Aminobutyl)pyridine (C ₉ H ₁₄ N ₂), L	HL/H.L H ₂ L/HL.H	10.30 ^a 5.56 ^a			82MT
3-(4-Aminobutyl)pyridine (C ₉ H ₁₄ N ₂), L	HL/H.L H ₂ L/HL.H	10.16 ^a 5.52 ^a			82MT
4-(4-Aminobutyl)pyridine (C ₉ H ₁₄ N ₂), L	HL/H.L H ₂ L/HL.H	10.18 ^a 5.81 ^a			82MT

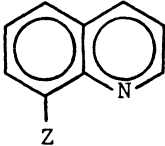
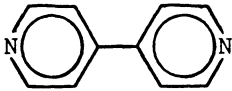
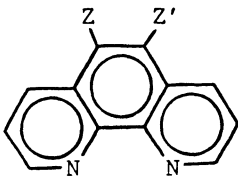
^a25°,0.1; ^b25°,0.5; ^c25°,1.0; ^j20°,1.0

Azines (continued)

Ligand	Equilibrium	Log K	ΔH	ΔS	Bibliography
		25°, 0	25°, 0	25°, 0	
2-(5-Aminopentyl)pyridine (C ₁₀ H ₁₆ N ₂), L	HL/H.L H ₂ L/HL.H	10.38 ^a 5.70 ^a			82MT
3-(5-Aminopentyl)pyridine (C ₁₀ H ₁₆ N ₂), L	HL/H.L H ₂ L/HL.H	10.34 ^a 5.61 ^a			82MT
4-(5-Aminopentyl)pyridine (C ₁₀ H ₁₆ N ₂), L	HL/H.L H ₂ L/HL.H	10.30 ^a 5.99 ^a			82MT
					
Benzo[b]pyridine (quinoline) (C ₉ H ₇ N), L	HL/H.L	4.81 4.97 ^a +0.01	-5.4	4	80BT, Other references: 52BP, 80BPa
					
5-Chloro-8-hydroxyquinoline (C ₁₀ H ₇ ONCl), HL (Other reference in Vol.2, p.351)	HL/H.L H ₂ L/HL.H	9.29 3.79			75PK
5-Chloro-7-iodo-8-hydroxy- quinoline (C ₁₀ H ₆ ONCl), HL	HL/H.L H ₂ L/HL.H	7.9 ^a 2.7 ^a			55DD
5,7-Dibromo-8-hydroxyquinoline (C ₁₀ H ₆ ONBr ₂), HL (Other reference in Vol.2, p.351)	HL/H.L H ₂ L/HL.H	7.3 ^a 2.6 ^a			55DD, Other references: 64Ka, 67SR, 68PCR, 80NKB
5,7-Diiodo-8-hydroxyquinoline (C ₁₀ H ₆ ONI ₂), HL (Other reference in Vol.2, p.351)	HL/H.L H ₂ L/HL.H	8.0 ^a 2.7 ^a			55DD, Other reference: 67SR
5-Nitro-8-hydroxyquinoline (C ₁₀ H ₇ O ₃ N ₂), HL	HL/H.L H ₂ L/HL.H	6.422 2.597			73KPK
					
8-Mercaptoquinoline (C ₁₀ H ₈ NS), HL (Other references in Vol.5, p.441)	HL/H.L H ₂ L/HL.H	8.39 ^a +0.01 8.43 ^h 2.05 ^a 2.08 ^h			82SKM, 85AJB, Other references: 64BC, 68BC

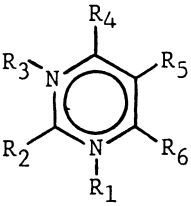
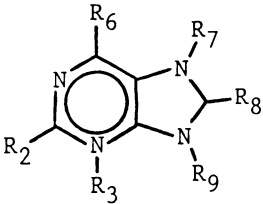
^a25°, 0.1; ^h20°, 0.1

Azines (continued)

Ligand	Equilibrium	Log K 25°, 0	ΔH 25°, 0	ΔS 25°, 0	Bibliography
2-Phenyl-8-mercaptoquinoline (C ₁₆ H ₁₂ NS), HL	HL/H.L H ₂ L/HL.H	8.00 ^h (1.4) ^h			85AJB
4-Phenyl-8-mercaptoquinoline (C ₁₆ H ₁₂ NS), HL	HL/H.L H ₂ L/HL.H	8.49 ^h 2.10 ^h			85AJB
5-Phenyl-8-mercaptoquinoline (C ₁₆ H ₁₂ NS), HL	HL/H.L H ₂ L/HL.H	8.41 ^h 2.0 ^h			85AJB
6-Phenyl-8-mercaptoquinoline (C ₁₆ H ₁₂ NS), HL	HL/H.L H ₂ L/HL.H	8.19 ^h 2.01 ^h			85AJB
5,8-Dimercaptoquinoline (C ₁₀ H ₈ NS ₂), H ₂ L	HL/H.L H ₂ L/HL.H H ₃ L/H ₂ L.H	9.41 ^h 4.64 ^h (1.7) ^h			85AR
					
8-(Methylthio)quinoline (C ₁₀ H ₉ NS), L	HL/H.L	3.53 ^a			64SF
8-(Methylseleno)quinoline (C ₁₀ H ₉ NSe), L	HL/H.L	3.26 ^a 3.50 ^b			64SF
8-Aminoquinoline (C ₉ H ₈ N ₂), L (Other values in Vol.2, p.234)	HL/H.L	3.95 ^a 4.04 ^h	-4.5	3	82ABS
					
4,4'-Bipyridyl (C ₁₀ H ₈ O ₂), L (Other reference in Vol.2, p.341)	HL/H.L	4.67 ^a ±0.02	-4.7 ^a ±0.0	6 ^a	82ABS
					
5,6-Dimethyl-1,10-phenanthroline (C ₁₄ H ₁₂ N ₂), L (Other values in Vol.2, p.262 and Vol.5, p.255)	HL/H.L	5.45 ±0.02 5.60 ^a	-6.0 ±0.5	5	82ABS
5-Nitro-1,10-phenanthroline (C ₁₂ H ₇ O ₂ N ₃), L (Other values in Vol.2, p.257 and Vol.5, p.255)	HL/H.L	3.25 ±0.03 3.22 ^a	-2.5 ±0.2	6	82ABS, 82ML, Other reference: 80BL

^a25°, 0.1; ^b25°, 0.5; ^h20°, 0.1

Azines (continued)

Ligand	Equilibrium	Log K 25°, 0	ΔH 25°, 0	ΔS 25°, 0	Bibliography
					
4-Amino-2-oxo-1,3-diazine (cytosine)*, L (C ₄ H ₅ ON ₃)	L/(H ₋₁ L).H	12.15 11.75 ^a ±0.07	-11.5	17	70CR, 82RK, Other references:
(Other values in Vol.2, p.264 and other references in Vol.5, p.466)	HL/H.L	4.58 4.55 ^a ±0.05	-5.1 -4.5 ^a	4 6 ^a	74TK, 83TSJ
1-(β-D-Ribofuranosyl)cytosine (cytidine)*, L (C ₉ H ₁₃ O ₅ N ₃)	L/(H ₋₁ L).H	12.5 4.08	-10.3 -5.1	23 -1	76OI, 82RK, 84KMa, Other references:
(Other values in Vol.2, p.265)	HL/H.L	4.15 ^a ±0.02 4.21 ^c ±0.04			64S, 81TRa, 85RRc
2,4-Dioxo-1,3-diazine (uracil)*, HL (C ₄ H ₄ O ₂ N ₂)	HL/H.L	9.49 ±0.03 9.27 ^a ±0.01	-7.8	17	70CR, 82RK, 83TSJ, Other references:
(Other references in Vol.2, p.342 and Vol.5, p.466)					74TK, 81TS
1-(β-D-Ribofuranosyl)uracil (uridine)*, HL (C ₉ H ₁₂ O ₆ N ₂)	L/(H ₋₁ L).H	12.59 9.30	-10.6 -7.2	21 18	70CR, 76OI, 82RK, Other references:
(Other references in Vol.2, p.342 and Vol.5, p.466)	HL/H.L	9.09 ^a ±0.04 9.11 ^c			64S
5-Methyluracil (thymine)*, HL (C ₅ H ₆ O ₂ N ₂) (Other value in Vol.2, p.271 and other reference in Vol.5, p.466)	HL/H.L	9.90 -0.1 9.69 ^a ±0.05	-8.2	18	82RK, 82TS, 83TSJ, 84PT Other references:
					74TK, 81FP
1-(2-Deoxy-β-D-ribofuranosyl)- thymine (thymidine), HL (C ₁₀ H ₁₄ O ₅ N ₂)	L/(H ₋₁ L).H	12.85 9.79	-12.4 -7.3	17 20	70CR
(Other values in Vol.2, p.272)	HL/H.L	9.55 ^a 9.56 ^c			
cis-syn-Dithymine*, H ₂ L (C ₁₀ H ₈ O ₄ N ₄)	HL/H.L	8.49 ^a			84PT
	H ₂ L/HL.H	6.83 ^a			
					
7-Methylpurine* (C ₆ H ₆ N ₄), L	HL/H.L	2.59 ^c			83Ae
9-Methylpurine* (C ₆ H ₆ N ₄), L	HL/H.L	2.77 ^a 2.90 ^c			83AL, Other references: 83ALa, 85AL

^a25°, 0.1; ^c25°, 1.0; * metal constants were also reported but not included in the compilation of selected values.

Azines (continued)

<u>Ligand</u>	<u>Equilibrium</u>	<u>Log K</u> <u>25°, 0</u>	<u>ΔH</u> <u>25°, 0</u>	<u>ΔS</u> <u>25°, 0</u>	<u>Bibliography</u>
2,9-Dimethylpurine* (C ₇ H ₈ N ₄), L	HL/H.L	3.69 ^c			83AL, Other references: 83ALa, 85AL
6,9-Dimethylpurine* (C ₇ H ₈ N ₄), L	HL/H.L	3.40 ^c			83AL
8,9-Dimethylpurine* (C ₇ H ₈ N ₄), L	HL/H.L	3.36 ^c			83AL, Other references: 83ALa, 85AL
2-Chloro-9-methylpurine* (C ₆ H ₅ N ₄ Cl), L	HL/H.L	(1.0) ^c			85AO
8-Chloro-9-methylpurine* (C ₆ H ₅ N ₄ Cl), L	HL/H.L	2.40 ^c			85AO
2-Methoxy-9-methylpurine* (C ₆ H ₆ N ₄), L	HL/H.L	2.71 ^c			85AO, Other reference: 85AL
8-Methoxy-9-methylpurine* (C ₆ H ₆ ON ₄), L	HL/H.L	3.44 ^c			85AO, Other reference: 85AL
9-(β-D-Ribofuranosyl)purine* (C ₁₀ H ₁₂ O ₄ N ₄), L	HL/H.L	2.31 ^c			81LA
6-Methoxy-9-(β-D-ribofuranosyl)- purine* (C ₁₀ H ₁₂ O ₅ N ₄), L	HL/H.L	(1.1) ^c			85AO
2-Methoxy-9-methylpurine* (C ₆ H ₆ ON ₄ S), L	HL/H.L	2.48 ^c			85AO
8-Methylthio-9-methylpurine* (C ₆ H ₆ N ₄ S), L	HL/H.L	3.24 ^c			85AO
6-Methylthio-9-(β-D-ribo- furanosyl)purine* (C ₁₀ H ₁₂ O ₄ N ₄ S), L	HL/H.L	(1.1) ^c			85AO
2-Amino-9-methylpurine* (C ₆ H ₇ N ₅), L	HL/H.L	4.11 ^c			85AO
6-Amino-9-methylpurine* (C ₆ H ₇ N ₅), L	HL/H.L	4.30 ^c			85AO
8-Amino-9-methylpurine* (C ₆ H ₇ N ₅), L	HL/H.L	4.62 ^c			85AO
6-Amino-2,9-dimethylpurine* (C ₇ H ₉ N ₅), L	HL/H.L	5.02 ^c			85AO
6-Amino-8,9-dimethylpurine* (C ₆ H ₇ N ₅), L	HL/H.L	4.51 ^c			85AO
6-Dimethylamino-9-(β-D-ribo- furanosyl)purine* (C ₁₁ H ₁₄ O ₄ N ₅), L	HL/H.L	4.03 ^c			85AO
9-(2-Oxanyl)purine (9-(tetrahydro-2-pyranyl)- purine* (C ₁₀ H ₁₄ ON ₄), L	HL/H.L	2.45 ^c			83AL

^c25°, 1.0; * metal constants were also reported but not included in the compilation of selected values.

Azines (continued)

Ligand	Equilibrium	Log K	ΔH	ΔS	Bibliography
		25°, 0	25°, 0	25°, 0	
6-Amino-9-(1-ethoxyethyl purine)* (C ₉ H ₁₄ ON ₅), L	HL/H.L	3.67 ^P			81La
2,6-Diaminopurine* (C ₅ H ₆ N ₆), L	HL/H.L	10.37 ^a	(-5) ^S	(31) ^a	82RK
(Other references in Vol.2, p.345)	H ₂ L/HL.H	10.27 ^q (4.89) ^a (5.04) ^q	(-6) ^S	(2) ^a	
8-Azaadenine* (C ₄ H ₃ N ₅), L	HL/H.L	5.99 ^q	(-4) ^S	(14) ^a	82RK
(Other reference in Vol.2, p.344)	H ₂ L/HL.H	2.73 ^q	(-1) ^S	(9) ^a	
6-Aminopurine (adenine)* (C ₅ H ₅ N ₅), L (Other values in Vol.2, p.276 and other reference in Vol.5, p.466)	L/(H ₋₁ L).H	9.85 ± 0.02	-9.4 ± 0.3	14	80TS, 81TS, 83TS, 83TSJ,
	HL/H.L	9.65 ^a ± 0.10 4.20 ± 0.00 4.22 ^a ± 0.04	-4.9 ± 0.1 -4.1 ^a ± 0.1	3 6 ^a	Other references: 62LT, 80GCD, 80GD, 80KHa, 82RK
9-(β-D-Ribofuranosyl)adenine (adenosine)* (C ₁₀ H ₁₃ O ₄ N ₅), L	L/(H ₋₁ L).H	12.35	-9.7	24	76OI, 80TS,
(Other values in Vol.2, p.277 and other references in Vol.5, p.466)	HL/H.L	3.55 ± 0.05 3.59 ^a ± 0.04 3.69 ^c ± 0.04	-3.9 -3.8	3 4 ^a	81LA, 82RK, Other references: 64S, 84KMa
2-Amino-6-oxopurine (guanine)* (C ₅ H ₄ ON ₅), L (Other H ⁺ value in Vol.2, p.345)	H.L/HL(s)	-4.97	(+10) ^r	(56)	80TV
6-Oxopurine (hypoxanthine)* (C ₅ H ₄ ON ₄), L (Other references in Vol.2, p.345)	L/(H ₋₁ L).H	12.04 ± 0.04	-9.8 ± 0.3	22	80GD, 82TSa, 83TSJ,
	HL/H.L	8.85 ± 0.06 8.85 ^a ± 0.05	-7.9 ± 0.1	14	Other reference: 81GD
	H ₂ L/HL.H	(1.9) ± 0.1 2.0 ^a ± 0.1	-2.7 ± 0.2	0	
9-(β-D-Ribofuranosyl)-hypoxanthine (inosine)*, L (C ₁₀ H ₁₂ O ₅ N ₄) (Other references in Vol.2, p.345)	L/(H ₋₁ L).H	12.36	-10.6	21	81LV, 83RRa,
	HL/H.L	8.96 8.8 ^a ± 0.1	-6.5	19	Other references: 64S, 84KMa
	H ₂ L/HL.H	(1.2) ^c			
2,6-Dioxopurine (xanthine)* (C ₅ H ₄ O ₂ N ₄), L (Other references in Vol.2, p.345)	L/(H ₋₁ L).H	11.84	-9.6	22	80GD
	HL/H.L	7.53 7.51 ^a ± 0.01	-6.3	13	
9-(β-D-Ribofuranosyl)xanthine (xanthosine)* (C ₁₀ H ₁₂ O ₆ N ₄), L (Other references in Vol.2, p.345 and Vol.5, p.466)	L/(H ₋₁ L).H	12.00	-10.9	18	80GD, 83RH,
	HL/H.L	5.67 5.66 ^a ± 0.07	-3.7	13	Other references: 80GCD, 83RR, 85RRb
Adenosine-2'-(dihydrogen-phosphate) (AMP-2)* (C ₁₀ H ₁₄ O ₇ N ₅ P), H ₂ L (Other values in Vol.2, p.278)	HL/H.L	6.01 ^{a, v} ± 0.03	(-1) ^t	(24) ^a	80TFa
	H ₂ L/HL.H	3.70 ^a ± 0.06	(-4) ^t	(4) ^a	

^a25°, 0.1; ^c25°, 1.0; ^P40°, 0.2; ^q35°, 0.1; ^r20-35°, 0; ^S35-55°, 0.1; ^t0-40°, 0.1; *metal constants were also reported but not included in the compilation of selected values.

Azines (continued)

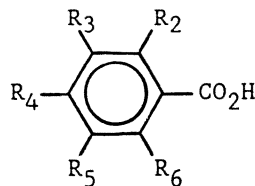
Ligand	Equilibrium	Log K	ΔH	ΔS	Bibliography
		25°, 0	25°, 0	25°, 0	
Adenosine-3'-(dihydrogen-phosphate) (AMP-3)* (C ₁₀ H ₁₄ O ₇ N ₅ P), H ₂ L (Other values in Vol.2, p.279 and other reference in Vol.5, p.466)	HL/H.L	5.80 ^{a,u} ±0.08 5.83 ^{a,v} -0.07	(-1) ^t	(23) ^a	76OI, 80TFa
	H ₂ L/HL.H	3.65 ^a ±0.01	(-4) ^t	(3) ^a	
Guanosine-3'-(dihydrogen-phosphate) (GMP-3) (C ₁₀ H ₁₄ O ₈ N ₅ P), H ₂ L	H ₂ L/HL.H	2.15 ^a			76OI
Guanosine-5'-(dihydrogen-phosphate) (GMP-5)* (C ₁₀ H ₁₃ O ₈ N ₅ P), H ₂ L (Other values in Vol.2, p.289 and other reference in Vol.5, p.466)	L/(H ₁ L).H	9.4 ^{a,u} 9.47 ^{h,v} 9.17 ^{n,u}			63SV, 70OI, 83CM, 87SC
	HL/H.L	6.66	(-0.4) ^r	(29)	
	H ₂ L/HL.H	6.24 ^{a,u} ±0.03 2.37 ^a ±0.03 2.35 ⁿ			
Inosine-5'-(dihydrogen-phosphate) (IMP-5) (C ₁₀ H ₁₃ O ₈ N ₄ P), H ₂ L (Other references in Vol.2, p.345)	HL/H.L	6.64 ±0.02	(-0.5) ^r	(29)	88SC
Cytidine-3'-(dihydrogen-phosphate) (CMP-3) (C ₁₀ H ₁₄ O ₈ N ₃ P), H ₂ L (Other value in Vol.2, p.265)	H ₂ L/HL.H	4.24 ^a			76OI
Uridine-3'-(dihydrogen-phosphate) (UMP-3) (C ₉ H ₁₃ O ₇ N ₂ P), H ₂ L	L/(H ₁ L).H	9.23 ^a			76OI
Guanosine-5'-(trihydrogen-diphosphate) (GDP) (C ₁₀ H ₁₄ O ₁₁ N ₅ P ₂), H ₃ L (Other values in Vol.2, p.289 and other reference in Vol.5, p.466)	L/(H ₁ L).H	9.6 ^a			88SC
	HL/H.L	7.19	(-0.4) ^r	(32)	
	H ₂ L/HL.H	6.3 ^{a,u} 2.9 ^a			
Inosine-5'-(trihydrogen-diphosphate) (IDP) (C ₁₀ H ₁₄ O ₁₁ N ₄ P ₂), H ₃ L (Other reference in Vol.2, p.345)	HL/H.L	7.18	(-0.6) ^r	(31)	88SC
Uridine-5'-(trihydrogen-diphosphate) (UDP) (C ₉ H ₁₄ O ₁₂ N ₂ P ₂), H ₃ L (Other values in Vol.2, p.269 and other reference in Vol.5, p.466)	L/(H ₁ L).H	9.4 ^a			88SC
	HL/H.L	7.16	(-0.8) ^r	(30)	

^a25°, 0.1; ^c25°, 1.0; ^h20°, 0.1; ⁿ37°, 0.15; ^r10-37°, 0; ^t0-40°, 0.1;

^uNaClO₄ used as background electrolyte; ^vKNO₃ used as background electrolyte; *metal constants were also reported but not included in the compilation of selected values.

Azines (Continued)

Ligand	Equilibrium	Log K 25°.0	ΔH 25°.0	ΔS 25°.0	Bibliography
Guanosine-5'-(tetrahydrogen-triphosphate) (GTP) (C ₁₀ H ₁₅ O ₁₄ N ₅ P ₃), H ₄ L (Other values in Vol.2, p.290 and Vol.5, p.263)	L/(H ₁ L).H HL/H.L H ₂ L/HL.H	9.6 ^a ±0.2 7.65 6.45 ^{a,u} ±0.0 3.2 ^a ±0.2	(-0.1) ^r	(35)	88SC
Inosine-5'-(tetrahydrogen-triphosphate) (ITP)* (C ₁₀ H ₁₅ O ₁₄ N ₄ P ₃), H ₄ L (Other values in Vol.2, p.286 and Vol.5, p.262)	L/(H ₁ L).H HL/H.L H ₂ L/HL.H	9.1 ^a ±0.1 7.68 6.48 ^{a,u} ±0.03 2.2 ^a	(-0.3) ^r	(34)	88SC, Other reference: 63WT
Uridine-5'-(tetrahydrogen-triphosphate) (UTP) (C ₉ H ₁₅ O ₁₅ N ₂ P ₃), H ₄ L (Other values in Vol.2, p.270 and Vol.5, p.257)	L/(H ₁ L).H HL/H.L H ₂ L/HL.H	9.70 ^{a,u} ±0.2 7.58 6.46 ^{a,u} ±0.01 2.0 ^a	(+0.1) ^r	(35)	85TMS,87SC, Other reference: 83RRa
2'-Deoxyadenosine-5'-(dihydrogenphosphate)* (C ₁₀ H ₁₄ O ₆ N ₅ P), H ₂ L (Other reference in Vol.2, p.344)	HL/H.L H ₂ L/HL.H	6.27 ^{h,v} 3.99 ^h	-2.6 ^a	20 ^a	80TFa
7. <u>Aminophosphonic acids</u> $\text{H}_2\text{O}_3\text{PCH}_2\text{N} \begin{cases} \text{CH}_2\text{PO}_3\text{H}_2 \\ \text{CH}_2\text{PO}_3\text{H}_2 \end{cases}$					
Nitrilotris(methylene-phosphonic acid)* (C ₃ H ₁₂ O ₉ NP ₃), H ₆ L (Other reference in Vol.2, p.319 and other values in Vol.5, p.277)	HL/H.L H ₂ L/HL.H H ₃ L/H ₂ L.H H ₄ L/H ₃ L.H H ₆ L/H ₄ L.H ²	(14.3) (12.1) ^{a,v} (12.3) ^{c,v} 8.41 7.30 ^a 6.66 ^c 6.74 5.86 ^a 5.46 ^c 5.31 4.64 ^a 4.30 ^c 2.5 (1.8) ^a	-9.2 -8.8 ^b -8.2 ^c +2.8 +1.6 ^b +1.0 ^c +2.3 +1.6 ^b +1.2 ^c +1.1 +0.7 ^b +0.8 ^c +2.9 +2.0 ^b	35 29 ^c 48 34 ^c 39 29 ^c 28 22 ^c 21	84VKd, Other references: 79MZA,80MRR,82SPS, 84LPG,84SB

C. Other Organic Ligands1. Carboxylic acids

2,3-Dimethylbenzoic acid (C ₉ H ₁₀ O ₂) HL (Other reference in Vol.3, p.332)	HL/H.L	3.73 ±0.01	+1.9 ±0.1	24	54DH,81SB
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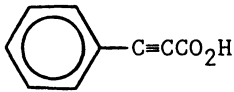
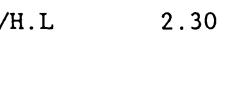
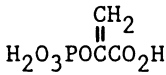
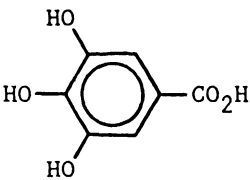
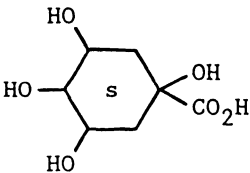
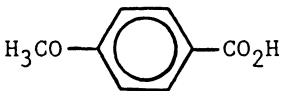
^a25°,0.1; ^b25°,0.5; ^c25°,1.0; ^h20°,0.1; ^r10-37°,0; ^uNaClO₄ used as background electrolyte; ^vKNO₃ used as background electrolyte; *metal constants were also reported but not included in the compilation of selected values.

Carboxylic acids (continued)

<u>Ligand</u>	<u>Equilibrium</u>	<u>Log K</u> <u>25°, 0</u>	<u>ΔH</u> <u>25°, 0</u>	<u>ΔS</u> <u>25°, 0</u>	<u>Bibliography</u>
2,4-Dimethylbenzoic acid (C ₉ H ₁₀ O ₂) HL (Other reference in Vol.3, p.332)	HL/H.L	4.20 ±0.02	+2.3	27	54DH
2,5-Dimethylbenzoic acid (C ₉ H ₁₀ O ₂) HL (Other reference in Vol.3, p.332)	HL/H.L	3.99 ±0.01	+2.1 ±0.7	25	54DH, 81SB
2,6-Dimethylbenzoic acid (C ₉ H ₁₀ O ₂) HL (Other reference in Vol.3, p.332)	HL/H.L	3.30 ±0.06	+3.7 ±0.7	28	54DH, 81SB
3,5-Dimethylbenzoic acid (C ₉ H ₁₀ O ₂) HL (Other reference in Vol.3, p.332)	HL/H.L	4.307±0.009	+0.1 ±0.1	20.1	54DH, 81SB
2,3,6-Trimethylbenzoic acid (C ₁₀ H ₁₂ O ₂), HL	HL/H.L	3.31	+3.0	25	85SB
2,4,6-Trimethylbenzoic acid (C ₁₀ H ₁₂ O ₂), HL (Other reference in Vol.3, p.332)	HL/H.L	3.438±0.008	+3.6 ±0.8	28	54DH, 85SB
2,3,4,5-Tetramethylbenzoic acid (C ₁₁ H ₁₄ O ₂), HL	HL/H.L	4.00	+1.6	24	85SB
2,3,4,6-Tetramethylbenzoic acid (C ₁₁ H ₁₄ O ₂), HL	HL/H.L	3.47	+2.8	25	85SB
2,3,5,6-Tetramethylbenzoic acid (C ₁₁ H ₁₄ O ₂), HL (Other reference in Vol.3, p.332)	HL/H.L	3.40 ±0.02	+3.2 ±0.3	26	85SB
4-Nitrobenzoic acid (C ₇ H ₅ O ₄ N), HL (Other values in Vol.3, p.22 and other reference in Vol.5, p.468)	HL/H.L	3.442±0.001 3.27 ^a	-0.43±0.3	14.3	56WM, Other references: 77FR, 82ABb
4-Chlorobenzoic acid (C ₇ H ₅ O ₂ Cl) HL (Other references in Vol.3, p.334)	HL/H.L	3.986±0.001 3.80 ^a	-0.17±0.07	17.7	56WM, Other reference: 77RF
2-Fluorobenzoic acid (C ₇ H ₅ O ₂ F) HL (Other references in Vol.3, p.334)	HL/H.L	3.469	+1.06	19.4	82SVD
3-Fluorobenzoic acid (C ₇ H ₅ O ₂ F) HL (Other references in Vol.3, p.334)	HL/H.L	3.863±0.003	-0.19±0.03	17.1	82SVD
4-Fluorobenzoic acid (C ₇ H ₅ O ₂ F) HL (Other references in Vol.3, p.334)	HL/H.L	4.131	-0.27	18.0	82SVD
2,4-Difluorobenzoic acid (C ₇ H ₄ O ₂ F ₂), HL	HL/H.L	3.438	+0.84	18.5	82SVD
2,6-Difluorobenzoic acid (C ₇ H ₄ O ₂ F ₂), HL	HL/H.L	2.236	+2.85	20.2	82SVD

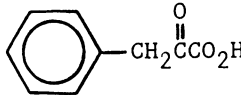
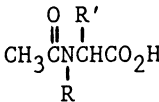
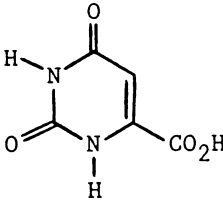
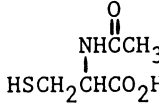
^a25°, 0.1;

Carboxylic acids (continued)

<u>Ligand</u>	<u>Equilibrium</u>	<u>Log K</u> <u>25°, 0</u>	<u>ΔH</u> <u>25°, 0</u>	<u>ΔS</u> <u>25°, 0</u>	<u>Bibliography</u>
Pentafluorobenzoic acid (C ₇ H ₀ F ₅), HL	HL/H.L	1.512	+2.49	15.3	80Ma
					
3-Phenylpropynoic acid (C ₉ H ₆ O ₂), HL	HL/H.L	2.30	+1.4	15	82SGL
					
Trifluoroacetic acid (C ₂ H ₀ F ₃), HL	HL/H.L	-0.2	0.0	-1	59D,81MP, Other reference: 69KF
					
2-Hydroxypropenoic acid-2- dihydrogen phosphate (phosphoenolpyruvic acid) (C ₃ H ₅ O ₆ P), H ₃ L (Other values in Vol.3, p.23)	HL/H.L H ₂ L/HL.H	6.14 ^{a,v} 6.35 ^{a,z} 3.45 ^a ±0.0			85ML
					
3,4,5-Trihydroxy-1-cyclohexene- carboxylic acid (shikimic acid)* (C ₇ H ₁₀ O ₅), HL	HL/H.L	4.01 ^a			85LSC
					
1,3,4,5-Tetrahydroxycyclohexane- carboxylic acid (chlorogenic acid)* (C ₇ H ₁₂ O ₆), HL	HL/H.L	3.37 ^a			85LSC
					
4-Methoxybenzoic acid (p-anisic acid) (C ₈ H ₈ O ₃), HL (Other references in Vol.3, p.339)	HL/H.L	4.475±0.004 4.26 ^a	-0.57±0.3	18.6	56WM, Other reference: 82RCF

^a25°, 0.1; ^vKNO₃ used as background electrolyte; ^z(C₃H₇)₄NI used as background electrolyte;
* metal constants were also reported but not included in the compilation of selected values.

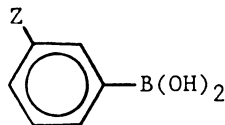
Carboxylic acids (continued)

Ligand	Equilibrium	Log K 25°, 0	ΔH 25°, 0	ΔS 25°, 0	Bibliography
					
2-Oxo-3-phenylpropanoic acid (phenylpyruvic acid)(C ₉ H ₈ O ₃), HL	HL/H.L	2.33 ^a			78T
					
N-Acetylsarcosine (C ₅ H ₉ O ₃ N), HL	HL/H.L	3.3 ^q			74ER
DL-N-Acetylphenylalanine (C ₁₁ H ₁₃ O ₃ N), HL	HL/H.L		+0.59		85RSE
					
1,3-Dihydro-1,3-diazine-2,4-dione-6-carboxylic acid (orotic acid)* (C ₅ H ₄ O ₄ N ₂), H ₂ L (Other values in Vol.3, p.88)	HL/H.L	9.6 9.29 ^a ±0.05 9.13 ^b	-8.7	14	82VD, 83MDa
	H ₂ L/HL.H	(1.8) 2.0 ^a ±0.0 (1.8) ^b	-0.5	6	
					
L-N-Acetylcysteine (C ₅ H ₉ O ₃ NS) H ₂ L (Other references in Vol.3, p.337 and Vol.5, p.304)	HL/H.L	9.52 ^a			83HS,
	H ₂ L/HL.H	3.04 ^a			Other reference: 81BCJ
	HO ₂ C-Z-CO ₂ H				
Butynedioic acid (acetylenedicarboxylic acid) (C ₄ H ₂ O ₄), H ₂ L (Other reference in Vol.5, p.469)	HL/H.L	2.34	+2.5	19	80SGL
	H ₂ L/HL.H	0.7	-1.1	-1	
(Phenylmethylené)propanedioic acid (benzalmalonic acid) (C ₁₀ H ₈ O ₄), H ₂ L	HL/H.L	4.77 ^a			67PN
	H ₂ L/HL.H	2.11 ^a			
Benzene-1,4-dicarboxylic acid (terephthalic acid)(C ₈ H ₆ O ₄), H ₂ L	HL/H.L	4.50			83MM, Other
	H ₂ L/HL.H	3.61			reference: 84JP

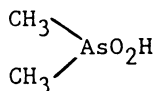
^a25°, 0.1; ^b25°, 0.5; ^q35°, 0.1; *metal constants were also reported but not included in the compilation of selected values.

Carboxylic acids (continued)

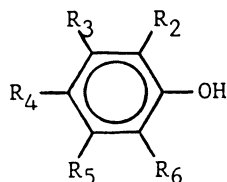
Ligand	Equilibrium	Log K 25°, 0	ΔH 25°, 0	ΔS 25°, 0	Bibliography
Biphenyl-2,2'-dicarboxylic acid (diphenic acid)(C ₁₄ H ₁₀ O ₄), H ₂ L	H ₂ L/HL.H	3.27			83MM, Other reference: 56MF
Methylphosphinodiacetic acid (C ₅ H ₉ O ₄ P), H ₂ L	HL/H.L H ₂ L/HL.H	6.19 ^a 2.76 ^a			84PH
$\text{HO}_2\text{C}(\text{CH}_2)_n\text{SS}(\text{CH}_2)_n\text{CO}_2\text{H}$					
3,3'-Dithiodipropanoic acid (C ₆ H ₁₀ O ₄ S ₂), H ₂ L (Other values in Vol.3, p.146)	HL/H.L H ₂ L/HL.H	4.47 ^h 4.99 ^{e,u} 3.88 ^h 4.34 ^{e,u}			84MT, Other references: 83Sb, 83SGb, 84SGa, 84SGb, 84SGP, 85HI, 85Sb
4,4'-Dithiodibutanoic acid (C ₈ H ₁₄ O ₄ S ₂), H ₂ L	HL/H.L H ₂ L/HL.H	5.46 ^{e,u} 4.79 ^{e,u}			84MT, Other reference: 85HI

2. Boronic acids

Phenylboronic acid (C ₆ H ₇ O ₂ B), HL	HL/H.L	8.84 8.67 ^a ±0.05	(-2) ^r	(34)	57T, 61ES, 74FP
3-Nitrophenylboronic acid (C ₆ H ₆ O ₄ NB), HL	HL/H.L	6.96 ^a			80BP

3. Arsinic acid

Dimethylarsinic acid (cacodylic acid) (C ₂ H ₇ O ₂ As), HL	HL/H.L	6.29 6.25 ^o 6.12 ^p 6.05 ^q			28M, 76W
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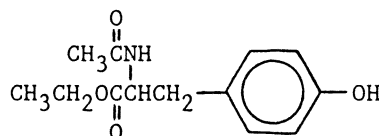
4. Phenols

Hydroxybenzene (phenol) (C ₆ H ₆ O)*, HL (Other values in Vol.3, p.181 and other references in Vol.5, p.445)	HL/H.L	9.98 ±0.04 9.77 ^a ±0.07 9.64 ^b 9.80 ^c	-5.5 ±0.1 -6.0 ^a ±0.1 -6.5 ^c	27 25 ^a 23 ^c	71MB, 78K, 82KT, 83RCB, 84Aa, Other references: 61S, 82GSS
4-Methylphenol (4-cresol) (C ₇ H ₈ O), HL (Other values in Vol.3, p.181 and other reference in Vol.5, p.446)	HL/H.L	10.26 ±0.01 10.04 ^a 9.87 ^b	-5.6 ±0.1	28	80JH

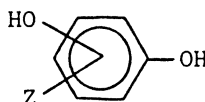
^a25°,0.1; ^b25°,0.5; ^c25°,1.0; ^e25°,3.0; ^h20°,15; ^o30°,0; ^p30°,0.1; ^q25°,0.7; ^r25-50°0;
^uNaClO₄ used as background electrolyte; *metal constants were also reported but not
included in the compilation of selected values.

Phenols (continued)

Ligand	Equilibrium	Log K 25°, 0	ΔH 25°, 0	ΔS 25°, 0	Bibliography
3,5-Dimethylphenol (C ₈ H ₁₀ O), HL (Other references in Vol.2, p.347 and Vol.5, p.446)	HL/H.L	10.19 ±0.01 9.98 ^a	-5.3	29	85FCa
4-Chlorophenol (C ₆ H ₅ OCl), HL (Other values in Vol.3, p.182 and other reference in Vol.5, p.446)	HL/H.L	9.43 ±0.01 9.20 ^a ±0.03	-5.6 -0.1 -6.1 ^a	24 22 ^a	80JH
3-Nitrophenol (C ₆ H ₅ O ₃ N), HL (Other values in Vol.3, p.183 and other reference in Vol.5, p.447)	HL/H.L	8.38 ±0.02 8.16 ^a ±0.02 8.03 ^b	-4.9 ±0.3 -4.8 ^a	22 21 ^a	74BEa, 80JH
4-Nitrophenol (C ₆ H ₅ O ₃ N) [*] , HL (Other values in Vol.3, p.183 and other reference in Vol.5, p.447)	HL/H.L	7.15 ±0.01 6.90 ^a -0.01 6.85 ^b +0.01 6.89 ^c	-4.6 ±0.1 -4.8 ^a	17 15 ^a	61BN, 74BEa, Other reference: 78K



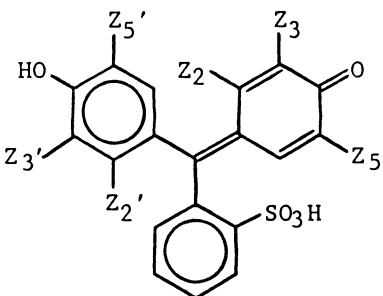
N-Acetyl-DL-tyrosine ethylester (C ₁₃ H ₁₆ O ₄ N), HL	HL/H.L		-5.7 ^o		71MB, Other reference: 83IS
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1,3-Dihydroxybenzene (resorcinol) (C ₆ H ₆ O ₂), H ₂ L (Other values in Vol.3, p.202)	HL/H.L	11.06 ^h 11.0 ^c			79ST, 84Aa
	H ₂ L/HL.H	9.30 ^h 9.28 ^c	-7.9 ^c	34 ^c	
1,4-Dihydroxybenzene (hydroquinone) (C ₆ H ₆ O ₂), H ₂ L (Other reference in Vol.3, p.361)	HL/H.L	11.39 ^b 11.5 ^c			53BH, 79ST
	H ₂ L/HL.H	9.85 ^b 9.89 ^c			
1,4-Dihydroxy-2-methylbenzene (toluhydroquinone) (C ₇ H ₈ O ₂), H ₂ L	HL/H.L	11.62 ^b			53BH
	H ₂ L/HL.H	10.05 ^b			
1,4-Dihydroxytetramethyl- benzene (durohydroquinone) (C ₁₀ H ₁₄ O ₂), H ₂ L	HL/H.L	(12.70) ^b			53BH
	H ₂ L/HL.H	11.25 ^b			
2,6-Dichloro-1,4-dihydroxy- benzene (C ₆ H ₄ O ₂ Cl ₂), H ₂ L	HL/H.L	9.99 ^b			53BH
	H ₂ L/HL.H	7.30 ^b			
3,4-Dinitrocatechol (C ₆ H ₄ O ₆ N ₂), H ₂ L	HL/H.L	8.24 ^P			59MV
	H ₂ L/HL.H	4.02 ^P			

^a25°,0.1; ^b25°,0.5; ^c25°,1.0; ^h20°,0.1; ^o20°,~0; ^P30°,0.1; *metal constants were also reported but not included in the compilation of selected values.

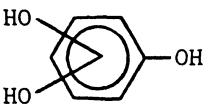
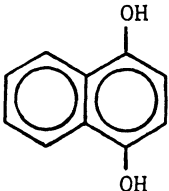
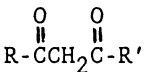
Phenols (continued)

Ligand	Equilibrium	Log K	ΔH	ΔS	Bibliography
		25°.0	25°.0	25°.0	
3,5-Dinitrocatechol (C ₆ H ₄ O ₆ N ₂), H ₂ L (Other reference in Vol.3, p.350)	HL/H.L	10.0 ^a			59MV
	H ₂ L/HL.H	9.86 ^p			
		3.39 ^a			
		3.32 ^p			
3-(3,4-Dihydroxyphenyl)propanoic acid (C ₉ H ₁₀ O ₄), HL (Other references in Vol.3, p.361 and Vol.5, p.448)	HL/H.L	(12.0) ^a	(-9) ^s	(25) ^a	80JH
	H ₂ L/HL.H	9.54 ^a ±0.04	(-7) ^s	(20) ^a	
	H ₃ L/H ₂ L.H	4.36 ^a			
3,5-Dihydroxybenzoic acid (α -resorcylic acid)* (C ₇ H ₆ O ₄), H ₃ L (Other values in Vol.3, p.210)	HL/H.L	(10.54) ^a			80LSP, 81AMM,
		(10.74) ^b			Other reference:
	H ₂ L/HL.H	9.02 ^a ±0.02			84EF
		8.99 ^b			
	H ₃ L/HL.H	3.85 ^a ±0.01			
		3.81 ^b			
2,3-Dihydroxy-5-sulfobenzoic acid* (C ₇ H ₆ O ₇ S), H ₄ L	H ₃ L/HL.H	2.43 ^a			82C
					
4'-Hydroxyfuchson-2"-sulfonic acid (Phenol Red) (C ₁₉ H ₁₄ O ₅ S) H ₂ L (Other reference in Vol.5, p.449)	HL/H.L	8.04			61SR, 71RM, 85RM
		7.50 ^q	(-4) ^t	(20) ^q	
		7.70 ^a ±0.04			
		7.57 ⁿ			
		7.54 ^c			
4'-Hydroxy-3,3',5,5'-tetrabromo- 2,2'-dimethylfuchson-2"-sulfonic acid (Bromocresol Green) (C ₂₁ H ₁₂ O ₅ Br ₄ S), H ₂ L (Other reference in Vol.5, p.450)	HL/H.L	5.03			61BN
		4.49 ^c			
4-Hydroxy-2,2'-dimethyl-5,5'- di(2-propyl)fuchson-2"-sulfonic acid (Thymol Blue) (C ₂₃ H ₂₂ O ₅ S) H ₂ L (Other reference in Vol.5, p.449)	HL/H.L	9.19 ±0.05	(-3) ^r	(32)	61BN, 83GL
		8.66 ^c			
4'-Hydroxy-3,3'-dibromo-2,2'- dimethyl-5,5'-di(2-propyl)- fuchson-2"-sulfonic acid (Bromothymol Blue) (C ₂₃ H ₂₀ O ₅ Br ₂ S), H ₂ L (Other reference in Vol.5, p.540)	HL/H.L	7.20			71RM
		6.84 ^c			

^a25°,0.1; ^b25°,0.5; ^c25°,1.0; ⁿ37°,0.15; ^p30°,0.1; ^q25°,0.7; ^r25-50°,0; ^s1-45°,0.1;

^t5-30°,0.7; *metal constants were also reported but not included in the compilation of selected values.

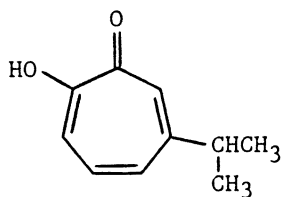
Phenols (continued)

<u>Ligand</u>	<u>Equilibrium</u>	<u>Log K</u> <u>25°, 0</u>	<u>ΔH</u> <u>25°, 0</u>	<u>ΔS</u> <u>25°, 0</u>	<u>Bibliography</u>
					
1,2,3-Trihydroxybenzene (pyrogallol)* (C ₆ H ₆ O ₃), H ₃ L (Other values in Vol.3, p.212 and Vol.5, p.349)	HL/H.L H ₂ L/HL.H H ₃ L/H ₂ L.H	(14) ^h 11.00 ^a 11.08 ^h 11.12 ^c 8.96 ^a ±0.02 8.94 ^h 8.96 ^c	(-6) ^s (-4) ^s	(30) ^a (28) ^a	79CS, 81AMM, Other references: 80NKL, 81BDa, 82HO, 82PTa
1,2,4-Trihydroxybenzene (hydroxyquinol) (C ₆ H ₆ O ₃), H ₃ L (Other reference in Vol.3, p.361)	H ₂ L/HL.H H ₃ L/H ₂ L.H	11.38 ^c 9.02 ^c			79CS
1,3,5-Trihydroxybenzene (phloroglucinol) (C ₆ H ₆ O ₃), H ₃ L (Other reference in Vol.3, p.472)	H ₂ L/HL.H H ₃ L/H ₂ L.H	8.76 ^c 8.42 ^c	-7.9 ^c -6.7 ^c	14 ^c 16 ^c	79CS, 84Aa
(2R,3S)-2-(3,4-Dimethoxyphenyl)- 2H-1-benzopyran-3,5,7-triol (C ₁₇ H ₁₈ O ₆), H ₂ L	HL/H.L H ₂ L/HL.H	10.92 ^a 8.84 ^a			84KMP
					
1,4-Dihydroxynaphthalene (1,4-naphthohydroquinone) (C ₁₀ H ₈ O ₂), H ₂ L	HL/H.L H ₂ L/HL.H	10.93 ^b 9.37 ^b			53BH
5. <u>Carbonyl ligands</u>					
Hexane-2,4-dione (C ₆ H ₁₀ O ₂), HL (Other references in Vol.3, p.352)	HL/H.L	9.38 9.11 ^h	(-5) ^r	(25)	73KO
Heptane-3,5-dione (C ₇ H ₁₂ O ₂), HL (Other references in Vol.3, p.353)	HL/H.L	10.04 9.55 ^h			69KO
Nonane-4,6-dione (C ₉ H ₁₆ O ₂), HL	HL/H.L	9.67 ^h			71KO
2,6-Dimethylheptane-3,5-dione (C ₉ H ₁₆ O ₂), HL	HL/H.L	9.82 ^h			69KO

^a25°,0.1; ^b25°,0.5; ^c25°,1.0; ^h20°,0.1; ^r5-45°,0; ^s25-45°,0.2; *metal constants were also reported but not included in the compilation of selected values.

Carbonyl ligands (continued)

<u>Ligand</u>	<u>Equilibrium</u>	<u>Log K</u> <u>25°, 0</u>	<u>ΔH</u> <u>25°, 0</u>	<u>ΔS</u> <u>25°, 0</u>	<u>Bibliography</u>
2,2-Dimethylheptane-3,5-dione (C ₉ H ₁₆ O ₂), HL	HL/H.L	10.00 ^h			69KO
Undecane-5,7-dione (C ₁₁ H ₂₀ O ₂), HL	HL/H.L	9.72 ^h			71KO
3,8-Dimethylnonane-4,6-dione (C ₁₁ H ₂₀ O ₂), HL	HL/H.L	9.88 ^h			71KO
2,2,6,6-Tetramethylheptane- 3,5-dione (C ₁₁ H ₂₀ O ₂), HL	HL/H.L	11.57 ^h			69KO
Tridecane-6,8-dione (C ₁₃ H ₂₄ O ₂), HL	HL/H.L	9.71 ^h			71KO

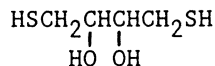


4-(1-Methylethyl)tropolone (C ₁₀ H ₁₂ O ₂), HL (Other values in Vol.3, p.253)	HL/H.L	7.29 7.04 ^a (6.72) ^d			83SR
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6. Alcohols

Z-OH

(+)-Sucrose (C ₁₂ H ₂₂ O ₁₁), L	(H ₋₁ L)/(H ₋₂ L).H L/(H ₋₁ L).H	13.45 ^c 12.57 ^c			76CV, 83HD
D(+)-Trehalose (C ₁₂ H ₂₂ O ₁₁), L	(H ₋₁ L)/(H ₋₂ L).H L/(H ₋₁ L).H	13.64 ^c 13.13 ^c			75CV, 76CV
D(+)-Raffinose (C ₁₈ H ₃₂ O ₁₆), L	(H ₋₂ L)/(H ₋₃ L).H (H ₋₁ L)/(H ₋₂ L).H L/(H ₋₁ L).H	13.5 ^c 13.44 ^c 12.40 ^c			76CV
(+)-Melezitose (C ₁₈ H ₃₂ O ₁₆), L	(H ₋₂ L)/(H ₋₃ L).H (H ₋₁ L)/(H ₋₂ L).H L/(H ₋₁ L).H	13.4 ^c 13.35 ^c 12.52 ^c			76CV

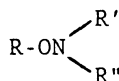
7. Thiols

DL-threo-1,4-Dimercapto- butan-2,3-diol (dithiothreitol) (C ₄ H ₁₀ O ₂ S ₂), H ₂ L	HL/H.L H ₂ L/HL.H	-8.5° -6.6°			71MB
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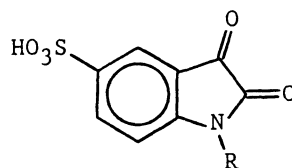
^a25°, 0.1; ^c25°, 1.0; ^d25°, 2.0; °20°, -0

8. Oximes

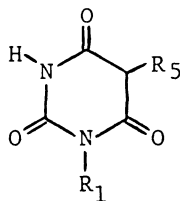
<u>Ligand</u>	<u>Equilibrium</u>	<u>Log K</u>	<u>ΔH</u>	<u>ΔS</u>	<u>Bibliography</u>
		<u>25°. 0</u>	<u>25°. 0</u>	<u>25°. 0</u>	
	$\begin{array}{c} \text{HON} \qquad \qquad \text{NOH} \\ \parallel \qquad \qquad \parallel \\ \text{H}_2\text{NCCH}_2\text{CH}_2\text{-X-CH}_2\text{CH}_2\text{CNH}_2 \end{array}$				
3,3'-Iminobis(propioamidooxime) (C ₆ H ₁₅ O ₂ N ₅), H ₂ L	HL/H.L	8.47 ^a	-8.6 ^a	10 ^a	82CCa
	H ₂ L/HL.H	4.58 ^a	-6.2 ^a	0 ^a	
	H ₃ L/H ₂ L.H	3.54 ^a	-7.2 ^a	-8 ^a	
3,3'-Oxybis(propioamidooxime) (C ₆ H ₁₅ O ₂ N ₅), H ₂ L	HL/H.L	5.83 ^a	-6.6 ^a	5 ^a	82CCa
	H ₂ L/HL.H	4.61 ^a	-7.9 ^a	-5 ^a	
3,3'-Thiobis(propioamidooxime) (C ₆ H ₁₅ O ₂ N ₅), H ₂ L	HL/H.L	5.89 ^a	-7.1 ^a	3 ^a	82CCa
	H ₂ L/HL.H	4.95 ^a	-7.5 ^a	-2 ^a	



N-Methylhydroxylamine (CH ₅ ON), L	HL/H.L	5.96			57BP
N,N-Dimethylhydroxylamine (C ₂ H ₇ ON), L	HL/H.L	5.20			57BP
O-Methylhydroxylamine (CH ₅ ON), L (Other reference in Vol.3, p.366)	HL/H.L	4.60			57BP
N,O-Dimethylhydroxylamine (C ₂ H ₇ ON), L	HL/H.L	4.75			57BP
N,N,O-Trimethylhydroxylamine (C ₃ H ₉ ON), L	HL/H.L	3.65			57BP

9. Amides

Isatin-5-sulfonic acid (C ₈ H ₅ O ₅ NS), HL	HL/H.L	9.43 ⁿ			81Sa
N-Methylisatin-5-sulfonic acid (C ₉ H ₇ O ₅ NS), HL	HL/H.L	10.00 ⁿ			81Sa



2,4,6-Trioxypyrimidine (barbituric acid) (C ₄ H ₄ O ₃ N ₂), L (Other references in Vol.2, p.342 and Vol.5, p.452)	L/(H ₁ L).H	(12.3)			69BST
	HL/H.L	4.04 ± 0.05	-0.06	18.3	
		3.89 ^a			
		3.90 ^b ± 0.02			
		3.98 ^c			
		4.24 ^d			

^a25°, 0.1; ^c25°, 1.0; ^d25°, 2.0; ⁿ37°, 0.15

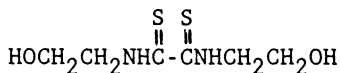
Amides (continued)

<u>Ligand</u>	<u>Equilibrium</u>	<u>Log K</u> <u>25°, 0</u>	<u>ΔH</u> <u>25°, 0</u>	<u>ΔS</u> <u>25°, 0</u>	<u>Bibliography</u>
5,5-Dimethylbarbituric acid (C ₆ H ₈ O ₃ N ₂), L	HL/H.L	8.51			80Mb
5-Ethyl-5-methylbarbituric acid (C ₇ H ₁₀ O ₃ N ₂), L	HL/H.L	8.28			80Mb
5,5-Diethylbarbituric acid (barbital) (C ₈ H ₁₂ O ₃ N ₂), L (Other references in Vol.2, p.342 and other values in Vol.5, p.384)	L/(H ₋₁ L).H HL/H.L	(12.6) ±0.2 7.980±0.04 7.79 ^a 7.73 ^b 7.78 ^c 7.93 ^d			69BST, 80Mb
5-Methyl-5(1-methylethyl)- barbituric acid (C ₈ H ₁₂ O ₃ N ₂), L	HL/H.L	8.45			80Mb
5-Ethyl-5(1-methylethyl)- barbituric acid (C ₉ H ₁₄ O ₃ N ₂), L	HL/H.L	8.14			80Mb
5-Allyl-5(1-methylethyl)- barbituric acid (C ₉ H ₁₂ O ₃ N ₂), L	HL/H.L	8.02			80Mb
5,5-Diallylbarbituric acid (C ₈ H ₈ O ₃ N ₂), L (Other reference in Vol.2, p.342)	HL/H.L	7.79 ±0.02	-4.22	19.1	80Mb
5-Methyl-5-phenylbarbituric acid (C ₁₁ H ₁₀ O ₃ N ₂), L (Other reference in Vol.2, p.342)	HL/H.L	7.76 ±0.03			80Mb
5-Ethyl-5-phenylbarbituric acid (C ₁₂ H ₁₂ O ₃ N ₂), L (Other reference in Vol.2, p.343)	L/(H ₋₁ L).H HL/H.L	(12.2) 7.44 ±0.04	-4.60	18.6	69BST, 80Mb
5,5-Diphenylbarbituric acid (C ₁₆ H ₁₂ O ₃ N ₂), L	L/(H ₋₁ L).H HL/H.L	(11.9) 7.30			80Mb
5-Ethyl-5(3-nitrophenyl)- barbituric acid (C ₁₂ H ₁₁ O ₅ N ₃), L	HL/H.L	7.04			80Mb
5-Ethyl-5(4-nitrophenyl)- barbituric acid (C ₁₂ H ₁₁ O ₅ N ₃), L	HL/H.L	6.94			80Mb
5-5-Dichlorobarbituric acid (C ₄ H ₂ O ₃ N ₂ Cl ₂), L	HL/H.L	5.55			80Mb
5-5-Dibromobarbituric acid (C ₄ H ₂ O ₃ N ₂ Br ₂), L	HL/H.L	5.68			80Mb
5-Ethyl-5(3-methylbutyl)- barbituric acid (C ₁₂ H ₂₀ O ₃ N ₂), L (Other references in Vol.2, p.342)	HL/H.L	7.95 ±0.01	-5.81	16.9	69BST

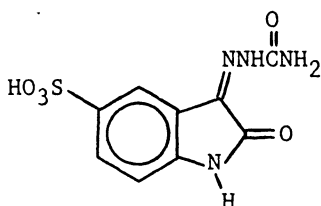
^a25°, 0.1; ^b25°, 0.5; ^c25°, 1.0; ^d25°, 2.0

Amides (continued)

Ligand	Equilibrium	Log K 25°, 0	ΔH 25°, 0	ΔS 25°, 0	Bibliography
1,5-Dimethyl-5-(1-cyclohexenyl)-barbituric acid ($C_{12}H_{16}O_3N_2$), L	HL/H.L	8.37 $\pm$ 0.00	-5.4	20.2	56B, 69BST
5-Ethyl-1-methyl-5-phenylbarbituric acid ($C_{13}H_{14}O_3N_2$), L	HL/H.L	8.01	-3.7	24.3	69BST



N,N'-Bis(2-hydroxyethyl)-dithiooxamide* ($C_6H_{12}O_2N_2S_2$), HL (Other reference in Vol.5, p.477)	HL/H.L	11.07 ^a			68VH
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5-Sulfoisatin-3-semicarbazone ($C_9H_8O_5N_4S$), HL	HL/H.L	9.70 ⁿ			81Sb
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D. Inorganic Ligands

Hydrogen silicate (silicic acid)* (H_4O_4Si), H_2L (Other values in Vol.4, p.39 and other reference in Vol.5, p.453)	HL/H.L	(13.2) $\pm$ 0.2 12.96 ^a 12.62 ^b $\pm$ 0.06 (-10) ^s 12.65 ^d 12.73 ^e			73KPG, 81SN, 83SI, 85SI, Other references: 59I, 74AD, 79R
	$H_2L/HL.H$	9.84 $\pm$ 0.02 9.58 ^a $\pm$ 0.01 9.47 ^b $\pm$ 0.01 (-5) ^s 9.47 ^c 9.46 ^d 9.42 ^e $\pm$ 0.02 9.54 ^g		(24) ^b (27) ^b	
	$H_2L_2/(HL)_2$	(1.2) ^b			
Hydrogen nitrite (nitrous acid)* (HO_2N), HL (Other values in Vol.4, p.47 and Vol.5, p.406)	HL/H.L	3.15 2.94 ^b 3.00 ^c -0.1 3.24 ^d	-2.9	5	69ZJ, 77H, Other references: 70G, 70KC, 71BI, 71GF, 80BD, 82RD, 83BD, 83ZY
Hydrogen pentaphosphate ($H_7O_{16}P_5$), H_7L (Other references in Vol.4, p.135)	HL/H.L $H_2L/HL.H$	8.15 ^{a,z} 7.03 ^{a,z}			82WH

^a25°, 0.1; ^b25°, 0.5; ^c25°, 1.0; ^d25°, 2.0; ^e25°, 4.5; ⁿ37°, 0.15; ^s25-50°, 0.5;

^z(CH_3)₄NCl used as background electrolyte; *, metal constants were also reported but not included in the compilation of selected values.

Inorganic ligands (continued)

<u>Ligand</u>	<u>Equilibrium</u>	<u>Log K</u>	<u>ΔH</u>	<u>ΔS</u>	<u>Bibliography</u>
		<u>25°, 0</u>	<u>25°, 0</u>	<u>25°, 0</u>	
Hydrogen hexaphosphate (H ₈ O ₁₉ P ₆), H ₈ L (Other references in Vol.4, p.135 and Vol.5, p.477)	HL/H.L H ₂ L/HL.H	8.12 ^{a,z} 7.16 ^{a,z}			82WH
Hydrogen heptaphosphate (H ₉ O ₂₂ P ₇), H ₉ L	HL/H.L H ₂ L/HL.H	8.07 ^{a,z} 7.18 ^{a,z}			82WH
Hydrogen peroxide* (H ₂ O ₂), H ₂ L (Other values in Vol.4, p.75 and other reference in Vol.5, p.478)	H ₂ L/HL.H	11.65 ± 0.03 11.38 ^b 11.39 ^c 12.13 ¹	-7.6 -7.4 ^a	28	85VKI, Other references: 63R, 66L, 69S, 69SMG, 70BS, 70SK, 73KP, 74M
Aminodisulphonic acid (H ₃ O ₆ NS ₂), H ₂ L	HL/H.L	8.50 ^c			49DD
Hydrogen periodate* (H ₅ O ₆ I), H ₅ L (Other values in Vol.4, p.129)	H ₃ L/H ₂ L.H [H ₄ L+IO ₄]/H ₃ L.H H ₅ L/[H ₄ L+IO ₄].H IO ₄ /H ₄ L H ₄ I ₂ O ₁₀ /(H ₃ L) ²	12.2 11.6 ^a 11.28 ^b 8.29 ± 0.04 7.53 ^b 1.58 ± 0.03 1.15 ^e 1.45 ± 0.02 2.15 ^a 2.63 ^b	+2.8 (+11) ^r (+15) ^t	47 (44) (60) ^a	69Aa, 69BHL, 70Bwa, Other references: 59SW, 71H, 74L
Hydrogen perxenate (H ₄ O ₆ Xe), H ₄ L	H ₂ L/HL.H	10.1 ^a			64AM
Hydrogen xenonate (H ₂ O ₄ Xe), H ₂ L	HL/H.L	10.8 ^a 10.5 ^b			64AM

^a25°, 0.1; ^b25°, 0.5; ^c25°, 1.0; ^d25°, 2.0; ^e25°, 3.0; ¹5°, 3.0; ^r5-45°, 0; ^t1-70°, 0.1;
^z(CH₃)₄NCl used as background electrolyte; * metal constants were also reported but not
included in the compilation of selected values.

LIGANDS CONSIDERED BUT NOT INCLUDED IN THE COMPILATION OF SELECTED CONSTANTS

A. Aminoacids1. Aminocarboxylic acidsa. Primary amines

<u>Ligand</u>	<u>Bibliography</u>
DL-2-Aminopentanoic acid (norvaline) ($C_5H_{11}O_2N$) (Values in Vol.1, p.7 and Vol.5, p.4)	81Ma, 82MO, 85VD
DL-2-Aminohexanoic acid (norleucine) ($C_6H_{13}O_2N$) (Values in Vol.1, p.8 and Vol.5, p.5)	82MO, 83SDa, 84SDa, 85VD
DL-2-Amino-2-methylbutanoic acid (isovaline) ($C_5H_{11}O_2N$)	71MB
L-2-Amino-3-methylpentanoic acid (isoleucine) ($C_6H_{13}O_2N$) (Values in Vol.1, p.12 and Vol.5, p.7)	73VB, 80SGa, 82NM, 83NM, 84PBP, 85VD
1-Aminocyclopentanecarboxylic acid (cycloleucine) ($C_6H_{11}O_2N$) (Values in Vol.1, p.15)	65PP
DL-3-Amino-2-methylpropanoic acid ($C_4H_9O_2N$)	80RR
5-Aminopentanoic acid ($C_5H_{11}O_2N$) (Values in Vol.1, p.22 and Vol.5, p.11)	81Ma
6-Aminohexanoic acid ($C_6H_{13}O_2N$) (Values in Vol.1, p.22 and Vol.5, p.11)	81Ma
DL-2-Aminohexanedioic acid ($C_6H_{11}O_4N$)	82BCS
DL-4-Amino-3-hydroxybutanoic acid ($C_4H_9O_3N$) (Values in Vol.1, p.39 and H^+ values in Vol.5, p.428)	81NS
DL-Aspartic acid 1-ethylester ($C_6H_{11}O_4N$)	69P
DL-Aspartic acid 4-ethylester ($C_6H_{11}O_4N$)	69P
L-Isoasparagine ($C_5H_{10}O_3N_2$)	84KW
L-2-Amino-5-ureidopentanoic acid (citrulline) ($C_6H_{13}O_3N_3$) (Values in Vol.1, p.42 and other references in Vol.5, p.455)	72GH, 83PS
L-1-Aspartyl-L-phenylalanine methylester (aspartame) ($C_{14}H_{18}O_5N_2$)	85AA
L-O-Methyltyrosine ($C_{10}H_{13}O_3N$) (Other reference in Vol.1, p.395 and values in Vol.5, p.14)	84OY
DL-5-Hydroxytryptophan ($C_{11}H_{12}O_3N_2$) (Values in Vol.1, p.65)	84OY
meso-2,4-Diaminopentanedioic acid ($C_5H_{10}O_4N_2$)	83NS
threo-2,4-Diaminopentanedioic acid ($C_5H_{10}O_4N_2$)	83NS
DL-4,4'-Dithiobis(2-aminobutanoic acid) (homocystine) ($C_8H_{16}O_4N_2S_2$) (H^+ values in Vol.1, p.396)	81BLa
DL-3,3-Dimethylcystine (D-penicillamine-DL-cysteine disulfide) ($C_8H_{16}O_4N_2S_2$)	84TC
Aminoxyacetic acid ($C_2H_5O_3N$)	84JMB

Aminocarboxylic acids (continued)

<u>Ligand</u>	<u>Bibliography</u>
DL-2-Aminooxypropanoic acid ($C_3H_7O_3N$)	84JMB
DL-2-Aminooxybutanoic acid ($C_4H_9O_3N$)	84JMB
2-Aminooxy-2-methylpropanoic acid ($C_4H_9O_3N$)	84JMB
Aminoboryl-methanoic acid (aminocarboxylborane) (CH_5O_2NB)	82SMS
N-Methylaminoboryl-methanoic acid ($C_2H_7O_2NB$)	82SMS
N,N-Dimethylaminoboryl-methanoic acid ($C_3H_9O_2NB$)	82SMS
N,N,N-Trimethylaminoboryl-methanoic acid ($C_4H_{11}O_2NB$)	82SMS

b. Secondary amines

L-Piperidine-2-carboxylic acid ($C_6H_{11}O_2N$) (Values in Vol.1, p.70 and other reference in Vol.5, p.455)	85RRd
DL-6-Methylpiperidine-2-carboxylic acid ($C_7H_{13}O_2N$)	85RRd
2-Oxo-1,4-diazacyclohexane-3-acetic-1-succinic acid ($C_{10}H_{14}O_7N_2$)	83KKM
N-(2-Hydroxybenzyl)glycine ($C_9H_{11}O_3N$)	80Z
N-(2-Hydroxy-4-nitrobenzyl)glycine ($C_9H_{10}O_5N_2$)	83C, 83Ca, 83Cb
(Carboxymethylamino)acetohydroxamic acid ($C_4H_8O_4N_2$) (Values in Vol.1, p.71)	81KP
N-[Tris(hydroxymethyl)methyl]aminoacetic acid (tricine) ($C_6H_{15}O_4N$) (Other reference in Vol.1, p.408 and H^+ values in Vol.5, p.427)	84KK, 85TG
Imidazolylpyruvic acid ($C_6H_6O_3N_2$)	75SD
Iminodiacetic acid ethylester ($C_6H_{11}O_4N$)	69P
L-Proline 2-methylpropylamide ($C_9H_{17}O_3N_2$)	82LB
2-Propyl-1,3-thiazoline-4-carboxylic acid ($C_7H_{13}O_2NS$)	83RVc
2-Phenyl-1,3-thiazoline-4-carboxylic acid ($C_{10}H_{11}O_2NS$)	83RVc
2-(2-Furyl)-1,3-thiazoline-4-carboxylic acid ($C_8H_{10}O_3NS$)	83RVc
N-(4-Methylphenylsulfonyl)glycine (N-tosylglycine) ($C_9H_{11}O_4NS$)	83AB
N-(Benzenesulfonyl)-L-phenylalanine ($C_{15}H_{15}O_4NS$)	80MJa
N-(5-Dimethylaminonaphthalene-1-sulfonyl)glycine (N-dansylglycine) ($C_{14}H_{16}O_4N_2S$)	60KF, 81IK, 85GGM
N-Dansylphenylalanine ($C_{21}H_{22}O_4N_2S$)	81IK
Trimethylenediiminodiacetic acid ($C_7H_{14}O_4N_2$)	83EH

c. Tertiary amines

N,N-Diethylglycine ($C_6H_{13}O_2N$) (Values in Vol.1, p.100)	84L
N-Benzyl-L-proline ($C_{12}H_{15}O_2N$)	80JM
N-(Carboxymethyl)-N-(2-hydroxyethyl)aminoacetohydroxamic acid ($C_6H_{12}O_5N_2$) (Values in Vol.1, p.104)	83KJa
N,N-Bis(2-hydroxyethyl)aminoacetic acid (bicine) ($C_5H_{13}O_4N$) (Values in Vol.1, p.105 and other references in Vol.5, p.456)	83NK, 84Gb

Aminocarboxylic acids (continued)

<u>Ligand</u>	<u>Bibliography</u>
N-(Acetylaminomethyl)-L-proline ($C_8H_{14}O_3N_2$)	80MJ
N-(Hydroxymethylaminocarbonylbutanoylaminomethyl)-L-proline ($C_{12}H_{21}O_5N_3$)	80MJ
N,N'-Dimethylethylenedinitrilodiacetic acid ($C_8H_{16}O_4N_2$) (Values in Vol.1, p.109)	83EH
1,5-Diazacyclooctane-1,5-diacetic acid ($C_{10}H_{18}O_4N_2$)	85EH
N,N'-Bis(2-hydroxyethyl)ethylenedinitrilodiacetic acid ($C_{10}H_{20}O_6N_2$)	81MMS, 83MMS, 84MMS
N,N'-Bis(2-hydroxyethyl)ethylenedinitrilodisuccinic acid ($C_{14}H_{24}O_{10}N_2$)	72H
7-Oxa-1,4-diazacyclononane-1,4-diacetic acid ($C_{10}H_{18}O_5N_2$)	85EH
8-Oxa-1,5-diazacyclodecane-1,5-diacetic acid ($C_{11}H_{20}O_5N_2$)	85EH
8,11-Dioxa-1,5-diazacyclotridecane-1,5-diacetic acid ($C_{13}H_{24}O_6N_2$)	85EH
N,N-Bis(2-aminoethyl)glycine ($C_6H_{15}O_2N_3$) (Values in Vol.1, p.108 and Vol.5, p.58)	81WN
Diethylenetrinitrilo-N,N"-diacetic-N,N',N"-tris(methylene-phosphonic acid) ($C_{11}H_{26}O_{13}N_3P_3$)	84ZG
Folic acid ($C_{17}H_{18}O_6N_6$) (Other reference in Vol.5, p.456)	85AT

2. Iminodiacetic acid derivatives

N-(2-Sulfoethyl)iminodiacetic acid ($C_6H_{11}O_7NS$) (Values in Vol.1, p.60)	70B, 82BM
N,N-Bis(carboxymethyl)glycylglycine (diglycine-N,N-diacetic acid) ($C_8H_{12}O_7N_2$) (Values in Vol.1, p.179)	84NK
2-(Carboxymethyloxy)benzyliminodiacetic acid ($C_{13}H_{15}O_5N$)	85ZX
5-Bis(carboxymethyl)aminomethyl-4-hydroxy-3-methoxybenzaldehyde ($C_{13}H_{15}O_7N$)	81LZZ
N-(5-Benzoyl-2-hydroxy-3-methoxybenzyl)iminodiacetic acid ($C_{19}H_{19}O_7N$)	81SYV
3-Bis(carboxymethyl)aminomethyl-1,2-dihydroxyanthraquinone (Alizarin Complexone) ($C_{19}H_{15}O_8N$) (Other reference in Vol.5, p.457)	81EEa, 81EI, 82XI
5'-Bis(carboxymethyl)aminomethyl-3,3'-bis(2-propyl)-6,6'-dimethyl-4'-hydroxyfuchson-2"-sulfonic acid (semi-Methylthymol Blue) ($C_{32}H_{37}O_9NS$)	83Kb
N-[3-(3-Carboxy-3-hydroxypropylamino)-3-carboxy-2-hydroxy-propyl]azetidine-2-carboxylic acid (mugineic acid) ($C_{12}H_{20}O_8N_2$)	81STM
N-[3-(3-Amino-3-carboxypropylamino)-3-carboxypropyl]-azetidine-2-carboxylic acid (nicotinamine) ($C_{12}H_{21}O_6N_3$)	83BSR
Ethylenedinitrilo-N,N'-di(3-propanoic)-N,N'-diacetic acid ($C_{12}H_{20}O_8N_2$) (Values in Vol.1, p.242)	81GMB
2,2'-Ethylenebis(phenylmethylnitrilo)tetraacetic acid ($C_{24}H_{28}O_8N_2$)	84VSO

Iminodiacetic acid derivatives (continued)

<u>Ligand</u>	<u>Bibliography</u>
2,2'-trans-Vinylenebis(phenylmethylnitrilo)tetraacetic acid (trans-stilbene-2,2'-bis(methylnitrilo)tetraacetic acid) (C ₂₄ H ₂₆ O ₈ N ₂)	84VSO
4,4'-trans-Vinylenebis(phenylmethylnitrilo)tetraacetic acid (C ₂₄ H ₂₆ O ₈ N ₂)	84VSO
2,2'-Acetylenebis(phenylmethylnitrilo)tetraacetic acid (C ₂₄ H ₂₄ O ₈ N ₂)	84VSO
1,8-Naphthalene-3,3'-bis(phenylmethylnitrilo)tetraacetic acid (C ₃₂ H ₃₀ O ₈ N ₂)	82LV
1,8-Naphthalene-3,4'-bis(phenylmethylnitrilo)tetraacetic acid (C ₃₂ H ₃₀ O ₈ N ₂)	82LV
1,8-Naphthalene-4,4'-bis(phenylmethylnitrilo)tetraacetic acid (C ₃₂ H ₃₀ O ₈ N ₂)	82LV
5,5'-Bis[bis(carboxymethyl)aminomethyl]-3,3'-dimethyl-4'-hydroxy-fuchson-2"-carboxylic acid (Phthalein Complexon) (C ₃₂ H ₃₂ O ₁₂ N ₂)	81GML
Bis[bis(carboxymethyl)aminomethyl]fluorescein (fluroexone) (C ₃₀ H ₂₈ O ₁₁ N ₂)	80AK
N'-(2-Ethoxyethyl)diethylenetrinitrilotetraacetic acid (C ₁₆ H ₂₉ O ₉ N ₃)	85TSS
Diethylenetrinitrilopentaacetic acid N,N"-bis(carboxydecylamide) (Puchel) (C ₃₆ H ₆₅ O ₁₂ N ₅)	84DM
3. <u>Peptides</u>	
Glycyl-L-valine (C ₇ H ₁₄ O ₃ N ₂) (Values in Vol.1, p.298 and Vol.5, p.93)	80SKc, 83Ab, 84YM, 85PO
Glycyl-L-phenylalanine (C ₁₁ H ₁₄ O ₃ N ₂) (Values in Vol.1, p.300 and Vol.5, p.94)	82S
Glycyl-L-tryptophan (C ₁₃ H ₁₄ O ₃ N ₃) (Other reference in Vol.1, p.410)	84WRa
L-Tryptophylglycine (C ₁₃ H ₁₄ O ₃ N ₃)	84WRa
DL-Alanyl-DL-alanine (C ₆ H ₁₂ O ₃ N ₂) (Other references in Vol.1, p.410 and Vol.5, p.458)	81KR, 82KR, 82RRa, 82RRb, 83KR, 84YMD, 85OP
DL-Alanyl-DL-norvaline (C ₈ H ₁₆ O ₃ N ₂)	83Ab, 85PO
DL-Alanyl-DL-norleucine (C ₉ H ₁₈ O ₃ N ₂)	85OP
DL-Alanyl-DL-valine (C ₈ H ₁₆ O ₃ N ₂) (Other references in Vol.1, p.410 and Vol.5, p.458)	85OP
DL-Alanyl-DL-leucine (C ₉ H ₁₈ O ₃ N ₂) (Other references in Vol.5, p.458)	81KR, 82KR, 82RRa, 82RRb, 83KR, 85OP
DL-Alanyl-DL-methionine (C ₈ H ₁₆ O ₃ N ₂ S)	83Ab
DL-Alanyl-DL-histidine (C ₉ H ₁₄ O ₃ N ₄)	82ED
DL-Histidyl-DL-alanine (C ₉ H ₁₄ O ₃ N ₄)	82ED
DL-Valyl-DL-histidine (C ₁₁ H ₁₈ O ₃ N ₄)	82ED

Peptides (continued)

<u>Ligand</u>	<u>Bibliography</u>
DL-Histidyl-DL-valine ($C_{11}H_{18}O_3N_4$)	82ED
DL-Leucyl-DL-leucine ($C_{12}H_{24}O_3N_2$) (Other reference in Vol.5, p.459)	81KR, 82KR, 83KR
L-Tyrosyl-L-tyrosine ($C_{18}H_{20}O_5N_2$)	83IS
L-Leucylglycylglycine ($C_{10}H_{19}O_4N_3$) (Other references in Vol.1, p.403 and values in Vol.5, p.115)	81SGK, 81SK
Glycylglycyl-L-tyrosine ($C_{13}H_{17}O_5N_3$)	83IS
Glycyl-L-tyrosylglycine ($C_{13}H_{17}O_5N_3$)	83IS
L-Tyrosylglycylglycine ($C_{13}H_{17}O_5N_3$)	81SGK, 83IS
DL-Histidylglycylglycine ($C_{10}H_{15}O_4N_5$) (Other references in Vol.5, p.459)	83DEL
L-5-Glutamyl-3-(DL-2-amino-2-carboxyethylthio)-L-alanyl-glycine (DL-cysteine-glutathione disulfide) ($C_{13}H_{22}O_8N_4S_2$)	84TC
DL-Aspartyl-DL-alanyl-DL-histidine amide ($C_{13}H_{20}O_5N_6$)	82AG
DL-Arginyl-DL-lysyl-DL-aspartyl-DL-valyl-DL-tyrosine ($C_{30}H_{49}O_7N_9$)	84SKG

4. Anilinecarboxylic acids

2-Aminobenzoic acid (anthranilic acid) ($C_7H_7O_2N$) (Values in Vol.1, p.338 and Vol.5, p.121)	81YK, 82KY, 84RBa
3-Aminobenzoic acid ($C_7H_7O_2N$) (H^+ values in Vol.1, p.405 and other references in Vol.5, p.459)	83RBc
Phenylanthranilic acid ($C_{13}H_{11}O_2N$)	77MMN
4-Aminophenylthioacetic acid ($C_8H_9O_2NS$)	75DP
N-(2,6-Dimethylphenyl)iminodiacetic acid ($C_{12}H_{15}O_4N$)	82SGA
N-(2-Hydroxyphenyl)iminodiacetic acid ($C_{10}H_{11}O_5N$) (Values in Vol.1, p.359)	71EV
4,4'-Methylenebis(phenylnitrilo)tetraacetic acid ($C_{21}H_{22}O_8N_2$)	80MCC

5. Pyridinecarboxylic acids

Pyridine-4-carboxylic acid (isonicotinic acid) ($C_6H_5O_2N$) (H^+ values in Vol.1, p.407 and other reference in Vol.5, p.459)	70Ba, 77CDM
6-Methylpyridine-2-carboxylic acid ($C_7H_7O_2N$) (Values in Vol.1, p.371)	70Ba, 70R
Pyridine-2-carboxylic acid N-oxide ($C_6H_5O_3N$) (Values in Vol.1, p.373)	70Ba, 70P, 70R, 81RRa, 81RRb
Pyridine-2,3-dicarboxylic acid (quinolinic acid) ($C_7H_5O_4N$) (Values in Vol.1, p.375 and other reference in Vol.5, p.459)	77CDD, 81SJ
Pyridine-2,4-dicarboxylic acid (lutidinic acid) ($C_7H_5O_4N$) (Values in Vol.1, p.375 and other reference in Vol.5, p.459)	77CDD
Pyridine-2,5-dicarboxylic acid (isocinchomeric acid) ($C_7H_5O_4N$) (Values in Vol.1, p.376 and other reference in Vol.5, p.459)	77CDD, 83PSS

Pyridinecarboxylic acids (continued)

<u>Ligand</u>	<u>Bibliography</u>
3-Hydroxypyridine-2-carboxylic acid ($C_6H_5O_3N$) (Other reference in Vol.1, p.408)	81BMa
4-Hydroxypyridine-2-carboxylic acid N-oxide ($C_6H_5O_4N$)	81RRa, 82RRc
4-Methoxypyridine-2-carboxylic acid N-oxide ($C_7H_7O_4N$)	81RRa, 82RRc
4-Ethoxypyridine-2-carboxylic acid N-oxide ($C_8H_9O_4N$)	81RRa, 82RRc
4-Propoxypyridine-2-carboxylic acid N-oxide ($C_9H_{11}O_4N$)	81RRa
2-Aminopyridine-3-carboxylic acid (2-aminonicotinic acid) ($C_6H_6O_2N_2$)	80SGK, 80SK
Pyridine-2,6-bis(methylnitrilo)tetraacetic acid ($C_{15}H_{19}O_8N_3$)	84VO
4-Methoxypyridine-2,6-bis(methylnitrilo)tetraacetic acid ($C_{16}H_{21}O_9N_3$)	84VO
4-Dimethylaminopyridine-2,6-bis(methylnitrilo)tetraacetic acid ($C_{17}H_{23}O_8N_4$)	84VO
B. <u>Amines</u>	
1. <u>Primary amines</u>	
Propylamine (C_3H_9N) (Values in Vol.2, p.3 and other reference in Vol.5, p.459)	84KM
Butylamine ($C_4H_{11}N$) (Values in Vol.2, p.3)	81TB, 84KM
Pentylamine ($C_5H_{13}N$) (Values in Vol.2, p.4)	84KM
Hexylamine ($C_6H_{15}N$) (Values in Vol.2, p.4 and Vol.5, p.430)	84KM
Aminobenzene (aniline) (C_6H_7N) (Values in Vol.2, p.8 and Vol.5, p.133)	63BK
2-Aminoethanesulfonic acid (taurine) ($C_2H_7O_3NS$) (Values in Vol.2, p.10 and other references in Vol.5, p.460)	84MCa
4',4"-Bis(2-phenylazo-1-aminonaphthalene-4-sulfonic acid) 83BL (Congo Red) ($C_{32}H_{24}O_6N_6$)	
2-Hydroxybenzylamine (C_7H_9ON)	60BF, 84ZX
2-Amino-4-sulfophenol ($C_6H_7O_4NS$)	85DJ
Tyrosine methylester ($C_{10}H_{12}O_3N$)	83IS
Tyrosine ethylester ($C_{11}H_{14}O_3N$)	83IS
DL-1-Amino-2-propanol (C_3H_9ON) (Values in Vol.2, p.16 and other references in Vol.5, p.460)	80AAa, 81AAC, 82AAC, 82RM
DL-2-Aminobutanol ($C_4H_{11}ON$) (H^+ values in Vol.2, p.332 and Vol.5, p.431)	80AAC, 82AAC
2-Amino-2-methylpropanol ($C_4H_{11}ON$) (H^+ values in Vol.2, p.332 and Vol.5, p.431)	77KR, 82AAC, 83RM
3-Aminopropanol (C_3H_9ON) (Values in Vol.2, p.16)	80AAa, 81AAC
2-Methoxyethylamine (C_3H_9ON) (Values in Vol.2, p.21)	84KM
3-Aminopropanethiol (C_3H_9NS) (Other reference in Vol.5, p.460)	83BV
4-Aminobutanethiol ($C_4H_{11}NS$) (Other reference in Vol.5, p.460)	83BV

Primary amines (continued)

<u>Ligand</u>	<u>Bibliography</u>
2-Aminobenzenethiol (C_6H_7NS)	81BCc
2-Ethylthioethylamine ($C_4H_{11}NS$) (Values in Vol.5, p.139)	72MM
Glycinamide ($C_2H_5ON_2$) (Values in Vol.2, p.26 and Vol.5, p.136)	80NSa, 81NMK
L-Aspartamide ($C_4H_9O_2N_3$)	84KW
DL-Methylethylenediamine (1,2-propylenediamine, pn) ($C_3H_{10}N_2$) (Values in Vol.2, p.39 and Vol.5, p.143)	80GCG, 82KJ, 83GJ, 83GV, 83GVa, 84GV, 85ISB
Hexamethylenediamine ($C_6H_{16}N_2$) (H^+ Values in Vol.1, p.334 and other references in Vol.5, p.461)	80BMK
4-Methyl-1,2-diaminobenzene ($C_7H_{10}N_2$)	80AM
4-Methyl-1,3-diaminobenzene ($C_7H_{10}N_2$)	80AM
4,7-Dioxa-1,10-diazadecane [ethylenebis(oxyethyleneamine)] ($C_6H_{16}O_2N_2$) (Values in Vol.3, p.58 and Vol.5, p.148)	83SC
N,N'-Bis(aminoacetyl)carbamide ($C_5H_{10}O_3N_4$)	80SAB

2. Secondary amines

Hexamethyleneimine ($C_5H_{11}N$)	80BMK
Phenylhydrazine ($C_6H_8N_2$) (Other references in Vol.2, p.335 and H^+ values in Vol.5, p.434)	83KMa, 84KCM
DL-2-(1-Methylethylamino)-1-(3,4-dihydroxyphenyl)ethanol (isoprenaline) ($C_{11}H_{16}O_3N$) (H^+ values in Vol.2, p.335)	80VC
2-Methylamino)ethanol (N-methylethanolamine) (C_3H_8ON) (Values in Vol.2, p.79)	77RK, 80AA, 80AAa, 82AAC
2-Ethylamino)ethanol (N-ethylethanolamine) ($C_4H_{10}ON$) (Values in Vol.2, p.79)	80AA, 80AAa, 82AAC
2-(Methylamino)ethanethiol (C_3H_9NS)	83BV
N-Ethylethylenediamine ($C_4H_{12}N_2$) (Values in Vol.2, p.83)	61KE, 61KEa, 72MM
N,N-Dibenzylethylenediamine ($C_{16}H_{20}N_2$)	80OY
2-(3-Aminopropylamino)ethanol [N-(2-hydroxyethyl)trimethylene- diamine] ($C_4H_{12}ON_2$) (Values in Vol.2, p.97)	77KR
DL-1-(2-Aminoethylamino)-2-propanol [N-(2-hydroxypropyl)- ethylenediamine] ($C_5H_{14}ON_2$) (Values in Vol.2, p.96)	61KE, 61KEa
3-(2-Aminoethylamino)propanol [N-(3-hydroxypropyl)ethylene- diamine] ($C_5H_{14}ON_2$) (Other reference in Vol.2, p.348)	61KE, 61KEa
Ethylenediiminodi-2-ethanol [N,N'-bis(2-hydroxyethyl)ethylene- diamine] ($C_6H_{16}O_2N_2$) (Values in Vol.2, p.98 and other references in Vol.5, p.461)	81BSM

Secondary amines (continued)

<u>Ligand</u>	<u>Bibliography</u>
3,7-Diazanonanedioic acid diamide ($C_7H_{16}O_2N_4$) (Other references in Vol.2, p.348 and Vol.5, p.461)	84G
1,4,8-Triazaoctane (2,3-tri) ($C_5H_{15}N_3$) (Other references in Vol.2. p.103 and values in Vol.5, p.163)	75WO
3. <u>Tertiary amines</u>	
5-Dimethylaminonaphthalene-1-sulfonic acid ($C_{12}H_{13}O_3NS$)	60KF
2-(Dimethylamino)ethanol ($C_4H_{11}ON$) (Values in Vol.2, p.115)	77KR, 80AAa, 83AAC
2-(Diethylamino)ethanol ($C_6H_{15}ON$) (Values in Vol.2, p.116)	77KR, 80AAa, 83AAC
DL-1-(Dimethylamino)-2-propanol ($C_5H_{13}ON$) (H^+ Values in Vol.2, p.337)	77KR, 82RM
N-Butyliminodi-2-ethanol (N-butyldiethanolamine) ($C_8H_{19}O_2N$)	77KR
rac-Nitrilotri-1-(2-propanol) [tris(2-hydroxypropyl)amine] ($C_9H_{21}O_3N$)	82ME, 82RM
2-Amino-2-deoxy-D-glucopyranose (D-glucosamine) ($C_6H_{13}O_5N$) (H^+ values in Vol.5, p.432)	85MDD
2-(Dimethylamino)ethanethiol ($C_4H_{11}NS$)	83BV
2-(Diethylamino)ethanethiol ($C_6H_{15}NS$)	83BV
4-Diethylaminophthalhydrazide ($C_{12}H_{15}O_2N_3$)	81DPS, 85PD
N,N,N',N'-Tetramethylethylenediamine ($C_6H_{16}N_2$) (Values in Vol.2, p.125 and Vol.5, p.174)	84OY, 84RH, 85RRb
Ethylenedinitrilotetra-2-ethanol ($C_{10}H_{24}O_4N_2$) (Values in Vol.1, p.128)	71RMS
4. <u>Quaternary amines</u>	
2-Hydroxy-N,N,N-trimethylanilinium iodide ($C_9H_{14}ONI$)	83H
5. <u>Cyclic amines</u>	
1,4,7-Triazacyclononane ([9]ane N_3) ($C_6H_{15}N_3$) (Values in Vol.5, p.181)	75WO
1,4,7-Triazacyclodecane ([10]ane N_3) ($C_7H_{17}N_3$) (Values in Vol.5, p.181)	80GMZ
1,5,9-Triazacyclotridecane ([13]ane N_3) ($C_{10}H_{23}N_3$)	80KY
1,4,7,10-Tetramethyl-1,4,7,10-tetraazacyclododecane ($C_{12}H_{28}N_4$)	82CH
1,4,8,11-Tetraazacycloheptadecane ($C_{13}H_{30}N_4$)	84BBS
1,3,5,7-Tetraazatricyclo[3.3.1.1 ^{3,7}]decane (hexamethylenetetramine) ($C_6H_{12}N_4$) (Other references in Vol.2. p.348 and values in Vol.5, p.180)	80PSa, 82II

Cyclic amines (continued)

<u>Ligand</u>	<u>Bibliography</u>
3,8,16,21,28-Hexaazatricyclo[21.3.1.1 ^{10,14}]octacos-10,12,23,25,27,29-hexaene (C ₂₂ H ₄₀ N ₆)	85ASS
1,4,7-Trioxa-10,13-diazacyclopentadecane (C ₁₀ H ₂₂ O ₃ N ₂)	83LC
1,4,10-Trioxa-7,13-diazacyclopentadecane (C ₁₀ H ₂₂ O ₃ N ₂) (Values on Vol.5, p.189)	79GF,82AS,83CS, 83LC
7,13-Dimethyl-1,4,10-trioxa-7,13-diazacyclopentadecane (C ₁₂ H ₂₆ O ₃ N ₂)	79GF,85GLa
7,13-Bis(2-hydroxyethyl)-1,4,10-trioxa-7,13-diazacyclopentadecane (C ₁₄ H ₃₀ O ₅ N ₂)	79GF,85GLa
1,4,7,13-Tetraoxa-10,16-diazacyclooctadecane (C ₁₂ H ₂₆ O ₄ N ₂)	83LC
4,7,13,21,24-Hexaoxa-1,10-diazabicyclo[8.8.8]benzo[5.6]-hexacosane (benzocryptand[2.2.2]) (C ₂₂ H ₃₆ O ₆ N ₂)	78CK,84CTS
4,7,13,16,21,24-Hexaoxa-1,10-diazabicyclo[8.8.8]dibenzo[5,6-14,15]hexacosane (dibenzocryptand[2.2.2]) (C ₂₆ H ₃₆ O ₆ N ₂)	81CKa,84CTS
1,10-Dioxa-4,7,13,16-tetraazacyclooctadecane (C ₁₂ H ₂₈ O ₂ N ₄)	83LC
1,4,8,11-Tetraazacyclotridecan-5,7-dione (C ₉ H ₁₈ O ₂ N ₄)	82HB
10,22,27,32-Tetrathia-4,16-dioxa-1,7,13,19-tetraazatricyclo[17.5.5.5 ^{7,13}]tetratriacontane (C ₂₄ H ₄₈ O ₆ N ₄)	85AAS

6. Thiazoles

4-(1,3-Thiazol-2-ylazo)resorcinol (TAR) (C ₉ H ₇ O ₂ N ₃ S) (Other references in Vol.2. p.349 and Vol.5, p.463)	850a
2-Hydroxy-1-(1,3-thiazol-2-ylazo)naphthalene-3,6-disulfonic acid (3,6-disulfo-TAN) (C ₁₃ H ₉ O ₇ N ₃ S ₃)	83P,84PSR
1,8-Dihydroxy-2-(1,3-thiazol-2-ylazo)naphthalene-3,6-disulfonic acid (TAC) (C ₁₃ H ₉ O ₈ N ₃ S ₃)	81PSR,82PR,83P, 84PSR

7. 1,2-Diazoles

3-Methylpyrazole (C ₄ H ₆ N ₂) (Other references in Vol.2. p.349 and values in Vol.5, p.205)	80BI,80CF
3,5-Dimethylpyrazole (C ₅ H ₈ N ₂) (Values in Vol.1, p.205)	80BI,80CF
3-Methyl-1-phenylpyrazole (C ₁₀ H ₁₀ N ₂)	80CF
3-Methyl-1-phenyl-4-benzoylpyrazol-5-one (C ₁₇ H ₁₃ O ₂ N ₂)	80S
5-Mercapto-3-phenyl-1,3,4-thiadiazole-2-thione (Bismuthol-II) (C ₈ H ₆ N ₂ S ₂)	85SSM
Bis(2,3-dimethyl-5-oxo-1-phenylpyrazol-4-yl)methane (diantipyrinylmethane) (C ₂₃ H ₂₄ O ₂ N ₄) (Other references in Vol.2, p.366 and Vol.5, p.463)	82SK
Diantipyrinylpropylmethane (C ₂₆ H ₃₀ O ₃ N ₄)	82SKa

8. 1,3-Diazoles

1-(2-Imidazolin-2-yl)naphthalene (C ₁₃ H ₁₀ N ₂)	77KLa
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1,3-Diazoles (continued)

<u>Ligand</u>	<u>Bibliography</u>
2-Amino-3(4-imidazolyl)propanohydroxamic acid (histidinehydroxamic acid) ($C_6H_{10}O_2N_4$)	84BS
2-(Hydroxymethyl)benzo-1,3-diazole ($C_8H_8ON_2$)	85ROC
5-Methyl-2-(hydroxymethyl)benzo-1,3-diazole ($C_9H_{10}ON_2$)	85ROC
5-Chloro-2-(hydroxymethyl)benzo-1,3-diazole ($C_8H_7ON_2Cl$)	85ROC
Cyclo(glycyl-L-histidyl) ($C_8H_{10}O_2N_4$)	85KI
Cyclo(L-histidyl-L-histidyl) ($C_{11}H_{15}O_2N_6$)	81K
Cyclo(L-methionyl-L-histidyl) ($C_{11}H_{16}O_2N_4S$)	85KI
2-Mercaptoimidazole ($C_3H_4N_2S$) (H^+ values in Vol.5, p.439)	77STa
2-Mercapto-1-methylimidazole ($C_4H_6N_2S$) (H^+ values in Vol.5, p.439)	77STa
2-Mercapto-4-(2-aminoethyl)imidazole (2-mercaptohistamine) ($C_5H_9N_3S$) (H^+ values in Vol.5, p.439)	77STa
1-Methylhistamine ($C_6H_{11}N_3$)	85DJa
1-(2-Imidazolin-2-yl)isoquinoline ($C_{12}H_9N_3$)	77KLa
Pilocarpine ($C_{11}H_{13}O_2N_2$)	83LW
Tolazoline ($C_{10}H_{12}N_2$)	83LW
Metronidazole ($C_6H_9O_3N_2$)	83LW

9. Triazoles

4-Butyl-1,2,4-triazole ($C_6H_{11}N_3$)	81RP
6-(1,2,4-Triazolyl-3-azo)-2,4-dimethylphenol ($C_{10}H_{11}ON_5$)	83CNG

10. Tetrazoles

1-(5-Tetrazolylazo)-2-hydroxynaphthalene-3,6-disulfonic acid (T-azo-R) ($C_{11}H_9O_7N_6S_2$) (Other reference in Vol.5, p.460)	78RP, 79PR, 81PSR, 83P, 84PSR
2-(5-Tetrazolylazo)-1,8-dihydroxynaphthalene-3,6-disulfonic acid (T-azo-C) ($C_{11}H_9O_8N_6S_2$)	79PR, 81PSR, 82PR, 83P, 84PSR
5-Mercapto-1-phenyltetrazole ($C_7H_6N_4S$)	82PPG
N,N'-Bis(2-tetrazol-5-ylethyl)ethylenediamine ($C_8H_{16}N_{10}$)	81ES
N,N'-Bis(2-tetrazol-5-ylethyl)diethylenetriamine ($C_{10}H_{21}N_{11}$)	81ES
N,N'-Bis(2-tetrazol-5-ylethyl)triethylenetetraamine ($C_{12}H_{26}N_{12}$)	81ES

11. Azinesa. Pyridines

2,3-Dimethylpyridine (2,3-lutidine) (C_7H_9N) (Other references in Vol.2, p.171 and values in Vol.5, p.225)	68PP
2,4-Dimethylpyridine (2,4-lutidine) (C_7H_9N) (Values in Vol.2, p.171 and Vol.5, p.225)	68PP
2,5-Dimethylpyridine (2,5-lutidine) (C_7H_9N) (Values in Vol.2, p.172 and Vol.5, p.225)	68PP

Azines (continued)

<u>Ligand</u>	<u>Bibliography</u>
3,4-Dimethylpyridine (3,4-lutidine) (C_7H_9N) (Other references in Vol.2, p.173 and values in Vol.5, p.226)	68PP
3,5-Dimethylpyridine (3,5-lutidine) (C_7H_9N) (Values in Vol.2, p.174 and other reference in Vol.5, p.464)	68PP
2-Methylpyridine (C_6H_7N) (Values in Vol.2, p.167 and Vol.5, p.220)	68PP, 73BM, 74KI, 85KS
3-Methylpyridine (C_6H_7N) (Values in Vol.2, p.168 and Vol.5, p.222)	68PP, 73BM, 74KI, 80CZ, 85KS
4-Methylpyridine (C_6H_7N) (Values in Vol.2, p.169 and Vol.5, p.223)	68PP, 73BM, 81FS, 85KS
4-Phenylpyridine ($C_{11}H_9N$) (Values in Vol.2, p.176)	80CKa
3-Chloropyridine (C_5H_4NCl) (Other reference in Vol.1, p.340 and values in Vol.5, p.224)	84ER
2-Amino-3-hydroxypyridine ($C_5H_6ON_2$) (Other reference in Vol.5, p.464)	82KMG, 85SS
1-Pyridylazo-2-naphthol-6-sulfonic acid ($C_{15}H_{12}O_4N_3S$)	82OW
1-Pyridylazo-2-naphthol-7-sulfonic acid ($C_{15}H_{12}O_4N_3S$)	82OW
1-Pyridylazo-2-naphthol-8-sulfonic acid ($C_{15}H_{12}O_4N_3S$)	82OW
2-Pyridylazo-1-naphthol-3-sulfonic acid ($C_{15}H_{12}O_4N_3S$)	82OW
2-Pyridylazo-1-naphthol-4-sulfonic acid ($C_{15}H_{12}O_4N_3S$)	82OW
2-Pyridylazo-1-naphthol-5-sulfonic acid ($C_{15}H_{12}O_4N_3S$)	82OW
2-Pyridylazo-1-naphthol-6-sulfonic acid ($C_{15}H_{12}O_4N_3S$)	82OW
2-Pyridylazo-1-naphthol-7-sulfonic acid ($C_{15}H_{12}O_4N_3S$)	82OW
2-Pyridylazo-1-naphthol-8-sulfonic acid ($C_{15}H_{12}O_4N_3S$)	82OW
1,3-Dihydroxy-4-(2-pyridylazo)benzene (PAR) ($C_{11}H_9O_2N_3$) (Values in Vol.2, p.178 and H^+ values in Vol.5, p.440)	64H, 78K, 80HL, 82VJ, 83O, 84Oa, 85MBK
Pyridine-4-carboxylic acid methylester ($C_7H_7O_2N$)	81FS
Pyridine-4-carboxylic acid N-acetylhydrazide (acylisonicotinyl hydrazine) ($C_8H_9O_2N_3$)	80ZM
Pyridine-3-hydroxamic acid (nicotino-hydroxamic acid) ($C_6H_5O_2N_2$) (Other references in Vol.5, p.464)	83Ad
Pyridine-2-cyanoxime ($C_7H_7ON_3$)	84GCB
2-Acetylpyridine thiosemicarbazone ($C_8H_{10}N_4S$)	76AP
4-Aminopyridine ($C_5H_6N_2$) (Values in Vol.2, p.208 and Vol.5, p.240)	71BF, 73BM, 74KI
2-(Methylaminomethyl)pyridine ($C_7H_{10}O_2N_2$) (Values in Vol.2, p.214 and Vol.5, p.243)	73BM
3-(N-Methyl-2-azolidinyl)pyridine (nicotine) ($C_{10}H_{14}N_2$)	80TMb, 81TMb

Azines (continued)

b. Benzo[b]pyridines

<u>Ligand</u>	<u>Bibliography</u>
Benzo[c]pyridine (isoquinoline) (C_9H_7N) (Values in Vol.2, p.222 and other reference in Vol.5, p.465)	80CKa
7-Iodo-8-hydroxyquinoline-5-sulfonic acid (ferron) ($C_9H_6O_4NIS$) (Values in Vol.2, p.232 and Vol.5, p.441)	82PSV, 83Ac, 85ZH
7-Nitro-8-hydroxyquinoline-5-sulfonic acid ($C_9H_6O_6N_2S$) (Values in Vol.2, p.231 and other reference in Vol.5, p.465)	72PS, 83Ac
7-Nitroso-8-hydroxyquinoline-5-sulfonic acid ($C_9H_6O_4N_2S$) Other reference in Vol.5, p.465)	81HA
2-Methyl-8-hydroxyquinoline ($C_{10}H_{10}ON$) (Values in Vol.2, p.225)	52BP, 67SR, 80R
4-Methyl-8-hydroxyquinoline ($C_{10}H_{10}ON$) (Other reference in Vol.2, p.351)	80R
5,7-Dichloro-8-hydroxyquinoline ($C_{10}H_6ONCl_2$) (Values in Vol.2, p.226)	67SR, 80NKB
7-(1-Vinyl-3,3,5,5-tetramethylhexyl)-8-hydroxyquinoline ($C_{22}H_{30}ON$)	82BFa
6-Methyl-8-mercaptoquinoline-5-sulfonic acid ($C_{10}H_9O_3NS_2$)	85DAB
Quinoline-2-cyanoxine ($C_{11}H_9ON_3$)	84GCB

c. Dipyridines

Iminobis(methylene-2-pyridine) (di-2-picolyamine) ($C_{12}H_{13}N_3$) (Values in Vol.2, p.246)	81WN
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d. 1,10-Phenanthrolines

2,9-Dimethyl-1,10-phenanthroline ($C_{14}H_{12}N_2$) (Values in Vol.2, p.260 and Vol.5, p.441)	84SH
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12. 1,3-Diazines

4-Amino-1,6-dihydro-1-methyl-2-methoxy-5-nitroso-6-oxo-pyrimidine ($C_6H_8O_3N_3$)	80VS
4-Amino-1,6-dihydro-1-methyl-2-methylthio-5-nitroso-6-oxo-pyrimidine ($C_6H_8O_2N_3S$)	84ML
6-Amino-5-nitrouracil ($C_4H_4O_4N_4$)	84SR
4-Amino-3-methyl-5-nitrosouracil ($C_5H_6O_3N_3$)	80LSG
4-Amino-1,3-dimethyl-5-nitrosouracil ($C_6H_8O_3N_3$)	77VG
Thiaminephosphate ($C_{12}H_{18}O_4N_4ClPS$) (Other reference in Vol.5, p.466)	81TN
Thiaminediphosphate ($C_{12}H_{19}O_7N_4ClP_2S$) (Other reference in Vol.5, p.466)	81TN
6,7-Dimethyl-9-D-1'-ribitylbenzo[b]-1,4-diazino[2,3-d]-1,3-diazin-2,4-dione (riboflavin) ($C_{17}H_{20}O_6N_4$) (Other references in Vol.5, p.465)	80LD, 84MMd

13. Purines

<u>Ligand</u>	<u>Bibliography</u>
9-(1-Ethoxyethyl)purine ($C_9H_{12}ON_4$)	80La
1-Methylinosine ($C_{11}H_{14}O_5N_4$)	81LV
7-Methylinosine ($C_{11}H_{14}O_5N_4$)	81LV, 84KMa
8-Ethylxanthine ($C_7H_8O_2N_4$)	85SSC
8-Ethyl-3-methylxanthine ($C_8H_{10}O_2N_4$)	85SSC
Adenosine-5'-(trihydrogen-1-thiodiphosphate) ($C_{10}H_{15}O_9N_5P_2S$)	84PHC
Adenosine-5'-(tetrahydrogen-1-thiotriphosphate) ($C_{10}H_{16}O_{12}N_5P_3S$)	84PHC
Adenosine-5'-(tetrahydrogen-2-thiotriphosphate) ($C_{10}H_{16}O_{12}N_5P_3S$)	84PHC
1, N^6 -Ethenoadenosine-5'-(trihydrogendiphosphate) ($C_{12}H_{15}O_{10}N_5P_2$)	79VW
1, N^6 -Ethenoadenosine-5'-(tetrahydrogentriphosphate) ($C_{12}H_{16}O_{13}N_5P_3$)	79VW

14. Aminophosphonic acids

1-Aminoethane-1,1-diphosphonic acid ($C_2H_7O_6NP_2$)	80KW
N-Sulfoethyliminobis(methylenephosphonic acid) ($C_4H_{13}O_9NP_2S$)	81LY, 83KDM
N-Mercaptoethyliminobis(methylenephosphonic acid) ($C_4H_{13}O_6NP_2S$)	81LY, 83KDM
N-(2-Hydroxyethyl)ethylenedinitrilotris(methylenephosphonic acid) ($C_7H_{21}O_{10}N_2P_3$) (Values in Vol.5, p.280)	79MZa
Hexamethylenedinitrilotetrakis(methylenephosphonic acid) ($C_{10}H_{18}O_{12}N_2P_4$)	80ZRa
Oxybis[ethylenenitrilobis(methylenephosphonic acid)] ($C_8H_{24}O_{13}N_2P_4$) (Values in Vol.5, p.282)	81LY, 83KDM
Thiobis[ethylenenitrilobis(methylenephosphonic acid)] ($C_8H_{24}O_{12}N_2P_4S$)	81LY, 83KDM
N'-Hexyldiethylenetrinitrilotetrakis(methylenephosphonic acid) ($C_{14}H_{37}O_{12}N_3P_4$)	84ZG
N'-Octyldiethylenetrinitrilotetrakis(methylenephosphonic acid) ($C_{16}H_{41}O_{12}N_3P_4$)	84ZG
Diethylenetrinitrilopentakis(methylenephosphonic acid) ($C_9H_{28}O_{15}N_3P_5$) (Values in Vol.2, p.325 and other reference in Vol.5, p.467)	79MZ, 79MZa, 82SPS, 84SB, 84ZG

C. Other Organic Ligands1. Carboxylic acidsa. Monocarboxylic acids

3-Methylbutanoic acid (isovaleric acid) ($C_5H_{10}O_2$) (Values in Vol.3, p.12 and other references in Vol.5, p.467)	81J
2,2-Dimethylpropanoic acid (pivalic acid) ($C_5H_{10}O_2$) (Values in Vol.3, p.13 and Vol.5, p.286)	81J, 83NR
Cyclohexanecarboxylic acid ($C_7H_{12}O_2$) (H^+ values in Vol.3, p.330)	67CIH
Cyclohexylacetic acid ($C_8H_{14}O_2$) (H^+ values in Vol.3, p.330)	81Ja

Carboxylic acids (continued)

<u>Ligand</u>	<u>Bibliography</u>
Propenoic acid (acrylic acid) ($C_3H_4O_2$) (H^+ values in Vol.3, p.330 and other references in Vol.5, p.467)	80KCW
trans-But-2-enoic acid (crotonic acid) ($C_4H_6O_2$) (Values in Vol.3, p.14 and other references in Vol.5, p.467)	80DN,83GA,83KC,85MH
trans-3-Phenylpropenoic acid (trans-cinnamic acid) ($C_9H_8O_2$) (H^+ values in Vol.3, p.330 and other references in Vol.5, p.467)	83GA,83KC
2-Methylbenzoic acid ($C_8H_8O_2$) (H^+ values in Vol.3, p.331)	67WG,78SP,80SC,82EF
3-Methylbenzoic acid ($C_8H_8O_2$) (H^+ values in Vol.3, p.332)	72BF,78SP,80SC
4-Methylbenzoic acid ($C_8H_8O_2$) (H^+ values in Vol.3, p.332)	72BF,78SP,80SC
1-Naphthoic acid ($C_{11}H_8O_2$) (Other references in Vol.3, p.332 and H^+ values in Vol.5, p.442)	83MM
2-Nitrobenzoic acid ($C_7H_5O_4N$) (Values in Vol.3, p.22 and other references in Vol.5, p.468)	77FR,82ABb
3-Nitrobenzoic acid ($C_7H_5O_4N$) (Values in Vol.3, p.22 and other references in Vol.5, p.468)	77FR,82ABb
3,5-Dinitrobenzoic acid ($C_7H_4O_6N_2$) (H^+ value in Vol.3, p.335)	67SW,84AG,84RPH
Fluoroacetic acid ($C_2H_3O_2F$) (H^+ values in Vol.3, p.333 and other reference in Vol.5, p.467)	59D
Difluoroacetic acid ($C_2H_2O_2F_2$)	59D,69KF
Chlorodifluoroacetic acid ($C_2HO_2ClF_2$)	69KF
2-Chloropropanoic acid ($C_3H_5O_2Cl$) (H^+ values in Vol.3, p.333 and other references in Vol.5, p.468)	81TR
2,2-Dichloropropanoic acid ($C_3H_4O_2Cl_2$) (H^+ values in Vol.3, p.333)	81TR
2,3-Dichloropropanoic acid ($C_3H_4O_2Cl_2$) (H^+ values in Vol.3, p.333)	81J,81TR
2-Chlorobenzoic acid ($C_7H_5O_2Cl$) (Values in Vol.3, p.334 and other reference in Vol.5, p.468)	77RF,82EF
3-Chlorobenzoic acid ($C_7H_5O_2Cl$) (H^+ values in Vol.3, p.334)	77RF
2-Chloro-4-nitrobenzoic acid ($C_7H_4O_4NCl$)	84RPH
2,4-Dichlorobenzoic acid ($C_7H_4O_2Cl_2$)	84RPH
Bromoacetic acid ($C_2H_3O_2Br$) (Values in Vol.3, p.19 and other references in Vol.5, p.468)	59D,81J,80KCW
2-Bromopropanoic acid ($C_2H_3O_2Br$) (Values in Vol.3, p.333 and other references in Vol.5, p.468)	77PK,81J,81TR
3-Bromopropanoic acid ($C_3H_5O_2Br$) (Values in Vol.3, p.333 and other references in Vol.5, p.468)	81J,81TR
2-Bromobutanoic acid ($C_4H_7O_2Br$)	77PK
3-Bromo-3-methylbutanoic acid ($C_5H_9O_2Br$)	81J
Dibromoacetic acid ($C_2H_2O_2Br_2$)	59D

Carboxylic acids (continued)

<u>Ligand</u>	<u>Bibliography</u>
2,3-Dibromopropanoic acid ($C_3H_4O_2Br_2$) (H^+ values in Vol.3, p.333)	81TR
Tribromoacetic acid ($C_2HO_2Br_3$)	59D
Iodoacetic acid ($C_2H_3O_2I$) (Values in Vol.2, p.20 and other references in Vol.5, p.468)	59D,81J,80KCW
3-Iodopropanoic acid ($C_3H_5O_2I$)	81J
Phosphonoformic acid (CH_3O_5P) (H^+ values in Vol.5, p.443)	81FH,82FP
Phosphonoacetic acid ($C_2H_5O_5P$) (Other reference in Vol.3, p.359 and values in Vol.5, p.288)	81FH,82FP
DL-2-Hydroxy-2-methylbutanoic acid ($C_5H_{10}O_3$) (Values in Vol.3, p.38)	32Va,83IT
2-Hydroxy-2-ethylbutanoic acid ($C_6H_{12}O_3$) (Values in Vol.3, p.44)	83IT
DL-2-Hydroxy-2-ethylpentanoic acid ($C_7H_{14}O_3$)	32Va
2-Hydroxycyclopentanecarboxylic acid ($C_6H_{10}O_3$)	32Va
2-Hydroxycyclohexanecarboxylic acid ($C_7H_{12}O_3$)	32Va
Diphenylhydroxyacetic acid (benzilic acid) ($C_{14}H_{12}O_3$) (Values in Vol.3, p.50 and other reference in Vol.5, p.468)	85CA
2,4-Dihydroxy-3,3-dimethylbutanoic acid ($C_6H_{14}O_4$)	85FS
Lactobionic acid ($C_{12}H_{22}O_{12}$)	83ZG
4-Hydroxybutanoic acid ($C_4H_8O_3$) (Values in Vol.3, p.64 and Vol.5, p.297)	75BJ
D(+)-2,4-Dihydroxy-3,3-dimethylbutanoyl- β -alanine (pantothenic acid) ($C_9H_{17}O_5N$)	80FMS
Methoxyacetic acid ($C_3H_6O_3$) (Values in Vol.3, p.69 and Vol.5, p.300)	81Ja
2-Methoxybenzoic acid ($C_8H_8O_3$) (Values in Vol.3, p.73 and other references in Vol.5, p.468)	81MTK,83RCF
3-Methoxybenzoic acid ($C_8H_8O_3$) (H^+ values in Vol.3, p.339)	85ROF
2-[1-(2-Methoxy-5-sulfophenyl)-3-phenyl-5-formazano]benzoic acid ($C_{21}H_{17}O_6N_4S$)	83U
Oxoacetic acid (glyoxylic acid) ($C_2H_2O_3$) (Values in Vol.3, p.65 and Vol.5, p.298)	77BMa,84GSG
2-Acetoxybenzoic acid (acetylsalicylic acid) ($C_9H_8O_3$) (Other reference in Vol.3, p.360 and values in Vol.5, p.299)	65PP,85KL
2-(Acetylthio)benzoic acid (thioaspirin) ($C_8H_8O_3S$)	65PP,66SP
N-Acetylglutamine ($C_4H_7O_3N$) (Values in Vol.3, p.68 and Vol.5, p.299)	71JBV,83NR
N-Benzoylglutamine (hippuric acid) ($C_9H_9O_3N$) (Values in Vol.3, p.69 and Vol.5, p.299)	81VS,82SB

Carboxylic acids (continued)

<u>Ligand</u>	<u>Bibliography</u>
N-Benzenesulphonylglucylglycine ($C_{10}H_{11}O_5N_2S$)	85MCh
3-Methylorotic acid ($C_6H_6O_4N_2$) (Other reference in Vol.5, p.468)	81LGD
1,4,5,6-Tetrahydro-4,6-dioxo-1,3,5-triazine-2-carboxylic acid (oxonic acid) ($C_4H_3O_4N_3$)	81LDD
DL-2-Mercaptopropanoic acid (thiolactic acid) ($C_3H_6O_2S$) (Values in Vol.3, p.75 and other references in Vol.5, p.468)	80CK, 81CK, 82NAN, 83MO, 84J, 84MSa, 85SN
2-Mercaptobenzoic acid (thiosalicylic acid) ($C_7H_6O_2S$)	65PP, 66SP
3-Mercaptopropanoic acid ($C_3H_6O_2S$) (Values in Vol.3, p.76 and Vol.5, p.303)	82NAN, 84TZ
trans-N-[2(S)-3-Mercapto-2-methylpropanoyl]-L-proline (captopril) ($C_9H_{15}O_3NS$)	82RI, 85HSa
cis-N-[2(S)-3-Mercapto-2-methylpropanoyl]-L-proline ($C_9H_{15}O_3NS$)	82RI
Methylthioacetic acid ($C_3H_6O_2S$) (Values in Vol.3, p.77)	82CC
Ethylthioacetic acid ($C_4H_8O_2S$) (Values in Vol.3, p.77 and Vol.5, p.305)	80KVP
N-Amidino-N-methylaminoacetic acid (creatine) ($C_4H_9O_2N_3$) (H^+ values in Vol.3, p.339)	83SSb, 83SSc
Phenoxymethylpenicillin ($C_{16}H_{18}O_4N_2S$)	83SB
b. <u>Dicarboxylic acids</u>	
cis-Methylbutenedioic acid (citraconic acid) ($C_5H_6O_4$) (Values in Vol.3, p.114 and other references in Vol.5, p.469)	80NSd, 83KC
Pentanedioic acid (glutaric acid) ($C_5H_8O_4$) (Values in Vol.3, p.117 and Vol.5, p.314)	81MSa, 81SJ, 81SY, 81SYb, 83IT, 83Sc, 84LS, 84M
Hexanedioic acid (adipic acid) ($C_6H_{10}O_4$) (Values in Vol.3, p.118 and Vol.5, p.315)	80DN, 80FH, 81SJ, 81SSY, 83Sc, 84GV, 85KM
Octanedioic acid (suberic acid) ($C_8H_{14}O_4$)	67CIH, 84JP
Ethyl-3-methylbutylmalonic acid ($C_{10}H_{18}O_4$) (H^+ values in Vol.3, p.340)	67CIH
Cyclobutane-1,1-dicarboxylic acid ($C_6H_8O_4$) (Values in Vol.3, p.106 and Vol.5, p.311)	80GMR
endo-cis-Bicyclo[2,2,1]-5-heptene-2,3-dicarboxylic acid ($C_9H_{10}O_4$)	83ZB
exo-cis-Bicyclo[2,2,1]-5-heptene-2,3-dicarboxylic acid ($C_9H_{10}O_4$)	83ZB
3-Hydroxypentanedioic acid ($C_5H_8O_5$)	83GAD
2,3,4-Trihydroxypentanedioic acid (trihydroxyglutaric acid) ($C_5H_8O_7$) (Other references in Vol.3, p.359 and Vol.5, p.469)	69Ma
Oxybis(propanedioic acid) (ditartronic acid) ($C_6H_6O_9$) (Values in Vol.3, p.167)	84MMA
2-Nitrobenzene-1,4-dioxydiacetic acid ($C_{10}H_9O_8N$)	85TZ

Carboxylic acids (continued)

<u>Ligand</u>	<u>Bibliography</u>
4,4'-Thiodibutanoic acid ($C_8H_{14}O_4S$) (Other reference in Vol.3, p.342 and values in Vol.5, p.325)	84MT, 85HI
Dithiodiacetic acid ($C_4H_6O_4S_2$) (Values in Vol.3, p.144 and Vol.5, p.324)	80DBP, 82DBa, 83Sb, 85Sb
Thiosemicarbazidediacetic acid ($C_5H_9O_4N_3S$)	83BT

c. Tricarboxylic acids

DL-Methylcitric acid ($C_7H_{10}O_7$)	83GAD
DL-Homocitric acid ($C_7H_{10}O_7$)	83GAD
DL-threo-2-Methylisocitric acid ($C_7H_{10}O_7$)	83GAD
DL-erythro-2-Methylisocitric acid ($C_7H_{10}O_7$)	83GAD
DL-threo-Homoisocitric acid ($C_7H_{10}O_7$)	83GAD
DL-erythro-Fluorocitric acid ($C_6H_7O_7F$)	83GAD
DL-threo-1,2-Dihydroxypropane-1,2,3-tricarboxylic acid (garcinia acid) ($C_6H_8O_8$)	83GAD
DL-erythro-1,2-Dihydroxypropane-1,2,3-tricarboxylic acid (hibiscus acid) ($C_6H_8O_8$)	83GAD
2-Methoxypropane-1,2,3-tricarboxylic acid ($C_7H_{10}O_7$)	83GAD
Carboxymethoxypropanedioic acid ($C_5H_6O_7$) (Values in Vol.3, p.164)	84MMA
DL-Carboxymethylthiobutanedioic acid ($C_6H_8O_6S$) (Other reference in Vol.3, p.165 and values in Vol.5, p.331)	75DP, 83AS, 84Sa
Acetylaspartylvalylaspartylalanine ($C_{18}H_{28}O_{10}N_4$)	84ABA

2. Phosphorus acidsa. Phosphonic acids

Hexamethylenediphosphonic acid ($C_6H_{12}O_6P_2$) (H^+ values in Vol.5, p.345)	68DMA
1-Acetamidopropane-1,1-diphosphonic acid ($C_5H_{13}O_7NP_2$)	83LJ, 83LSJ
1-Propionamidoethane-1,1-diphosphonic acid ($C_5H_{13}O_7NP_2$)	83LJ, 83LSJ

b. Hydrogen phosphates

Phosphoric acid ethylester (ethylphosphate) ($C_2H_7O_4P$)	80FP
D(-)-Ribose-5-(tetrahydrogentriphosphate) ($C_5H_{13}O_{14}P_3$)	81BKO
Glycerol-1-(dihydrogenphosphate) ($C_3H_9O_6P$) (Values in Vol.3, p.172)	28M
Glucose-1-(dihydrogenphosphate) ($C_6H_{13}O_9P$) (Values in Vol.3, p.173)	52TM

3. Arsonic acid

	<u>Ligand</u>	<u>Bibliography</u>
Methylarsonic acid ($\text{CH}_3\text{O}_3\text{As}$)		76W
(Values in Vol.3, p.180 and Vol.5, p.445)		

4. Phenolsa. Monohydroxyphenols

2-Nitrophenol ($\text{C}_6\text{H}_5\text{O}_3\text{N}$)	(Values in Vol.3, p.183 and Vol.5, p.447)	78K
2,4-Dinitrophenol ($\text{C}_6\text{H}_4\text{O}_5\text{N}_2$)	(Values in Vol.3, p.183 and Vol.5, p.447)	78K
2,6-Dinitrophenol ($\text{C}_6\text{H}_4\text{O}_5\text{N}_2$)	(H^+ values in Vol.3, p.348 and Vol.5, p.447)	78K
3-Hydroxybenzoic acid ($\text{C}_7\text{H}_6\text{O}_3$)	(Other reference in Vol.3, p.349 and H^+ values in Vol.5, p.447)	80RC, 84EF
4-Hydroxybenzoic acid ($\text{C}_7\text{H}_6\text{O}_3$)	(Other references in Vol.3, p.349 and H^+ values in Vol.5, p.448)	61BN, 80RC
2-Hydroxy-3-methylbenzoic acid (2,3-cresotic acid) ($\text{C}_8\text{H}_8\text{O}_3$)	(Values in Vol.3, p.187 and other references in Vol.5, p.471)	66DK, 80CS, 82C, 84Ac
2-Hydroxy-4-methylbenzoic acid (2,4-cresotic acid) ($\text{C}_8\text{H}_8\text{O}_3$)	(Values in Vol.3, p.188 and other references in Vol.5, p.471)	66DK, 80CS, 82C, 84Ac
2-Hydroxy-5-methylbenzoic acid (2,5-cresotic acid) ($\text{C}_8\text{H}_8\text{O}_3$)	(Values in Vol.3, p.188 and other references in Vol.5, p.471)	66DK, 80CS, 82C, 84Ac
2-(2-Hydroxy-5-methylphenylazo)benzoic acid ($\text{C}_{13}\text{H}_{12}\text{O}_3\text{N}_2$)		84MSb
4-Chlorosalicylic acid ($\text{C}_7\text{H}_5\text{O}_3\text{Cl}$)		82NL
3,5-Dichlorosalicylic acid ($\text{C}_7\text{H}_4\text{O}_3\text{Cl}_2$)		82DJ
3-Bromosalicylic acid ($\text{C}_7\text{H}_5\text{O}_3\text{Br}$)		82DJ
4-Bromosalicylic acid ($\text{C}_7\text{H}_5\text{O}_3\text{Br}$)		66DK
3,5-Dibromosalicylic acid ($\text{C}_7\text{H}_4\text{O}_3\text{Br}_2$)		82DJ
3-Methyl-5-sulfosalicylic acid ($\text{C}_8\text{H}_8\text{O}_6\text{S}$)		80CS, 81CS, 82C
4-Methyl-5-sulfosalicylic acid ($\text{C}_8\text{H}_8\text{O}_6\text{S}$)		80CS, 82C
5-Methyl-3-sulfosalicylic acid ($\text{C}_8\text{H}_8\text{O}_6\text{S}$)		80CS, 81CS, 82C
5-(4-Sulfophenylazo)salicylic acid ($\text{C}_{12}\text{H}_{10}\text{O}_6\text{N}_2\text{S}$)		81GSS, 82GSS
4-Methyl-5-(4-sulfophenylazo)salicylic acid ($\text{C}_{13}\text{H}_{12}\text{O}_6\text{N}_2\text{S}$)		81GSS, 82GSS
3-Amino-5-sulfosalicylic acid ($\text{C}_7\text{H}_7\text{O}_6\text{NS}$)		82LL
5-(3-Nitro-4-sulfophenylazo)salicylic acid ($\text{C}_{12}\text{H}_9\text{O}_8\text{N}_3\text{S}$)		81GSS, 82GSS
4-Cyanosalicylic acid ($\text{C}_8\text{H}_5\text{O}_3\text{N}$)		66DK
5-Cyanosalicylic acid ($\text{C}_8\text{H}_5\text{O}_3\text{N}$)		66DK
4-Methoxysalicylic acid ($\text{C}_8\text{H}_8\text{O}_4$)		66DK
4-Ethoxysalicylic acid ($\text{C}_9\text{H}_{10}\text{O}_4$)		66DK
5-Methoxysalicylic acid ($\text{C}_8\text{H}_8\text{O}_4$)		66DK, 80YA
2-Hydroxyphenoxyacetic acid ($\text{C}_8\text{H}_8\text{O}_4$)		76HB, 76SB
4-Hydroxy-3-methoxyphenyl)hydroxyacetic acid (vanillomandelic acid) ($\text{C}_9\text{H}_{10}\text{O}_5$)		80CK, 81CK

C. OTHER ORGANIC LIGANDS

Phenols (continued)

<u>Ligand</u>	<u>Bibliography</u>
3-Hydroxy-1-benzopyran-2-one (3-hydroxycoumarin) ($C_9H_6O_3$)	83SSN
N-Acetyl-L-tyrosine ($C_{11}H_{13}O_4N$) (H^+ values in Vol.3, p.337)	83IS
3-Hydroxyphthalhydrazide ($C_8H_6O_3N_2$)	83KBa
DL-2-(Methylamino)-1-(3-hydroxyphenyl)ethanol (phenylephrin) ($C_9H_{13}O_2N$) (H^+ values in Vol.5, p.434)	84GK

b. Dihydroxyphenols

3-Methyl-1,2-dihydroxybenzene ($C_7H_8O_2$)	80NKL
1,3-Dihydroxy-2,4-dinitrobenzene ($C_6H_4O_6N_2$)	85BI
2,4-Dihydroxy-1-(4-nitrophenylazo)benzene ($C_{12}H_9O_4N_3$)	82CB
4-Chloro-1,2-dihydroxybenzene ($C_6H_5O_2Cl$)	80NKL
2,4-Dihydroxyazobenzene-4'-sulfonic acid (tropaeolin-O) ($C_{12}H_9O_5N_2S$) (Other reference in Vol.5, p.472)	81II
3,4-Dihydroxybenzaldehyde (protocatechualdehyde) ($C_7H_6O_3$) (Values in Vol.3, p.211)	80NKL
6,7-Dihydroxy-1-benzopyran-2-one (esculetin) ($C_9H_6O_4$)	67JS
4-Methylesculetin ($C_{10}H_8O_4$)	67JS
5-(Pyrazolone-4-ylazo)-2,4-dihydroxybenzoic acid ($C_{18}H_{16}O_5N_4$)	80DP
2-(5-Hydroxy-3-methyl-1-phenyl-1,2-diazol-4-ylazo)-4-methyl- phenol-6-sulfonic acid (Alizarin Red G) ($C_{17}H_{16}O_5N_4S$)	80FSa

c. Polyhydroxyphenols

1-(2,3,4-Trihydroxyphenylazo)benzene-4-sulfonic acid ($C_{12}H_{10}O_6N_2S$)	84GGA
Hemaloxylon ($C_{16}H_{14}O_6$) (Other reference in Vol.3, p.361)	82MH
3,3',4,4'-Tetrahydroxydiphenylsulfone ($C_{12}H_{10}O_6S$)	82HO
3,3',4,4',5,5'-Hexahydroxydiphenylsulfone ($C_{12}H_{10}O_8S$)	82HO

d. Fuchsons

4'-Hydroxy-3,3',5'-trimethylfuchson-2"-sulfonic acid (p-Xylenol Blue) ($C_{22}H_{20}O_5S$)	74Va
4'-Hydroxy-5,5'-dibromo-3,3',5'-trimethylfuchson-2"-sulfonic acid (Bromoxylenol Blue) ($C_{22}H_{18}O_5Br_2S$)	74Va
4'-Hydroxy-3,3',5,5'-tetrabromofuchson-2"-sulfonic acid (Bromophenol Blue) ($C_{19}H_{10}O_5Br_4S$) (Other references in Vol.5, p.472)	78K, 79Ha
4'-Hydroxy-3,3'-dimethyl-2"-sulfofuchson-5,5'-dicarboxylic acid (Eriochrome Cyanine R) ($C_{23}H_{18}O_9S$) (Values in Vol.3, p.24 and other references in Vol.5, p.472)	69MM, 79BS, 81PG
4'-Hydroxy-5,5'-dimethyl-2",4"-disulfofuchson-3,3'-dicarboxylic acid (Sulphochrome) ($C_{23}H_{18}O_{12}S_2$)	85CK
4'-Hydroxy-2",6"-dichloro-3,3'-dimethyl-3"-sulfofuchson-5,5'- dicarboxylic acid (Chrome Azurol) ($C_{23}H_{16}O_9Cl_2S$) (Values in Vol.3, p.215)	69K, 69MM, 81Eib, 81PG

Phenols (continued)

<u>Ligand</u>	<u>Bibliography</u>
3,3',4'-Trihydroxyfuchson-2"-sulfonic acid (Pyrocatechol Violet) ($C_{19}H_{14}O_7S$) (Values in Vol.3, p.216 and other references in Vol.5, p.472)	80SKC
2',4',5',7'-Tetrabromofluorescein (Eosin Y) ($C_{20}H_8O_5Br_4$)	80MAN
e. <u>Napthols</u>	
2-Naphthol ($C_{10}H_8O$) (H^+ values in vol.3, p.351 and Vol.5, p.450)	83MM
1-Hydroxy-4-(4-nitrophenyl)naphthalene ($C_{16}H_{11}O_3N$)	82CB
2-Hydroxy-1-nitrosonaphthalene-3,6-disulfonic acid (nitroso-R acid) ($C_{10}H_7O_8NS_2$) (Values in Vol.3, p.227 and other references in Vol.5, p.472)	75GB,81LC
2-Hydroxy-1-(4-sulfo-1-naphthylazo)naphthalene (amaranth) ($C_{20}H_{14}O_4N_2$)	84PSR
2-Hydroxy-1-(pyrazolon-4-ylazo)-3-naphthoic acid ($C_{22}H_{18}O_4N_4$)	81DPa
2-Hydroxy-1,4-naphthoquinone (lawsone) ($C_{10}H_6O_3$) (H^+ values in Vol.3, p.353)	66SP
2-Hydroxy-3-methyl-1,4-naphthoquinone (phthiocol) ($C_{11}H_8O_3$)	66SP
2-Hydroxy-1-(2-arsonophenylazo)naphthalene-3,6-disulfonic acid (Thoron) ($C_{16}H_{12}O_{10}N_2AsS_2$) (Values in Vol.3, p.230 and other references in Vol.5, p.472)	81Nc
1-(2-Carboxyphenylazo)-2-naphthol ($C_{17}H_{12}O_3N_2$)	81GMH
1-(4-Carboxyphenylazo)-2-naphthol ($C_{17}H_{12}O_3N_2$)	81GMH
2-Hydroxy-1-[3-methyl-5-oxo-1-(3-sulfophenyl)-4-pyrazolylazo]- naphthalene-4-sulfonic acid (C.I. Acid Red 186) ($C_{20}H_{16}O_8N_4S_2$)	83AAE
1-Amino-8-hydroxynaphthalene-2,4-disulfonic acid ($C_{10}H_9O_7NS_2$)	83SSM
8-Amino-1-hydroxynaphthalene-3,6-disulfonic acid ($C_{10}H_9O_7NS_2$) (Other references in Vol.3, p.362 and in Vol.5, p.460)	80MPc
1-Hydroxy-2-(4-amino-1,2,4-triazol-3-ylazo)naphthalene-4- sulfonic acid ($C_{12}H_9O_4N_4S$)	81GMa,82GM
2,3-Dihydroxynaphthalene ($C_{10}H_8O_2$) (Values in Vol.3, p.233 and Vol.5, p.353)	80NKL
2-Hydroxy-1-(1-hydroxy-2-naphthylazo)naphthalene-4-sulfonic acid (Eriochrome Blue Black R) (Solo 6BN) ($C_{20}H_{14}O_5N_2S$) (H^+ values in Vol.3, p.352 and other references in Vol.5, p.473)	62RA,75MP,83BL
2-Hydroxy-1-(2-hydroxy-5-methylphenylazo)naphthalene-4-acid (Calmagite) ($C_{17}H_{14}O_5N_2S$) (Other references in Vol.3, p.362 and Vol.5, p.472)	84BSa
1,8-Dihydroxy-2-(4-sulfophenylazo)naphthalene-3,4-disulfonic acid (SPADNS) ($C_{16}H_{12}O_{11}N_2S_3$)	75MP
2-Hydroxy-1-(2-hydroxy-6-sulfo-1-naphthylazo)naphthalene-3,6- disulfonic acid ($C_{16}H_{12}O_{11}N_2S_3$)	80WN

Phenols (continued)

<u>Ligand</u>	<u>Bibliography</u>
2-Hydroxy-1-(2-hydroxy-3,6-disulfo-1-naphthylazo)naphthalene-3,6-disulfonic acid ($C_{16}H_{12}O_{14}N_2S_4$)	80WN
2-Hydroxy-1-(1-hydroxy-2-naphthylazo)-6-nitronaphthalene-4-sulfonic acid (Eriochrome Black T) ($C_{20}H_{13}O_7N_3S$) (Values in Vol.3, p.231 and other references in Vol.5, p.472)	63R, 75MP, 80PKG
2-Hydroxy-1-(5-chloro-2-hydroxy-3-sulfophenylazo)naphthalene-3,6-disulfonic acid ($C_{16}H_{11}O_{11}N_2ClS_3$)	80WN
2,7-Dichloro-1,8-dihydroxynaphthalene-3,6-disulfonic acid (2,7-dichlorochromotropic acid) ($C_{10}H_6O_8Cl_2S_2$) (Other reference in Vol.3, p.363)	80BKb
2-(Phenylazo)chromotropic acid (CTR) ($C_{16}H_{12}O_8N_2S_2$)	75MP
2-(4-Nitrophenylazo)chromotropic acid (Chromotrope 2B) ($C_{16}H_{11}O_{10}N_3S_2$) (Other references in Vol.3, p.273)	79PR, 82PR
2-(4-Sulfophenylazo)chromotropic acid ($C_{16}H_{12}O_{11}N_2S_3$) (Values in Vol.3, p.238 and other reference in Vol.5, p.473)	80DNK
2,7-Bis(4-chloro-2-phosphonophenylazo)chromotropic acid (Chlorophosphonazo III) ($C_{22}H_{16}O_{14}N_4Cl_2P_2S_2$) (Other references in Vol.3, p.363 and Vol.5, p.473)	80SKc
2-(2-Arsonophenylazo)chromotropic acid (Arsenazo I) ($C_{16}H_{13}O_{11}N_2AsS_2$) (Values in Vol.3, p.239 and other reference in Vol.5, p.473)	82CBa
2,7-Bis(2-arsonophenylazo)chromotropic acid (Arsenazo III) ($C_{22}H_{18}O_{14}N_4As_2S_2$) (Other references in Vol.3, p.363 and Vol.5, p.473)	80MK, 83Lb, 83MOI
2-Hydroxy-1-(5-chloro-2-hydroxy-3-sulfophenylazo)-3-naphthoic acid ($C_{17}H_{11}O_7N_2ClS$)	80WN
2-Hydroxy-1-(3-carboxy-2-hydroxy-1-naphthylazo)naphthalene-3,6-disulfonic acid ($C_{17}H_{12}O_{10}N_2S_2$)	80WN
1-Hydroxy-8-(2,4-dihydroxyphenylazo)naphthalene-3,6-disulfonic acid (H-Resorcinol) ($C_{16}H_{12}O_9N_2S_2$)	80NF
2-Hydroxy-1-(2,3-dihydroxy-1-naphthylazo)naphthalene-3,6-disulfonic acid ($C_{16}H_{12}O_9N_2S_2$)	80WN
2-Hydroxy-1-(2,3-dihydroxy-6-sulfo-1-naphthylazo)naphthalene-3,6-disulfonic acid ($C_{16}H_{12}O_{12}S_3$)	80WN
Cyclo-tris-7-(1-azo-8-hydroxynaphthalene-3,6-disulfonic acid) (Calcichrome) ($C_{30}H_{18}O_{21}N_6S_6$) (Other reference in Vol.3, p.363)	81Ela

f. Hydroxyanthraquinones

1,2-Dihydroxyanthraquinone (Alizarin) ($C_{14}H_8O_4$)	80IE, 82EDa
1,2-Dihydroxyanthraquinone-3-sulfonic acid (Alizarin Red S) ($C_{14}H_8O_7S$) (Values in Vol.3, p.242 and other references in Vol.5, p.473)	81FK, 83KMa

Phenols (continued)

<u>Ligand</u>	<u>Bibliography</u>
3-Amino-1,2-dihydroxyanthraquinone (Alizarin Maroon) ($C_{14}H_9O_4N$)	82IS, 84IS
5. <u>Carbonyl ligands</u>	
Propanone (acetone) (C_3H_6O) (Value in Vol.3, p.243)	74KI, 80Pe, 84CK
Ethane-1,2-dial (glyoxal) ($C_2H_2O_2$)	80IA
1,1,1,2,2,3,3,7,7,7-Decafluoroheptane-4,6-dione ($C_7H_2O_2F_{10}$)	72MBa
1,1,2,2,3,3,3-Heptafluoro-7,7-dimethyloctane-4,6-dione ($C_{10}H_{11}O_2F_7$) (Other reference in Vol.3, p.363)	72MBa
2-Acetyllindan-1,3-dione ($C_{11}H_8O_3$)	80ZT
2-Sulfophenylhydrazopentane-2,4-dione ($C_{11}H_{13}O_5N_2S$)	84ES
3-Sulfophenylhydrazopentane-2,4-dione ($C_{11}H_{13}O_5N_2S$)	84ES
4-Sulfophenylhydrazopentane-2,4-dione ($C_{11}H_{13}O_5N_2S$)	84ES
4-Methoxyphenylhydrazopentane-2,4-dione ($C_{12}H_{15}O_3N_2$)	84ES
2-Hydroxyethanal (glycolic aldehyde) ($C_2H_4O_2$)	80IA
2-Hydroxy-3,4,5-tris(methoxycarbonyl)cyclopentadienone ($C_{11}H_{10}O_8$)	84BLa
3-Hydroxy-2-(2-sulfophenyl)-1-benzopyran-4-one (flavonol-2'-sulfonic acid) ($C_{15}H_{10}O_6S$) (Values in Vol.3, p.261)	82YH
2,5-Dihydroxy-1,4-benzoquinone ($C_6H_4O_4$) (Values in Vol.3, p.261)	80VP
2,5-Dichloro-3,6-dihydroxy-1,4-benzoquinone (Chloranilic acid) ($C_6H_2O_4Cl_2$) (Values in Vol.3, p.262 and other references in Vol.5, p.473)	80VP, 81BMb
2,5-Dibromo-3,6-dihydroxy-1,4-benzoquinone (bromanilic acid) ($C_6H_2O_4Br_2$) (Other references in Vol.5, p.473)	80VP
5,6-Dihydroxy-5-cyclohexene-1,2,3,4-tetrone (rhodizonic acid) ($C_6H_2O_6$) (H^+ values in Vol.3, p.354 and other references in Vol.5, p.473)	78V
6. <u>Alcohols</u>	
Methanol (CH_4O)	80Pe
Propanol (C_3H_8O)	80Pe
Butanol ($C_4H_{10}O$)	80Pe
Propane-1,3-diol ($C_3H_8O_2$) (values in Vol.3, p.268)	59LE
Butane-1,3-diol ($C_4H_{10}O_2$)	80Pd
rac-Butane-2,3-diol ($C_4H_{10}O_2$)	56SR, 59LE
meso-Butane-2,3-diol ($C_4H_{10}O_2$)	56SR, 59LE
Phenylethylenediol ($C_8H_{10}O_2$)	57RL, 59LE
3-Methoxypropane-1,2-diol ($C_4H_{10}O_3$) (Values in Vol.3, p.267)	59LE

Alcohols (continued)

<u>Ligand</u>	<u>Bibliography</u>
Tetrakis(hydroxymethyl)methane (pentaerythritol) ($C_5H_{12}O_4$) (Values in Vol.3, p.269)	59LE
Xylitol ($C_5H_{12}O_5$)	79H,81Ha,82Ha
D-Arabinitol ($C_5H_{12}O_5$)	79H,81Ha,82Ha
meso-Inositol ($C_6H_{12}O_6$) (Values in Vol. 3, p.27)	81V
D(-)-Ribose ($C_5H_{10}O_5$) (Values in Vol.3, p.271)	80LV
D(-)-Xylose ($C_5H_{10}O_5$) (Values in Vol.3, p.272)	42TC,80LV,83HD
D(+)-Arabinose ($C_5H_{10}O_5$) (Values in Vol.3, p.273)	42TC,59LE,84K
Methyl α -D-ribofuranoside ($C_6H_{12}O_5$)	80LV,81LV
Methyl β -D-ribofuranoside ($C_6H_{12}O_5$)	80LV,81LV
Methyl α -D-lyxofuranoside ($C_6H_{12}O_5$)	80LV,81LV
Methyl α -D-xylofuranoside ($C_6H_{12}O_5$)	80LV,81LV
Methyl β -D-xylofuranoside ($C_6H_{12}O_5$)	80LV,81LV
Methyl α -D-arabinofuranoside ($C_6H_{12}O_5$)	80LV,81LV
Methyl β -arabinofuranoside ($C_6H_{12}O_5$)	80LV,81LV
Mannitane ($C_6H_{12}O_5$)	32V
L-Sorbose ($C_6H_{12}O_6$) (Values in Vol.3, p.274)	83HD
α -D(+)-Mannose ($C_6H_{12}O_6$) (Values in Vol.3, p.275)	59LE
α -D(+)-Galactose ($C_6H_{12}O_6$) (Values in Vol.3, p.277)	42TC,59LE,83HD,84K
α -D(+)-Lactose ($C_{12}H_{22}O_{11}$)	83ZG
α -Cyclodextrin ($C_{36}H_{60}O_{30}$)	81PS
β -Cyclodextrin ($C_{42}H_{70}O_{35}$)	81PS
γ -Cyclodextrin ($C_{48}H_{80}O_{40}$)	81PS
7. <u>Polyethers</u>	
1,4-Dioxane ($C_4H_8O_2$)	74KI,80Pe
1,4,7,10-Tetraoxacyclododecane (12-crown-4) ($C_8H_{16}O_4$) (Value in Vol.5, p.368)	85LA
1,4,7,10,13-Pentaoxacyclododecane (15-crown-5) ($C_{10}H_{20}O_4$) (Values in Vol.5, p.368)	81LP,82DG,85BFL
Cyclohexyl-15-crown-5 ($C_{14}H_{26}O_5$)	71F
Benzo-15-crown-5 ($C_{14}H_{20}O_5$)	85LA
Cyclohexyl-18-crown-6 ($C_{16}H_{30}O_6$)	71F
Dicyclohexyl-18-crown-6 ($C_{20}H_{36}O_6$) (Values in Vol.3, p.278 and Vol.5, p.370)	85LA
Dibenzo-18-crown-6 ($C_{20}H_{24}O_6$) (Values in Vol.3, p.278)	80KC
Dicyclohexyl-21-crown-7 ($C_{22}H_{40}O_7$)	71F

Polyethers (continued)

<u>Ligand</u>	<u>Bibliography</u>
Dicyclohexyl-24-crown-8 ($C_{24}H_{44}O_8$)	71F
Dibenzo-24-crown-8 ($C_{24}H_{32}O_8$)	85LA
Dimethylsulfoxide (DMSO) (C_2H_6OS)	80Pe
8. <u>Thiols</u>	
Dimercaptomaleonitrile ($C_4H_2N_2S_2$)	81ISa, 83BBd
Cyclo-L-methionylglycyl ($C_7H_{12}O_2N_2S$)	82BBa
9. <u>Thioacids</u>	
2-Methylhydrazinedithiocarboxylic acid ($C_2H_6N_2S_2$)	85IG
3,3-Dimethylhydrazinedithiocarboxylic acid ($C_3H_8N_2S_2$)	85IG
3-Methyl-3-phenylhydrazinedithiocarboxylic acid ($C_8H_{10}N_2S_2$)	85IG
Dithiophosphoric acid ethylester ($C_2H_5OPS_2$)	84US
Methyldithiophosphonic acid ethylester ($C_3H_8OPS_2$)	84US
Butyldithiophosphonic acid ethylester ($C_6H_{14}OPS_2$)	84US
Diethyldithiophosphinic acid ($C_4H_{10}OPS_2$)	84US
Diphenyldithiophosphonic acid ($C_{12}H_{10}OPS_2$)	84US
10. <u>Unsaturated hydrocarbons</u>	
Prop-2-en-1-ol (allyl alcohol) (C_3H_5O) (Values in Vol.3, p.290 and Vol.5, p.376)	83YU
Cyanomethane (acetonitrile) (C_2H_3N) (Values in Vol.3, p.293 and Vol.5, p.376)	80Pe
Methylisonitrosomalnonitrile ($C_4H_3ON_3$)	85R
Dodecylbenzenesulfonic acid ($C_{18}H_{30}O_3S$)	84TSS
11. <u>Hydroxamic acids</u>	
Betainhydroxamic acid ($C_5H_{13}O_2N_2$)	84BK, 85BKP
N-Methylacetohydroxamic acid ($C_3H_7O_2N$)	80Mca
Phenylacetohydroxamic acid ($C_8H_9O_2N$) (Other references in Vol. 5, p.475)	80RS, 80RSa, 82BN
DL-Phenylhydroxyacetohydroxamic acid ($C_8H_9O_3N$)	83SJ
Benzohydroxamic acid ($C_7H_7O_2N$) (Values in Vol.3, p.302 and Vol.5, p.378)	68RA, 71GL, 80Af, 80Ag, 80Mca, 83Ad, 84Ac
4-Methylbenzohydroxamic acid ($C_8H_9O_2N$)	80Af

Hydroxamic acids (continued)

<u>Ligand</u>	<u>Bibliography</u>
N-Methylbenzohydroxamic acid ($C_8H_9O_2N$) (Values in Vol.5, p.379)	80Mca
N-Phenylbenzohydroxamic acid ($C_{13}H_{11}O_2N$) (Values in Vol.3, p.302 and Vol.5, p.379)	80Mca
3-Chlorobenzohydroxamic acid ($C_7H_6O_2NCl$)	80Af
4-Chlorobenzohydroxamic acid ($C_7H_6O_2NCl$)	80Af
3-Nitrobenzohydroxamic acid ($C_7H_6O_4N_2$)	80Af
4-Nitrobenzohydroxamic acid ($C_7H_6O_4N_2$) (Other reference in Vol.5, p.475)	80Af
6-Bromo-2-hydroxybenzohydroxamic acid ($C_7H_6O_3NBr$)	83PMT
N-(3-Tolyl)-4-methoxybenzohydroxamic acid ($C_{15}H_{15}O_3N$)	80GK, 81GK
2,4-Dihydroxy-7-methoxy-1,4-benzoxazin-3-one ($C_9H_9O_5N$)	83DT
Desferriferrioxamin B ($C_{27}H_{48}O_8N_6$) (Values in Vol.3, p.303)	78WK, 81BBK, 81MCb, 82GLa, 83BBa, 83BBb, 84BBK

12. Oximes

Acetoxime (C_2H_5ON)	81II
Cyclopentanone oxime ($C_5H_{10}ON$)	81II
Pentane-2,3,4-trione 3-oxime ($C_5H_7O_3N$)	84RFC
Cyclohexane-1,2-dione dioxime (nioxime) ($C_6H_{10}O_2N_2$) (Values in Vol.3, p.307)	67PS
Cycloheptane-1,2-dione dioxime (heptoxime) ($C_7H_{12}O_2N_2$) (Values in Vol.3, p.308)	67PS, 80MH, 81ZH
Cyclooctane-1,2-dione dioxime ($C_8H_{14}O_2N_2$)	80MH, 81ZH
1,2-Di(2-furanyl)ethane-1,2-dione dioxime (α -furylidioxime) ($C_{10}H_8O_4N_2$) (Values in Vol.3, p.309)	67PS
Maleinimide dioxime ($C_4H_5O_2N$)	82AC, 84FC

13. Amides

Dimethylformamide (DMF) (C_3H_7ON)	80Pe
2-Oxohexamethyleneimine (ϵ -caprolactam) ($C_6H_{11}ON$)	84KPa, 85KPa
Pyrrolidine-2,5-dione (succinimide) ($C_4H_5O_2N$) (Values in Vol.3, p.311 and Vol.5, p.380)	81EA
N-Methylcarbamide ($C_2H_6ON_2$) (Other reference in Vol.3, p.366)	80MCb, 85Mca
N-Ethylcarbamide ($C_3H_8ON_2$) (Other reference in Vol.3, p.366)	80MCb, 85Mca
N,N'-Dimethylcarbamide ($C_3H_8ON_2$)	80MCb, 85Mca

Amides (continued)

<u>Ligand</u>	<u>Bibliography</u>
N,N'-Diethylcarbamide ($C_4H_{10}ON_2$)	80MCb, 85Mca
N-(Hydroxymethyl)carbamide ($C_2H_6O_2N_2$)	84BN
Methylenedicarbamide ($C_3H_8O_2N_4$)	84BN
Phenylazoformic acid 2-phenylhydrazide (1,5-diphenylhydrozone) ($C_{13}H_{12}ON_4$)	66GH
Furan-2-carboxylic acid hydrazide ($C_5H_6O_2N_2$)	81BP
Thiophene-2-carboxylic acid hydrazide ($C_5H_6ON_2S$)	80BBN, 81BP
2-Nitrobenzoic acid hydrazide ($C_7H_7O_3N_3$)	81BP
3-Nitrobenzoic acid hydrazide ($C_7H_7O_3N_3$)	81BP
4-Nitrobenzoic acid hydrazide ($C_7H_7O_3N_3$)	81BP
Diphenylphosphorylacetic acid hydrazide ($C_{14}H_{15}O_2N_2P$)	82RT
1,3-Diazolidine-2,4-dione (hydantoin) ($C_3H_4O_2N_2$)	81EA
N,N'-Dimethyltartaric acid diamide ($C_6H_{12}O_4N_2$)	83PR
1,2-Naphthoquinone-4-sulfonic acid 2-semicarbazone ($C_{11}H_9O_6N_3S$)	80MGG
Purpuric acid (murexide = $L.NH_3$) ($C_8H_5O_6N_5$) (Values in Vol.3, p.322 and other references in Vol.5, p.477)	850
Cyclo(L-valyl-D-valyl-D-valyl-L-lactyl) ₃ (valinomycin) ($C_{54}H_{43}O_{15}N_9$)	71FF, 77GOa
Thioacetamide (C_2H_5NS) (H^+ values in Vol.5, p.451)	81DDa, 83D, 84DBC
N-Phenylthiourea ($C_7H_8N_2S$) (Value in Vol.3, p.315)	83LX
N,N'-Bis(hydroxymethyl)thiourea ($C_3H_8O_2N_2S$) (Other reference in Vol.5, p.477)	79SS
Thiosemicarbazide (CH_5N_3S) (Values in Vol.3, p.317 and Vol.5, p.389)	63R, 84CMB
2-Mercapto-2,4,6-trioxypyrimidine (thiobarbituric acid) ($C_4H_4O_2N_2S$)	84SJ
N-Methylthiobarbituric acid ($C_5H_6O_2N_2S$)	84SJ
N-Phenylthiobarbituric acid ($C_{10}H_8O_2N_2S$)	84SJ
N-(2-Methylphenyl)thiobarbituric acid ($C_{11}H_{10}O_2N_2S$)	84SJ
N-(3-Methylphenyl)thiobarbituric acid ($C_{11}H_{10}O_2N_2S$)	84SJ
N-(4-Methylphenyl)thiobarbituric acid ($C_{11}H_{10}O_2N_2S$)	84SJ
Glyoxaldithiosemicarbazone ($C_4H_8N_6S_2$)	71BS
N-Methylthiocarbamide ($C_2H_6N_2S$) (Values in Vol.3, p.314 and Vol.5, p.385)	85MC
14. <u>Amidines</u>	
2-Sulfoethylbiguanide ($C_4H_{11}O_3N_4S$)	84MCI

D. Inorganic ligands

<u>Ligand</u>	<u>Bibliography</u>
Hydrogen peroxychromate (V) ($\text{H}_2\text{O}_8\text{Cr}$)	65QE
Technetate (VII) ion (pertechnetic acid) (O_4Tc^-) (Other references in Vol.4, p.135)	85NL
Rhenate (VII) ion (perrhenic acid) (O_4Re^-) (Value in Vol.4, p.20)	69MPR, 70PO, 85NL
Carbon monoxide (CO)	81BE
Hydrogen cyanate (cyanic acid) (CHON) (Values in Vol.4, p.28)	69CEa
Hydrogen hexafluorosilicate ($\text{H}_2\text{F}_6\text{Si}$)	78SKF
Hydrogen germanate ($\text{H}_4\text{O}_4\text{Ge}$) (H^+ values in Vol.4, p.131 and other reference in Vol.5, p.477)	63IS, 66AN, 68NF
Trimetaphosphimic acid ($\text{H}_6\text{O}_6\text{N}_3\text{P}_3$) (Values in Vol.4, p.72)	83RBM
Hydrogen peroxodiphosphate ($\text{H}_4\text{O}_8\text{P}_2$) (Values in Vol.4, p.73)	85GGG
Hydrogen amidophosphate ($\text{H}_4\text{O}_3\text{NP}$) (Values in Vol.4, p.132)	63CF
Hydrogen arsenite (arsenous acid) ($\text{H}_3\text{O}_3\text{As}$) (Other references in Vol.4, p.132 and values in Vol.5, p.409)	61ATa, 69SHY, 71ES, 81PB
Hydrogen arsenate (arsenic acid) ($\text{H}_3\text{O}_4\text{As}$) (Other references in Vol.4, p.133 and values in Vol.5, p.410)	55AA, 64YP, 69H, 70SIB, 71BL, 73BLL, 76Tb, 76W, 81DP
Hydrogen sulfide (hydrosulfuric acid) (H_2S) (Values in Vol.4, p.76 and Vol.5, p.410)	69BTF, 69H, 70CL, 72CP, 74K, 74KS, 74S, 77HG, 79HH, 83MWK, 85TZB
Hydrogen amidosulfate (sulfamic acid) ($\text{H}_3\text{O}_3\text{NS}$) (Values in Vol.4, p.88 and Vol.5, p.413)	51TD, 69KF, 69Pc, 79HH
Hydrogen dithionite ($\text{H}_2\text{O}_4\text{S}_2$) (Other references in Vol.4, p.135)	69BT, 69BTa, 69Pc
Hydrogen selenide (hydroselenic acid) (H_2Se) (Values in Vol.4, p.90)	72GK
Hydrogen selenite (selenous acid) ($\text{H}_2\text{O}_4\text{Se}$) (Values in Vol.4, p.91 and Vol.5, p.414)	69MG, 69SHV, 70TW, 73NS
Hydrogen selenate (selenic acid) (HO_4Se) (Values in Vol.4, p.93 and Vol.5, p.414)	70TW
Hydrogen telluride (hydrotelluric acid) (H_2Te) (Values in Vol.4, p.94)	72GK
Hydrogen tellurite (tellurous acid) ($\text{H}_4\text{O}_4\text{Te}$) (Values in Vol.4, p.95 and H^+ values in Vol.5, p.453)	72MK
Hydrogen tellurate (telluric acid) ($\text{H}_6\text{O}_6\text{Te}$) (H^+ values in Vol.4, p.134 and other references in Vol.5, p.478)	68KM, 70KB

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CH ₂ O ₂ 299	C ₂ H ₃ O ₂ Br .. (2) 514	C ₂ H ₇ ON 173	C ₃ H ₆ O..... 522	C ₃ H ₈ O ₂ N ₂ 29
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CH ₄ ON ₂ 423	C ₂ H ₄ N ₄ (2) 257	C ₂ H ₇ O ₃ NS 506	C ₃ H ₆ O ₂ S... (3) 516	C ₃ H ₈ O ₃ S ₃ 415
CH ₄ O ₃ ClP..... 360	C ₂ H ₄ N ₄ 476	C ₂ H ₇ O ₄ P 517	C ₃ H ₆ O ₃ 311	C ₃ H ₈ O ₅ NP 11
CH ₄ O ₆ Cl ₂ P ₂ ... 362	C ₂ H ₄ N ₄ S 476	C ₂ H ₇ O ₆ NP ₂ 513	C ₃ H ₆ O ₃ 317	C ₃ H ₈ O ₅ NP 37
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CH ₅ N ₃ S..... 526	C ₂ H ₄ O ₂ 522	C ₂ H ₈ O ₇ P ₂ 363	C ₃ H ₆ O ₄ 315	C ₃ H ₈ O ₁₀ P ₂ 309
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CH ₅ O ₂ NB..... 502	C ₂ H ₄ O ₃ 310	C ₃ H ₃ O ₂ N 308	C ₃ H ₇ ON..... 525	C ₃ H ₉ N 473
CH ₅ O ₃ As..... 518	C ₂ H ₅ NS 526	C ₃ H ₃ O ₂ N ₃ 464	C ₃ H ₇ O ₂ N..... 3	C ₃ H ₉ N 506
CH ₅ O ₃ P..... 360	C ₂ H ₅ ON 525	C ₃ H ₄ N ₂ 243	C ₃ H ₇ O ₂ N..... 36	C ₃ H ₉ NS 506
CH ₆ O ₆ P ₂ 361	C ₂ H ₅ OPS ₂ 524	C ₃ H ₄ N ₂ 247	C ₃ H ₇ O ₂ N..... 416	C ₃ H ₉ NS 507
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C ₂ HN ₃ Br ₂ 476	C ₂ H ₅ O ₂ N 416	C ₃ H ₄ N ₂ S 510	C ₃ H ₇ O ₂ N..... 7	C ₃ H ₉ ON ... (3) 506
C ₂ HN ₄ F ₃ 476	C ₂ H ₅ O ₃ N 501	C ₃ H ₄ O ₂ 514	C ₃ H ₇ O ₂ NS..... 20	C ₃ H ₉ ON ₃ 175
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C ₂ HO ₂ Cl ₃ 308	C ₂ H ₆ N ₂ S ₂ 524	C ₃ H ₄ O ₂ N ₂ 526	C ₃ H ₇ O ₃ N..... 502	C ₃ H ₉ O ₆ P 517
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C ₂ H ₂ O ₂ 522	C ₂ H ₆ ON ₂ 525	C ₃ H ₄ O ₄ 326	C ₃ H ₈ N ₂ S ₂ 524	C ₃ H ₁₀ N ₂ 471
C ₂ H ₂ O ₂ Br ₂ 514	C ₂ H ₆ OS 414	C ₃ H ₅ N ₃ S 246	C ₃ H ₈ O..... 522	C ₃ H ₁₀ N ₂ 507
C ₂ H ₂ O ₂ Cl ₂ 251	C ₂ H ₆ OS 524	C ₃ H ₅ N ₃ S 256	C ₃ H ₈ ON..... 507	C ₃ H ₁₀ ON ₂ 182
C ₂ H ₂ O ₂ F ₂ 514	C ₂ H ₆ O ₂ 407	C ₃ H ₅ O 524	C ₃ H ₈ ON ₂ 176	C ₃ H ₁₂ O ₉ NP ₃ ... 488

$C_3H_{12}O_{10}P_4$ 365	$C_4H_6O_4S_2$ 517	$C_4H_9O_2N_3$ 507	$C_4H_{12}N_2$ 193	$C_5H_6O_2N_2$ 484
$C_4H_2N_2S_2$ 524	$C_4H_6O_4Se$ 353	$C_4H_9O_2N_3$ 516	$C_4H_{12}N_2$ 507	$C_5H_6O_2N_2$ 526
$C_4H_2O_3N_2Br_2$ 498	$C_4H_6O_5$ 339	$C_4H_9O_3N$ (2)17	$C_4H_{12}N_2S$ 185	$C_5H_6O_2N_2S$ 524
$C_4H_2O_3N_2Cl_2$ 498	$C_4H_6O_5$ 346	$C_4H_9O_3N$ 501	$C_4H_{12}ON_2$ 193	$C_5H_6O_3$ 345
$C_4H_2O_4$ 491	$C_4H_6O_6$ 341	$C_4H_9O_3N$ (2)502	$C_4H_{12}ON_2$ 507	$C_5H_6O_3N_3$ 512
$C_4H_3N_5$ 486	$C_4H_6O_6$ 344	$C_4H_9O_5NS$ 8	$C_4H_{13}N_3$ 195	$C_5H_6O_4$ 338
$C_4H_3ON_3$ 524	$C_4H_7N_3S$ 246	$C_4H_9O_7NP_2$ 364	$C_4H_{13}O_6NP_2$. . . 293	$C_5H_6O_4$ (2)516
$C_4H_3O_2N_2F$ 282	$C_4H_7N_3S$ 246	$C_4H_{10}O$ 522	$C_4H_{13}O_6NP_2S$	$C_5H_6O_7$ 517
$C_4H_3O_3N_3S$ 422	$C_4H_7O_2Br$ 514	$C_4H_{10}ON$ 507	 (2)513	C_5H_7NS 242
$C_4H_3O_4N_3$ 421	$C_4H_7O_2NS$ 39	$C_4H_{10}ON_2$ (2)176	$C_4H_{14}O_6N_2P_2$. . . 292	$C_5H_7N_3$ 480
$C_4H_3O_4N_3$ 465	$C_4H_7O_3N$ 515	$C_4H_{10}ON_2$ 526	$C_5H_2O_2F_6$ 403	$C_5H_7N_3$ (3)481
$C_4H_3O_4N_3$ 516	$C_4H_7O_4N$ 67	$C_4H_{10}OPS_2$ 524	C_5H_4NBr 477	$C_5H_7O_3N$ 421
$C_4H_4O_2N_2$ 484	$C_4H_7O_4N$ 9	$C_4H_{10}O_2$ (3)522	C_5H_4NBr 477	$C_5H_7O_3N$ 525
$C_4H_4O_2N_2S$ 524	$C_4H_7O_5N$ 76	$C_4H_{10}O_2N_2$ 29	C_5H_4NCl 511	$C_5H_8N_2$ 249
$C_4H_4O_3$ 344	$C_4H_8N_6S_2$ 526	$C_4H_{10}O_2N_2$ 40	$C_5H_4ON_4$ 486	$C_5H_8N_2$ 250
$C_4H_4O_3N$ 497	$C_4H_8O_2$ 303	$C_4H_{10}O_2S_2$ 415	$C_5H_4ON_5$ 486	$C_5H_8N_2$ 251
$C_4H_4O_4$ (2)337	$C_4H_8O_2$ 304	$C_4H_{10}O_2S_2$ 496	$C_5H_4O_2N_2$ 162	$C_5H_8N_2$ 509
$C_4H_4O_4N_4$ 512	$C_4H_8O_2$ 523	$C_4H_{10}O_3$ 522	$C_5H_4O_2N_2$ (3)477	$C_5H_8ON_2$ 241
$C_4H_5ON_3$ 484	$C_4H_8O_2NCl$ 6	$C_4H_{10}O_4N_2S$. . . 190	$C_5H_4O_2N_4$ 486	$C_5H_8O_2$ 305
$C_4H_5O_2N$ (2)525	$C_4H_8O_2S$ 516	$C_4H_{11}N$ 168	$C_5H_4O_2S$ 324	$C_5H_8O_2$ 400
$C_4H_6N_2$ 248	$C_4H_8O_3$ (2)312	$C_4H_{11}N$ 169	$C_5H_4O_3$ 322	$C_5H_8O_3$ 321
$C_4H_6N_2$ 249	$C_4H_8O_3$ 318	$C_4H_{11}N$ 506	$C_5H_4O_4N_2$ 491	$C_5H_8O_4$ 329
$C_4H_6N_2$ 476	$C_4H_8O_3$ 515	$C_4H_{11}N$ 169	C_5H_5N 258	$C_5H_8O_4$ 333
$C_4H_6N_2$ 509	$C_4H_8O_3N_2$ 128	$C_4H_{11}NS$ 506	$C_5H_5N_2Br$ 480	$C_5H_8O_4S_2$ 352
$C_4H_6N_2S$ 242	$C_4H_8O_3N_2$ 19	$C_4H_{11}NS$ 507	$C_5H_5N_5$ 486	$C_5H_8O_5$ 516
$C_4H_6N_2S$ 245	$C_4H_8O_4N_2$ 502	$C_4H_{11}NS$ 508	C_5H_5ON 260	$C_5H_8O_6$ 346
$C_4H_6N_2S$ 510	$C_4H_8O_4N_2$ 75	$C_4H_{11}ON$ (2)506	C_5H_5ON 261	$C_5H_8O_7$ 516
$C_4H_6N_4$ 476	C_4H_9ON 474	$C_4H_{11}ON$ 508	$C_5H_5O_2F_3$ 403	$C_5H_9N_3$ 254
$C_4H_6ON_2$ 252	C_4H_9ONS 463	$C_4H_{11}ON_3$ 175	$C_5H_5O_2N$ 161	$C_5H_9N_3S$ 510
$C_4H_6O_2$ 514	$C_4H_9O_2N$ 4	$C_4H_{11}O_2N$ 190	$C_5H_5O_2N$ 261	$C_5H_9O_2Br$ 514
$C_4H_6O_3$ 320	$C_4H_9O_2N$ 6	$C_4H_{11}O_2N$ 471	$C_5H_5O_2N_3$ (4)480	$C_5H_9O_2N$ 37
$C_4H_6O_3$ 321	$C_4H_9O_2N$ 470	$C_4H_{11}O_2NB$ 502	$C_5H_5O_4N_3$ 421	$C_5H_9O_3N$ 39
$C_4H_6O_4$ 328	$C_4H_9O_2N$ 501	$C_4H_{11}O_2N_5$ 191	$C_5H_6N_2$ 271	$C_5H_9O_3N$ 491
$C_4H_6O_4$ 336	$C_4H_9O_2N$ 51	$C_4H_{11}O_3N$ 173	$C_5H_6N_2$ 511	$C_5H_9O_3NS$ 323
$C_4H_6O_4S$ 350	$C_4H_9O_2N$ (2)8	$C_4H_{11}O_3N_4S$. . . 526	$C_5H_6N_6$ 486	$C_5H_9O_3NS$ 491
$C_4H_6O_4S$ 351	$C_4H_9O_2NS$ 23	$C_4H_{11}O_3P$ 361	$C_5H_6ON_2$ 511	$C_5H_9O_4N$ 10
$C_4H_6O_4S_2$ 350	$C_4H_9O_2NS$ 25	$C_4H_{11}O_8NP_2$ 51	$C_5H_6ON_2S$ 526	$C_5H_9O_4N$ 309

$C_5H_9O_4N$ 71	$C_5H_{12}O_5$... (2)523	$C_6H_5O_2N$505	$C_6H_6O_9$ 516	$C_6H_9O_2N_3S$22
$C_5H_9O_4NS$ 25	$C_5H_{13}N$ 169	$C_6H_5O_2NS$414	C_6H_7N 506	$C_6H_9O_3N_2$510
$C_5H_9O_4N_3S$ 517	$C_5H_{13}N$ 506	$C_6H_5O_2N_2$511	C_6H_7N (3)511	$C_6H_9O_6N$69
$C_5H_9O_4P$ 492	$C_5H_{13}ON$ 508	$C_6H_5O_3Cl$405	C_6H_7NS 507	$C_6H_9O_6N$77
$C_5H_9O_5N$ 10	$C_5H_{13}O_2N_2$ 524	$C_6H_5O_3I$405	$C_6H_7N_5$ (4)485	$C_6H_9O_6P$359
$C_5H_9O_{10}P$ 348	$C_5H_{13}O_4N$ 502	$C_6H_5O_3N$... (2)493	C_6H_7ON 264	$C_6H_{10}N_2$251
$C_5H_{10}ON$ 525	$C_5H_{13}O_7NP_2$ (2)517	$C_6H_5O_3N$505	C_6H_7ON 265	$C_6H_{10}O_2$305
$C_5H_{10}O_2$... (2)513	$C_5H_{13}O_{14}P_3$... 517	$C_6H_5O_3N$506	C_6H_7ON (3)470	$C_6H_{10}O_2$495
$C_5H_{10}O_3$ 515	$C_5H_{14}NS^+$ 415	$C_6H_5O_3N$518	C_6H_7ON 477	$C_6H_{10}O_2N_2$ 525
$C_5H_{10}O_3N_2$ 128	$C_5H_{14}N_2S$ 185	$C_6H_5O_4Br$406	C_6H_7ON 478	$C_6H_{10}O_2N_4$ 510
$C_5H_{10}O_3N_2$ 129	$C_5H_{14}N_2S$ 195	$C_6H_5O_4I$406	$C_6H_7ON_3$... 266	$C_6H_{10}O_3$515
$C_5H_{10}O_3N_2$ 19	$C_5H_{14}ON_2$.. (2)507	$C_6H_5O_4N$379	$C_6H_7O_2B$ 492	$C_6H_{10}O_4$330
$C_5H_{10}O_3N_2$ 466	$C_5H_{14}O_5NP$ 295	$C_6H_5O_4N$380	$C_6H_7O_2N$ 206	$C_6H_{10}O_4$516
$C_5H_{10}O_3N_2$ 467	$C_5H_{15}N_3$ 187	$C_6H_5O_4N$506	$C_6H_7O_2N$ 477	$C_6H_{10}O_4S$351
$C_5H_{10}O_3N_2$ 501	$C_5H_{15}N_3$ 197	$C_6H_6Fe_3^-$433	$C_6H_7O_3P$ 361	$C_6H_{10}O_4S_2$ 352
$C_5H_{10}O_3N_4$ 507	$C_5H_{15}N_3$ 508	$C_6H_6N_4$... (2)484	$C_6H_7O_4NS$ 506	$C_6H_{10}O_4S_2$ 492
$C_5H_{10}O_4$ 318	$C_6H_2N_6Fe_2^-$... 433	$C_6H_6N_4$485	$C_6H_7O_4N_3$.. (2)422	$C_6H_{10}O_4Se$ 353
$C_5H_{10}O_4N_2$ 133	$C_6H_2O_4Br_2$ 522	$C_6H_6N_4S$485	$C_6H_7O_6$ 406	$C_6H_{10}O_5N_2$ 132
$C_5H_{10}O_4N_2$ 418	$C_6H_2O_4Cl_2$ 522	C_6H_6O492	$C_6H_7O_7F$ 517	$C_6H_{10}O_5N_2$ 92
$C_5H_{10}O_4N_2$.. (2)501	$C_6H_2O_6$ 522	$C_6H_6ON_2$267	$C_6H_8N_2$ 182	$C_6H_{10}O_6$348
$C_5H_{10}O_5$... (3)523	$C_6H_4N_2$ (2)477	$C_6H_6ON_4$485	$C_6H_8N_2$ (2)472	$C_6H_{10}O_7$... (2)301
$C_5H_{10}O_7NP$ 85	$C_6H_4O_2Cl_2$ 493	$C_6H_6ON_4S$ 485	$C_6H_8N_2$ (3)481	$C_6H_{10}O_7$... (3)347
$C_5H_{10}O_{10}P_2$... 362	$C_6H_4O_4$ 522	$C_6H_6O_2$378	$C_6H_8N_2$ 507	$C_6H_{10}O_8$344
$C_5H_{11}N$ 170	$C_6H_4O_4N_2$ 469	$C_6H_6O_2$... (2)493	C_6H_8ONCl 477	$C_6H_{10}O_{12}N_2P_4$..298
$C_5H_{11}N$ 507	$C_6H_4O_5$ (2)349	$C_6H_6O_2N$469	$C_6H_8O_2N_3S$ 512	$C_6H_{11}N_3$... (2)510
$C_5H_{11}O_2N$ 4	$C_6H_4O_5N_2$.. (2)518	$C_6H_6O_2N_2$ 506	$C_6H_8O_3N_2$ 498	$C_6H_{11}ON$525
$C_5H_{11}O_2N$.. (3)501	$C_6H_4O_6N_2$ 493	$C_6H_6O_3$404	$C_6H_8O_3N_3$.. (2)512	$C_6H_{11}O_2N$ 501
$C_5H_{11}O_2NS$ 21	$C_6H_4O_6N_2$ 494	$C_6H_6O_3$405	$C_6H_8O_4$ 332	$C_6H_{11}O_2N$ 502
$C_5H_{11}O_2NS$ 23	$C_6H_4O_6N_2$ 519	$C_6H_6O_3$... (2)495	$C_6H_8O_4$ 516	$C_6H_{11}O_4N$.. (3)501
$C_5H_{11}O_2NS$ 24	C_6H_5NCl 470	$C_6H_6O_3$495	$C_6H_8O_5$ 321	$C_6H_{11}O_4N$ 502
$C_5H_{11}O_2NS$.. (2)26	$C_6H_5N_3$ 476	$C_6H_6O_3N_2$ 502	$C_6H_8O_6$ 345	$C_6H_{11}O_4N$68
$C_5H_{11}O_2NS$ 471	$C_6H_5N_4Cl$.. (2)485	$C_6H_6O_4$405	$C_6H_8O_6$ 354	$C_6H_{11}O_4N$... (2)72
$C_5H_{11}O_8P$ 365	C_6H_5OCl 493	$C_6H_6O_4NB$ 492	$C_6H_8O_6S$ 517	$C_6H_{11}O_4NS$ 25
$C_5H_{12}O_2N_2$ 30	C_6H_5ON (3)479	$C_6H_6O_4N_2$ 516	$C_6H_8O_7$ 355	$C_6H_{11}O_4N_3$ 133
$C_5H_{12}O_3NP$ 293	$C_6H_5O_2Cl$ 519	$C_6H_6O_5$406	$C_6H_8O_7$ 356	$C_6H_{11}O_4N_3$ 147
$C_5H_{12}O_4$ 523	$C_6H_5O_2N$ 163	$C_6H_6O_5S$381	$C_6H_8O_8$ (2)517	$C_6H_{11}O_4P$ 353
$C_5H_{12}O_5$ 407	$C_6H_5O_2N$ 469	$C_6H_6O_8S_2$ 381	$C_6H_9O_2N_3$ 31	$C_6H_{11}O_5N$76

$C_6H_{11}O_5N$ 88	$C_6H_{14}O_2N_4$ 527	$C_7H_4O_3Br_2$ 518	C_7H_7ON 265	C_7H_9N (2)511
$C_6H_{11}O_7NS$ 503	$C_6H_{14}O_4$ 515	$C_7H_4O_3Cl_2$ 518	C_7H_7ON (2)479	C_7H_9NS 268
$C_6H_{12}N_4$ 508	$C_6H_{14}O_6$... (3)408	$C_7H_4O_4NC1$ 514	$C_7H_7ON_3$ 511	$C_7H_9N_5$ 485
$C_6H_{12}O_2$ 304	$C_6H_{15}N$ 188	$C_7H_4O_6N_2$ 514	$C_7H_7O_2N$ 164	C_7H_9ON 470
$C_6H_{12}O_2N_2S_2$.. 499	$C_6H_{15}N$ 473	$C_7H_4O_7N_2$ 368	$C_7H_7O_2N$ 468	C_7H_9ON (2)478
$C_6H_{12}O_2S_2$ 324	$C_6H_{15}N$ 506	$C_7H_5O_2Cl$ 489	$C_7H_7O_2N$ 471	C_7H_9ON 479
$C_6H_{12}O_3$ 515	$C_6H_{15}NS$ 508	$C_7H_5O_2Cl$.. (2)514	$C_7H_7O_2N$ (3)505	C_7H_9ON 506
$C_6H_{12}O_3N_2$. (3)467	$C_6H_{15}N_3$ 188	$C_7H_5O_2F$... (3)489	$C_7H_7O_2N$ 511	$C_7H_9O_3N$ 18
$C_6H_{12}O_3N_2$ 504	$C_6H_{15}N_3$ 508	$C_7H_5O_3Br$ 367	$C_7H_7O_2N$ 524.	$C_7H_9O_3NS$ 260
$C_6H_{12}O_3N_4$ 178	$C_6H_{15}ON$ 508	$C_7H_5O_3Br$.. (2)518	$C_7H_7O_2N_3$ 263	$C_7H_9O_6ClP_2$... 362
$C_6H_{12}O_4N_2$ 41	$C_6H_{15}O_2N$ 472	$C_7H_5O_3Cl$ 367	$C_7H_7O_3N$ (2)369	$C_7H_{10}N_2$ 271
$C_6H_{12}O_4N_2$ 526	$C_6H_{15}O_2N_3$ 41	$C_7H_5O_3Cl$ 518	$C_7H_7O_3N_3$.. (3)526	$C_7H_{10}N_2$... (3)481
$C_6H_{12}O_4N_2S_2$.. 26	$C_6H_{15}O_2N_3$ 503	$C_7H_5O_3I$ 367	$C_7H_7O_4N$ 506	$C_7H_{10}N_2$... (2)507
$C_6H_{12}O_5$... (8)523	$C_6H_{15}O_2N_5$. (3)497	$C_7H_5O_4N$ 163	$C_7H_7O_5$ 406	$C_7H_{10}O_2N_2$ 511
$C_6H_{12}O_5N_2$ 502	$C_6H_{15}O_3N$ 204	$C_7H_5O_4N$ 489	$C_7H_7O_6N_5$ 518	$C_7H_{10}O_2N_2S$... 267
$C_6H_{12}O_6$ 408	$C_6H_{15}O_4N$ 502	$C_7H_5O_4N$... (3)505	C_7H_8N 472	$C_7H_{10}O_3N_2$ 498
$C_6H_{12}O_6$ 409	$C_6H_{15}O_6NS$ 190	$C_7H_5O_4N$... (2)514	C_7H_8NBr 477	$C_7H_{10}O_4$ 332
$C_6H_{12}O_6$... (4)523	$C_6H_{16}N_2$ 471	$C_7H_5O_5N$... (2)367	C_7H_8NC1 477	$C_7H_{10}O_5$ 490
$C_6H_{12}O_6N_4$ 204	$C_6H_{16}N_2$ 507	$C_7H_5O_5N$... (2)368	$C_7H_8N_2S$ 526	$C_7H_{10}O_6$ 354
$C_6H_{12}O_6P_2$ 517	$C_6H_{16}N_2$ 508	$C_7H_6N_4$ 476	$C_7H_8N_4$ 476	$C_7H_{10}O_7$ 347
$C_6H_{12}O_7$ 301	$C_6H_{16}N_2S$ 185	$C_7H_6N_4S$ 510	$C_7H_8N_4$ (3)485	$C_7H_{10}O_7$... (6)517
$C_6H_{13}N$ 170	$C_6H_{16}N_2S$ 186	$C_7H_6ON_4$ 476	C_7H_8O 492	$C_7H_{10}O_8$ 347
$C_6H_{13}NS$ 192	$C_6H_{16}N_2S$ 195	$C_7H_6O_2$ 306	$C_7H_8ON_2$ 266	$C_7H_{11}O_4N$ 74
$C_6H_{13}O_2N$ 5	$C_6H_{16}N_2S$ 208	$C_7H_6O_2$ 404	$C_7H_8ON_2$ 267	$C_7H_{11}O_6N$ 70
$C_6H_{13}O_2N$.. (3)501	$C_6H_{16}N_2S_2$ 186	$C_7H_6O_2NC1$. (2)525	$C_7H_8ON_2$... (3)480	$C_7H_{11}O_6N$ 78
$C_6H_{13}O_2N$ 502	$C_6H_{16}O_2N_2$. (2)507	$C_7H_6O_2S$ 516	$C_7H_8O_2$ 379	$C_7H_{12}N_2$ 251
$C_6H_{13}O_2NS$ 24	$C_6H_{17}N_3$ 187	$C_7H_6O_3$ 366	$C_7H_8O_2$ 493	$C_7H_{12}O_2$ 305
$C_6H_{13}O_3N_3$ 501	$C_6H_{17}N_3$ 196	$C_7H_6O_3$ (2)518	$C_7H_8O_2$ 519	$C_7H_{12}O_2$ 495
$C_6H_{13}O_3P$ 361	$C_6H_{17}N_3$... (2)209	$C_7H_6O_3$ 519	$C_7H_8O_2N_2$ 259	$C_7H_{12}O_2$ 513
$C_6H_{13}O_4N$ 52	$C_6H_{17}O_6NP_2$... 294	$C_7H_6O_3NBr$ 525	$C_7H_8O_2N_2$ 477	$C_7H_{12}O_2N_2$ 525
$C_6H_{13}O_5N$ 508	$C_6H_{18}N_4$ 198	$C_7H_6O_4$ 383	$C_7H_8O_2N_4$ 513	$C_7H_{12}O_2N_2S$... 524
$C_6H_{13}O_9P$ 517	$C_6H_{18}N_4$ 210	$C_7H_6O_4$ 384	$C_7H_8O_4$ 406	$C_7H_{12}O_3$ 515
$C_6H_{14}N_2S$ 237	$C_6N_6Co_3^-$ 434	$C_7H_6O_4$ 494	$C_7H_8O_8P_2$ 363	$C_7H_{12}O_3N_2$ 130
$C_6H_{14}ON_2$ 223	$C_7HO_2F_5$ 490	$C_7H_6O_4N_2$.. (2)525	C_7H_9N 170	$C_7H_{12}O_3N_2$ 136
$C_6H_{14}OPS_2$ 524	$C_7H_2O_2F_{10}$ 522	$C_7H_6O_5$ 385	C_7H_9N (2)259	$C_7H_{12}O_4$ 330
$C_6H_{14}O_2N_2$ 30	$C_7H_4O_2Cl_2$ 514	$C_7H_6O_5S$ 368	C_7H_9N 469	$C_7H_{12}O_4$ 332
$C_6H_{14}O_2N_4$ 20	$C_7H_4O_2F_2$.. (2)489	$C_7H_6O_7S$ 494	C_7H_9N (3)510	$C_7H_{12}O_4$ 334

$C_7H_{12}O_4N_2$ 466	$C_7H_{21}O_{10}N_2P_3$. 513	$C_8H_9O_2N_3$511	$C_8H_{12}N_2S$ 270	$C_8H_{16}O_2N_4$ 232
$C_7H_{12}O_5N$.. (2)465	$C_7H_{22}O_{13}N_2P_4$. 298	$C_8H_9O_3N$262	$C_8H_{12}ON_2$ 478	$C_8H_{16}O_3N_2$ 129
$C_7H_{12}O_5N$ 466	$C_8H_5O_2SF_3$ 403	$C_8H_9O_3N$418	$C_8H_{12}O_2N_2$ 478	$C_8H_{16}O_3N_2$ 130
$C_7H_{12}O_5N_2$ 132	$C_8H_5O_3N$... (2)518	$C_8H_9O_3N$524	$C_8H_{12}O_3N_2$. (2)498	$C_8H_{16}O_3N_2$ 134
$C_7H_{12}O_5N_2$ 93	$C_8H_5O_5NS$ 497	$C_8H_9O_3N_3S_2$...424	$C_8H_{12}O_3N_4$ 134	$C_8H_{16}O_3N_2$ 142
$C_7H_{12}O_6$ 490	$C_8H_5O_6N_5$ 526	$C_8H_9O_4N$506	$C_8H_{12}O_3N_4$ 137	$C_8H_{16}O_3N_2$ 464
$C_7H_{12}O_6N$ 465	$C_8H_6N_2S_2$ 509	$C_8H_9O_7N$93	$C_8H_{12}O_4$ 333	$C_8H_{16}O_3N_2$. (2)504
$C_7H_{13}O_2N$ 502	$C_8H_6O_3N_2$ 519	$C_8H_{10}N$472	$C_8H_{12}O_6$ 354	$C_8H_{16}O_3N_2S$... 504
$C_7H_{13}O_2NS$ 502	$C_8H_6O_4$ 338	$C_8H_{10}N_2S_2$524	$C_8H_{12}O_7N_2$ 503	$C_8H_{16}O_3N_2S_2$.. 144
$C_7H_{13}O_3NS$ 324	$C_8H_6O_4$ 339	$C_8H_{10}N_4S$511	$C_8H_{12}O_8$ 347	$C_8H_{16}O_4$ 523
$C_7H_{13}O_4N$ 72	$C_8H_6O_4$ 491	$C_8H_{10}O$493	$C_8H_{12}O_8N_2$ 42	$C_8H_{16}O_4N_2$ 41
$C_7H_{13}O_4N_3$ 147	$C_8H_7ON_2Cl$ 510	$C_8H_{10}ON_2$..(3)480	$C_8H_{13}N_3$ 272	$C_8H_{16}O_4N_2$ 503
$C_7H_{13}O_4N_3$ 148	$C_8H_8N_2$ 260	$C_8H_{10}O_2$522	$C_8H_{13}O_5N_2P$ (2)478	$C_8H_{16}O_4N_2S_2$... 28
$C_7H_{13}O_4N_3$ 467	$C_8H_8N_4$ 282	$C_8H_{10}O_2N_2$477	$C_8H_{13}O_6N$ 80	$C_8H_{16}O_4N_2S_2$
$C_7H_{13}O_6N$ 89	$C_8H_8ON_2$ 510	$C_8H_{10}O_2N_4$510	$C_8H_{13}O_6N_3$ 94	 (2)501
$C_7H_{14}O_3$ 515	$C_8H_8O_2$ 304	$C_8H_{10}O_2N_4$513	$C_8H_{14}O_2$ 513	$C_8H_{16}O_5N_2$ 50
$C_7H_{14}O_3N_2$ 129	$C_8H_8O_2$ (3)514	$C_8H_{10}O_3NS$502	$C_8H_{14}O_2N_2$ 525	$C_8H_{16}S_4$ 413
$C_7H_{14}O_3N_2$ 134	$C_8H_8O_2NI$ 417	$C_8H_{10}O_3N_2$33	$C_8H_{14}O_3N_2$ 139	$C_8H_{17}O_2N_3$ 178
$C_7H_{14}O_3N_2$ 139	$C_8H_8O_2N_2Cl$... 417	$C_8H_{10}O_4N_2$..(2)34	$C_8H_{14}O_3N_2$ 142	$C_8H_{17}O_3N_3$ 134
$C_7H_{14}O_3N_2$ 504	$C_8H_8O_3$ 314	$C_8H_{10}O_4N_2$35	$C_8H_{14}O_3N_2$ 503	$C_8H_{18}N_2S_2$. (2)238
$C_7H_{14}O_3N_2S$... 133	$C_8H_8O_3$ 322	$C_8H_{10}O_6NP$263	$C_8H_{14}O_4$ 331	$C_8H_{18}O_2N_2$ 224
$C_7H_{14}O_3N_2S$... 137	$C_8H_8O_3$ 490	$C_8H_{10}N$470	$C_8H_{14}O_4$ 516	$C_8H_{18}O_2N_4$ 184
$C_7H_{14}O_4N_2$ 502	$C_8H_8O_3$ (2)515	$C_8H_{11}N$(2)469	$C_8H_{14}O_4N_2$ 61	$C_8H_{18}O_2N_4$ 194
$C_7H_{14}O_4N_2S_2$... 27	$C_8H_8O_3$ (3)518	$C_8H_{11}NS$... (2)268	$C_8H_{14}O_4S$ 517	$C_8H_{18}O_6NP_2$... 294
$C_7H_{15}N$ 469	$C_8H_8O_3N_2$ 498	$C_8H_{11}ON$260	$C_8H_{14}O_4S_2$ 492	$C_8H_{18}O_6N_2S_2$.. 474
$C_7H_{15}O_2N_3$ 178	$C_8H_8O_3S$ 515	$C_8H_{11}ON$264	$C_8H_{14}O_4S_3$ 353	$C_8H_{18}O_{10}N_2P_2$.. 53
$C_7H_{15}O_4N$ 53	$C_8H_8O_4$ (3)518	$C_8H_{11}ON$... (2)470	$C_8H_{14}O_5N$.. (3)465	$C_8H_{19}N_3S$ 240
$C_7H_{16}O_2N_4$. (2)184	$C_8H_8O_4N_2$ 418	$C_8H_{11}ON$... (2)479	$C_8H_{14}O_5N$ 466	$C_8H_{19}O_2N$ 508
$C_7H_{16}O_2N_4$ 508	$C_8H_8O_6S$... (3)518	$C_8H_{11}ONS$269	$C_8H_{14}O_5N_4$ 152	$C_8H_{19}O_2N_2^+$ 36
$C_7H_{16}O_2N_4$ 527	$C_8H_9O_2N$ 417	$C_8H_{11}O_2N$171	$C_8H_{14}O_6N$ 465	$C_8H_{19}O_5N$ 205
$C_7H_{17}N_3$ 508	$C_8H_9O_2N$ 418	$C_8H_{11}O_2N$477	$C_8H_{14}O_9$ 347	$C_8H_{20}N_2S$ 186
$C_7H_{18}N_2S$ 186	$C_8H_9O_2N$ 471	$C_8H_{11}O_2N$478	$C_8H_{15}O_4N$ 72	$C_8H_{20}N_2S$ 208
$C_7H_{18}N_2S$ 195	$C_8H_9O_2N$ 478	$C_8H_{11}O_3N$171	$C_8H_{15}O_4N$... (2)73	$C_8H_{20}N_2S$ 473
$C_7H_{18}N_2S$.. (2)208	$C_8H_9O_2N$... (2)524	$C_8H_{11}O_3N$470	$C_8H_{15}O_4N_3$ 148	$C_8H_{20}N_4$ 211
$C_7H_{19}N_3$ 196	$C_8H_9O_2N$ 525	$C_8H_{11}O_3N_3$464	$C_8H_{15}O_4N_5$ 179	$C_8H_{21}N_3$ 197
$C_7H_{19}N_3$... (2)209	$C_8H_9O_2NI$ 417	$C_8H_{11}O_8N$71	$C_8H_{15}O_6N$ 90	$C_8H_{21}N_3$ 210
$C_7H_{20}N_4$ 199	$C_8H_9O_2NS$ 505	$C_8H_{12}N_2$... (3)481	$C_8H_{16}N_{10}$ 510	$C_8H_{22}N_3$ 198

$C_8H_{22}N_4$ 200	$C_9H_{10}O_4$ 494	$C_9H_{13}O_2N$ 478	$C_9H_{17}O_3N_2$ 502	$C_{10}H_8NS$ 482
$C_8H_{22}N_4$ 201	$C_9H_{10}O_4$... (2) 516	$C_9H_{13}O_2N$ 519	$C_9H_{17}O_4N$ 73	$C_{10}H_8NS_2$ 483
$C_8H_{22}N_4$ 202	$C_9H_{10}O_4$ 518	$C_9H_{13}O_3N$ 189	$C_9H_{17}O_5N$ 515	$C_{10}H_8N_2$ 276
$C_8H_{22}N_4S$ 203	$C_9H_{10}O_5$ 518	$C_9H_{13}O_5N_3$ 484	$C_9H_{17}O_6N$ 91	$C_{10}H_8O$ 520
$C_8H_{22}ON_4$ 202	$C_9H_{10}O_5N_2$ 502	$C_9H_{13}O_6NP_2$... 294	$C_9H_{18}O_2N_4$ 233	$C_{10}H_8O_2$ 483
$C_8H_{23}N_5$ 203	$C_9H_{11}N$ 472	$C_9H_{13}O_7N_2P$... 487	$C_9H_{18}O_2N_4$ 509	$C_{10}H_8O_2$ 495
$C_8H_{24}O_{12}N_2P_4S$ 513	$C_9H_{11}O_2N$ 417	$C_9H_{13}O_9N_2P$... 285	$C_9H_{18}O_3N_2$.. (2) 467	$C_{10}H_8O_2$ 520
$C_8H_{24}O_{13}N_2P_4$.. 513	$C_9H_{11}O_2N$ 418	$C_9H_{14}N_2$... (3) 481	$C_9H_{18}O_3N_2$.. (2) 504	$C_{10}H_8O_2N_2S$... 524
$C_8N_8Mo_4$ 434	$C_9H_{11}O_2N$ 468	$C_9H_{14}N_2S$.. (2) 270	$C_9H_{18}O_3N_2S$ (2) 144	$C_{10}H_8O_4$ 491
$C_8N_8W_2$ 434	$C_9H_{11}O_2N$.. (2) 471	$C_9H_{14}ONI$ 508	$C_9H_{18}O_3N_2S_2$	$C_{10}H_8O_4$ 519
$C_9H_6O_2$ 490	$C_9H_{11}O_2N$ 478	$C_9H_{14}ON_5$ 486	 (2) 145	$C_{10}H_8O_4N_2$ 525
$C_9H_6O_3$ (2) 519	$C_9H_{11}O_2N$ 7	$C_9H_{14}O_3N_2$ 498	$C_9H_{18}O_4N_2S_2$... 28	$C_{10}H_8O_4N_3$ 465
$C_9H_6O_4NIS$ 512	$C_9H_{11}O_3N$... (2) 12	$C_9H_{14}O_3N_4$ 138	$C_9H_{18}O_5N_2S_2$... 28	$C_{10}H_8O_4N_4$ 484
$C_9H_6O_4N_2S$.. (2) 512	$C_9H_{11}O_3N$ 13	$C_9H_{14}O_3N_4$ 140	$C_9H_{18}S_4$ 413	$C_{10}H_8O_5S$.. (2) 397
C_9H_7N 482	$C_9H_{11}O_3N$... (2) 18	$C_9H_{14}O_3N_4$.. (2) 504	$C_9H_{20}O_2N_2$ 223	$C_{10}H_8O_8S_2$ 398
C_9H_7N 512	$C_9H_{11}O_3N$ 418	$C_9H_{14}O_8N_3P$... 283	$C_9H_{20}O_2N_4$.. (2) 184	$C_{10}H_9NS$ 483
C_9H_7ON 273	$C_9H_{11}O_3N$ 502	$C_9H_{14}O_9$ 349	$C_9H_{20}O_2N_4$.. (2) 194	$C_{10}H_9NSe$ 483
$C_9H_7O_2N_3S$ 509	$C_9H_{11}O_4N$ 15	$C_9H_{14}O_{10}$.. (2) 349	$C_9H_{20}O_3N_4$ 194	$C_{10}H_9O_3NS_2$... 512
$C_9H_7O_4NS$ 275	$C_9H_{11}O_4N$ 506	$C_9H_{14}O_{12}N_2P_2$.. 487	$C_9H_{20}O_4$ (2) 335	$C_{10}H_9O_7NS_2$... 396
$C_9H_7O_5NS$ 497	$C_9H_{11}O_4NS$ 502	$C_9H_{15}ON_3$ 272	$C_9H_{20}S_4$ 412	$C_{10}H_9O_7NS_2$ (2) 520
$C_9H_8N_2$ 483	$C_9H_{11}O_6NS$ 384	$C_9H_{15}ON_3$ 273	$C_9H_{21}O_3N$ 508	$C_{10}H_9O_8N$ 516
$C_9H_8O_2$ 514	$C_9H_{12}N$ (2) 472	$C_9H_{15}O_3NS$.. (2) 516	$C_9H_{22}O_4$ 212	$C_{10}H_{10}N_2$ 509
$C_9H_8O_2N_2$.. (2) 417	$C_9H_{12}ON_2$.. (3) 480	$C_9H_{15}O_6N$ 78	$C_9H_{23}N_3$ 210	$C_{10}H_{10}ON$.. (2) 512
$C_9H_8O_2N_3$ 464	$C_9H_{12}ON_4$ 513	$C_9H_{15}O_6N$ 81	$C_9H_{24}N_4$ 201	$C_{10}H_{10}O_2$ 403
$C_9H_8O_3$ 491	$C_9H_{12}O_2N_2$ 177	$C_9H_{15}O_6N$ 82	$C_9H_{24}N_4$ 472	$C_{10}H_{10}O_2N_3$... 464
$C_9H_8O_3$ 515	$C_9H_{12}O_3N_2$ 498	$C_9H_{15}O_6NS$ 84	$C_9H_{28}O_{15}N_3P_5$.. 513	$C_{10}H_{10}O_4$ 281
$C_9H_8O_4$ 383	$C_9H_{12}O_6$ 355	$C_9H_{15}O_7NP_2$... 295	$C_{10}H_6ONBr_2$... 482	$C_{10}H_{10}O_4$ 332
$C_9H_8O_4N_4S_2$... 425	$C_9H_{12}O_6N_2$ 484	$C_9H_{15}O_{11}N_3P_2$.. 283	$C_{10}H_6ONCl$ 482	$C_{10}H_{10}O_4$ 335
$C_9H_8O_5N_4S$ 499	$C_9H_{12}O_9$ 347	$C_9H_{15}O_{15}N_2P_3$.. 488	$C_{10}^{HH}H_6ONCl_2$.. 512	$C_{10}H_{10}O_4N_4S_2$.. 425
$C_9H_9O_3N$ 515	$C_9H_{12}O_{10}N_2$ 48	$C_9H_{16}O_2$... (2) 495	$C_{10}H_6ONI_2$ 482	$C_{10}H_{11}ON_5$ 510
$C_9H_9O_3NI_2$ 463	$C_9H_{12}O_{11}$.. (2) 348	$C_9H_{16}O_2$ 496	$C_{10}H_6O_3$ 520	$C_{10}H_{11}O_2F_7$... 522
$C_9H_9O_4N$ 165	$C_9H_{13}N$ 259	$C_9H_{16}O_2N_3S^+$... 40	$C_{10}H_6O_8Cl_2S_2$.. 521	$C_{10}H_{11}O_2NS$... 502
$C_9H_9O_5N$ 525	$C_9H_{13}N$ 469	$C_9H_{16}O_4$ 335	$C_{10}H_7ONCl$ 482	$C_{10}H_{11}O_3N$ 417
$C_9H_{10}ON_2$ 510	$C_9H_{13}NS$ 269	$C_9H_{16}O_5N$ 465	$C_{10}H_7O_2F_3$ 403	$C_{10}H_{11}O_4N$ 468
$C_9H_{10}O_2$ 304	$C_9H_{13}ON$... (3) 479	$C_9H_{16}O_5N_4$ 153	$C_{10}H_7O_3N_2$ 482	$C_{10}H_{11}O_5N$ 505
$C_9H_{10}O_2$ 488	$C_9H_{13}ONS$ 269	$C_9H_{16}O_6N$ 465	$C_{10}H_7O_5NS$ 391	$C_{10}H_{11}O_5N_2S$.. 516
$C_9H_{10}O_2$... (4) 489	$C_9H_{13}O_2N$ 470	$C_9H_{16}O_{14}N_3P_3$.. 284	$C_{10}H_7O_8NS_2$... 520	$C_{10}H_{12}O_2$ 305

$C_{10}H_{12}O_2 \dots (2)489$	$C_{10}H_{15}N \dots 469$	$C_{10}H_{20}O_3N_2S_2 \dots$	$C_{11}H_8O_6S \dots 394$	$C_{11}H_{14}O_2 \dots (3)489$
$C_{10}H_{12}O_2 \dots 496$	$C_{10}H_{15}ON \dots 472$	$\dots (2)145$	$C_{11}H_8O_6S \dots 395$	$C_{11}H_{14}O_3N \dots 506$
$C_{10}H_{12}O_2 \dots 510$	$C_{10}H_{15}ON \dots (3)479$	$C_{10}H_{20}O_4 \dots 523$	$C_{11}H_8O_7S \dots 399$	$C_{11}H_{14}O_3N_2 \dots 504$
$C_{10}H_{12}O_3N \dots 506$	$C_{10}H_{15}O_2N \dots 469$	$C_{10}H_{20}O_4N_2 \dots (3)42$	$C_{11}H_8O_7S \dots 400$	$C_{11}H_{14}O_4N_2 \dots 132$
$C_{10}H_{12}O_4N_2 \dots 159$	$C_{10}H_{15}O_4N_5 \dots 148$	$C_{10}H_{20}O_4N_2S_2 \dots 27$	$C_{11}H_8O_9S_2 \dots 395$	$C_{11}H_{14}O_4N_2 \dots 136$
$C_{10}H_{12}O_4N_2 \dots 165$	$C_{10}H_{15}O_4N_5 \dots 151$	$C_{10}H_{20}O_4N_2S_2 \dots 28$	$C_{11}H_8O_9S_2 \dots 396$	$C_{11}H_{14}O_4N_2 \dots 166$
$C_{10}H_{12}O_4N_4 \dots 485$	$C_{10}H_{15}O_4N_5 \dots 505$	$C_{10}H_{20}O_6N_2 \dots 503$	$C_{11}H_9N \dots 511$	$C_{11}H_{14}O_4N_4 \dots 146$
$C_{10}H_{12}O_4N_4S \dots 485$	$C_{10}H_{15}O_8NS \dots 466$	$C_{10}H_{20}S_4 \dots 413$	$C_{11}H_9ON_3 \dots 512$	$C_{11}H_{14}O_4N_5 \dots 485$
$C_{10}H_{12}O_5N_4 \dots 485$	$C_{10}H_{15}O_9N_5P_2S \dots 513$	$C_{10}H_{20}S_5 \dots 413$	$C_{11}H_9O_2N_3 \dots 511$	$C_{11}H_{14}O_5N_4 (2)513$
$C_{10}H_{12}O_5N_4 \dots 486$	$C_{10}H_{15}O_{10}N_5P_2 \dots 286$	$C_{10}H_{21}N_5 \dots 197$	$C_{11}H_9O_6N_3S \dots 526$	$C_{11}H_{15}O_2N_6 \dots 510$
$C_{10}H_{12}O_6N_4 \dots 486$	$C_{10}H_{15}O_{14}N_4P_3 \dots 488$	$C_{10}H_{21}N_{11} \dots 510$	$C_{11}H_9O_7N_6S_2 \dots 510$	$C_{11}H_{16}N \dots 472$
$C_{10}H_{13}ON \dots 260$	$C_{10}H_{15}O_{14}N_5P_3 \dots 488$	$C_{10}H_{21}O_4N_3 \dots 50$	$C_{11}H_9O_8N_6S_2 \dots 510$	$C_{11}H_{16}O_2N_2S \dots 40$
$C_{10}H_{13}O_2N \dots 470$	$C_{10}H_{16}N_2 \dots (3)482$	$C_{10}H_{22}N_2S_2 \dots 238$	$C_{11}H_{10}O_2N_2S \dots$	$C_{11}H_{16}O_2N_4S \dots 510$
$C_{10}H_{13}O_2N \dots 471$	$C_{10}H_{16}N_2S \dots 271$	$C_{10}H_{22}N_2S_2 (2)239$	$\dots (3)524$	$C_{11}H_{16}O_3N \dots 507$
$C_{10}H_{13}O_2N \dots 480$	$C_{10}H_{16}N_6S \dots 253$	$C_{10}H_{22}ON_4 \dots 233$	$C_{11}H_{10}O_3N_2 \dots 498$	$C_{11}H_{16}O_{10}N_2 \dots 114$
$C_{10}H_{13}O_3N \dots 14$	$C_{10}H_{16}O_4N_4 \dots 423$	$C_{10}H_{22}O_2N_2 \dots 193$	$C_{11}H_{10}O_8 \dots 522$	$C_{11}H_{16}O_{11} \dots 348$
$C_{10}H_{13}O_3N \dots 501$	$C_{10}H_{16}O_8N_2 \dots 44$	$C_{10}H_{22}O_3N_2 (2)509$	$C_{11}H_{11}NS \dots 276$	$C_{11}H_{17}N \dots 469$
$C_{10}H_{13}O_4N \dots 16$	$C_{10}H_{16}O_8N_2 \dots 96$	$C_{10}H_{22}O_4N_4 \dots 60$	$C_{11}H_{11}O_6N \dots 160$	$C_{11}H_{18}O_2N_4 \dots 236$
$C_{10}H_{13}O_4N_5 \dots 486$	$C_{10}H_{16}O_8P_2 \dots 359$	$C_{10}H_{23}N_3 \dots 508$	$C_{11}H_{12}ON_2 \dots 244$	$C_{11}H_{18}O_3N_4 \dots 504$
$C_{10}H_{13}O_5N_5 \dots 290$	$C_{10}H_{16}O_{12}N_5P_3S \dots$	$C_{10}H_{23}O_3P \dots 361$	$C_{11}H_{12}ON_4 (2)281$	$C_{11}H_{18}O_3N_4 \dots 505$
$C_{10}H_{13}O_8N_4P \dots 487$	$\dots (2)513$	$C_{10}H_{24}N_2S_2 \dots 195$	$C_{11}H_{12}ON_4 \dots 282$	$C_{11}H_{18}O_5N_4 \dots 154$
$C_{10}H_{13}O_8N_5P \dots 487$	$C_{10}H_{16}O_{13}N_5P_3 \dots 288$	$C_{10}H_{24}N_4 \dots 212$	$C_{11}H_{12}O_2N_2 \dots 33$	$C_{11}H_{18}O_8N_2 \dots 100$
$C_{10}H_{14}N \dots (4)472$	$C_{10}H_{17}N \dots 469$	$C_{10}H_{24}N_4 \dots 213$	$C_{11}H_{12}O_2N_2 \dots 476$	$C_{11}H_{18}O_8N_2 \dots 108$
$C_{10}H_{14}N_2 \dots 511$	$C_{10}H_{17}O_4N \dots 74$	$C_{10}H_{24}N_4 \dots (2)214$	$C_{11}H_{12}O_3N_2 \dots 501$	$C_{11}H_{18}O_9N_2 \dots 117$
$C_{10}H_{14}ON_2 (3)480$	$C_{10}H_{17}O_6N_3S \dots 150$	$C_{10}H_{24}O_4N_2 \dots 508$	$C_{11}H_{13}ON_3 \dots 244$	$C_{11}H_{20}O_2 \dots (3)496$
$C_{10}H_{14}ON_4 \dots 485$	$C_{10}H_{18}O_3N_4 \dots 235$	$C_{10}H_{24}O_7NP \dots 295$	$C_{11}H_{13}O_2N \dots 479$	$C_{11}H_{20}O_3N_2 \dots 143$
$C_{10}H_{14}O_2 \dots 493$	$C_{10}H_{18}O_4 \dots 516$	$C_{10}H_{25}N_5 \dots 220$	$C_{11}H_{13}O_2N_2 \dots 510$	$C_{11}H_{20}O_5N_2 \dots 503$
$C_{10}H_{14}O_5N_2 \dots 484$	$C_{10}H_{18}O_4N_2 \dots 503$	$C_{10}H_{25}O_2N_5 \dots 197$	$C_{11}H_{13}O_3N \dots 479$	$C_{11}H_{20}O_6N_4 \dots 57$
$C_{10}H_{14}O_6N_5P \dots 488$	$C_{10}H_{18}O_5N \dots 465$	$C_{10}H_{26}N_4 \dots 201$	$C_{11}H_{13}O_3N \dots 491$	$C_{11}H_{20}O_{10}N_2P_2S \dots$
$C_{10}H_{14}O_7N_2 \dots 502$	$C_{10}H_{18}O_5N_2 \dots 503$	$C_{10}H_{26}N_4 \dots (2)202$	$C_{11}H_{13}O_4N \dots 519$	$\dots 296$
$C_{10}H_{14}O_7N_5P \dots 285$	$C_{10}H_{18}O_5N_4 \dots 152$	$C_{10}H_{26}N_4 \dots 472$	$C_{11}H_{13}O_4N \dots 75$	$C_{11}H_{21}O_4N_3 \dots 148$
$C_{10}H_{14}O_7N_5P \dots 486$	$C_{10}H_{18}O_7N_2 \dots 95$	$C_{10}H_{26}N_4 \dots (2)473$	$C_{11}H_{13}O_5N \dots 85$	$C_{11}H_{22}O_2N_4 \dots 234$
$C_{10}H_{14}O_7N_5P \dots 487$	$C_{10}H_{18}O_{12}N_2P_4 \dots 513$	$C_{11}H_8O_2 \dots 514$	$C_{11}H_{13}O_5N \dots 87$	$C_{11}H_{22}O_4N_2 \dots 419$
$C_{10}H_{14}O_8N_3P \dots 487$	$C_{10}H_{19}O_4N \dots 73$	$C_{11}H_8O_3 \dots 392$	$C_{11}H_{13}O_5N_2S \dots$	$C_{11}H_{22}S_4 \dots 413$
$C_{10}H_{14}O_8N_5P \dots 487$	$C_{10}H_{19}O_4N_3 \dots 505$	$C_{11}H_8O_3 \dots 522$	$\dots (2)522$	$C_{11}H_{23}O_3N_3 \dots 140$
$C_{10}H_{14}O_{11}N_4P_2 \dots 487$	$C_{10}H_{20}O_2N_4 \dots 234$	$C_{11}H_8O_3 \dots 520$	$C_{11}H_{13}O_5N_2S \dots 522$	$C_{11}H_{24}S_4 \dots 412$
$C_{10}H_{14}O_{11}N_5P_2 \dots 487$	$C_{10}H_{20}O_3N_2 \dots 140$	$C_{11}H_8O_6S \dots 393$	$C_{11}H_{14}O_2 \dots 305$	$C_{11}H_{26}N_4 \dots 213$

$C_{11}H_{26}N_4$ 215	$C_{12}H_{16}O_3N_2$... 499	$C_{12}H_{24}O_2N_4$... 234	$C_{13}H_{14}O_3N_2$... 499	$C_{14}H_{15}O_2N_2P$.. 526
$C_{11}H_{26}N_4$.. (2)218	$C_{12}H_{16}O_4N_4$... 252	$C_{12}H_{24}O_3N_2$... 505	$C_{13}H_{14}O_3N_3$ (2)504	$C_{14}H_{16}O_4N_2S$.. 502
$C_{11}H_{26}N_4S$ 240	$C_{12}H_{16}O_{13}N_5P_3$ 513	$C_{12}H_{24}O_3N_4$... 178	$C_{13}H_{15}O_5N$ 503	$C_{14}H_{16}O_5N_2$... 370
$C_{11}H_{26}ON_2$ 226	$C_{12}H_{18}O_4N_4ClPS$..	$C_{12}H_{24}O_4N_2$... 419	$C_{13}H_{15}O_7N$ 503	$C_{14}H_{16}O_8N_2$... 160
$C_{11}H_{26}O_{13}N_3P_3$ 503	 512	$C_{12}H_{24}O_6$ 409	$C_{13}H_{16}O_4N$ 493	$C_{14}H_{16}O_8N_2$ (2)468
$C_{11}H_{27}N_5$ 220	$C_{12}H_{18}O_8N_2$ 46	$C_{12}H_{24}S_4$ 413	$C_{13}H_{17}ON_3$ 245	$C_{14}H_{18}N_4$ 277
$C_{11}H_{27}O_2N_5$... 475	$C_{12}H_{18}O_8N_2$ 47	$C_{12}H_{26}N_2S_2$... 238	$C_{13}H_{17}O_5N_3$ (3)505	$C_{14}H_{18}O_4N_2$... 144
$C_{11}H_{28}N_4$ 202	$C_{12}H_{18}O_{12}$.. (2)349	$C_{12}H_{26}N_2S_2$... 239	$C_{13}H_{17}O_6N$ 465	$C_{14}H_{18}O_5N_2$... 501
$C_{12}H_7O_2N_3$ 483	$C_{12}H_{19}O_7N_4ClP_2S$..	$C_{12}H_{26}N_{12}$ 510	$C_{13}H_{17}O_6N$ 91	$C_{14}H_{20}O_4N_4$... 179
$C_{12}H_8N_2$ 281	 512	$C_{12}H_{26}O_3N_2$... 509	$C_{13}H_{20}O_5N_6$... 505	$C_{14}H_{20}O_5$ 523
$C_{12}H_9N_3$ 510	$C_{12}H_{20}N_6S_2$... 255	$C_{12}H_{26}O_4N_2$... 225	$C_{13}H_{22}O_6N_2$... 101	$C_{14}H_{22}O_5N_6$... 149
$C_{12}H_9O_4N_3$ 519	$C_{12}H_{20}ON_6$ 255	$C_{12}H_{26}O_4N_2$... 509	$C_{13}H_{22}O_8N_2$... 101	$C_{14}H_{22}O_8N$ 105
$C_{12}H_9O_4N_4S$... 520	$C_{12}H_{20}O_3N_2$... 498	$C_{12}H_{27}O_3N_3$ (2)231	$C_{13}H_{22}O_8N_2$... 105	$C_{14}H_{22}O_8N_2$... 107
$C_{12}H_9O_5N_2S$... 519	$C_{12}H_{20}O_8N_2$... 101	$C_{12}H_{28}N_4$ 213	$C_{13}H_{22}O_8N_2$... 110	$C_{14}H_{22}O_8N_2$ 47
$C_{12}H_9O_8N_3S$... 518	$C_{12}H_{20}O_8N_2$... 103	$C_{12}H_{28}N_4$ 215	$C_{13}H_{22}O_8N_2$... 113	$C_{14}H_{22}O_9N_2$... 118
$C_{12}H_{10}OPS_2$... 524	$C_{12}H_{20}O_8N_2$... 104	$C_{12}H_{28}N_4$ 218	$C_{13}H_{22}O_8N_4S_2$.. 505	$C_{14}H_{22}O_{10}N_4$.. 120
$C_{12}H_{10}O_6N_2S$.. 518	$C_{12}H_{20}O_8N_2$... 105	$C_{12}H_{28}N_4$ 219	$C_{13}H_{22}O_9N_2$... 117	$C_{14}H_{22}O_{10}N_4$.. 121
$C_{12}H_{10}O_6N_2S$.. 519	$C_{12}H_{20}O_8N_2$... 110	$C_{12}H_{28}N_4$ 475	$C_{13}H_{22}O_{10}N_2$.. 466	$C_{14}H_{22}O_{10}N_4$.. 122
$C_{12}H_{10}O_6S$ 519	$C_{12}H_{20}O_8N_2$ 45	$C_{12}H_{28}N_4$ 508	$C_{13}H_{24}O_2$ 496	$C_{14}H_{23}O_{10}N_3$.. 124
$C_{12}H_{10}O_8S$ 519	$C_{12}H_{20}O_8N_2$ (2)503	$C_{12}H_{28}O_2N_4$... 509	$C_{13}H_{24}O_3N_4$... 191	$C_{14}H_{24}O_3N_6$... 151
$C_{12}H_{11}O_5N_3$ (2)498	$C_{12}H_{20}O_8N_2S$.. 123	$C_{12}H_{28}O_8NP$... 296	$C_{13}H_{24}O_6N_2$... 503	$C_{14}H_{24}O_6N_2$... 102
$C_{12}H_{12}N_2$ 277	$C_{12}H_{20}O_{10}N_2$... 57	$C_{12}H_{29}N_5$ 220	$C_{13}H_{25}N_5$ 273	$C_{14}H_{24}O_8N_2$... 102
$C_{12}H_{12}N_2O_3$... 167	$C_{12}H_{21}N_7$ 256	$C_{12}H_{29}N_5$ 221	$C_{13}H_{26}N_4$ 220	$C_{14}H_{24}O_8N_2$ (2)105
$C_{12}H_{12}O_3N_2$... 498	$C_{12}H_{21}O_3N_5$... 141	$C_{12}H_{30}N_4$ 201	$C_{13}H_{26}O_2N_4$... 234	$C_{14}H_{24}O_8N_2$... 108
$C_{12}H_{12}O_3N_4$... 146	$C_{12}H_{21}O_3N_5$... 146	$C_{12}H_{30}N_4$ 474	$C_{13}H_{26}O_4N_2$... 419	$C_{14}H_{24}O_8N_2$... 111
$C_{12}H_{13}N_3$ 512	$C_{12}H_{21}O_5N_3$... 503	$C_{12}H_{30}N_6$ 222	$C_{13}H_{30}N_4$ 215	$C_{14}H_{24}O_9N_2$... 119
$C_{12}H_{13}O_3NS$... 508	$C_{12}H_{21}O_6N$ 83	$C_{12}H_{31}N_5$ 203	$C_{13}H_{30}N_4$ 475	$C_{14}H_{24}O_{10}N_2$.. 120
$C_{12}H_{13}O_4N_5$... 290	$C_{12}H_{21}O_6N_3$... 503	$C_{13}H_9O_7N_3S_3$.. 509	$C_{13}H_{30}N_4$ 508	$C_{14}H_{24}O_{10}N_2$.. 503
$C_{12}H_{14}O_7N_5$... 291	$C_{12}H_{21}O_6N_3$ 63	$C_{13}H_9O_8N_3S_3$.. 509	$C_{13}H_{31}N_5$ 220	$C_{14}H_{25}N_5$ 221
$C_{12}H_{15}O_2N$ 502	$C_{12}H_{22}O_6N_4$ 58	$C_{13}H_{10}N_2$ 509	$C_{14}H_2O_4N$ 73	$C_{14}H_{25}N_7$ 256
$C_{12}H_{15}O_2N_3$... 508	$C_{12}H_{22}O_6N_4$ 59	$C_{13}H_{11}O_2N$ 505	$C_{14}H_8O_4$ 521	$C_{14}H_{25}O_8N_3$... 123
$C_{12}H_{15}O_3N_2$... 522	$C_{12}H_{22}O_{11}$.. (2)496	$C_{13}H_{11}O_2N$ 525	$C_{14}H_8O_7S$ 521	$C_{14}H_{26}O_5$ 523
$C_{12}H_{15}O_4N$ 505	$C_{12}H_{22}O_{11}$ 523	$C_{13}H_{12}ON_4$ 526	$C_{14}H_9O_4N$ 522	$C_{14}H_{26}O_5N_4$... 152
$C_{12}H_{15}O_5N$ 465	$C_{12}H_{22}O_{12}$ 515	$C_{13}H_{12}O_3N_2$... 518	$C_{14}H_{10}O_4$ 492	$C_{14}H_{26}O_7N_2$ 61
$C_{12}H_{15}O_{10}N_5P_2$ 513	$C_{12}H_{23}O_4N$ 73	$C_{13}H_{12}O_6N_2S$.. 518	$C_{14}H_{12}N_2$ 483	$C_{14}H_{28}N_4$ 217
$C_{12}H_{16}O_2$ 305	$C_{12}H_{23}O_4N_3$... 148	$C_{13}H_{14}N_4$ 272	$C_{14}H_{12}N_2$ 512	$C_{14}H_{28}O_2N_4$... 234
$C_{12}H_{16}O_3N_2$ (2)467	$C_{12}H_{24}N_4$ 217	$C_{13}H_{14}O_2N_3$... 475	$C_{14}H_{12}O_3$ 515	$C_{14}H_{28}O_4N_2$ (2)228

$C_{14}H_{28}O_4N_2 \dots$ 419	$C_{16}H_{12}O_8N_2S_2 \dots$ 521	$C_{16}H_{30}O_8N_2 \dots$ 62	$C_{18}H_{20}O_{12}N_2S_2$ 386	$C_{19}H_{25}O_4N_5 \dots$ 235
$C_{14}H_{30}O_4N_2 \dots$ 225	$C_{16}H_{12}O_9N_2S_2 \dots$	$C_{16}H_{32}N_4 \dots$ 217	$C_{18}H_{24}O_5N_2 \dots$ 36	$C_{19}H_{26}O_2N_4 \dots$ 236
$C_{14}H_{30}O_5N_2 \dots$ 509	$\dots (2) 521$	$C_{16}H_{32}O_5N_2 (2) 229$	$C_{18}H_{24}O_5N_4 \dots$ 154	$C_{19}H_{27}O_6N_4 \dots$ 464
$C_{14}H_{32}N_4 \dots$ 215	$C_{16}H_{12}O_{10}N_2AsS_2 \dots$	$C_{16}H_{32}O_6N_2 \dots$ 225	$C_{18}H_{24}O_6N_4 \dots$ 155	$C_{19}H_{34}O_8N_4 (2) 463$
$C_{14}H_{32}N_4 \dots$ 216	$\dots 520$	$C_{16}H_{36}N_4 \dots (2) 217$	$C_{18}H_{24}O_9N_6 \dots$ 419	$C_{19}H_{34}O_8N_4 \dots$ 464
$C_{14}H_{32}N_4 \dots$ 219	$C_{16}H_{12}O_{11}N_2S_3$ 521	$C_{16}H_{36}N_4 \dots$ 219	$C_{18}H_{25}O_2N_3 \dots$ 198	$C_{19}H_{36}O_4N_4 \dots$ 207
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$C_{14}H_{37}O_{12}N_3P_4$ 513	$\dots (2) 520$	$C_{16}H_{40}N_8 \dots$ 222	$C_{18}H_{25}O_8N_3 \dots$ 124	$C_{20}H_8O_5Br_4 \dots$ 520
$C_{15}H_{10}O_6 \dots$ 522	$C_{16}H_{12}O_{12}S_3 \dots$ 521	$C_{16}H_{41}O_{12}N_3P_4$ 513	$C_{18}H_{26}N_4 \dots$ 278	$C_{20}H_{13}O_7N_3S \dots$ 521
$C_{15}H_{11}N_3 \dots$ 280	$C_{16}H_{12}O_{14}N_2S_4$ 521	$C_{17}H_{11}O_7N_2ClS$ 521	$C_{18}H_{26}N_4S_2 \dots$ 279	$C_{20}H_{14}O_4N_2 \dots$ 520
$C_{15}H_{11}ON_3 \dots$ 262	$C_{16}H_{13}O_{11}N_2AsS_2 \dots$	$C_{17}H_{12}O_3N_2 (2) 520$	$C_{18}H_{27}N_5 \dots$ 279	$C_{20}H_{14}O_5N_2S \dots$ 520
$C_{15}H_{12}O_4N_3S \dots$	$\dots 521$	$C_{17}H_{12}O_{10}N_2S_2$ 521	$C_{18}H_{28}O_2N_4 \dots$ 234	$C_{20}H_{14}O_{11}N_2S_3$ 398
$\dots (9) 511$	$C_{16}H_{14}O_6 \dots$ 519	$C_{17}H_{13}O_2N_2 \dots$ 509	$C_{18}H_{28}O_{10}N_4 \dots$ 517	$C_{20}H_{16}O_8N_4S_2 \dots$ 520
$C_{15}H_{14}O_6 \dots$ 385	$C_{16}H_{15}O_5NS \dots$ 473	$C_{17}H_{14}O_5N_2S \dots$ 520	$C_{18}H_{30}O_3S \dots$ 524	$C_{20}H_{24}O_6 \dots$ 523
$C_{15}H_{15}O_3N \dots$ 525	$C_{16}H_{18}O_4N_2S \dots$ 516	$C_{17}H_{16}O_5N_4S \dots$ 519	$C_{18}H_{30}O_{12}N_4 \dots$ 126	$C_{20}H_{24}O_6N_2 \dots$ 55
$C_{15}H_{15}O_4NS \dots$ 502	$C_{16}H_{20}N_2 \dots$ 507	$C_{17}H_{18}O_6 \dots$ 495	$C_{18}H_{32}O_4N_4 \dots$ 474	$C_{20}H_{24}O_{12}N_2S_2 \dots$ 56
$C_{15}H_{16}O_4 \dots$ 335	$C_{16}H_{21}O_9N_3 \dots$ 506	$C_{17}H_{18}O_6N_6 \dots$ 503	$C_{18}H_{32}O_8N_4 \dots$ 463	$C_{20}H_{26}O_2N_2 \dots$ 224
$C_{15}H_{18}O_8N_2 \dots$ 161	$C_{16}H_{22}N_4 \dots$ 277	$C_{17}H_{20}O_3N_6 \dots$ 253	$C_{18}H_{32}O_8N_4 \dots$ 65	$C_{20}H_{26}O_3N_4 \dots$ 235
$C_{15}H_{19}O_8N_3 \dots$ 506	$C_{16}H_{22}N_4S \dots$ 278	$C_{17}H_{20}O_6N_4 \dots$ 512	$C_{18}H_{32}O_{16} (2) 496$	$C_{20}H_{30}O_8N_2P_2 \dots$ 296
$C_{15}H_{20}N_4 \dots$ 277	$C_{16}H_{22}N_4S_2 \dots$ 279	$C_{17}H_{23}O_8N_4 \dots$ 506	$C_{18}H_{34}O_4N_4 (2) 207$	$C_{20}H_{32}O_8N_2 \dots$ 113
$C_{15}H_{22}O_3N_2 (3) 467$	$C_{16}H_{22}ON_4 \dots$ 278	$C_{17}H_{24}N_4 \dots$ 277	$C_{18}H_{34}O_4N_8 \dots$ 236	$C_{20}H_{32}O_{12}N_6S_2$ 158
$C_{15}H_{22}O_4N_2 \dots$ 141	$C_{16}H_{22}O_4N_6 \dots$ 252	$C_{17}H_{24}O_2N_5 \dots$ 282	$C_{18}H_{34}O_8N_2 \dots$ 62	$C_{20}H_{36}O_6 \dots$ 523
$C_{15}H_{22}O_4N_2 \dots$ 143	$C_{16}H_{22}O_4N_6 \dots$ 253	$C_{17}H_{26}O_2N_4 \dots$ 233	$C_{18}H_{36}O_6N_2 \dots$ 225	$C_{20}H_{36}O_8N_4 \dots$ 463
$C_{15}H_{24}O_9N_2 \dots$ 118	$C_{16}H_{23}N_5 \dots$ 279	$C_{17}H_{26}O_2N_4 \dots$ 234	$C_{18}H_{36}O_6N_2 (2) 229$	$C_{20}H_{38}O_4N_4 \dots$ 207
$C_{15}H_{24}O_{10}N_4 \dots$ 122	$C_{16}H_{24}O_6 \dots$ 410	$C_{17}H_{26}O_7 \dots$ 410	$C_{18}H_{36}O_8N_4 \dots$ 241	$C_{20}H_{38}O_4N_4 \dots$ 208
$C_{15}H_{26}O_8N_4S_2 \dots$ 467	$C_{16}H_{25}O_2N_5 \dots$ 233	$C_{17}H_{27}O_2N_5 \dots$ 235	$C_{18}H_{40}O_4N_4 \dots$ 232	$C_{20}H_{38}O_4N_8 \dots$ 237
$C_{15}H_{27}O_4N_3 \dots$ 206	$C_{16}H_{25}O_3N_5 \dots$ 233	$C_{17}H_{27}O_3N_5 \dots$ 235	$C_{19}H_{10}O_5Br_4S \dots$ 519	$C_{20}H_{38}O_{12}N_6 \dots$ 464
$C_{15}H_{27}O_5N_5 \dots$ 156	$C_{16}H_{26}O_{10}N_4 \dots$ 121	$C_{17}H_{29}O_9N_3 \dots$ 125	$C_{19}H_{13}O_7N_3S_2 \dots$ 275	$C_{20}H_{40}O_{10}N_4 \dots$ 410
$C_{15}H_{34}N_4 \dots$ 475	$C_{16}H_{27}O_3N_5 \dots$ 260	$C_{17}H_{29}O_{10}N_3 \dots$ 125	$C_{19}H_{13}O_{11}N_3S_3$ 275	$C_{21}H_{12}O_5Br_4S \dots$ 494
$C_{15}H_{35}N_5 \dots$ 475	$C_{16}H_{28}O_8N_2 \dots$ 102	$C_{17}H_{30}N_4 \dots$ 215	$C_{19}H_{14}O_5S \dots$ 494	$C_{21}H_{17}O_6N_4S \dots$ 515
$C_{16}H_{11}O_3N \dots$ 520	$C_{16}H_{28}O_8N_2 \dots$ 113	$C_{17}H_{30}O_8N_4 \dots$ 64	$C_{19}H_{14}O_7S \dots$ 520	$C_{21}H_{22}O_4N_2S \dots$ 502
$C_{16}H_{11}O_6N_3S \dots$ 275	$C_{16}H_{28}O_8N_4 \dots$ 63	$C_{17}H_{39}N_5 \dots$ 216	$C_{19}H_{15}O_8N \dots$ 503	$C_{21}H_{22}O_8N_2 \dots$ 505
$C_{16}H_{11}O_{10}N_3S_2$ 521	$C_{16}H_{28}O_{14} \dots$ 411	$C_{18}H_{12}N_6 \dots$ 280	$C_{19}H_{19}O_7N \dots$ 503	$C_{21}H_{22}O_8N_2Cl$ 372
$C_{16}H_{11}O_{11}N_2ClS_3 \dots$	$C_{16}H_{29}O_9N_3 \dots$ 504	$C_{18}H_{15}O_3SP \dots$ 416	$C_{19}H_{24}O_2N_2 \dots$ 224	$C_{21}H_{26}O_2N_2 \dots$ 475
$\dots 521$	$C_{16}H_{30}O_5N_4 \dots$ 153	$C_{18}H_{16}O_5N_4 \dots$ 519	$C_{19}H_{24}O_2N_2 \dots$ 474	$C_{21}H_{31}O_8N_5 \dots$ 464
$C_{16}H_{12}NS \dots (4) 483$	$C_{16}H_{30}O_6 \dots$ 523	$C_{18}H_{20}O_5N_2 \dots$ 505	$C_{19}H_{24}O_5N_4 \dots$ 370	$C_{21}H_{32}N_4 \dots$ 215
$C_{16}H_{12}O_3N_2 \dots$ 498	$C_{16}H_{30}O_6N_4 \dots$ 226	$C_{18}H_{20}O_6N_2 \dots$ 49	$C_{19}H_{25}O_3N_5 \dots$ 235	$C_{21}H_{41}O_4N_5 \dots$ 207

$C_{21}H_{41}O_4N_5 \dots$	207	$C_{24}H_{28}O_8N_2 \dots$	503	$C_{31}H_{35}O_{18}N_3S_3$	388	$HO_4Se \dots \dots \dots$	527	$H_5O_{10}P_3 \dots \dots \dots$	447
$C_{22}H_{16}O_{14}N_4Cl_2^-$		$C_{24}H_{32}O_8 \dots \dots \dots$	524	$C_{32}H_{24}O_6N_6 \dots \dots \dots$	506	$H_2F_6Si \dots \dots \dots$	527	$H_5O_6I \dots \dots \dots$	500
$-P_2S_2 \dots \dots \dots$	521	$C_{24}H_{40}O_{18}N_4 \dots \dots \dots$	411	$C_{32}H_{30}O_8N_2 (3)504$		$H_2O_2 \dots \dots \dots$	500	$H_6O_{13}P_4 \dots \dots \dots$	448
$C_{22}H_{18}O_4N_4 \dots \dots \dots$	520	$C_{24}H_{44}O_8 \dots \dots \dots$	524	$C_{32}H_{32}O_{12}N_2 \dots \dots \dots$	504	$H_2O_3S \dots \dots \dots$	450	$H_6O_{18}P_6 \dots \dots \dots$	449
$C_{22}H_{18}O_5Br_2S \dots \dots \dots$	519	$C_{24}H_{48}O_4N_6 \dots \dots \dots$	207	$C_{32}H_{33}O_{13}N_2S \dots \dots \dots$	466	$H_2O_3S_2 \dots \dots \dots$	452	$H_6O_6N_3P_3 \dots \dots \dots$	527
$C_{22}H_{18}O_{14}N_4^-$		$C_{24}H_{48}O_6N_4 (2)227$		$C_{32}H_{37}O_9NS \dots \dots \dots$	503	$H_2O_4Cr \dots \dots \dots$	432	$H_6O_6Te \dots \dots \dots$	527
$-As_2S_2 \dots \dots \dots$	521	$C_{24}H_{48}O_6N_4 \dots \dots \dots$	509	$C_{32}H_{56}O_8N_6 \dots \dots \dots$	474	$H_2O_4Mo \dots \dots \dots$	432	$H_7O_{16}P_5 \dots \dots \dots$	499
$C_{22}H_{20}O_5S \dots \dots \dots$	519	$C_{24}H_{48}O_{10}N_4 \dots \dots \dots$	410	$C_{33}H_{33}O_{18}N_3S_3$	389	$H_2O_4S_2 \dots \dots \dots$	527	$H_8O_{19}P_6 \dots \dots \dots$	500
$C_{22}H_{23}O_7N_2 \dots \dots \dots$	375	$C_{24}H_{54}O_3N_8 \dots \dots \dots$	230	$C_{33}H_{43}O_{18}N_3S_3$	387	$H_2O_4Se \dots \dots \dots$	527	$H_9O_{22}P_7 \dots \dots \dots$	500
$C_{22}H_{23}O_8N_2Cl \dots \dots \dots$	371	$C_{24}H_{54}O_3N_8 \dots \dots \dots$	230	$C_{35}H_{55}O_{13}N_6 \dots \dots \dots$	420	$H_2O_4W \dots \dots \dots$	432	$I^- \dots \dots \dots$	460
$C_{22}H_{24}O_8N_2 \dots \dots \dots$	370	$C_{24}H_{56}O_6N_8 \dots \dots \dots$	412	$C_{36}H_{33}O_{21}N_3S_3$	389	$H_2O_4Xe \dots \dots \dots$	500	$O_3Br^- \dots \dots \dots$	460
$C_{22}H_{24}O_8N_2 \dots \dots \dots$	374	$C_{25}H_{30}O_7N_4 \dots \dots \dots$	156	$C_{36}H_{52}O_{26}N_4 \dots \dots \dots$	411	$H_2O_8Cr \dots \dots \dots$	526	$O_3C_1^- \dots \dots \dots$	458
$C_{22}H_{24}O_9N_2 \dots \dots \dots$	373	$C_{26}H_{24}O_9NS \dots \dots \dots$	87	$C_{36}H_{56}O_{18}N_4 \dots \dots \dots$	412	$H_2O_8S_2 \dots \dots \dots$	452	$O_3N^- \dots \dots \dots$	443
$C_{22}H_{28}O_2N_4 \dots \dots \dots$	234	$C_{26}H_{29}O_{10}N \dots \dots \dots$	172	$C_{36}H_{60}O_{30} \dots \dots \dots$	523	$H_2S \dots \dots \dots$	527	$O_4Cl^- \dots \dots \dots$	458
$C_{22}H_{30}ON \dots \dots \dots$	512	$C_{26}H_{30}O_3N_4 \dots \dots \dots$	509	$C_{36}H_{65}O_{12}N_5 \dots \dots \dots$	504	$H_2Se \dots \dots \dots$	527	$O_4Re^- \dots \dots \dots$	526
$C_{22}H_{30}O_8N_4 \dots \dots \dots$	54	$C_{26}H_{36}O_6N_2 \dots \dots \dots$	509	$C_{37}H_{44}O_{13}N_2S \dots \dots \dots$	116	$H_2Te \dots \dots \dots$	527	$O_4Tc^- \dots \dots \dots$	526
$C_{22}H_{34}O_8N_2P_2 \dots \dots \dots$	297	$C_{27}H_{31}O_{18}N_3S_3$	387	$C_{38}H_{42}O_{24}N_4S_4$	391	$H_3N \dots \dots \dots$	439		
$C_{22}H_{34}O_9N_8 \dots \dots \dots$	158	$C_{27}H_{35}O_2N_3 \dots \dots \dots$	473	$C_{39}H_{45}O_{18}N_3S_3$	389	$H_3O_2P \dots \dots \dots$	443		
$C_{22}H_{36}O_6N_2 \dots \dots \dots$	509	$C_{27}H_{35}O_7N_5S \dots \dots \dots$	157	$C_{39}H_{51}O_{18}N_3S_3$	387	$H_3O_3As \dots \dots \dots$	527		
$C_{22}H_{37}O_{14}N_5 \dots \dots \dots$	127	$C_{27}H_{48}O_8N_6 \dots \dots \dots$	525	$C_{40}H_{76}O_{18}N_{16}$	411	$H_3O_3B \dots \dots \dots$	434		
$C_{22}H_{40}N_6 \dots \dots \dots$	509	$C_{28}H_{37}O_6N_6S \dots \dots \dots$	180	$C_{41}H_{45}O_{24}N_3S_5$	387	$H_3O_3NS \dots \dots \dots$	527		
$C_{22}H_{40}O_7 \dots \dots \dots$	523	$C_{28}H_{39}O_5N_5 \dots \dots \dots$	179	$C_{42}H_{70}O_{35} \dots \dots \dots$	523	$H_3O_3P \dots \dots \dots$	444		
$C_{22}H_{40}O_8N_4 \dots \dots \dots$	463	$C_{28}H_{40}O_4N_6 \dots \dots \dots$	207	$C_{48}H_{72}O_{14}N_{12}$	412	$H_3O_4As \dots \dots \dots$	527		
$C_{22}H_{40}O_{12}N_4 \dots \dots \dots$	66	$C_{28}H_{47}O_{13}N_9 \dots \dots \dots$	420	$C_{48}H_{80}O_{40} \dots \dots \dots$	523	$H_3O_4P \dots \dots \dots$	444		
$C_{23}H_{16}O_9C_{12}S \dots \dots \dots$	519	$C_{28}H_{48}O_{18}N_4 \dots \dots \dots$	410	$C_{52}H_{64}O_{18}N_4 \dots \dots \dots$	411	$H_3O_4V \dots \dots \dots$	431		
$C_{23}H_{18}O_9S \dots \dots \dots$	519	$C_{29}H_{39}O_6N_6S \dots \dots \dots$	180	$C_{54}H_{43}O_{15}N_9 \dots \dots \dots$	526	$H_3O_6NS_2 \dots \dots \dots$	500		
$C_{23}H_{18}O_{12}S_2 \dots \dots \dots$	519	$C_{29}H_{40}O_6N_7S \dots \dots \dots$	180	$C_{56}H_{56}O_{22}N_4S_4$	410	$H_3O_9P_3 \dots \dots \dots$	448		
$C_{23}H_{20}O_5Br_2S \dots \dots \dots$	494	$C_{30}H_{18}O_{21}N_6S_6$	521	$C_{60}H_{56}O_{18}N_4 \dots \dots \dots$	411	$H_3ON \dots \dots \dots$	441		
$C_{23}H_{22}O_5S \dots \dots \dots$	494	$C_{30}H_{26}O_{12} \dots \dots \dots$	386	$C_{60}H_{68}O_{18}N_8 \dots \dots \dots$	411	$H_4N_2 \dots \dots \dots$	440		
$C_{23}H_{24}O_2N_4 \dots \dots \dots$	509	$C_{30}H_{27}O_{18}N_3S_3$	388	$Br^- \dots \dots \dots$	459	$H_4O_{12}P_4 \dots \dots \dots$	449		
$C_{23}H_{24}O_8N_2 \dots \dots \dots$	376	$C_{30}H_{27}O_{18}N_3S_3$	390	$Cl^- \dots \dots \dots$	455	$H_4O_3NP \dots \dots \dots$	527		
$C_{23}H_{25}O_8N_2I^+ \dots \dots \dots$	377	$C_{30}H_{28}O_{11}N_2 \dots \dots \dots$	504	$HF \dots \dots \dots$	453	$H_4O_4Ge \dots \dots \dots$	527		
$C_{23}H_{27}O_5N_3 \dots \dots \dots$	150	$C_{30}H_{33}O_{15}N_3 \dots \dots \dots$	390	$HN_3 \dots \dots \dots$	441	$H_4O_4Si \dots \dots \dots$	499		
$C_{23}H_{29}N_5 \dots \dots \dots$	473	$C_{30}H_{37}O_7N_5 \dots \dots \dots$	157	$HO^- \dots \dots \dots$	426	$H_4O_4Te \dots \dots \dots$	527		
$C_{23}H_{29}O_7N_3 \dots \dots \dots$	376	$C_{30}H_{49}O_7N_9 \dots \dots \dots$	505	$HO_2N \dots \dots \dots$	499	$H_4O_6Xe \dots \dots \dots$	500		
$C_{24}H_{24}O_8N_2 \dots \dots \dots$	504	$C_{30}H_{52}O_9N_{10} \dots \dots \dots$	158	$HO_3I^- \dots \dots \dots$	461	$H_4O_7P_2 \dots \dots \dots$	446		
$C_{24}H_{26}O_8N_2 (2)504$		$C_{31}H_{32}O_{13}N_2S \dots \dots \dots$	115	$HO_4S^- \dots \dots \dots$	450	$H_4O_8P_2 \dots \dots \dots$	527		

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[9]aneN ₃	508	4-Acetylpyridine	265
[10]aneN ₃	508	2-Acetylpyridine thiosemicarbazone	511
[12]aneN ₄	211	Acetylsalicylic acid	515
[13]aneN ₃	508	N-Acetylsarcosine	491
[13]aneN ₄	212	2-(Acetylthio)benzoic acid	515
[14]aneN ₄	214	3-Acetyl-2,4,6-trimethylpyridine	260
[15]aneN ₄	218	N-Acetyl-L-tyrosine	519
[15]aneN ₅	220	N-Acetyl-DL-tyrosine ethylester	493
[16]aneN ₄	219	Acrylic acid	514
[16]aneN ₅	220	Acylisonicotinylhydrazine	511
[18]aneN ₄	219	Adenine	486
[18]aneN ₆	222	Adenosine	486
[20]aneN ₄	219	Adenosine-2'-(dihydrogenphosphate)	486
[24]aneN ₈	222	Adenosine-3'-(dihydrogenphosphate)	487
[12]aneS ₄	413	Adenosine-5'-(dihydrogenphosphate)	285
[13]aneS ₄	413	Adenosine-5'-(tetrahydrogen-1-thio- triphosphate)	513
[14]aneS ₄	413	Adenosine-5'-(tetrahydrogen-2-thio- triphosphate)	513
[15]aneS ₄	413	Adenosine-5'-(tetrahydrogentriphosphate)	288
[15]aneS ₅	413	Adenosine-5'-(trihydrogen-1-thio- diphosphate)	513
[16]aneS ₄	413	Adenosine-5'-(trihydrogendiphosphate)	286
N-(2-Acetamido)-2-aminoethanesulfonic acid.....	190	Adipic acid	516
4-Acetamidoantipyrine.....	475	D-Adonitol	407
N-(2-Acetamido)iminodiacetic acid.....	92	ADP	286
1-Acetamidopropane-1,1-diphosphonic acid.....	517	Adrenaline	189
3-(Acetamido)pyridine.....	266	L-Alaninamide	176
Acetic acid.....	300	β -Alaninamide	471
Acetoacetic acid.....	321	L-Alanine	3
Acetohydroxamic acid.....	416	β -Alanine	7
Acetone.....	522	DL-Alanine-N,N-diacetic acid	78
Acetonitrile.....	524	β -Alanyl- β -alanine	467
N-(3-Acetophenyl)acetohydroxamic acid.....	417	L-Alanyl-L-alanine	467
Acetoxime.....	525	L-Alanyl-D-alanine	467
2-Acetoxybenzoic acid.....	515	DL-Alanyl-DL-alanine	504
Acetylacetone.....	400	β -Alanylglycine	467
N-(Acetylaminomethyl)-L-proline.....	503	L-Alanylglycylglycine	148
Acetylaspartylvalylaspartylalanine.....	517	β -Alanyl-L-histidine	138
L-N-Acetylcysteine.....	491	L-Alanyl-L-histidine	140
2,2'-Acetylenebis(phenylmethylnitrilo)- tetraacetic acid.....	504	DL-Alanyl-DL-histidine	504
Acetylenedicarboxylic acid.....	491	L-Alanyl-L-leucine	467
N-Acetylglycine.....	515	D-Alanyl-L-leucine	467
N-Acetyl-L-histidine.....	464	DL-Alanyl-DL-leucine	504
2-Acetyllindan-1,3-dione.....	522	DL-Alanyl-DL-methionine	504
N(2)-Acetyl-L-lysine.....	464	DL-Alanyl-2-methylalaninamide	178
N-Acetyl-D-penicillamine.....	324	DL-Alanyl-2-methylalanine	139
DL-N-Acetylphenylalanine.....	491	DL-Alanyl-2-methylalanyl-2-methylalanine	148
2-Acetylpyridine.....	479	DL-Alanyl-DL-norleucine	504
3-Acetylpyridine.....	479		

DL-Alanyl-DL-norvaline.....	504	N-[3-(3-Amino-3-carboxypropylamino)-3-carboxypropyl]azetidine-2-carboxylic acid.....	503
L-Alanyl-L-phenylalanine.....	467	DL-2-Amino-3-chlorobutanoic acid.....	6
L-Alanyl-D-phenylalanine.....	467	DL-2-Amino-3-chloropropanoic acid.....	6
L-Alanyl-L-proline.....	139	1-Aminocyclopentanecarboxylic acid.....	501
DL-Alanyl-DL-valine.....	504	6-Amino-9-(1-ethoxyethyl)purine.....	486
Alizarin.....	521	DL-2-Amino-4-(ethylthio)butanoic acid....	24
Alizarin Complexone.....	503	L-2-Amino-3(ethylthio)propanoic acid.....	23
Alizarin Maroon.....	522	2-Amino-2-deoxy-D-glucopyranose.....	508
Alizarin Red G.....	519	4-Amino-1,6-dihydro-1-methyl-2-methoxy-5-nitroso-6-oxypyrimidine.....	512
Alizarin Red S.....	521	4-Amino-1,6-dihydro-1-methyl-2-methylthio-5-nitroso-6-oxypyrimidine.....	512
Allomaltol.....	405	2-Amino-4,5-dihydro-1,3-thiazole.....	243
Allylacetic acid.....	305	3-Amino-1,2-dihydroxyanthraquinone.....	522
Allyl alcohol.....	524	L-2-Amino-1-(3,4-dihydroxyphenyl)ethanol	171
N-Allyliminodiacetic acid.....	74	L-2-Amino-3-(3,4-dihydroxyphenyl)propanoic acid.....	15
Allylmalonic acid.....	332	4-Amino-1,3-dimethyl-5-nitrosouracil....	512
5-Allyl-5(1-methylethyl)barbituric acid..	498	4-Amino-1,5-dimethyl-2-phenyl-1,2-diazolin-3-one.....	244
N'-(Allyloxyethyl)diethylenetriamine-tetraacetic acid.....	125	6-Amino-2,9-dimethylpurine.....	485
Amantadine.....	469	6-Amino-8,9-dimethylpurine.....	485
Amaranth.....	520	5-Amino-3,4-dimethyl-1,2-oxazole.....	241
N-Amidino-N-methylaminoacetic acid.....	516	Aminodisulphonic acid.....	500
2-Aminoacetamidoxine.....	175	1-Aminoethane-1,1-diphosphonic acid.....	513
Aminoacetic acid.....	1	2-Aminoethanesulfonic acid.....	506
Aminoacetohydroxamic acid.....	174	2-Aminoethanethiol.....	181
2-Amino-3-aminomethyl-4,6-dimethylpyridine.....	272	2-Aminoethanol.....	173
2-Amino-3-aminomethyl-4-methoxymethyl-6-methylpyridine.....	272	2-Amino-5-ethyl-1,3,4-thiadiazole.....	246
2-Amino-3-aminomethyl-4-methyl-6-methoxymethylpyridine.....	273	1-(2-Aminoethyl)-4,8,11-trimethyl-1,4,8,11-tetraazacyclotetradecane....	475
Aminobenzene.....	506	4-(2-Aminoethyl)imidazole.....	254
2-Aminobenzenethiol.....	507	2-(2-Aminoethyl)pyridine.....	481
4-Aminobenzoic acid.....	468	4-(2-Aminoethyl)pyridine.....	481
3-Aminobenzoic acid.....	505	3-(2-Aminoethyl)pyridine.....	481
2-Aminobenzoic acid.....	505	DL-1-(2-Aminoethylamino)-2-propanol....	507
4-Aminobenzoic acid butyl ester.....	471	2-(2-Aminoethylamino)ethanol.....	193
4-Aminobenzoic acid ethyl ester.....	471	3-(2-Aminoethylamino)propanol.....	507
4-Aminobenzoic acid methyl ester.....	471	N-2-Aminoethylglycine.....	40
4-Aminobenzoic acid propyl ester.....	471	L-2-Amino-5-guanidopentanoic acid.....	20
Aminoborylmethanoic acid.....	502	DL-2-Aminohexanedioic acid.....	501
2-Amino-5-bromopyridine.....	480	6-Aminohexanoic acid.....	501
L-Aminobutanedioic acid.....	9	DL-2-Aminohexanoic acid.....	501
L-2-Aminobutanedioic acid 4-amide.....	19	2-Aminohexanoic-N,N-diacetic acid.....	83
4-Aminobutanethiol.....	506	L-trans-2-Amino-3-hydroxy-2,3-dihydrobenzoic acid.....	18
DL-2-Aminobutanoic acid.....	4	DL-2-Amino-1-(4-hydroxyphenyl)ethanol...	470
DL-3-Aminobutanoic acid.....	8	erythro-2-Amino-3-hydroxy-3-phenylpropanoic acid.....	18
4-Aminobutanoic acid.....	8	threo-2-Amino-3-hydroxy-3-phenylpropanoic acid.....	18
DL-2-Aminobutanol.....	506	L-2-Amino-3-hydroxybutanoic acid.....	17
4-(4-Aminobutyl)pyridine.....	481	DL-4-Amino-3-hydroxybutanoic acid.....	501
3-(4-Aminobutyl)pyridine.....	481	4-Amino-2-hydroxybenzoic acid.....	369
2-(4-Aminobutyl)pyridine.....	481	5-Amino-2-hydroxybenzoic acid.....	369
DL-(4-Amino-4-carboxybutyl)trimethylammonium ion.....	36	2-Amino-2-hydroxymethyl-1,3-propanediol.	173
L-2-Amino-3-(2-carboxyethylthio)propanoic acid.....	25		
Aminocarboxylborane.....	502		
L-2-Amino-3-(carboxymethylthio)propanoic acid.....	25		

1-Amino-8-hydroxynaphthalene- 2,4-disulfonic acid.....	520	L-2-Amino-3-(methylthio)propanoic acid...	23
8-Amino-1-hydroxynaphthalene- 3,6-disulfonic acid.....	520	8-Amino-1-naphthol-3,6-disulfonic acid...	396
L-2-Amino-3-(3-hydroxy-4-oxo-1,4-dihydro- 1-pyridinyl)propanoic acid.....	34	2-Aminonicotinic acid.....	506
DL-2-Amino-3-(5-hydroxy-4-oxo-1,4-dihydro- 2-pyridinyl)propanoic acid.....	34	2-Amino-3-nitropyridine.....	480
DL-2-Amino-3-(5-hydroxy-6-oxo-1,6-dihydro- 2-pyridinyl)propanoic acid.....	35	2-Amino-5-nitropyridine.....	480
DL-2-Amino-3-hydroxypentanedioic acid....	10	3-Amino-5-nitropyridine.....	480
DL-2-Amino-3-(2-hydroxyphenyl)propanoic acid.....	12	4-Amino-3-nitropyridine.....	480
DL-2-Amino-3-(3-hydroxyphenyl)propanoic acid.....	12	6-Amino-5-nitrouracil.....	512
L-2-Amino-3-(4-hydroxyphenyl)propanoic acid.....	13	D-4-Amino-1,2-oxazolidin-3-one.....	177
DL-2-Amino-3-(4-hydroxyphenyl)propanol...	470	4-Amino-2-oxo-1,3-diazine.....	484
1-Amino-2-hydroxypropanohydroxamic acid..	175	DL-2-Amino-3-(6-oxo-1,6-dihydro- 2-pyridinyl)propanoic acid.....	33
DL-3-Amino-2-hydroxypropanoic acid.....	464	2-Amino-6-oxopurine.....	486
L-2-Amino-3-hydroxypropanoic acid.....	16	Aminooxyacetic acid.....	501
2-Amino-3-hydroxypyridine.....	511	DL-2-Aminooxybutanoic acid.....	502
L-2-Amino-3-(4-imidazolyl)propanoic acid..	31	2-Aminooxy-2-methylpropanoic acid.....	502
2-Amino-3-(4-imidazolyl)propanohydroxamic acid.....	510	DL-2-Aminooxypropanoic acid.....	502
L-2-Amino-3-(3-indolyl)propanoic acid....	33	L-2-Aminopentanedioic acid.....	10
DL-2-Amino-4-mercaptobutanoic acid.....	463	L-2-Aminopentanedioic acid 5-amide.....	19
D-2-Amino-3-mercapto-3-methylbutanoic acid.....	21	DL-2-Aminopentanoic acid.....	501
L-2-Amino-3-mercaptopropanoic acid.....	20	5-Aminopentanoic acid.....	501
DL-2-Amino-2-methylbutanoic acid.....	501	2-(5-Aminopentyl)pyridine.....	482
L-2-Amino-3-methylbutanoic acid.....	4	3-(5-Aminopentyl)pyridine.....	482
L-2-Amino-2-methyl-3-(3,4-dihydroxy- phenyl)propanoic acid.....	16	4-(5-Aminopentyl)pyridine.....	482
4-Aminomethyl-3-hydroxy-5-hydroxymethyl-2- methylpyridine.....	478	2-Aminophenol.....	470
5-Aminomethyl-3-hydroxy-4-hydroxymethyl- 2-methylpyridine- 4-(dihydrogenphosphate).....	478	3-Aminophenol.....	470
L-2-Amino-2-methyl-3-(4-hydroxyphenyl)- propanoic acid.....	14	4-Aminophenol.....	470
4-Amino-3-methyl-5-nitrosouracil.....	512	(4-Aminophenylamino)butanedioic acid....	159
L-2-Amino-3-methylpentanoic acid.....	501	N-(Aminophenyl)aspartic acid.....	159
L-2-Amino-4-methylpentanoic acid.....	5	L-2-Amino-3-phenylpropanoic acid.....	7
2-Amino-2-methyl-1,3-propanediol.....	471	4-Aminophenylthioacetic acid.....	505
DL-3-Amino-2-methylpropanoic acid.....	501	DL-2-Amino-3-phosphonopropanoic acid....	11
2-Amino-2-methylpropanol.....	506	L-2-Amino-3-phosphopropanoic acid.....	11
2-Amino-9-methylpurine.....	485	3-Aminopropanethiol.....	506
6-Amino-9-methylpurine.....	485	L-2-Aminopropanoic acid.....	3
8-Amino-9-methylpurine.....	485	3-Aminopropanoic acid.....	7
2-(Aminomethyl)pyridine.....	481	DL-1-Amino-2-propanol.....	506
3-(Aminomethyl)pyridine.....	481	3-Aminopropanol.....	506
4-(Aminomethyl)pyridine.....	481	2-(3-Aminopropylamino)ethanol.....	507
2-Amino-5-methyl-1,3,4-thiadiazole.....	246	2-(3-Aminopropyl)pyridine.....	481
5-Amino-3-methyl-1,2,4-thiadiazole.....	256	3-(3-Aminopropyl)pyridine.....	481
2-Amino-4-methyl-1,3-thiazole.....	242	4-(3-Aminopropyl)pyridine.....	481
DL-2-Amino-4-(methylthio)butanoic acid....	24	6-Aminopurine.....	486
		2-Aminopyridine.....	271
		3-Aminopyridine.....	271
		4-Aminopyridine.....	511
		2-Aminopyridine-3-carboxylic acid.....	506
		8-Aminoquinoline.....	483
		DL-2-Amino-4-sulfobutanoic acid.....	8
		2-Amino-4-sulfophenol.....	506
		3-Amino-5-sulfosalicylic acid.....	518
		2-(4-Amino-2-thiabutyl)pyridine.....	270
		2-Amino-1,3,4-thiadiazole.....	245
		6-Amino-3-thiahexanoic acid.....	26
		6-Amino-4-thiahexanoic acid.....	26
		2-(6-Amino-3-thiahexyl)pyridine.....	271
		5-Amino-3-thiapentanoic acid.....	25
		2-(5-Amino-2-thiapentyl)pyridine.....	270

2-(5-Amino-3-thiapentyl)pyridine.....	270	Benzotriazole	476
2-Amino-1,3-thiazole.....	242	Benzoylacetone	403
3-Amino-1,2,4-triazole.....	257	N-Benzoylglycine	515
4-Amino-1,2,4-triazole.....	257	N-(5-Benzoyl-2-hydroxy-3-methoxybenzyl)- iminodiacetic acid	503
L-2-Amino-5-ureidopentanoic acid.....	501	Benzylamine	170
Ammonia.....	439	N-Benzyliminobis(methylenephosphonic acid)	294
AMP-2.....	486	N-Benzyliminodiacetic acid	75
AMP-3.....	487	Benzylmalonic acid	332
AMP-5.....	285	N-Benzyl-L-proline	502
Anhydrocycline.....	376	6-Benzyl-1,4,8,11-tetraazacyclo- tetradecane	215
Aniline.....	506	6-Benzyl-1,4,8,11-tetraazacyclo- tetradecan-5,7-dione	234
p-Anisic acid.....	490	Betainhydroxamic acid	524
p-Anisidine.....	470	Bicine	502
Anthranilic acid.....	505	endo-cis-Bicyclo[2,2,1]-5-heptene- 2,3-dicarboxylic acid	516
Antipyrine.....	244	exo-cis-Bicyclo[2,2,1]-5-heptene- 2,3-dicarboxylic acid	516
D-Arabinitol.....	523	Biphenyl-2,2'-dicarboxylic acid	492
D(+)-Arabinose.....	523	2,2'-Bipyridyl	276
DL-Arginyl-DL-lysyl-DL-aspartyl- DL-valyl-DL-tyrosine.....	505	4,4'-Bipyridyl	483
Arsenazo I.....	521	Bis	471
Arsenazo III.....	521	N,N'-Bis(aminoacetyl)carbamide	507
Arsenic acid.....	527	2,6-Bis[1-(2-aminoethylamino)ethyl]- pyridine	273
Arsenous acid.....	527	N,N'-Bis(2-aminoethyl)ethylenediimino- diacetic acid	60
2-(2-Arsonophenylazo)chromotropic acid..	521	N,N-Bis(2-aminoethyl)glycine	503
L-Ascorbic acid.....	406	N,N'-Bis(2-aminoethyl)malonamide- N",N",N"',N"'-tetraacetic acid	122
Asparagine.....	19	N,N'-Bis(2-aminoethyl)oxalamide- N",N",N"',N"'-tetraacetic acid	122
Aspartame.....	501	2,2-Bis(aminomethyl)butylamine	187
L-Aspartamide.....	507	2,2-Bis(aminomethyl)propylamine	187
Aspartic acid.....	9	2,5-Bis(aminomethyl)tetrahydrofuran- N,N,N',N'-tetraacetic acid	118
DL-Aspartic acid 1-ethylester.....	501	2,6-Bis(aminomethyl)tetrahydropyran- N,N,N',N'-tetraacetic acid	118
DL-Aspartic acid 4-ethylester.....	501	Bis(3-aminopropyl)ether- N,N,N',N'-tetraacetic acid	119
DL-Aspartyl-DL-alanyl-DL-histidine amide.	505	2,7-Bis(2-arsonophenylazo)chromotropic acid	521
L-Aspartyl-L-alanyl-L-histidine methylester.....	149	5,5'-Bis[bis(carboxymethyl)aminomethyl]- 3,3'-dimethyl-4'-hydroxyfuchson- 2"-carboxylic acid	504
L-1-Aspartyl-L-phenylalanine methylester.	501	5,5'-Bis[bis(carboxymethyl)aminomethyl]- 3,3'-dimethyl-4'-hydroxyfuchson-2"- sulfonic acid	115
ATP.....	288	5,5'-Bis[bis(carboxymethyl)aminomethyl]- 3,3'-di-(2-propyl)-6,6'-dimethyl- 4'-hydroxyfuchson-2"-sulfonic acid ...	116
8-Azaadenine.....	486	Bis[bis(carboxymethyl)aminomethyl]- fluorescein	504
Azine.....	258	2,5-Bis[bis(carboxymethyl)aminomethyl]- oxalane	118
BAL.....	415		
Barbital.....	498		
Barbituric acid.....	497		
Benzalmalonic acid.....	491		
Benzenecarboxylic acid.....	306		
Benzene-1,2-dicarboxylic acid.....	338		
Benzene-1,3-dicarboxylic acid.....	339		
Benzene-1,4-dicarboxylic acid.....	491		
N-Benzenesulphonylglycylglycine.....	516		
N-(Benzenesulfonyl)-L-phenylalanine.....	502		
Benzilic acid.....	515		
Benzo-15-crown-5.....	523		
Benzocryptand[2.2.2].....	509		
Benzo-1,3-dioxole-2,2-diphosphonic acid..	363		
Benzo-1,4,7,10,13,16-hexaoxa- cyclooctadecane.....	410		
Benzohydroxamic acid.....	524		
Benzoic acid.....	306		
Benzo[b]pyridine.....	482		
Benzo[c]pyridine.....	512		

2,6-Bis[bis(carboxymethyl)aminomethyl]-oxane.....	118	N,N'-Bis(2-hydroxybenzyl)ethylenediamine-N,N'-bis(methylenephosphonic acid ethylester)	297
(Bis[3-(bis(carboxymethyl)amino)propyl]-methylammonio)acetate.....	125	N,N'-Bis(2-hydroxybenzyl)ethylenediamine-N,N'-bis(methylenephosphonic acid methylester)	296
7,16-Bis(carbamylmethyl)-1,4,10,13-tetraoxa-7,16-diazacyclooctadecane....	226	N,N'-Bis(2-hydroxybenzyl)ethylenediamine-N,N'-diacetic acid	55
1-[Bis(carboxymethyl)amino]butan-2,3-dione dioxime.....	94	DL-N,N-Bis(2-hydroxyethyl)alanine	53
5'-Bis(carboxymethyl)aminomethyl-3,3'-bis(2-propyl)-6,6'-dimethyl-4'-hydroxy-fuchson-2"-sulfonic acid.....	503	N,N-Bis(2-hydroxyethyl)aminoacetic acid ..	502
3-Bis(carboxymethyl)aminomethyl-1,2-dihydroxyanthraquinone.....	503	N,N-Bis(2-hydroxyethyl)-2-aminoethane-sulfonic acid	473
5'-Bis(carboxymethyl)aminomethyl-3,3'-dimethyl-4'-hydroxyfuchson-2''-sulfonic acid.....	87	2-[(Bis(2-hydroxyethyl)amino)-2-hydroxymethyl-1,3-propanediol	205
5-Bis(carboxymethyl)aminomethyl-4-hydroxy-3-methoxybenzaldehyde.....	503	N,N-Bis(2-hydroxyethyl)aminomethyl-phosphonic acid	295
5,5'-[Bis(carboxymethyl)aminomethyl]-3,3',6'-trimethyl-4'-hydroxyfuchson-2"-sulfonic acid.....	466	N,N'-Bis(2-hydroxyethyl)dithiooxamide ...	499
N,N-Bis(carboxymethyl)glycylglycine.....	503	N,N'-Bis(2-hydroxyethyl)ethylenediamine ..	507
2,2'-Bis(carboxymethyl)iminodiacetic acid. 71		N,N'-Bis(2-hydroxyethyl)ethylenediamine-N,N'-dimalonic acid	57
rac-2,2'-Bis(carboxymethyl)oxydiacetic acid.....	347	N,N'-Bis(2-hydroxyethyl)ethylenediimino-dipropanedioic acid	57
meso-2,2'-Bis(carboxymethyl)oxydiacetic acid.....	347	N,N'-Bis(2-hydroxyethyl)ethylenedinitrilo-diacetic acid	503
rac-1,2-Bis(carboxymethyloxymethyl)-(ethylenedioxy)diacetic acid.....	349	N,N'-Bis(2-hydroxyethyl)ethylenedinitrilo-disuccinic acid	503
meso-1,2-Bis(carboxymethyloxymethyl)-(ethylenedioxy)diacetic acid.....	349	N,N-Bis(2-hydroxyethyl)glycine	52
DL-2,2'-Bis(carboxymethyloxymethyl)-oxydiacetic acid.....	348	7,16-Bis(2-hydroxyethyl)-1,4,10,13-tetraoxa-7,16-diazacyclooctadecane ...	225
rac-2,2'-Bis(carboxymethyloxy)-oxydiacetic acid.....	348	7,13-Bis(2-hydroxyethyl)-1,4,10-trioxa-7,13-diazacyclopentadecane	509
meso-2,2'-Bis(carboxymethyloxy)-oxydiacetic acid.....	348	DL-2,2'-Bis-(hydroxymethyl)-2,2'-di(methoxy)oxydiacetic acid	347
2,7-Bis(4-chloro-2-phosphonophenylazo)-chromotropic acid.....	521	N-[1,1-Bis(hydroxymethyl)ethyl]-iminodiacetic acid	90
Bisdien.....	227	DL-2,2'-Bis(hydroxymethyl)oxydiacetic acid	347
1,6-Bis(2,3-dihydroxy-5-sulfobenzoyl)-1,6-diazaheptane.....	386	2,2-Bis(hydroxymethyl)propanoic acid	318
N,N'-Bis(N,N'-dimethyl-2-aminoethyl)-ethylenebis[imino-3-propanoic acid (morpholine amide)].....	207	N-[1,1-Bis(hydroxymethyl)propyl]-iminodiacetic acid	91
6-Bis(1,1-dimethylethyl)-4-methylpyridine-3-sulfonic acid.....	260	N,N'-Bis(hydroxymethyl)thiourea	526
Bis(2,3-dimethyl-5-oxo-1-phenylpyrozol-4-yl)methane.....	509	1,9-Bis(2-hydroxyphenyl)-2,5,8-triazanonane	198
[13]Bisdioxocyclam.....	236	N,N'-Bis(2-hydroxy-5-sulfobenzyl)-ethylenediamine-N,N'-diacetic acid	56
[14]Bisdioxocyclam.....	237	Bis(2-imidazolyl)methane	476
Bis(5,7-dioxo-1,4,8,11-tetraaza-cyclotetradecan-6-yl).....	237	N,N"-Bis(4-imidazolylmethyl)-diethylenetriamine	256
Bis(11,13-dioxo-1,4,7,10-tetraaza-cyclotridecan-12-yl).....	236	N,N"-Bis(4-imidazolylmethyl)-di-1,3-propylenetriamine	256
N,N"-Bis(2-hydroxybenzyl)-N'-benzyl-diethylenetriamine.....	473	7,16-Bis-(2-methoxyethyl)-1,4,10,13-tetraoxa-7,16-diazacyclooctadecane ...	225
		1,10-Bis(6-methyl-2-pyridyl)-2,9-diaza-5,6-dithiadecane	279
		N,N'-Bis[2-(morpholinocarbonyl)ethyl]-piperazine	474
		Bismuthol-II	509

4',4''-Bis(2-phenylazo-1-amino-naphthalene-4-sulfonic acid).....	506	meso-Butane-2,3-diol	522
N,N-Bis(phosphonomethyl)glycine.....	51	rac-Butane-2,3-diol	522
N,N''-Bis(2-pyridylmethyl)-N'-benzyl-diethylenetriamine.....	473	Butanoic acid	303
N,N'-Bis(2-pyridylmethyl)-1,2-diaminoethane.....	277	Butanol	522
N,N'-Bis(2-pyridylmethyl)-1,3-diaminopropane.....	277	But-3-ene-1,1-dicarboxylic acid	332
N,N'-Bis(2-pyridylmethyl)-1,4-diaminobutane.....	277	cis-Butenedioic acid	337
N,N'-Bis(2-pyridylmethyl)-1,5-diaminopentane.....	277	trans-Butenedioic acid	337
N,N'-Bis(2-pyridylmethyl)-1,6-diaminohexane.....	278	trans-But-2-enoic acid	514
N,N''-Bis(2-pyridylmethyl)-diethylenetriamine.....	279	Butylamine	506
N,N''-Bis(2-pyridylmethyl)-di-1,3-propylenetriamine.....	279	DL-2-Butylamine	168
N,N'-Bis(4-pyridylmethyl)ethylenebis[imino-3-propanoic acid (morpholine amide)].....	207	s-Butylamine	168
1,10-Bis(3-sulfobenzyl)-1,5,10-tris(2,3-dihydroxy-5-sulfobenzoyl)-1,5,10-triazadecane.....	387	t-Butylamine	169
N,N'-Bis(2-sulfonoethyl)piperazine.....	474	N-Butylaniline	472
N,N'-Bis(2-tetrazol-5-ylethyl)-diethylenetriamine.....	510	N-Butyldiethanolamine	508
N,N'-Bis(2-tetrazol-5-ylethyl)-ethylenediamine.....	510	Butyldithiophosphonic acid ethylester ...	524
N,N'-Bis(2-tetrazol-5-ylethyl)-triethylenetetraamine.....	510	rac-2,3-Butylenedinitrilotetraacetic acid	104
Bistren.....	230	meso-2,3-Butylenedinitrilotetraacetic acid	104
Bistris.....	205	DL-(Butylethylene)dinitrilotetraacetic acid	102
Boric acid.....	434	N-Butyliminodiacetic acid	72
Bromacetic acid.....	514	N-Butyliminodi-2-ethanol	508
Bromanilic acid.....	522	Butylmalonic acid	330
Bromate ion.....	460	t-Butylmalonic acid	332
Bromide ion.....	459	6-Butyl-1,4,8,11-tetraaza-cyclotetradecane	215
2-Bromobutanoic acid.....	514	6-Butyl-1,4,8,11-tetraazacyclotetradecan-5,7-dione	234
Bromocresol Green.....	494	4-Butyl-1,2,4-triazole	510
4-Bromo-2,6-dimethylpyridine.....	477	Butynedioic acid	491
6-Bromo-2-hydroxybenzohydroxamic acid....	525	Cacodylic acid	492
6-Bromokojic acid.....	406	Caffeic acid	383
3-Bromo-3-methylbutanoic acid.....	514	Calcichrome	521
Bromophenol Blue.....	519	Calmagite	520
2-Bromopropanoic acid.....	514	Caproic acid	304
3-Bromopropanoic acid.....	514	ε-Caprolactam	525
3-Bromopyridine.....	477	Captopril	516
4-Bromopyridine.....	477	Carbamide	423
3-Bromosalicylic acid.....	518	N-(2-Carbamylethyl)iminodiacetic acid	93
4-Bromosalicylic acid.....	518	2-(Carbamylmethylamino)ethanesulfonic acid	190
5-Bromosalicylic acid.....	367	N-(Carbamylmethyl)iminodiacetic acid	92
Bromothymol Blue.....	494	Carbonic acid	437
Bromoxilenol Blue.....	519	Carbon monoxide	526
Butane-1,1-dicarboxylic acid.....	330	DL-2-Carboxy-2'-ethyliminodiacetic acid ..	70
Butanedioic acid.....	336	N-(2-Carboxyethyl)oxybis(ethyleneamine)-N,N',N'-triacetic acid	117
Butane-1,3-diol.....	522	N-[3-(3-Carboxy-3-hydroxypropylamino)-3-carboxy-2-hydroxypropyl]azetidine-2-carboxylic acid	503
		2-Carboxy-5-hydroxy-4-pyrone	406
		DL-1-Carboxy-2-(2-mercapto-4-imidazolyl)-ethyl(trimethyl)ammonium (chloride) ...	40
		Carboxymethoxypropanedioic acid	517
		(Carboxymethylamine)acetohydroxamic acid ..	502
		N-Carboxymethylaspartic acid	69
		S-(Carboxymethyl)cysteine	25

N-(Carboxymethyl)-N-(2-hydroxyethyl)- aminoacetohydroxamic acid.....	502	8-Chloro-9-methylpurine	485
DL-2-Carboxymethyliminodiacetic acid.....	69	2-Chloro-4-nitrobenzoic acid	514
2-(Carboxymethyloxy)benzyliminodiacetic acid.....	503	4-Chlorophenol	493
DL-2-(Carboxymethyl)oxydiacetic acid.....	347	N-(4-Chlorophenyl)acetohydroxamic acid ..	417
RS-[Carboxymethyloxy(hydroxy)methyl]- (ethylenedioxy)diacetic acid.....	349	4-Chlorophenylmethylenediphosphonic acid	362
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		N-(2-Hydroxy-1,1-dimethylethyl)- iminodiacetic acid	465
		4'-Hydroxy-3,3'-dimethyl-2"sulfofuchsone- 5,5'-dicarboxylic acid	519
		1-Hydroxy-4,7-disulfo-2-naphthoic acid ..	395
		3-Hydroxy-5,7-disulfo-2-naphthoic acid ..	396
		2-Hydroxyethanal	522
		1-Hydroxyethane-1,1-diphosphonic acid ...	363
		2-Hydroxy-2-ethylbutanoic acid	515
		N-(2-Hydroxyethyl)ethylenediamine	193
		N-(2-Hydroxyethyl)ethylenedinitrilo- triacetic acid	95
		N-(2-Hydroxyethyl)ethylenedinitrilo- tris(methylenephosphonic acid)	513
		N-(2-Hydroxyethyl)iminodiacetic acid	88
		DL-2-Hydroxy-2-ethylpentanoic acid	515
		2-(2-Hydroxyethyl)pyridine	478
		3-(2-Hydroxyethyl)pyridine	478
		4-(2-Hydroxyethyl)pyridine	479
		N-(2-Hydroxyethyl)trimethylenediamine ...	507
		4'-Hydroxyfuchson-2"-sulfonic acid	494
		3-Hydroxyglutamic acid	10
		N-Hydroxyglutaramic acid	309
		N-Hydroxyglutarimide	421
		N-(6-Hydroxyhexyl)iminodiacetic acid	465
		2-Hydroxy-1-(2-hydroxy-3,6-disulfo- 1-naphthylazo)naphthalene- 3,6-disulfonic acid	521
		8-Hydroxy-7-(8-hydroxy-3,6-disulfo-1- naphthylazo)quinoline-5-sulfonic acid	275
		3-Hydroxy-5-hydroxymethyl-2-methyl- pyridine-4-carboxaldehyde	262
		2-Hydroxy-1-(2-hydroxy- 5-methylphenylazo)naphthalene-4-acid .	520
		3-Hydroxy-2-hydroxymethylpyridine	477
		2-Hydroxy-1-(1-hydroxy-2-naphthylazo)- naphthalene-4-sulfonic acid	520
		2-Hydroxy-1-(1-hydroxy-2-naphthylazo)- 6-nitronaphthalene-4-sulfonic acid ...	521

2-Hydroxy-1-(2-hydroxy-6-sulfo-1-naphthylazo)naphthalene-3,6-disulfonic acid.....	520	3-(5-Hydroxypentyl)pyridine	479
N-Hydroxyiminodiacetic acid.....	76	4-(5-Hydroxypentyl)pyridine	479
N-Hydroxy-2,2'-iminodipropionic acid.....	76	2-Hydroxyphenoxyacetic acid	518
Hydroxylamine.....	441	2-(2-Hydroxyphenyl)ethylamine	470
4-Hydroxy-3-methoxyphenyl)hydroxyacetic acid.....	518	2-(3-Hydroxyphenyl)ethylamine	470
N-(Hydroxymethylaminocarbonylbutanoyl-aminomethyl)-L-proline.....	503	2-(4-Hydroxyphenyl)ethylamine	470
2-(Hydroxymethyl)benzo-1,3-diazole.....	510	N-(2-Hydroxy-2-phenylethyl)iminodiacetic acid	465
3'-Hydroxymethylbenzo-1,4,7,10,13,16-hexaoxacyclooctadecane.....	410	N-(2-Hydroxyphenyl)iminodiacetic acid ...	505
2-Hydroxy-3-methylbenzoic acid.....	518	3-Hydroxyphthalhydrazide	519
2-Hydroxy-4-methylbenzoic acid.....	518	Hydroxyproline	39
2-Hydroxy-5-methylbenzoic acid.....	518	DL-1-Hydroxypropane-1,2,3-tricarboxylic acid	355
DL-2-Hydroxy-2-methylbutanoic acid.....	515	2-Hydroxypropane-1,2,3-tricarboxylic acid	356
N-(Hydroxymethyl)carbamide.....	526	D-2-Hydroxypropanoic acid	311
3-Hydroxy-1-methyl-1,4-dihydropyridin-4-one.....	206	3-Hydroxypropanoic acid	317
DL-N-(1-Hydroxymethyl-2-hydroxy-2-phenylethyl)iminodiacetic acid.....	91	2-Hydroxypropenoic acid-2-dihydrogen-phosphate	490
2-Hydroxymethyl-5-hydroxy-4-pyrone.....	405	2-Hydroxy-1,3-propylenediamine-N,N,N',-tetramethylenephosphonic acid	298
4-(Hydroxymethyl)imidazole.....	252	2-Hydroxy-1,3-propylenedinitrilo-tetraacetic acid	117
6-(Hydroxymethyl)kojic acid.....	406	N-(2-Hydroxypropyl)ethylenediamine	507
DL-2-(Hydroxymethyl)-2'-(methoxy)-oxydiacetic acid.....	347	N-(3-Hydroxypropyl)ethylenediamine	507
2-Hydroxy-3-methyl-1,4-naphthoquinone.....	520	N-(2-Hydroxypropyl)iminodiacetic acid ...	465
2-Hydroxy-1-[3-methyl-5-oxo-1-(3-sulfo-phenyl)-4-pyrazolylazo]naphthalene-4-sulfonic acid.....	520	N-(3-Hydroxypropyl)iminodiacetic acid ...	465
DL-2-(Hydroxymethyl)oxydiacetic acid.....	346	2-(3-Hydroxypropyl)pyridine	479
2-(2-Hydroxy-5-methylphenylazo)benzoic acid.....	518	3-(3-Hydroxypropyl)pyridine	264
2-(5-Hydroxy-3-methyl-1-phenyl-1,2-diazol-4-ylazo)-4-methylphenol-6-sulfonic acid.....	519	4-(3-Hydroxypropyl)pyridine	479
DL-2-Hydroxymethyl-2'-(phospho)oxydiacetic acid.....	348	2-Hydroxy-1-(pyrazolon-4-ylazo)-3-naphthoic acid	520
2-Hydroxy-2-methylpropanoic acid.....	312	2-Hydroxypyridine	260
3-Hydroxy-6-methylpyridine.....	477	3-Hydroxypyridine	261
2-(Hydroxymethyl)pyridine.....	478	4-Hydroxypyridine	261
3-(Hydroxymethyl)pyridine.....	264	3-Hydroxypyridine-2-carboxylic acid	506
4-(Hydroxymethyl)pyridine.....	265	4-Hydroxypyridine-2-carboxylic acid N-oxide	506
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1-Hydroxy-2-naphthoic acid.....	392	8-Hydroxyquinoline	273
2-Hydroxy-1-naphthoic acid.....	392	8-Hydroxyquinoline-5-sulfonic acid	275
2-Hydroxy-3-naphthoic acid.....	392	3-Hydroxysalicylic acid	383
N-(2-Hydroxy-4-nitrobenzyl)glycine.....	502	4-Hydroxysalicylic acid	383
1-Hydroxy-4-(4-nitrophenyl)naphthalene...	520	5-Hydroxysalicylic acid	383
2-Hydroxy-1-nitrosonaphthalene-3,6-disulfonic acid.....	520	6-Hydroxysalicylic acid	383
DL-3-Hydroxy-1-oxobutane-1,3-dicarboxylic acid.....	345	2-Hydroxy-3-sulfobenzoic acid	368
3-Hydroxypentanedioic acid.....	516	N-(2-Hydroxy-5-sulfobenzyl)ethylenediamine-N,N'-bis(methylenephosphonic acid) ...	296
N-(5-Hydroxypentyl)iminodiacetic acid....	465	1-Hydroxy-4-sulfo-2-naphthoic acid	393
2-(5-Hydroxypentyl)pyridine.....	479	1-Hydroxy-7-sulfo-2-naphthoic acid	394
		8-Hydroxy-7-(6-sulfo-2-naphthylazo)-quinoline-5-sulfonic acid	275
		2-Hydroxy-1-(4-sulfo-1-naphthylazo)-naphthalene	520
		3-Hydroxy-2-(2-sulfophenyl)-1-benzopyran-4-one	522

4'-Hydroxy-3,3',5,5'-tetrabromo-2,2'- dimethylfuchson-2"-sulfonic acid.....	494	6-Iodokojic acid	406
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5-Hydroxytetrazole.....	476	N-(4-Iodophenyl)acetohydroxamic acid	417
2-(4-Hydroxy-2-thiabutyl)pyridine.....	269	3-Iodopropanoic acid	515
2-(5-Hydroxy-3-thiapentyl)pyridine.....	269	5-Iodosalicylic acid	367
2-Hydroxy-1-(1,3-thiazol-2-ylazo)- naphthalene-3,6-disulfonic acid.....	509	Isatin-5-sulfonic acid	497
2-Hydroxy-N,N,N-trimethylanilinium iodide.....	508	L-Isoasparagine	501
2-Hydroxytrimethylenediamine.....	182	Isobutyric acid	304
2-Hydroxytrimethylenediamine-N,N'- di-3-propanoic acid diamide.....	194	Isocinchomeric acid	505
(2-Hydroxytrimethylene)dinitrilo- tetraacetic acid.....	117	Isocitric acid	355
2-Hydroxytrimethylenedinitrilo- tetrakis(methylenephosphonic acid)....	298	Isocyclam	214
3,3'-(S,S'-2-Hydroxytrimethylenedithio)- bis(L-2-aminopropanoic acid).....	28	Isoleucine	501
4'-Hydroxy-3,3',5'-trimethylfuchsone- 2"-sulfonic acid.....	519	Isomimosine	34
2-Hydroxy-3,4,5-tris(methoxycarbonyl)- cyclopentadienone.....	522	Isonicotinic acid	505
DL-5-Hydroxytryptophan.....	501	Isonicotinoylhydrazine	266
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1-(2-Imidazolin-2-yl)naphthalene.....	509	Isovaline	501
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Iminobis(methylene-2-pyridine).....	512	Lactic acid	311
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Iminodisuccinic acid.....	71	L-Leucyl-L-histidine	141
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Inosine-5'-(dihydrogenphosphate).....	487	L-Leucyl-D-phenylalanine	467
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Iodokojic acid.....	405	2,4-Lutidine	510
		2,5-Lutidine	510
		2,6-Lutidine	259
		3,4-Lutidine	511
		3,5-Lutidine	511
		Lutidinic acid	505
		Lysine	30
		MECAMS	388
		Maleic acid	337
		Maleinimide dioxime	525
		Malic acid	339
		Malonic acid	326

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Mandelic acid.....	314	4-Methoxyphenylhydrazopentane-2,4-dione .	522
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D(-)-Mannitol.....	408	acid	517
α -D(+)-Mannose.....	523	3-Methoxypropane-1,2-diol	522
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(+)-Melezitose.....	496	4-Methoxypyridine-2,6-bis(methylnitrilo)-	
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2-Mercapto-4-(2-aminoethyl)imidazole....	510	N-oxide	506
2-Mercaptobenzoic acid.....	516	6-Methoxy-9-(β -D-ribofuranosyl)purine ...	485
DL-Mercaptobutanedioic acid.....	350	4-Methoxysalicylic acid	518
2-Mercaptoethanol.....	414	5-Methoxysalicylic acid	518
2-Mercaptoethylamine.....	181	2-[1-(2-Methoxy-5-sulfophenyl)-3-phenyl-	
N-Mercaptoethyliminobis(methylene-		5-formazano]benzoic acid	515
phosphonic acid).....	513	N-Methylacetohydroxamic acid	524
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2-Mercaptohistamine.....	510	2-Methylalanyl-2-methylalanine	142
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2-Mercaptoimidazole.....	510	alaninamide	178
2-Mercapto-1-methylimidazole.....	510	2-Methylalanyl-2-methylalanyl-	
4-Mercapto-N-methylpiperidine.....	192	2-methylalanine	148
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L-proline.....	516	2-methylalanylglycine	152
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propanoyl]-L-proline.....	516	2-methylalanyl-2-methylalanine	153
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DL-2-Mercaptopropanoic acid.....	516	L-2-(Methylamino)-1-(3,4-	
3-Mercapatopropanoic acid.....	516	dihydroxyphenyl)ethanol	189
DL-(2-Mercaptopropionyl)glycine.....	323	2-(Methylamino)ethanethiol	507
8-Mercaptoquinoline.....	482	2-(Methylamino)ethanol	507
2-Mercapto-2,4,6-trioxypyrimidine.....	524	DL-2-(Methylamino)-1-(3-hydroxyphenyl)-	
2-Mercapto-4,5,6-trioxypyrimidine		ethanol	519
5-oxime.....	422	2-(Methylaminomethyl)pyridine	511
Metacycline.....	375	L-erythro-2-(Methylamino)-1-phenyl-	
2-(Methanesulfonamidomethyl)pyridine....	267	propanol	472
Methanoic acid.....	299	N-Methylaniline	472
Methanol.....	522	4-Methylaniline	469
Methionine.....	24	Methyl α -D-arabinofuranoside	523
Methionine-N,N-diacetic acid.....	84	Methyl β -arabinofuranoside	523
Methionine enkephalin.....	157	Methylarsonic acid	518
L-Methionylglycine.....	137	3-(N-Methyl-2-azolidinyl)pyridine	511
L-Methionyl-L-methionine.....	145	N-Methylbenzohydroxamic acid	418
L-Methionyl-D-methionine.....	145	N-Methylbenzohydroxamic acid	525
L-Methionyl-L-S-methylcysteine.....	145	4-Methylbenzohydroxamic acid	524
D-Methionyl-L-S-methylcysteine.....	145	2-Methylbenzoic acid	514
Methoxyacetic acid.....	515	3-Methylbenzoic acid	514
4-Methoxyaniline.....	470	4-Methylbenzoic acid	514
4-Methoxybenzohydroxamic acid.....	418	N-Methyl-2,2-Bis(N-methylaminomethyl)-	
2-Methoxybenzoic acid.....	515	propylamine	198
3-Methoxybenzoic acid.....	515	3-Methylbutanoic acid	513
4-Methoxybenzoic acid.....	490	cis-Methylbutenedioic acid	516
2-Methoxyethylamine.....	506	N-Methylcarbamide	525
N-(2-Methoxyethyl)iminodiacetic acid....	466	DL-Methylcitric acid	517
2-Methoxy-9-methylpurine.....	485	S-Methylcysteine	23

L-S-Methylcysteiny-L-methionine.....	144	6-Methyl-8-mercaptoquinoline-5-sulfonic acid	512
L-S-Methylcysteiny-L-D-methionine.....	144	N-Methyl-4-methoxybenzohydroxamic acid ..	418
L-S-Methylcysteiny-L-S-methylcysteine...	144	N-Methyl-4-methylbenzohydroxamic acid ...	418
4-Methyl-1,2-diaminobenzene.....	507	5-Methyl-5(1-methylethyl)barbituric acid	498
4-Methyl-1,3-diaminobenzene.....	507	DL-2-Methylnitrilotriacetic acid	78
N(1)-Methyldiethylenetriamine.....	197	N-Methyl-4-nitrobenzohydroxamic acid	418
3-Methyl-1,2-dihydroxybenzene.....	519	3-Methylorotic acid	516
4-Methyl-1,2-dihydroxybenzene.....	379	4-Methylphenol	492
9-Methyl-1,4-dioxa-8,11-diazacyclodibenzo-[5,6-13,14]tetradecane.....	474	N-(4-Methylphenyl)acetohydroxamic acid ..	417
Methyldithiophosphonic acid ethylester...	524	5-Methyl-5-phenylbarbituric acid	498
Methyldopa.....	16	3-Methyl-1-phenyl-4-benzoylpyrazol-5-one	509
4,4'-Methylenebis(phenylnitrilo)-tetraacetic acid.....	505	4-Methyl-1,2-phenylenedinitrilo-tetraacetic acid	161
Methylenedicarbamide.....	526	3-Methyl-3-phenylhydrazine-dithiocarboxylic acid	524
Methylenediphosphonic acid.....	361	3-Methyl-1-phenylpyrazole	509
3,3'-(S,S'-Methylenedithio)bis(L-2-amino-propanoic acid).....	27	N-(4-Methylphenylsulfonyl)glycine	502
(Methylenedithio)diacetic acid.....	352	N-(2-Methylphenyl)thiobarbituric acid ...	524
4-Methylesculetin.....	519	N-(3-Methylphenyl)thiobarbituric acid ...	524
N-Methylethanolamine.....	507	N-(4-Methylphenyl)thiobarbituric acid ...	524
DL-2-(1-Methylethylamino)-1-(3,4-dihydroxyphenyl)ethanol.....	507	5-Methyl-1-phenyl-1,2,3-triazole-4-carboxylic acid	464
DL-Methylethylenediamine.....	507	Methylphosphinodiacetic acid	492
N-Methylethylenediamine.....	192	Methylphosphonic acid	360
DL-(Methylethylene)dinitrilotetraacetic acid.....	100	DL-6-Methylpiperidine-2-carboxylic acid ..	502
DL-1-Methylethylenedinitrilotetraacetic acid N,N'-diamide.....	57	2-Methylpropanoic acid	304
4-(1-Methylethyl)tropolone.....	496	2-Methyl-2-propylamine	169
N-Methylglycine.....	36	N-1-Methylpropylaniline	472
4-Methylhexane-3,3-dicarboxylic acid.....	335	N-2-Methylpropylaniline	472
1-Methylhistamine.....	510	DL-(2-Methylpropylethylene)dinitrilo-tetraacetic acid	102
2-Methylhydrazinedithiocarboxylic acid...	524	2-Methylpropyliminodiacetic acid	73
N-Methylhydroxylamine.....	497	2-Methyl-2-propyl-2-phosphonic acid	361
O-Methylhydroxylamine.....	497	7-Methylpurine	484
5-Methyl-2-(hydroxymethyl)benzo-1,3-diazole.....	510	9-Methylpurine	484
2-Methyl-3-hydroxy-4-pyrone.....	404	3-Methylpyrazole	509
2-Methyl-5-hydroxy-4-pyrone.....	405	2-Methylpyridine	511
2-Methyl-8-hydroxyquinoline.....	512	3-Methylpyridine	511
4-Methyl-8-hydroxyquinoline.....	512	4-Methylpyridine	511
1-Methylimidazole.....	248	6-Methylpyridine-2-carboxylic acid	505
2-Methylimidazole.....	476	3-O-Methylpyridoxal	478
4-Methylimidazole.....	249	6-Methylpyridoxine	478
N-Methyliminodi-3-propanoic acid (dimorpholine amide).....	206	N-(6-Methyl-2-pyridylmethyl)iminodiacetic acid	166
N-Methyliminodiacetic acid.....	71	1-Methylquinaldine-4-thione	276
1-Methylinosine.....	513	Methyl α -D-ribofuranoside	523
7-Methylinosine.....	513	Methyl β -D-ribofuranoside	523
N-Methylisatin-5-sulfonic acid.....	497	8-(Methylseleno)quinoline	483
DL-erythro-2-Methylisocitric acid.....	517	1-Methyl-5-sulfoisatin-3-thiosemicarbazone	425
DL-threo-2-Methylisocitric acid.....	517	4-Methyl-5-(4-sulfophenylazo)salicylic acid	518
Methylisonitrosomalnonitrile.....	524	3-Methyl-5-sulfosalicylic acid	518
6-Methylkojic acid.....	406	4-Methyl-5-sulfosalicylic acid	518
Methyl α -D-lyxofuranoside.....	523	5-Methyl-3-sulfosalicylic acid	518
Methylmalonic acid.....	328	6-Methyl-1,4,8,11-tetraaza-cyclotetradecane	215

6-Methyl-1,4,8,11-tetraaza-cyclotetradecan-5,7-dione.....	234	Nicotine	511
12-Methyl-1,4,7,10-tetraazacyclotridecan-1,4,7,10-tetraacetic acid.....	463	Nicotinic acid	469
4-N-Methyltetracycline iodide.....	377	Nicotinohydroxamic acid	511
1-Methyl-2,4,5,6-tetraoxypyrimidine 5-oxime.....	421	Nioxime	525
5-Methyltetrazole.....	476	Nitrate ion	443
7-Methyl-4-thia-1,7-diazaoctane.....	208	Nitrilotriacetic acid	77
7-Methyl-4-thia-1,8-diazanonane.....	208	Nitrilotriacetohydroxamic acid	204
8-Methyl-4-thia-1,8-diazanonane.....	208	Nitrilotri-2-ethanol	204
9-Methyl-5-thia-1,9-diazadecane.....	208	Nitrilotri-3-propanoic acid	78
Methylthioacetic acid.....	516	rac-Nitrilotri-1-(2-propanol)	508
N-Methylthiobarbituric acid.....	524	Nitrilotris(2-ethylamine)	210
N-Methylthiocarbamide.....	526	Nitrilotris(methylenephosphonic acid) ...	488
DL-2-(2-Methylthioethyl)nitrilotriacetic acid.....	84	3-Nitroaniline	469
8-Methylthio-9-methylpurine.....	485	2-Nitrobenzene-1,4-dioxydiacetic acid ...	516
2-(Methylthiomethyl)pyridine.....	268	4-Nitrobenzenethiol	414
8-(Methylthio)quinoline.....	483	3-Nitrobenzohydroxamic acid	525
6-Methylthio-9-(β -D-ribofuranosyl)purine.....	485	4-Nitrobenzohydroxamic acid	525
5-Methylthiotetrazole.....	476	2-Nitrobenzoic acid	514
Methylthymol Blue.....	116	3-Nitrobenzoic acid	514
4-Methyl-1,4,7-triazaoctane.....	209	4-Nitrobenzoic acid	489
7-Methyl-1,4,7-triazaoctane.....	209	2-Nitrobenzoic acid hydrazide	526
5-Methyl-2,5,8-triazanonane.....	209	3-Nitrobenzoic acid hydrazide	526
L-O-Methyltyrosine.....	501	4-Nitrobenzoic acid hydrazide	526
Methyltyrosine.....	14	3-Nitro-1,2-dihydroxybenzene	379
5-Methyluracil.....	484	4-Nitro-1,2-dihydroxybenzene	380
Methylxlenol Blue.....	466	5-Nitro-8-hydroxyquinoline	482
Methyl α -D-xylofuranoside.....	523	7-Nitro-8-hydroxyquinoline-5-sulfonic acid	512
Methyl β -D-xylofuranoside.....	523	5-Nitro-1,10-phenanthroline	483
Metronidazole.....	510	2-Nitrophenol	518
MIDA.....	71	3-Nitrophenol	493
Mimosine.....	34	4-Nitrophenol	493
Minocycline.....	376	2-(4-Nitrophenylazo)chromotropic acid ...	521
Molybdic acid.....	432	3-Nitrophenylboronic acid	492
Morpholine.....	474	2-Nitropyridine	477
Mugineic acid.....	503	3-Nitropyridine	477
Murexide.....	526	4-Nitropyridine	477
Nalidixic acid.....	167	3-Nitrosalicylic acid	367
1,8-Naphthalene-3,3'-bis(phenylmethyl-nitrilo)tetraacetic acid.....	504	4-Nitrosalicylic acid	367
1,8-Naphthalene-3,4'-bis(phenylmethyl-nitrilo)tetraacetic acid.....	504	5-Nitrosalicylic acid	368
1,8-Naphthalene-4,4'-bis(phenylmethyl-nitrilo)tetraacetic acid.....	504	6-Nitrosalicylic acid	368
1,4-Naphthohydroquinone.....	495	7-Nitroso-8-hydroxyquinoline-5-sulfonic acid	512
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ERRATA FOR VOLUMES 1,2,3,4,5

Volume 1

- p. 37 In formula, for $\text{CH}_3\text{CHCH}_2\text{CHCO}_2\text{H}$, read $\text{CH}_3\text{CHCHCO}_2\text{H}$.
- p. 61 Under Fe^{3+} , for ML/M.L, read MHL/M.HL.
- p. 76 For $\text{C}_3\text{H}_{10}\text{O}_2\text{N}_2$ read $\text{C}_4\text{H}_{10}\text{O}_2\text{N}_2$.
- p.119 Under Bibliography, for $\text{Y}^{3+}\text{-Lu}^{3+}$, read $\text{Sc}^{3+}\text{-Lu}^{3+}$.
Under Bibliography, H^+ , for 71LN, read 71LNa,72GG.
- p.140 Under Tb^{3+} , for -0.6, read -0.1.
For 51, read 52.
- p.141 Under Fe^{2+} , for 8.33, read 8.83.
- p.144 Under Tl^{3+} , for 67BA, read 67AB.
- p.210 Under Tl^{3+} , for 67BA, read 67AB.
Under Other references, add 58CG.
- p.240 Under Tl^{3+} , for 67BA, read 67AB.
- p.246 Under Bibliography, for $\text{Ga}^{3+}\text{-Tl}^{3+}$ 67BA, read Ga^{3+} , In^{3+} 67BA, Tl^{3+} 67AB.
- p.285 Under Bibliography, $\text{Y}^{3+}\text{-Lu}^{3+}$, add 65Aa, 65MM.
- p.350 For Ni^{2+} , read Co^{2+} .
For Cu^{2+} , read Ni^{2+} .
- p.457 Under $\text{C}_{17}\text{H}_{22}\text{O}_9\text{N}_2$, for 354, read 254.

Volume 2

- p. 4 Under Hexylamine, Ag^+ , ΔH , for -12.9, read -12.7.
- p. 21 Under 2-Methoxyethylamine, H^+ , for 9.44, read 9.30
For 9.48, read 9.43.
For $\text{CH}_3\text{OCH}_2\text{CH}_2\text{NH}$, read $\text{CH}_3\text{OCH}_2\text{CH}_2\text{NH}_2$.
- p. 23 Under Bibliography, for 71AA, read 71AAa.
- p. 57 Under Cu^{2+} , for 10.36, read 11.37.
- p.106 Under Bibliography, H^+ , for 50JM, read 50JLM.
- p.137 Under Bibliography, for Fe^{2+} , Ni^{2+} , Zn^{2+} , read Fe^{2+} , Zn^{2+} .
- p.180 Under Bibliography, for 71SE, read 71SO.
- p.224 Under footnotes, for $^{a}20^\circ, 0.1$, read $^{d}20^\circ, 0.1$.
- p.262 Under Co^{2+} , for 16.6, read 23.6.
- p.277 Under Bibliography, H^+ , add 62IC.
- p.302 Under Be^{2+} , for $\text{M}_2\text{L}/\text{ML.H}$, read $\text{M}_2\text{L}/\text{ML.M}$.
- p.333 Under 3-Aminopropanoic acid ethylester, for 71AA, read 71AAa.
- p.335 Under DL-Di-2-butylamine, for 11.91, read 10.91.
Under Bis(2-methylpropylamine), for 11.82, read 10.82.
- p.342 For 5-Ethyl-5-(2-methylbutyl)barbituric acid,
read 5-Ethyl-5-(3-methylbutyl)barbituric acid.
- p.352 Under Terpyridine, for 54ML, read 56ML.
- p.384 After 71AA, add 71AAa R.J. Angelici and J.W. Allison, Inorg. Chem., 1971, 10, 2238.

Volume 3

- p. 4 Under Pr^{3+} , for 3.3^d, read 3.3^k.
- p. 6 Under Cd^{2+} , for 2.26, read 2.26^e.
- p. 7 Under Bibliography, Mn^{2+} , for 47LW, read 57LW.
For VO^{2+} , read VO_2^+ .
- p. 8 Under Nd^{3+} , $\text{ML}_2/\text{M.L}^2$, for 15^d, read 25^d.
- p. 11 Under Gd^{3+} , for 3.30, read 3.20.
- p. 14 Under But-3-enoic acid, for 3.337, read 4.337.
- p. 17 Under Nd^{3+} , for 3.08, read 2.08.
- p. 23 For $\text{H}_2\text{O}_3\text{POCH}_2\text{CH}_2\text{CO}_2\text{H}$, read $\text{H}_2\text{O}_3\text{POCCO}_2\text{H}$.
For 2-Hydroxypropenoic, read 2-Hydroxypropenoic.
For $\text{C}_3\text{H}_7\text{O}_6\text{P}$, read $\text{C}_3\text{H}_5\text{O}_6\text{P}$.
- p. 25 In heading of third column, for 25°, 1.0, read 25°, 0.1.
- p. 41 Under Bibliography, for 65PR, read 65PP.
- p. 70 Under Bibliography, H^+ and $\text{Y}^{3+}\text{-Lu}^{3+}$, for 64PK, read 64PKP.
- p. 88 In first table, Zn^{2+} , for 6.42, read 6.42^z.
- p. 92 Under Sr^{2+} , 1.57 should be one line higher, i.e. $\text{MHL}/\text{M.HL} = 1.57$ for 25°, 0.
- p. 95 Under Bibliography, $\text{Am}^{3+}\text{-Cf}^{3+}$, for 65Sb, 68AL, 71S, read 65Sc, 68AL, 71Sf.
Under Bibliography, after VO_2^+ , add Ag^+ 60CI.
- p.112 In top formula, for $\text{HO}_2\text{CHCHCO}_2\text{H}$, read $\text{HO}_2\text{CCHCHCO}_2\text{H}$.
- p.120 Under Nonanedioic acid, H^+ , for 4.12^d, read 5.12^d.
For 5.31^d, read 5.31^e.
- p.122 Under Phthalic acid, $\text{Mn}^{2+}\text{-Cu}^{2+}$, add 60YY.
- p.126 Under Pb^{2+} , for $\text{MHL}/\text{M.HL}$, read $\text{ML}/\text{M.L}$.
For $\text{M}(\text{HL})_2/\text{M}(\text{HL})^2$, read $\text{ML}_2/\text{M.L}^2$.
- p.128 Under Al^{3+} , move values to third column, i.e. 25°, 0.1.
- p.129 Under In^{3+} , move values to third column.
- p.146 Under 3,3'-Thiodipropenoic acid, Cu^{2+} , for 1.59, read 1.80.
- p.149 In second table, formula, for $\text{HO}_2\text{CH}_2\text{SCH}_2\text{CH}_2\text{CH}_2\text{SCH}_2\text{CO}_2\text{H}$,
read $\text{HO}_2\text{CCH}_2\text{SCH}_2\text{CH}_2\text{CH}_2\text{SCH}_2\text{CO}_2\text{H}$.
In footnotes, for $^{k18^\circ}$, 1.0, read $^{k18^\circ}$, 2.0.
- p.194 In first table, Bibliography, H^+ , add 56Sa.
- p.225 In figure, 2-position, for NO, read OH.
- p.329 Under last ligand, for 4.17, read 4.71.
- p.344 Under Benzenehexacarboxylic acid, for 62PTR, read 72PTR.
- p.361 For Hamatoxylin, read Hematoxylin.
- p.366 Under N-Methylcarbamide, for $(\text{C}_2\text{H}_6\text{N}_2)$, read $(\text{C}_2\text{H}_6\text{ON}_2)$.
Under N-Ethylcarbamide, for $(\text{C}_3\text{H}_8\text{N}_2)$, read $(\text{C}_3\text{H}_8\text{ON}_2)$.

Volume 4

- p. 7 Under Fe^{3+} , $\text{M.L}^3/\text{MOOH}(\text{s},\alpha)$, for 41.5, read -41.5.
Under footnotes, add $^{f25^\circ}$, 4.0.
- p. 14 For 73MV, read 72MV.
- p. 58 Under In^{3+} , for 1.43, read 2.43.
Under Ca^{2+} , for 60M, read 60MB.
- p. 73 In first table, third column heading, for 25°, 0.1, read 20°, 0.1.
- p.112 Under Pb^{2+} , for 66VSe, read 66VSB.
Under Other references, fourth line, for 56Na, read 46Na.
Nineth line, for 55Tb, read 56Tb.
- p.119 Under Bibliography, Hg^{2+} , for 49BJ, read 48BJ.
- p.144 Under 30HO, for 5091, read 5079.
- p.195 Under 62FP, for 20, read 26.
- p.197 For 62SB, read 62SG.

Volume 5

- p. 5 Under first table structural formula, for $\text{CH}_3\text{CH}_2\text{CH}_2\text{CHCO}_2\text{H}$,
read $\text{CH}_3\text{CH}_2\text{CH}_2\text{CH}_2\text{CHCO}_2\text{H}$.
- p. 6 Under first table, Bibliography, other references, for 78MS, read 73MS.
- p. 11 Under 6-Aminohexanoic acid, Cu^{2+} , move 5.06^e to H^+ $\text{H}_2\text{L}/\text{HL.H}$ in same column.
- p. 21 Under Cysteine, Zn^{2+} , for 48.5, read 48.5^n .
- p. 23 Under Hg^{2+} , delete 14.32.
Under Pb^{2+} , $\text{ML}/\text{M.L}$, for 19.05, read 14.32.
Under Pb^{2+} , $\text{ML}_2/\text{M.L}^2$, add 19.05 in last column ($25^\circ, 3.0$).
- p. 24 Under H^+ , for $\text{M}_2\text{L}/\text{ML.H}$, read $\text{H}_2\text{L}/\text{HL.H}$.
- p. 32 Under Zn^{2+} , for 6.34, read 6.34^n .
Under Bibliography, H^+ , for 75Apa, read 75APa.
- p. 42 Under first table, for $\text{C}_3\text{H}_{10}\text{O}_2\text{N}_2$ read $\text{C}_4\text{H}_{10}\text{O}_2\text{N}_2$.
Under first table, Cd^{2+} for 12.23, read 13.23.
- p. 48 Under second table, Pr^{3+} , for 8.26, read 9.26.
- p. 62 Under Cu^{2+} , $\text{ML}/\text{MOHL.H}$, add $(-8)^r$ in ΔH column and (15) in ΔS column.
- p. 63 Under second table, Cu^{2+} , for $12.6 + 0.6$, read 12.6 ± 0.6 .
- p. 79 Under Bibliography, Other references, for 73Ka, read 75Kd.
- p.106 Under second table, structural formula, for N-H, read N- CH_3 .
- p.155 Under second table, H^+ , for 11.1, read 11.01.
- p.167 Under first table, Cr^{3+} , for $\text{ML}/\text{M.L}$, read $\text{ML}/\text{MOHL.H}$.
- p.178 Under heading for ΔH , for $20^\circ, 0.1$, read $25^\circ, 0.1$.
Under Cd^{2+} , for 11.8^h , read 11.8^b .
- p.190 Under second table, for Rb^{2+} , read Rb^+ .
Under Bibliography, for $\text{Li}^+-\text{Rb}^{2+}$, read Li^+-Rb^+ .
- p.192 Under first table, ligand name, for [12.8.8], read [11.8.8].
- p.201 Under second table, Other reference, for 78LK, read 78KL.
- p.207 Under Ni^{2+} , $\text{ML}/\text{MOHL.H}$, for 2.51^e , read 9.19^e .
- p.248 Under Cu^{2+} , last equilibrium, for 10.7, read -10.7.
For -16, read +16.
For -5, read +5.
- p.266 Under second table, Bibliography, H^+ , for 79WN, read 78WN.
- p.284 Under first table, Al^{3+} , for 3.43, read 3.8.
- p.285 Under first table, Al^{3+} , for 4.54, read 3.1.
Under Bibliography, H^+ , add 76Ga.
Under Bibliography, Cu^{2+} , for 79EFa, read 79EFb.
- p.287 Under first table, Bibliography, H^+ , for 78PB, read 78Pb.
- p.307 Under Co^{2+} , $\text{ML}_2/\text{M.L}^2$, add 6.4 ± 0.4 in third column ($25^\circ, 0.1$).
Under Bibliography, add Be^{2+} 77DB.
- p.309 Under first table, Bibliography, H^+ , for 77BN, read 77BNC.
- p.328 Under second table, structural formula, for $\text{HO}_2\text{CH}_2\text{CHCHCO}_2\text{H}$, read $\text{HO}_2\text{CCH}_2\text{CHCHCO}_2\text{H}$.
- p.330 Under Zn^{2+} , for 3.87, read 2.87.
- p.333 Under first table, Bibliography, Ca^{2+} , Cu^{2+} , for 78WN, read 79WN.
- p.336 Under Bibliography, V^{3+} , for 79PT, read 79PTa.
- p.340 Under Bibliography, H^+ for 76GS, read 76GK.
- p.348 Under first table, name, for triazatridecane, read triazacyclotridecane.
- p.350 Under second table, for (Other values in Vol.3, p.320),
read (Other values in Vol.3, p.220).
- p.353 Under first table, Bibliography, Al^{3+} , for 78L, read 78Lb.
Under second table, Fe^{3+} , for -1.15, read -0.8,
For -6.5, read -6.3.
For -12.0, read -11.8.
- p.356 Under Bibliography, Ge(IV), for 79MBc, read 79MBd.

- p.362 Under first table, Bibliography, for 79MBc, read 79MBd.
Under second table, Bibliography, for 79MBc, read 79MBd.
- p.369 Under third table, for $(\text{CH}_2\text{CH}_2)_2\text{NH}_2^+$, read $(\text{CH}_3\text{CH}_2)_2\text{NH}_2^+$.
- p.377 For Pb^{2+} , read Pd^{2+} .
- p.378 Under first table, for Bi^{3+} read Ga^{3+}
Under Bibliography, for Bi^{3+} , read Ga^{3+} .
- p.396 Under H^+ , for 76ACR, read 76ACa.
- p.406 Under second table, Bibliography, Other references, for 79MMN, read 78MMN.
- p.407 Under Ga^{3+} , for 7.46, read 7.26.
Under Bibliography, VO^{2+} , for 76CKP, read 76CKR.
- p.412 Under Bibliography, add NpO_2^+ 79VG.
- p.417 Under Bibliography, H^+ , for 75SSa, read 74SSa.
Under Bibliography, Cu^{2+} , for 74AC, read 74Ac.
- p.418 Under footnotes, for $^{e25^\circ}_{30}$, read $^{e25^\circ}_{3.0}$.
- p.419 Under Zn^{2+} , for $\text{ML}_3/\text{M.L}^3$, read $\text{ML}_2/\text{M.L}^2$.
Add $\text{ML}_3/\text{M.L}^3$ to line above $\text{ML}_4/\text{M.L}^4$.
Move $\text{ML}_4/\text{M.L}^4$ to next line below.
- p.422 Under Cd^{2+} , $\text{ML}_4/\text{M.L}^4$, for 2.9 ± 0.2 , read 2.9 ± 0.2 .
- p.423 Under Bibliography, Ag^+ , add 76CC.
- p.427 Under headings, fourth column, for Log K, read ΔH .
Fifth column, for Log K, read ΔS .
- p.428 Same
- p.429 Same
- p.431 Under first ligand, for 9.27^a, read 9.27^c.
Under DL-2-Aminobutanol, for Vol.2, p.322, read Vol.2, p.332.
Under (norepinephrine), add (see noradrenaline).
- p.434 Under (phenylephrin), for 9.13, read 9.13^c
Under (morpholine), for -9.83^c, read -9.83^b.
- p.461 Under second ligand from bottom, for $(\text{C}_7\text{H}_{16}\text{O}_2\text{N}_2)$, read $(\text{C}_7\text{H}_{16}\text{O}_2\text{N}_4)$.
- p.462 Under fourth ligand, for 74MS, read 75MS.
- p.535 Under twelveth entry, for 77MSa, read 77SMa.
- p.541 Add 78Lb L.H.J. Lajunen, Finn. Chem. Lett., 1978, 127.
- p.561 Add $\text{C}_8\text{H}_{10}\text{O}_4\text{N}_2$ 35.
- p.567 For L-N-Acetylsteine, read L-N-Acetylcysteine.
For N-Acetyl-4-nirtoaniline, read N-Acetyl-4-nitroaniline.
For Adenosine-5'-(dihydrogentriphosphate), read Adenosine-5'-(dihydrogenphosphate).
- p.579 For meso-1,2-Dimethylethylenedimaine, read meso-1,2-Dimethylethylenediamine.
For meso-(1,2-Dimethylethylene)diminodi-,
read meso-(1,2-Dimethylethylene)diiminodi-.
- p.580 For Dipyenyolphosphinoacetic acid, read Diphenylphosphinoacetic acid.
- p.582 For Glyciner cresol Red, read Glycine cresol Red.
- p.583 Under Hydrogen hypophosphate, for 387, read 378.
- p.584 Under 1-Hydroxyethane-1,1-diphosphonic acid, for 270, read 470.
- p.594 Under salicylaldehyde, for 399, read 339.