Equilibria and constants in CHEAQS: selection criteria, sources and assumptions
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Contents

Introduction

This document accompanies the speciation program CHEAQS (a program for calculating CHemical Equilibria in AQuatic Systems), version Pro 2011.1 and higher. It gives information about the selection process for the equilibria and equilibrium constants for CHEAQS' database. Selecting equilibrium constants is an *important* step in equilibrium modelling. However, reported values in the literature may vary considerably (Zuehlke & Byrne, 1984), even up to a factor of 100 to 1000 (Giesy & Alberts, 1989). Selecting equilibrium constants is therefore a *critical* step as well. To ensure that the database of CHEAQS contains a consistent set of correct constants, values were taken from the NIST database 46 (version 8) where available (NIST database 46, 2004). This database has been compiled by the ultimate experts in this field, A.E. Martell and R.M. Smith, and is the electronic follow-up of their printed compilations (Martell & Smith, 1974, 1977, 1982; Smith & Martell, 1975, 1976, 1989).
A few other sources were used as well, but only after it was confirmed that for matching constants comparable values were given as in the NIST database.
For the inclusion of constants in the NIST database, fairly critical criteria were applied. However, if a constant has not been selected for the NIST database, it does not necessarily mean that the value is not correct; possibly the information to check the correctness is just incomplete. Therefore, it can be assumed that the values taken from the NIST database are most likely correct (within certain uncertainty limits) according to most recent insights, but this does not mean that the database is complete!

If you feel you are an expert in a certain field, do not hesitate to make changes to the database. CHEAQS Pro contains many features to let you modify the database.

Note: version 7 of the database was never released due to a ‘counting error’.

Selection criteria

The following selection criteria were applied.

1. If values were available from the NIST database 46, those constants were selected.
   1.1. If constants were available for ionic strength (I) of 0 and temperature of 25°C, those data were used. Skip 1.2 and 1.3.
   1.2. If only data were available for ionic strength (I) different from 0 and temperature of 25°C, those data were extrapolated to I=0 using the Davies-equation (see on-line help, item "Activity correction"). Skip 1.3.
   1.3. If only data were available for temperatures different from 25°C, those data were used. Extrapolation to I=0 was done as described under 1.2. No temperature correction was performed (see on-line help, item "Temperature correction").
   1.4. Values between brackets (classified by Martell & Smith as being "of questionable value") were *in*cluded.
   1.5. Several constants had to be converted to a different format before they could be entered. If this required other constants, already selected constants were used (if necessary after conversion to the appropriate I).
   1.6. If, for solids with the same stoichiometry, two solubility constants were available for different crystalline forms, the highest solubility constant was selected (i.e. the least soluble form).
2. If additional constants were available from other sources, those constants were selected if the data appeared sufficiently compatible with the NIST-data (see the Appendix).

For organic complexation, please refer to section II.6 Organic complexation, page 106.

How to read this document

In part I of this document you will find the equilibria and constants selected from the NIST database. The first and second column contain the formulation of the equilibrium and the constant taken from the NIST database without any conversion (except for a few cases where an inversion of both the equilibrium and the constant took place). The third and fourth column contain the ionic strength (unit M) and temperature (unit °C) if different from the default values of 0 and 25°C resp. No data in these columns means default values. The last column (Conversion or remarks) contains the author's conversions, calculations and assumptions.
Complexes are first mentioned, followed by the solids and gases (if applicable). Part II basically uses the same setup. Part III contains the data of the molecular weights. The appendix demonstrates the compatibility of the different sources. Charges are omitted for readability, except for redox equilibria. Also, water is often not included in the formulation of the equilibria.

Part I: NIST database 46 version 8

In part I you will find all the constants taken from the NIST database 46 version 8 (2004). The ligands are included in the order in which they are given in the CHEAQS database; the cations are given in the order in which they appear in the NIST database. All calculations were done using five decimals.

Hydroxide (OH^-)

Equilibrium	Log (K)	I	T	Conversion or remarks
H + L ⇆ HL	13.997			
Li + L ⇆ LiL	0.36			
Na + L ⇆ NaL	0.1			
K + L ⇆ KL	0.0	0.15	37	I=0: 0.23787
Be + L ⇆ BeL	8.18	3.0		I=0: 7.63954
Be + 2 L ⇆ BeL_2	16.22	0.1		I=0: 16.86073
2 Be + L ⇆ Be_2L	10.82	0.1		I=0: 10.82
3 Be + 3 L ⇆ Be_3L_3	33.1			
5 Be + 6 L ⇆ Be_5L_6	63.83	0.5		I=0: 65.17194
5 Be + 7 L ⇆ Be_5L_7	70.68	1.0		I=0: 72.50844
6 Be + 8 L ⇆ Be_6L_8	84.8			
Mg + L ⇆ MgL	2.58			
4 Mg + 4 L ⇆ Mg_4L_4	16.1 18.1	3.0		16.1 using NaCl as background electrolyte; 18.1 using $NaClO_4$; used: average of 17.1 I=0: 16.55954
Ca + L ⇆ CaL	1.30			
Sr + L ⇆ SrL	0.82			
Ba + L ⇆ BaL	0.64			
Sc + L ⇆ ScL	9.7			
Sc + 2 L ⇆ ScL_2	18.3			
Sc + 3 L ⇆ ScL_3	23.9			
Sc + 4 L ⇆ ScL_4	30			
2 Sc + 2 L ⇆ Sc_2L_2	22.0			
3 Sc + 5 L ⇆ Sc_3L_5	53.8			
Y + L ⇆ YL	6.3			
2 Y + 2 L ⇆ Y_2L_2	13.8			
3 Y + 5 L ⇆ Y_3L_5	38.4			
La + L ⇆ LaL	5.5			
2 La + 2 L ⇆ La_2L_2	10.5	2.0		I=0: 10.47112
Ce + L ⇆ CeL	5.7			
2 Ce + 2 L ⇆ Ce_2L_2	11.7	3.0		I=0: 11.15954
Pr + L ⇆ PrL	5.2	0.5		I=0: 6.00516
2 Pr + 2 L ⇆ Pr_2L_2	11.9	2.0		I=0: 11.87112
Nd + L ⇆ NdL	6.0			
Nd + 4 L ⇆ NdL_4	18.6			
2 Nd + 2 L ⇆ Nd_2L_2	14.1			
Sm + L ⇆ SmL	6.1			
2 Sm + 2 L ⇆ Sm_2L_2	13.5	2.0		I=0: 13.47112
Eu + L ⇆ EuL	5.4	0.5		I=0: 6.20516
2 Eu + 2 L ⇆ Eu_2L_2	13.2	2.0		I=0: 13.17112
Gd + L ⇆ GdL	5.4	0.5		I=0: 6.20516
2 Gd + 2 L ⇆ Gd_2L_2	13.1	2.0		I=0: 13.07112
Tb + L ⇆ TbL	6.1			
Dy + L ⇆ DyL	5.6	0.5		I=0: 6.40516
2 Dy + 2 L ⇆ Dy_2L_2	14.0	2.0		I=0: 13.97112
Ho + L ⇆ HoL	5.7	0.5		I=0: 6.50516
Er + L ⇆ ErL	5.7	0.5		I=0: 6.50516
2 Er + 2 L ⇆ Er_2L_2	14.5	2.0		I=0: 14.47112
Tm + L ⇆ TmL	5.8	0.5		I=0: 6.60516
Yb + L ⇆ YbL	5.8	0.5		I=0: 6.60516
2 Yb + 2 L ⇆ Yb_2L_2	14.7	2.0		I=0: 14.67112
Lu + L ⇆ LuL	5.8	0.5		I=0: 6.60516
(UO_2) + L ⇆ $(UO_2)L$	8.1			
2 (UO_2) + 2 L ⇆ $(UO_2)_2L_2$	22.42			
3 (UO_2) + 5 L ⇆ $(UO_2)_3L_5$	54.4			
Mn(II) + L ⇆ Mn(II)L	3.4			
Mn(II) + 4 L ⇆ $Mn(II)L_4$	7.7			

Equilibrium	Log (K)	I	T	Conversion or remarks
$2\ Mn(II) + L \leftrightarrows Mn(II)_2L$	3.4			
$2\ Mn(II) + 3\ L \leftrightarrows Mn(II)_2L_3$	18.1			
$Fe(II) + L \leftrightarrows Fe(II)L$	4.6			
$Fe(II) + 2\ L \leftrightarrows Fe(II)L_2$	7.4			
$Fe(II) + 3\ L \leftrightarrows Fe(II)L_3$	11			
$Co(II) + L \leftrightarrows Co(II)L$	4.3			
$Co(II) + 2\ L \leftrightarrows Co(II)L_2$	9.2			
$Co(II) + 3\ L \leftrightarrows Co(II)L_3$	10.5			
$4\ Co(II) + 4\ L \leftrightarrows Co(II)_4L_4$	25.5			
$Ni + L \leftrightarrows NiL$	4.1			
$Ni + 2\ L \leftrightarrows NiL_2$	9			
$Ni + 3\ L \leftrightarrows NiL_3$	12			
$4\ Ni + 4\ L \leftrightarrows Ni_4L_4$	28.3			
$Cu(II) + L \leftrightarrows Cu(II)L$	6.5			
$2\ Cu(II) + L \leftrightarrows Cu(II)_2L$	7.7 8.4	3.0		7.7 is for LiClO4 as background electrolyte; 8.4 for $NaClO_4$. Used: average 8.05 I=0: 8.05
$2\ Cu(II) + 2\ L \leftrightarrows Cu(II)_2L_2$	17.5			
$3\ Cu(II) + 4\ L \leftrightarrows Cu(II)_3L_4$	35.2			
$Cr(III) + L \leftrightarrows Cr(III)L$	10.30			
$Cr(III) + 2\ L \leftrightarrows Cr(III)L_2$	18.3			
$2\ Cr(III) + 2\ L \leftrightarrows Cr(III)_2L_2$	24.0	1.0		I=0: 24.40632
$3\ Cr(III) + 4\ L \leftrightarrows Cr(III)_3L_4$	37.0	1.0		I=0: 37.60948
$4\ Cr(III) + 6\ L \leftrightarrows Cr(III)_4L_6$	80.2	1.0		I=0: 80.80948
$Fe(III) + L \leftrightarrows Fe(III)L$	11.81			
$Fe(III) + 2\ L \leftrightarrows Fe(III)L_2$	22.4			
$Fe(III) + 3\ L \leftrightarrows Fe(III)L_3$	30.2			
$Fe(III) + 4\ L \leftrightarrows Fe(III)L_4$	34.4			
$2\ Fe(III) + 2\ L \leftrightarrows Fe(III)_2L_2$	25.10			
$3\ Fe(III) + 4\ L \leftrightarrows Fe(III)_3L_4$	49.7			
$Co(III) + L \leftrightarrows Co(III)L$	13.54	3.0		I=0: 12.72931
$Zr + L \leftrightarrows ZrL$	14.3			
$Zr + 4\ L \leftrightarrows ZrL_4$	47.6	1.0	20	I=0: 49.63160
$Zr + 5\ L \leftrightarrows ZrL_5$	54.0			
$3\ Zr + 4\ L \leftrightarrows Zr_3L_4$	55.4			
$4\ Zr + 8\ L \leftrightarrows Zr_4L_8$	106.0			
$Hf + L \leftrightarrows HfL$	13.8			
$Hf + 5\ L \leftrightarrows HfL_5$	52.8			
$Ag + L \leftrightarrows AgL$	2.0			
$Ag + 2\ L \leftrightarrows AgL_2$	3.99			
$Pd + L \leftrightarrows PdL$	10.8	1.0		I=0: 11.20632
$Zn + L \leftrightarrows ZnL$	5.0			
$Zn + 2\ L \leftrightarrows ZnL_2$	11.1			
$Zn + 3\ L \leftrightarrows ZnL_3$	13.6			
$Zn + 4\ L \leftrightarrows ZnL_4$	14.8			
$2\ Zn + L \leftrightarrows Zn_2L$	5.0			
$4\ Zn + 4\ L \leftrightarrows Zn_4L_4$	27.9	3.0		I=0: 27.35954
$Cd + L \leftrightarrows CdL$	3.9			
$Cd + 2\ L \leftrightarrows CdL_2$	7.7			
$Cd + 3\ L \leftrightarrows CdL_3$	10.3	3.0		I=0: 9.48931
$Cd + 4\ L \leftrightarrows CdL_4$	8.7			
$2\ Cd + L \leftrightarrows Cd_2L$	4.6			
$4\ Cd + 4\ L \leftrightarrows Cd_4L_4$	23.2			
$Hg(II) + L \leftrightarrows Hg(II)L$	10.60			
$Hg(II) + 2\ L \leftrightarrows Hg(II)L_2$	21.83			
$2\ Hg(II) + L \leftrightarrows Hg(II)_2L$	10.7			
$3\ Hg(II) + 3\ L \leftrightarrows Hg(II)_3L_3$	35.6			
$Sn(II) + L \leftrightarrows Sn(II)L$	10.6			
$Sn(II) + 2\ L \leftrightarrows Sn(II)_2L$	20.9			
$Sn(II) + 3\ L \leftrightarrows Sn(II)_3L$	25.4			
$2\ Sn(II) + 2\ L \leftrightarrows Sn(II)_2L_2$	23.2			

Equilibrium	Log (K)	I	T	Conversion or remarks
3 Sn(II) + 4 L ⇆ $Sn(II)_3L_4$	49.12			
Pb(II) + L ⇆ Pb(II)L	6.4			
Pb(II) + 2 L ⇆ $Pb(II)L_2$	10.9			
Pb(II) + 3 L ⇆ $Pb(II)L_3$	13.9			
2 Pb(II) + L ⇆ $Pb(II)_2L$	7.6			
3 Pb(II) + 4 L ⇆ $Pb(II)_3L_4$	32.1			
4 Pb(II) + 4 L ⇆ $Pb(II)_4L_4$	35.1			
6 Pb(II) + 8 L ⇆ $Pb(II)_6L_8$	68.4			
Al + L ⇆ AlL	9.00			
Al + 2 L ⇆ AlL_2	17.7			
Al + 3 L ⇆ AlL_3	25.3			
Al + 4 L ⇆ AlL_4	33.3			
2 Al + 2 L ⇆ Al_2L_2	20.3			
3 Al + 4 L ⇆ Al_3L_4	42.1			
13 Al + 32 L ⇆ $Al_{13}O_4L_{24}$	349.3			
Ga + L ⇆ GaL	11.1			
Ga + 2 L ⇆ GaL_2	21.3			
Ga + 4 L ⇆ GaL_4	39.4			
2 Ga + 2 L ⇆ Ga_2L_2	25.8	0.5		I=0: 26.33678
In + L ⇆ InL	10.07			
In + 2 L ⇆ InL_2	20.2			
In + 3 L ⇆ InL_3	29.6			
In + 4 L ⇆ InL_4	33.9			
2 In + 2 L ⇆ In_2L_2	23.2	3.0		I=0: 22.65954
4 In + 4 L ⇆ In_4L_4	47.8	0.1		I=0: 45.23710
4 In + 6 L ⇆ In_4L_6	43.1	3.0		I=0: 42.28931
As(III) + L ⇆ As(III)L	16.5			not entered; As(III) only entered as anion/ligand
As(III) + 2 L ⇆ $As(III)L_2$	32.3			
As(III) + 3 L ⇆ $As(III)L_3$	46.9			
Bi + L ⇆ BiL	12.9			
Bi + 2 L ⇆ BiL_2	23.5	1.0		I=0: 24.51580
Bi + 3 L ⇆ BiL_3	33.0			(some poly(6 and 9)nuclear complexes of Bi skipped)
Bi + 4 L ⇆ BiL_4	34.8			

Solids:

Equilibrium	Log (K)	I	T	Conversion or remarks
Be + L ⇆ BeL	21.5			
Mg + L ⇆ MgL	11.1			
Ca + 2 L ⇆ CaL_2	5.29			
Ba + 2 L ⇆ $BaL_2(H_2O)_8$	3.6			
Sc + 3 L ⇆ ScOL	29.7			
Y + 3 L ⇆ YL_3	25.9			
La + 3 L ⇆ LaL_3	22.2			
Ce + 3 L ⇆ CeL_3	23.9			
Pr + 3 L ⇆ PrL_3	24.4			
Nd + 3 L ⇆ NdL_3	26.0			
Sm + 3 L ⇆ SmL_3	25.9			
Eu + 3 L ⇆ EuL_3	26.5			
Gd + 3 L ⇆ GdL_3	26.9			
Tb + 3 L ⇆ TbL_3	26.3			
Dy + 3 L ⇆ DyL_3	25.9			
Ho + 3 L ⇆ HoL_3	26.6			
Er + 3 L ⇆ ErL_3	26.6			
Tm + 3 L ⇆ TmL_3	26.7			
Yb + 3 L ⇆ YbL_3	26.6			
Lu + 3 L ⇆ LuL_3	27.0			
(UO_2) + 2 L ⇆ $(UO_2)L_2(H_2O)$	22.0			
Mn(II) + 2 L ⇆ $Mn(II)L_2$	12.8			
Fe(II) + 2 L ⇆ $Fe(II)L_2$	15.1			

$Co(II) + 2\ L \leftrightarrows Co(II)L_2$	15.7			
$Ni + 2\ L \leftrightarrows NiL_2$	17.2			
$Cu(II) + 2\ L \leftrightarrows Cu(II)O$	19.5			
$Cr(III) + 3\ L \leftrightarrows Cr(III)L_3$	30.2			
$Fe(III) + 3\ L \leftrightarrows (Fe(III)_2O_3)_{0.5}$	42.7			Entered: $2\ Fe(III) + 6\ L \leftrightarrows Fe(III)_2O_3$ log(K)=2*42.7=85.4
$Co(III) + 3\ L \leftrightarrows Co(III)L_3$	44.4			
$Zr + 4\ L \leftrightarrows ZrO_2$	54.1			
$Hf + 4\ L \leftrightarrows HfO_2$	54.8			
$Cu(I) + L \leftrightarrows (Cu(I)_2O)_{0.5}$	14.7			Entered: $2\ Cu(I) + 2\ L \leftrightarrows Cu(I)_2O$ log(K)=2*14.7=29.4
$Ag + L \leftrightarrows (Ag_2O)_{0.5}$	7.71			Entered: $2\ Ag + 2\ L \leftrightarrows Ag_2O$ log(K)=2*7.71=15.42
$Pd + 2\ L \leftrightarrows Pd(OH)_2$	30.8	0.1		I=0: 31.44073
$Zn + 2\ L \leftrightarrows ZnO$	16.76			
$Cd + 2\ L \leftrightarrows CdL_2$	14.35			
$Hg(II) + 2\ L \leftrightarrows Hg(II)O$	25.44			
$Sn(II) + 2\ L \leftrightarrows Sn(II)O$	26.2			
$Pb(II) + 2\ L \leftrightarrows Pb(II)O$	15.3			
$Al + 3\ L \leftrightarrows AlL_3$	33.7			
$Ga + 3\ L \leftrightarrows (Ga_2O_3)_{0.5}$	39.8			Entered: $2\ Ga + 6\ L \leftrightarrows Ga_2O_3$ log(K)=2*39.8=79.6
$In + 3\ L \leftrightarrows InL_3$	36.9			
$BiL_3 \leftrightarrows (Bi_2O_3)_{0.5}$	5.4			Entered: $2\ Bi + 6\ L \leftrightarrows Bi_2O_3$ log(K)=2*5.4=10.8

Borate ($H_2BO_3^-$)

Equilibrium	Log (K)	I	T	Conversion or remarks
$H + L \leftrightarrows HL$	9.236			
$HL + L \leftrightarrows HL_2$	-0.07			$H+L \leftrightarrows HL$ 9.236 $HL+L \leftrightarrows HL_2$ -0.07 $H + 2\ L \leftrightarrows HL_2$ 9.166
$HL + HL_2 \leftrightarrows H_2L_3$	2.00			$H + L \leftrightarrows HL$ 9.236 $H + 2\ L \leftrightarrows HL_2$ 9.166 $HL + HL_2 \leftrightarrows H_2L_3$ 2.00 $2\ H + 3\ L \leftrightarrows H_2L_3$ 20.402
$H_2L_3 + L \leftrightarrows H_2L_4$	1.51			$H_2L_3 + L \leftrightarrows H_2L_4$ 1.51 $2\ H + 3\ L \leftrightarrows H_2L_3$ 20.402 $2\ H + 4\ L \leftrightarrows H_2L_4$ 21.912
$Li + L \leftrightarrows LiL$	0.34			
$Na + L \leftrightarrows NaL$	-0.15			
$Mg + L \leftrightarrows MgL$	1.54			
$Ca + L \leftrightarrows CaL$	1.76			
$Sr + L \leftrightarrows SrL$	1.55			
$Ba + L \leftrightarrows BaL$	1.49			
$Cu + L \leftrightarrows CuL$	3.48	0.7		I=0: 3.97883
$Cu + 2\ L \leftrightarrows CuL_2$	6.13	0.7		I=0: 6.87824
$Zn + L \leftrightarrows ZnL$	0.9	0.7		I=0: 1.39883
$Zn + 2\ L \leftrightarrows ZnL_2$	3.32	0.7		I=0: 4.06824
$Cd + L \leftrightarrows CdL$	1.42	0.7		I=0: 1.91883
$Cd + 2\ L \leftrightarrows CdL_2$	2.71	0.7		I=0: 3.45824
$Pb(II) + L \leftrightarrows Pb(II)L$	2.2	0.7		I=0: 2.69883
$Pb(II) + 2\ L \leftrightarrows Pb(II)L_2$	4.41	0.7		I=0: 5.15824
$Fe(III) + L \leftrightarrows Fe(III)L$	6.58	0.7		I=0: 7.32824
$Ag + L \leftrightarrows AgL$	0.45	3.0		I=0: 0.17977

Solids:

Equilibrium	Log (K)	I	T	Conversion or remarks
$Ag + 2\ HL \leftrightarrows H + AgHL_2$	-4.5	3.0		$(H + L \leftrightarrows HL)*2$ 19.01246 3.0 (9.50623*2) $Ag + 2\ HL \leftrightarrows H + AgHL_2$ -4.5 3.0 $Ag + H + 2\ L \leftrightarrows AgHL_2$ 14.51246 3.0 I=0: 13.972

Carbonate (CO_3^{2-})

Equilibrium	Log (K)	I	T	Conversion or remarks
H + L ⇆ HL	10.329			
HL + H ⇆ H_2L	6.352			HL + H ⇆ H_2L 6.352 H + L ⇆ HL 10.329 2 H + L ⇆ H_2L 16.681
Na + L ⇆ NaL	1.27			
Na + HL ⇆ NaHL	-0.3			Na + HL ⇆ NaHL -0.3 H + L ⇆ HL 10.329 Na + H + L ⇆ NaHL 10.029
Cs + L ⇆ CsL	-0.7	1.0		I=0: -0.29368
Be + L ⇆ BeL	7.34	3.0		I=0: 6.25909
BeL ⇆ BeOHL + H	-6.56	3.0		BeL ⇆ BeOHL + H -6.56 3.0 Be + L ⇆ BeL 7.34 3.0 H + OH ⇆ H2O 14.26723 3.0 Be + L + OH ⇆ BeOHL + H_2O 15.04723 3.0 I=0: 13.96632
BeOHL ⇆ $Be(OH)_2L$ + H	-7.54	3.0		BeOHL ⇆ $Be(OH)_2L$ + H -7.54 3.0 Be + OH + L ⇆ BeOHL 15.04723 3.0 H + OH ⇆ H_2O 14.26723 3.0 Be + L + 2 OH ⇆ $Be(OH)_2L$ + H_2O 21.85446 3.0 I=0: 21.04377
3 Be + 3 L ⇆ $Be_3(OH)_3L_3$ + 3 H	6.9	3.0		3 Be + 3 L ⇆ $Be_3(OH)_3L_3$ + 3 H 6.9 3.0 3 H + 3 OH ⇆ 3 H_2O (3*14.26723) 42.80169 3.0 3 Be + 3 OH + 3 L ⇆ $Be_3(OH)_3L_3$ + 3 H_2O 49.70169 3.0 I=0: 47.26963
3 Be + L ⇆ $Be_3(OH)_2L$ + 2 H	-1.01	3.0		3 Be + L ⇆ $Be_3(OH)_2L$ + 2 H -1.01 3.0 2 H + 2 OH ⇆ 2 H_2O (2*14.26723): 28.53446 3.0 3 Be + L + 2 OH ⇆ $Be_3(OH)_2L$ + 2 H_2O 27.52446 3.0 I=0: 25.63286
5 Be + L ⇆ $Be_5(OH)_4L$ + 4 H	0.22	3.0		5 Be + L ⇆ $Be_5(OH)_4L$ + 4 H 0.22 3.0 4 H + 4 OH ⇆ 4 H_2O (4*14.26723): 57.06892 3.0 5 Be + L + 4 OH ⇆ $Be_5(OH)_4L$ + 4 H_2O 57.28892 3.0 I=0: 55.66755
6 Be + 2 L ⇆ $Be_6(OH)_5L_2$ + 5 H	5.46	3.0		6 Be + 2 L ⇆ $Be_6(OH)_5L_2$ + 5 H 5.46 3.0 5 H + 5 OH ⇆ 5 H_2O (5*14.26723): 71.33615 3.0 6 Be + 2 L + 5 OH ⇆ $Be_6(OH)_5L_2$ + 5 H_2O 76.79615 3.0 I=0: 73.01295
Mg + L ⇆ MgL	2.92			
Mg + HL ⇆ MgHL	1.01			Mg + HL ⇆ MgHL 1.01 H + L ⇆ HL 10.329 Mg + H + L ⇆ MgHL 11.339
Ca + L ⇆ CaL	3.22			
Ca + HL ⇆ CaHL	1.20			Ca + HL ⇆ CaHL 1.20 H + L ⇆ HL 10.329 Ca + H + L ⇆ CaHL 11.529
Sr + L ⇆ SrL	2.81			
Sr + HL ⇆ SrHL	1.21			Sr + HL ⇆ SrHL 1.21 H + L ⇆ HL 10.329 Sr + H + L ⇆ SrHL 11.539

Equilibrium	Log (K)	I	T	Conversion or remarks
Ba + L ⇆ BaL	2.71			
Ba + HL ⇆ BaHL	0.98			Ba + HL ⇆ BaHL 0.98 H + L ⇆ HL 10.329 Ba + H + L ⇆ BaHL 11.309
Y + L ⇆ YL	7.73			
Y + 2 L ⇆ YL_2	11.86			
Y + HL ⇆ YHL	2.4			Y + HL ⇆ YHL 2.4 H + L ⇆ HL 10.329 Y + H + L ⇆ YHL 12.729
2 Y + L ⇆ Y_2L	8.06			
La + L ⇆ LaL	6.98			
La + 2 L ⇆ LaL_2	11.86			
La + HL ⇆ LaHL	1.41	3.0		La + HL ⇆ LaHL 1.41 3.0 H + L ⇆ HL 10.86946 3.0 La + H + L ⇆ LaHL 12.27946 3.0 I=0: 10.92832
2 La + L ⇆ La_2L	6.92	3.0		I=0: 6.10931
Ce + L ⇆ CeL	7.31			
Ce + 2 L ⇆ CeL_2	12.32			
Ce + HL ⇆ CeHL	1.6	0.7		Ce + HL ⇆ CeHL 1.6 0.7 H + L ⇆ HL 9.83017 0.7 Ce + H + L ⇆ CeHL 11.43017 0.7 I=0: 12.67723
Pr + L ⇆ PrL	7.48			
Pr + 2 L ⇆ PrL_2	12.63			
Nd + L ⇆ NdL	7.53			
Nd + 2 L ⇆ NdL_2	12.73			
Sm + L ⇆ SmL	7.71			
Sm + 2 L ⇆ SmL_2	13.09			
Eu + L ⇆ EuL	7.73			
Eu + 2 L ⇆ EuL_2	13.19			
Eu + HL ⇆ EuHL	1.5	0.7		Eu + HL ⇆ EuHL 1.5 0.7 H + L ⇆ HL 9.83017 0.7 Eu + H + L ⇆ EuHL 11.33017 0.7 I=0: 12.57723
Gd + L ⇆ GdL	7.64			
Gd + 2 L ⇆ GdL_2	13.04			
Gd + HL ⇆ GdHL	1.9	0.7		Gd + HL ⇆ GdHL 1.9 0.7 H + L ⇆ HL 9.83017 0.7 Gd + H + L ⇆ GdHL 11.73017 0.7 I=0: 12.97723
Tb + L ⇆ TbL	7.71			
Tb + 2 L ⇆ TbL_2	13.34			
Tb + HL ⇆ TbHL	1.8	0.7		Tb + HL ⇆ TbHL 1.8 0.7 H + L ⇆ HL 9.83017 0.7 Tb + H + L ⇆ TbHL 11.63017 0.7 I=0: 12.87723
Dy + L ⇆ DyL	7.81			
Dy + 2 L ⇆ DyL_2	13.47			
Ho + L ⇆ HoL	7.80			
Ho + 2 L ⇆ HoL_2	13.56			
Er + L ⇆ ErL	7.86			
Er + 2 L ⇆ ErL_2	13.68			
Tm + L ⇆ TmL	7.93			
Tm + 2 L ⇆ TmL_2	13.83			
Yb + L ⇆ YbL	8.06			
Yb + 2 L ⇆ YbL_2	13.86			
Yb + HL ⇆ YbHL	1.5	0.7		Yb + HL ⇆ YbHL 1.5 0.7 H + L ⇆ HL 9.83017 0.7 Yb + H + L ⇆ YbHL 11.33017 0.7 I=0: 12.57723
Lu + L ⇆ LuL	8.00			
Lu + 2 L ⇆ LuL_2	13.93			
(UO_2) + L ⇆ $(UO_2)L$	9.6			

Equilibrium	Log (K)	I	T	Conversion or remarks
$(UO_2) + 2\ L \leftrightarrows (UO_2)L_2$	16.9			
$(UO_2) + 3\ L \leftrightarrows (UO_2)L_3$	21.6			
$3\ (UO_2) + 6\ L \leftrightarrows (UO_2)_3L_6$	54.0			
$2\ (UO_2) + L \leftrightarrows (UO_2)_2(OH)_3L + 3\ H$	-0.9			$2\ (UO_2) + L \leftrightarrows (UO_2)2(OH)_3L + 3\ H$ -0.9 $(H + OH \leftrightarrows H_2O)$ $(3*\ 13.997)$ 41.991 $2\ (UO_2) + L + 3\ OH \leftrightarrows (UO_2)_2(OH)_3L + 3\ H_2O$ 41.091
$3\ (UO_2) + L \leftrightarrows (UO_2)_3(OH)_3L + 3\ H$	0.7			$3\ (UO_2) + L \leftrightarrows (UO_2)_3(OH)_3L + 3\ H$ 0.7 $(H + OH \leftrightarrows H_2O)$ $(3*13.997)$ 41.991 $3\ (UO_2) + L + 3\ OH \leftrightarrows (UO_2)_3(OH)_3L + 3\ H_2O$ 42.691
$11\ (UO_2) + 6\ L \leftrightarrows (UO_2)_{11}(OH)_{12}L_6 + 12\ H$	34			$11\ (UO_2) + 6\ L \leftrightarrows (UO_2)_{11}(OH)_{12}L_6 + 12\ H$ 34 $(H + OH \leftrightarrows H_2O)$ $(12*13.997)$ 167.964 $11\ (UO_2) + 6\ L + 12\ OH \leftrightarrows (UO_2)_{11}(OH)_{12}L_6 + 12\ H_2O$ 201.964
$Mn(II) + L \leftrightarrows Mn(II)L$	4.7			
$Mn(II) + HL \leftrightarrows Mn(II)HL$	1.30			$Mn(II) + HL \leftrightarrows Mn(II)HL$ 1.30 $H + L \leftrightarrows HL$ 10.329 $Mn(II) + H + L \leftrightarrows Mn(II)HL$ 11.629
$Fe(II) + HL \leftrightarrows Fe(II)HL$	1.10			$Fe(II) + HL \leftrightarrows Fe(II)HL$ 1.10 $H + L \leftrightarrows HL$ 10.329 $Fe(II) + H + L \leftrightarrows Fe(II)HL$ 11.429
$Co(II) + L \leftrightarrows Co(II)L$	3.15	0.5		I=0: 4.22355
$Co(II) + HL \leftrightarrows Co(II)HL$	1.39	0.7		$Co(II) + HL \leftrightarrows Co(II)HL$ 1.39 0.7 $H + L \leftrightarrows HL$ 9.83017 0.7 $Co(II) + H + L \leftrightarrows Co(II)HL$ 11.22017 0.7 I=0: 12.21782
$Ni(II) + L \leftrightarrows Ni(II)L$	3.57	0.7		I=0: 4.56765
$Ni(II) + HL \leftrightarrows Ni(II)HL$	1.59	0.7		$Ni(II) + HL \leftrightarrows Ni(II)HL$ 1.59 0.7 $H + L \leftrightarrows HL$ 9.83017 0.7 $Ni(II) + H + L \leftrightarrows Ni(II)HL$ 11.42017 0.7 I=0: 12.41782
$Cu(II) + L \leftrightarrows Cu(II)L$	6.77			
$Cu(II) + 2\ L \leftrightarrows Cu(II)L_2$	10.2			
$Cu(II) + HL \leftrightarrows Cu(II)HL$	1.8			$Cu(II) + HL \leftrightarrows Cu(II)HL$ 1.8 $H + L \leftrightarrows HL$ 10.329 $Cu(II) + H + L \leftrightarrows Cu(II)HL$ 12.129
$Fe(III) + L \leftrightarrows Fe(III)(OH)L + H$	-3.8	0.2		$Fe(III) + L \leftrightarrows Fe(III)(OH)L + H$ -3.8 0.2 $H + OH = H_2O$ 13.74405 0.2 $Fe(III) + L + OH = Fe(III)(OH)L$ 9.94405 0.2 I=0: 11.71471
$Fe(III) + 2\ L \leftrightarrows Fe(III)L_2$	7.4	0.2		I=0: 9.42361
$Zn + L \leftrightarrows ZnL$	4.76			
$Zn + 2\ L \leftrightarrows ZnL_2$	7.3			
$2\ Zn + L \leftrightarrows Zn_2L$	4.16	3.0		I=0: 3.07909
$Zn + HL \leftrightarrows ZnHL$	1.5			$Zn + HL \leftrightarrows ZnHL$ 1.5 $H + L \leftrightarrows HL$ 10.329 $Zn + H + L \leftrightarrows ZnHL$ 11.829
$Cd + L \leftrightarrows CdL$	3.5	0.1		I=0: 4.35430
$Cd + 2\ L \leftrightarrows CdL_2$	6.37	0.1	20	I=0: 7.22430
$Cd + HL \leftrightarrows CdHL$	0.9	3.0		$Cd + HL \leftrightarrows CdHL$ 0.9 3.0 $H + L \leftrightarrows HL$ 10.86946 3.0 $Cd + H + L \leftrightarrows CdHL$ 11.76946 3.0 I=0: 10.68855

Equilibrium	Log (K)	I	T	Conversion or remarks
Hg(II) + L ⇆ Hg(II)L	11.0	0.5		I=0: 12.07355
Hg(II) + 2 L ⇆ Hg(II)L_2	14.5	0.5		I=0: 15.57355
Hg(II) + HL ⇆ Hg(II)HL	5.48	0.5		Hg(II) + HL ⇆ Hg(II)HL 5.48 0.5 H + L ⇆ HL 9.79222 0.5 Hg(II) + H + L ⇆ Hg(II)HL 15.27222 0.5 I=0: 16.34577
Hg(II)L ⇆ Hg(II)OHL + H	-6.6	0.5		Hg(II)L ⇆ Hg(II)OHL + H -6.6 0.5 Hg(II) + L ⇆ Hg(II)L 11 0.5 H + OH ⇆ H_2O 13.72861 0.5 Hg(II) + L + OH ⇆ Hg(II)OHL 18.12861 0.5 I=0: 19.20216
Pb(II) + L ⇆ Pb(II)L	5.40	0.5		I=0: 6.47355
Pb(II) + 2 L ⇆ Pb(II)L_2	8.86	0.5		I=0: 9.93355
Pb(II) + OH + L ⇆ Pb(II)OHL	10.9	3.0		I=0: 9.81909
Pb(II) + HL ⇆ Pb(II)HL	1.91	3.0		Pb(II) + HL ⇆ Pb(II)HL 1.91 3.0 H + L ⇆ HL 10.86946 3.0 Pb(II) + H + L ⇆ Pb(II)HL 12.77946 3.0 I=0: 11.69855
2 Pb(II) + L ⇆ $Pb(II)_2L$	7.1	3.0		I=0: 6.01909
3 Pb(II) + L ⇆ $Pb(II)_3L$	8.43	3.0		I=0: 8.43
2 Al + HL ⇆ $Al_2(OH)_2L$ + 3 H	-7.3	0.1		2 Al + HL ⇆ $Al_2(OH)_2L$ + 3 H -7.3 0.1 H + L ⇆ HL 9.90185 0.1 (H + OH ⇆ H2O) (2* 13.78342) 27.56684 0.1 2 Al + L + 2 OH ⇆ $Al_2(OH)_2L$ 30.16869 0.1 I=0: 32.30444
3 Al + HL ⇆ $Al_3(OH)_4HL$ + 4 H	-9.4	0.1		3 Al + HL ⇆ $Al_3(OH)_4HL$ + 4 H -9.4 0.1 H + L ⇆ HL 9.90185 0.1 OH + H ⇆ H_2O (4*13.78342) 55.13368 0.1 3 Al + 4 OH + H + L ⇆ $Al_3(OH)_4HL$ 55.63553 0.1 I=0: 57.77128

Solids:

Equilibrium	Log (K)	I	T	Conversion or remarks
Mg + L ⇆ MgL	7.46			
Ca + L ⇆ CaL	8.48			calcite
Sr + L ⇆ SrL	9.27			
Ba + L ⇆ BaL	8.57			
2 Y + 3 L ⇆ Y_2L_3	33.0			
2 La + 3 L ⇆ La_2L_3	34.4			
2 Ce + 3 L ⇆ Ce_2L_3	31.1	3.0		I=0: 27.04657
Nd + OH + L ⇆ NdOHL	19.9	0.1		I=0: 21.39503
2 Nd + 3 L ⇆ Nd_2L_3	33.0			
2 Sm + 3 L ⇆ Sm_2L_3	32.5			
Eu + OH + L ⇆ EuOHL	20.2	0.1		I=0: 21.69503
2 Eu + 3 L ⇆ Eu_2L_3	32.3			
2 Gd + 3 L ⇆ Gd_2L_3	32.2			
2 Dy + 3 L ⇆ Dy_2L_3	31.5			
2 Yb + 3 L ⇆ Yb_2L_3	31.1			
(UO_2) + L ⇆ $(UO_2)L$	14.5			
Mn(II) + L ⇆ Mn(II)L	11.0			
Fe(II) + L ⇆ Fe(II)L	10.8			
Co(II) + L ⇆ Co(II)L	11.2			
Ni + L ⇆ NiL	11.2			
Cu(II) + L ⇆ Cu(II)L	11.5			

2 Cu(II) + 2 OH + L ⇆ $Cu(II)_2(OH)_2L$	33.3			malachite
3 Cu(II) + 2 OH + 2 L ⇆ $Cu(II)_3(OH)_2L_2$	44.9			azurite
2 Ag + L ⇆ Ag_2L	11.09			
Zn + L ⇆ ZnL	10.8			
Cd + L ⇆ CdL	12.1			otavite
3 Hg(II) + L ⇆ $Hg(II)_3O_2L$ + 4 H	11.1			3 Hg(II) + L ⇆ $Hg(II)_3(OH)_4L(s)$ + 4 H 11.1 (H + OH ⇆ H_2O) (4*13.997) 55.988 3 Hg(II) + L + 4 OH ⇆ $Hg(II)_3(OH)_4L(s)$ + 4 H_2O 67.088
Pb(II) + L ⇆ Pb(II)L	13.2			
3 Pb(II) + 2 OH + 2 L ⇆ $Pb(II)_3(OH)_2L_2$	43.8	0.5		I=0: 46.75227
10 Pb(II) + 6 L ⇆ $Pb(II)_{10}(OH)_6OL_6$ + 8 H	8.76			10 Pb(II) + 6 L ⇆ $Pb(II)_{10}(OH)_6L_6O$+ 8 H 8.76 (H + OH ⇆ H_2O) (8*13.997) 111.976 10 Pb(II) + 6 L + 8 OH ⇆ $Pb(II)_{10}(OH)_6L_6O$ + 8 H_2O 120.736

Gases:

Equilibrium	Log (K)	I	T	Conversion or remarks
H_2L ⇆ CO_2 (g)	1.466			H_2L ⇆ CO_2 (g) 1.466 2 H + L ⇆ H_2L 16.681 2 H + L ⇆ CO_2 (g) 18.147

Ammonia (NH_3)

Note: since NH_3 is an uncharged ligand, the Davies-correction yields the same values for I=0 as for any other I.

Equilibrium	Log (K)	I	T	Conversion or remarks
$H + L \leftrightarrows HL$	9.244			
$Li + L \leftrightarrows LiL$	-0.7			
$Mg + L \leftrightarrows MgL$	0.24	2.0		
$Mg + 2\ L \leftrightarrows MgL_2$	0.2			
$Ca + L \leftrightarrows CaL$	0.2			
$Sr + L \leftrightarrows SrL$	0.0			
$Ba + L \leftrightarrows BaL$	-0.1			
$Mn(II) + L \leftrightarrows Mn(II)L$	0.84			
$Mn(II) + 2\ L \leftrightarrows Mn(II)L_2$	1.25			
$Mn(II) + 3\ L \leftrightarrows Mn(II)L_3$	1.38			
$Mn(II) + 4\ L \leftrightarrows Mn(II)L_4$	1.24			
$Fe(II) + L \leftrightarrows Fe(II)L$	1.40			
$Fe(II) + 2\ L \leftrightarrows Fe(II)L_2$	2.25			
$Fe(II) + 3\ L \leftrightarrows Fe(II)L_3$	2.68			
$Fe(II) + 4\ L \leftrightarrows Fe(II)L_4$	2.75			
$Co(II) + L \leftrightarrows Co(II)L$	2.08	0.1		
$Co(II) + 2\ L \leftrightarrows Co(II)L_2$	3.70	1.0		
$Co(II) + 3\ L \leftrightarrows Co(II)L_3$	4.80	1.0		
$Co(II) + 4\ L \leftrightarrows Co(II)L_4$	5.52	1.0		
$Co(II) + 5\ L \leftrightarrows Co(II)L_5$	5.72	1.0		
$Ni + L \leftrightarrows NiL$	2.72			
$Ni + 2\ L \leftrightarrows NiL_2$	4.88			
$Ni + 3\ L \leftrightarrows NiL_3$	6.54			
$Ni + 4\ L \leftrightarrows NiL_4$	7.67			
$Ni + 5\ L \leftrightarrows NiL_5$	8.33			
$Ni + 6\ L \leftrightarrows NiL_6$	8.30			
$Cu(II) + L \leftrightarrows Cu(II)L$	4.02			
$Cu(II) + 2\ L \leftrightarrows Cu(II)L_2$	7.40			
$Cu(II) + 3\ L \leftrightarrows Cu(II)L_3$	10.2			
$Cu(II) + 4\ L \leftrightarrows Cu(II)L_4$	12.3			
$Cr(III)L \leftrightarrows Cr(III)OHL + H$	-4.4	0.5	20	This equilibrium and the three next ones have not been entered.
$Cr(III)L_2 \leftrightarrows Cr(III)(OH)L_2 + H$	-4.11	0.5	20	
$Cr(III)(OH)L_2 \leftrightarrows Cr(III)(OH)_2L_2 + H$	-6.59	0.5	20	
$Cr(III)(OH)_2L_2 \leftrightarrows Cr(III)(OH)_3L_2 + H$	-9.17	0.5	20	
$Cr(III)L_5 \leftrightarrows Cr(III)L_4 + L$	-1.6	4.0		$Cr(III)L_5 \leftrightarrows Cr(III)L_4 + L$ -1.6 4.0 $Cr(III) + 5\ L \leftrightarrows Cr(III)L_5$ 11.5 4.0 $Cr(III) + 4\ L \leftrightarrows Cr(III)L_4$ 9.9 4.0
$Cr(III)L_6 \leftrightarrows Cr(III)L_5 + L$	-1.5	4.0		$Cr(III)L_6 \leftrightarrows Cr(III)L_5 + L$ -1.5 4.0 $Cr(III) + 6\ L \leftrightarrows Cr(III)L_6$ 13 4.0 $Cr(III) + 5\ L \leftrightarrows Cr(III)L_5$ 11.5 4.0
$Cr(III) + 6\ L \leftrightarrows Cr(III)L_6$	13	4.0		

Equilibrium	Log (K)	I	T	Conversion or remarks
$Cr(III)L_4 \leftrightarrows Cr(III)(OH)L_4$ (cis) + H	-4.96	1		$Cr(III)L_4 \leftrightarrows Cr(III)(OH)L_4$ (cis) + H -4.96 1 $Cr(III) + 4\ L \leftrightarrows Cr(III)L_4$ 9.9 1 $H + OH \leftrightarrows H_2O$ 13.79384 1 $Cr(III) + 4\ L + OH \leftrightarrows Cr(III)(OH)L_4$ (cis) 18.73384 1 I=0: 19.34332
$Cr(III)OHL_4 \leftrightarrows Cr(III)(OH)_2L_4$ (cis) + H	-7.53	1		$Cr(III)OHL_4 \leftrightarrows Cr(III)(OH)_2L_4$ (cis) + H -7.53 1 $Cr(III) + 4\ L + OH \leftrightarrows Cr(III)(OH)L_4$ (cis?)[1] 18.73384 1 $H + OH \leftrightarrows H_2O$ 13.79384 1 $Cr(III) + 4\ L + 2\ OH \leftrightarrows Cr(III)(OH)L_4$ (cis) 24.99768 1 I=0: 26.01348
$Cr(III)L_4 \leftrightarrows Cr(III)(OH)L_4$ (trans) + H	-4.38	1		$Cr(III)L_4 \leftrightarrows Cr(III)(OH)L_4$ (trans) + H -4.38 1 $Cr(III) + 4\ L \leftrightarrows Cr(III)L_4$ 9.9 1 $H + OH \leftrightarrows H_2O$ 13.79384 1 $Cr(III) + 4\ L + OH \leftrightarrows Cr(III)(OH)L_4$ (trans) 19.31384 1 I=0: 19.92332
$Cr(III)OHL_4 \leftrightarrows Cr(III)(OH)_2L_4$ (trans) + H	-7.78	1		$Cr(III)OHL_4 \leftrightarrows Cr(III)(OH)_2L_4$ (trans) + H -7.78 1 $Cr(III) + 4\ L + OH \leftrightarrows Cr(III)(OH)L_4$ (trans?)[2] 19.31384 1 $H + OH \leftrightarrows H_2O$ 13.79384 1 $Cr(III) + 4\ L + 2\ OH \leftrightarrows Cr(III)(OH)L_4$ (trans) 25.32768 1 I=0: 26.34348
$Cr(III)(OH)L_5 + H \leftrightarrows Cr(III)L_5$	4.99	0.1		$Cr(III)L_5 \leftrightarrows Cr(III)(OH)L_5 + H$ -4.99 0.1 $Cr(III) + 5\ L \leftrightarrows Cr(III)L_5$ 11.5 0.1 $H + OH \leftrightarrows H_2O$ 13.78342 0.1 $Cr(III) + 5\ L + OH \leftrightarrows Cr(III)(OH)L_5$ 20.29342 0.1 I=0: 20.93415
$Co(III)(OH)L_3$ (fac) + H $\leftrightarrows$ $Co(III)L_3$	5.33	0.1	20	Note: this equilibrium and the next one have not been entered
$Co(III)(OH)_2L_3$ (fac) + H $\leftrightarrows$ $Co(III)(OH)L_3$	7.6	0.1	20	
$Co(III)(OH)L_4$ (cis) + H $\leftrightarrows$ $Co(III)L_4$	5.69	0.1	20	$Co(III)L_4 \leftrightarrows Co(III)(OH)L_4$ (cis) + H -5.69 0.1 $Co(III) + 4\ L \leftrightarrows Co(III)L_4$ 24.96 0.1 $OH + H \leftrightarrows H_2O$ 13.78342 0.1 $Co(III) + OH + 4\ L \leftrightarrows Co(III)OHL_4$ 33.05342 0.1 I=0: 33.69415
$Co(III)(OH)_2L_4$ (cis) + H $\leftrightarrows$ $Co(III)(OH)L_4$	7.99	0.1	20	$Co(III)(OH)L_4 \leftrightarrows Co(III)(OH)_2L_4$ (cis) + H -7.99 0.1 $OH + H \leftrightarrows H_2O$ 13.78342 0.1 $Co(III) + 2\ OH + 4\ L \leftrightarrows Co(III)(OH)_2L_4$ (cis) 5.79342 0.1 I=0: 6.86130

[1] It is not clear whether the cis or trans-version of $Cr(III)(OH)(NH_3)_4$ is meant. In this calculation, it is assumed that the cis-version reacts to form the cis-version of $Cr(III)(OH)_2(NH_3)_4$.This may be not correct.

[2] It is not clear whether the cis or trans-version of $Cr(III)(OH)(NH_3)_4$ is meant. In this calculation, it is assumed that the trans-version reacts to form the trans-version of $Cr(III)(OH)_2(NH_3)_4$.This may be not correct.

Equilibrium	Log (K)	I	T	Conversion or remarks
$Co(III)L_5 \leftrightarrows Co(III)L_4 + L$	-5.07	2.0		$Co(III)L_5 \leftrightarrows Co(III)L_4 + L$ -5.07 2 $Co(III) + 5\ L \leftrightarrows Co(III)L_5$ 30.03 2 $Co(III) + 4\ L \leftrightarrows Co(III)L_4$ 24.96 2
$Co(III)(OH)L_5 + H \leftrightarrows Co(III)L_5$	6.2	0.1		$Co(III)L_5 \leftrightarrows Co(III)(OH)L_5 + H$ -6.2 0.1 $Co(III) + 5\ L \leftrightarrows Co(III)L_5$ 30.03 0.1 $OH + H \leftrightarrows H_2O$ 13.78342 0.1 $Co(III) + 5\ L + OH \leftrightarrows Co(III)OHL5$ 37.61342 0.1 I=0: 38.25415
$Co(III)L_6 \leftrightarrows Co(III)L_5 + L$	-4.33	1.0		$Co(III)L_6 \leftrightarrows Co(III)L_5 + L$ -4.33 1 $Co(III) + 6\ L \leftrightarrows Co(III)L_6$ 34.36 1 $Co(III) + 5\ L \leftrightarrows Co(III)L_5$ 30.03 1
$Co(III) + 6\ L \leftrightarrows Co(III)L_6$	34.36	1.0	30	
$Cu(I) + L \leftrightarrows Cu(I)L$	5.74	2.0		
$Cu(I) + 2\ L \leftrightarrows Cu(I)L_2$	9.9	0.5		
$Ag + L \leftrightarrows AgL$	3.31			
$Ag + 2\ L \leftrightarrows AgL_2$	7.22			
$Pd + L \leftrightarrows PdL$	9.6	1.0		
$Pd + 2\ L \leftrightarrows PdL_2$	18.5	1.0		
$Pd + 3\ L \leftrightarrows PdL_3$	26.0	1.0		
$Pd + 4\ L \leftrightarrows PdL_4$	32.8	1.0		
$Zn + L \leftrightarrows ZnL$	2.21			
$Zn + 2\ L \leftrightarrows ZnL_2$	4.50			
$Zn + 3\ L \leftrightarrows ZnL_3$	6.86			
$Zn + 4\ L \leftrightarrows ZnL_4$	8.89			
$Cd + L \leftrightarrows CdL$	2.55			
$Cd + 2\ L \leftrightarrows CdL_2$	4.56			
$Cd + 3\ L \leftrightarrows CdL_3$	5.90			
$Cd + 4\ L \leftrightarrows CdL_4$	6.72			
$Hg(II) + L \leftrightarrows Hg(II)L$	8.75	2.0		
$Hg(II) + 2\ L \leftrightarrows Hg(II)L_2$	17.8	1.0		
$Hg(II) + 3\ L \leftrightarrows Hg(II)L_3$	18.2	2.0		
$Hg(II) + 4\ L \leftrightarrows Hg(II)L_4$	19.3	0.1		
$Pb(II) + L \leftrightarrows Pb(II)L$	1.55	5.0		

Nitrite (NO_2^-)

Equilibrium	Log (K)	I	T	Conversion or remarks
H + L ⇆ HL	3.15			
Mn(II) + L ⇆ Mn(II)L	0.45	1.0		I=0: 0.85632
Co(II) + L ⇆ Co(II)L	0.44	1.0		I=0: 0.84632
Ni + L ⇆ NiL	0.77	1.0		I=0: 1.07632
Ni + 2 L ⇆ NiL_2	1.08	1.0		I=0: 1.68948
Cu(II) + L ⇆ Cu(II)L	2.02			
Cu(II) + 2 L ⇆ $Cu(II)L_2$	3.03			
Fe(III) + L ⇆ Fe(III)L	2.59	1.0		I=0: 3.19948
Fe(III) + 2 L ⇆ $Fe(III)L_2$	3.70	1.0		I=0: 4.71580
Fe(III) + L ⇆ $Fe(III)L_3$	5.45	1.0		I=0: 6.66896
Ag + L ⇆ AgL	2.32			
Ag + 2 L ⇆ AgL_2	2.51			
Pd + 4 L ⇆ PdL_4	20.3	0.5		I=0: 20.83678
Zn + L ⇆ ZnL	0.37	1.0		I=0: 0.77632
Zn + 2 L ⇆ ZnL_2	0.49	1.0		I=0: 1.09948
Cd + L ⇆ CdL	1.54	1.0		I=0: 1.94632
Cd + 2 L ⇆ CdL_2	2.83	1.0		I=0: 3.43948
Cd + 3 L ⇆ CdL_3	3.81	3.0		I=0: 2.99931
Hg(II) + L ⇆ Hg(II)L	5.94	1.0		I=0: 6.34632
Hg(II) + 2 L ⇆ $Hg(II)L_2$	9.91	1.0		I=0: 10.51948
Hg(II) + 3 L ⇆ $Hg(II)L_3$	11.45	1.0		I=0: 12.05948
Hg(II) + 4 L ⇆ $Hg(II)L_4$	11.86	1.0		I=0: 12.26632
Pb(II) + L ⇆ Pb(II)L	2.51			
Pb(II) + 2 L ⇆ $Pb(II)L_2$	2.7	2.0		I=0: 2.65669
Pb(II) + 3 L ⇆ $Pb(II)L_3$	3.0	2.0		I=0: 2.95669
$B(OH)_3$ + L ⇆ $B(OH)_3L$	-0.49			H_2BO_3 + H ⇆ H_3BO_3 9.236 $B(OH)_3$ + L ⇆ $B(OH)_3L$ -0.49 H_2BO_3 + H + L ⇆ $B(OH)_3L$ 8.746 Note: H_3BO_3 is $B(OH)_3$
Ga + L ⇆ GaL	2.11	1.0		I=0: 2.71948
In + L ⇆ InL	2.6	1.0		I=0: 3.20948
In + 2 L ⇆ InL_2	4.0	1.0		I=0: 5.01580
In + 3 L ⇆ InL_3	4.9	1.0		I=0: 6.11896

Solid:

Equilibrium	Log (K)	I	T	Conversion or remarks
Ag + L ⇆ AgL (s)	4.13			

Nitrate (NO_3^-)

Equilibrium	Log (K)	I	T	Conversion or remarks
Na + L ⇆ NaL	-0.55			
K + L ⇆ KL	-0.19			
Rb + L ⇆ RbL	-0.08			
Cs + L ⇆ CsL	0.02			
Be + L ⇆ BeL	-0.9	1.0		I=0: -0.49368
Ca + L ⇆ CaL	0.5			
Sr + L ⇆ SrL	0.6			
Ba + L ⇆ BaL	0.7			
Sc + L ⇆ ScL	0.28	4.0		I=0: -1.34528
Sc + 2 L ⇆ ScL_2	-0.3	4.0		I=0: -3.00880
La + L ⇆ LaL	0.1	1.0		I=0: 0.70948
Ce + L ⇆ CeL	0.2	1.0		I=0: 0.80948
Pr + L ⇆ PrL	0.2	1.0		I=0: 0.80948
Nd + L ⇆ NdL	0.3	1.0		I=0: 0.90948
Pm + L ⇆ PmL	0.4	1.0		I=0: 1.00948
Sm + L ⇆ SmL	0.3	1.0		I=0: 0.90948
Eu + L ⇆ EuL	1.22			
Gd + L ⇆ GdL	0.0	1.0		I=0: 0.60948
Tb + L ⇆ TbL	0.88			
Dy + L ⇆ DyL	-0.3	1.0		I=0: 0.30948
Ho + L ⇆ HoL	-0.2	1.0		I=0: 0.40948
Er + L ⇆ ErL	-0.3	1.0		I=0: 0.30948
Tm + L ⇆ TmL	-0.25	1.0		I=0: 0.35948
Yb + L ⇆ YbL	-0.2	1.0		I=0: 0.40948
Lu + L ⇆ LuL	-0.2	1.0		I=0: 0.40948
$(U(VI)O_2)$ + L ⇆ $(U(VI)O_2)L$	0.3			
Mn(II) + L ⇆ Mn(II)L	0.2			
Mn(II) + 2 L ⇆ $Mn(II)L_2$	0.6			
Co(II) + L ⇆ Co(II)L	0.2			
Co(II) + 2 L ⇆ $Co(II)L_2$	-0.3	0.5		I=0: 0.50516
Ni + L ⇆ NiL	0.4			
Ni + 2 L ⇆ NiL_2	-0.5	2.0		I=0: -0.54331
Cu(II) + L ⇆ Cu(II)L	0.5			
Cu(II) + 2 L ⇆ $Cu(II)L_2$	-0.4			
Fe(III) + L ⇆ Fe(III)L	1.00			
Zr + L ⇆ ZrL	0.3	2.0		I=0: 0.24225
Zr + 2 L ⇆ ZrL_2	0.1	4.0	20	I=0: -3.69232
Zr + 3 L ⇆ ZrL_3	-0.3	4.0	20	I=0: -5.17584
Zr + 4 L ⇆ ZrL_4	-0.8	4.0	20	I=0: -6.21760
Hf + L ⇆ HfL	0.34	2.0		I=0: 0.28225
Hf + 2 L ⇆ HfL_2	0.0	2.0		I=0: -0.10107
Hf + 3 L ⇆ HfL_3	-0.7	2.0		I=0: -0.82994
Ag + L ⇆ AgL	-0.1			
Zn + L ⇆ ZnL	0.4			
Zn + 2 L ⇆ ZnL_2	-0.3			
Cd + L ⇆ CdL	0.5			
Cd + 2 L ⇆ CdL_2	0.2			
Hg(II) + L ⇆ Hg(II)L	0.11	3.0		I=0: -0.43046
Hg(II) + 2 L ⇆ $Hg(II)L_2$	0.0	3.0		I=0: -0.81069
Sn(II) + L ⇆ Sn(II)L	0.44	1.0		I=0: 0.84632
Pb(II) + L ⇆ Pb(II)L	1.17			
Pb(II) + 2 L ⇆ $Pb(II)L_2$	1.4			
Pb(II) + 3 L ⇆ $Pb(II)L_3$	0.1	2.0		I=0: 0.05669
Pb(II) + 4 L ⇆ $Pb(II)L_4$	-0.3	3.0		I=0: -0.84046
In + L ⇆ InL	0.18	0.7	20	I=0: 0.92824
In + 2 L ⇆ InL_2	-0.3	0.7	20	I=0: 0.94706
Bi + L ⇆ BiL	1.7			

$Bi + 2\ L \leftrightarrows BiL_2$	2.5			
$Bi + 3\ L \leftrightarrows BiL_3$	0.7	1.0		I=0: 1.91896
$Bi + 4\ L \leftrightarrows BiL_4$	0.6	2.0		I=0: 0.51337

Solid:

Equilibrium	Log (K)	I	T	Conversion or remarks
$Cu(II) + 1.5\ OH + 0.5\ L \leftrightarrows Cu(II)(OH)_{1.5}L_{0.5}$	16.37			$Cu(II) + 1.5\ OH + 0.5\ L \leftrightarrows Cu(II)(OH)_{1.5}L_{0.5}$ 16.37 (multiply by 2): $2\ Cu(II) + 3\ OH + L \leftrightarrows Cu(II)_2(OH)_3L$ 32.74
$Bi + L \leftrightarrows BiOL + 2\ H$	2.55			$Bi + L \leftrightarrows BiOL + 2\ H$ 2.55 $2\ H + 2\ OH \leftrightarrows 2\ H_2O$ (2*13.997) 27.994 $Bi + 2\ OH + L \leftrightarrows BiOL$ 30.544

Fluoride (F^-)

Equilibrium	Log (K)	I	T	Conversion or remarks
$H + L \leftrightarrows HL$	3.18			
$HL + L \leftrightarrows HL_2$	0.6			$HL + L \leftrightarrows HL_2$ 0.6 $H + L \leftrightarrows HL$ 3.18 $H + 2\ L \leftrightarrows HL_2$ 3.78
$Li + L \leftrightarrows LiL$	0.31			
$Na + L \leftrightarrows NaL$	0.02			
$K + L \leftrightarrows KL$	-0.34			
$Rb + L \leftrightarrows RbL$	-0.22			
$Cs + L \leftrightarrows CsL$	-0.36			
$Be + L \leftrightarrows BeL$	4.71	0.5		I=0: 5.24678
$Be + 2\ L \leftrightarrows BeL_2$	8.32	0.5		I=0: 9.12516
$Be + 3\ L \leftrightarrows BeL_4$	11.12	0.5		I=0: 11.92516
$Be + 4\ L \leftrightarrows BeL_4$	13.39	0.5		I=0: 13.92678
$3\ Be + L \leftrightarrows Be_3(OH)_3L + 3\ H$	-4.18	3.0		$3\ Be + L \leftrightarrows Be_3(OH)_3L + 3\ H$ -4.18 3.0 $3\ H + 3\ OH \leftrightarrows 3\ H_2O$ (3*14.26723) 42.80169 3.0 $3\ Be + 3\ OH + L \leftrightarrows Be_3(OH)_3L$ 38.62169 3.0 I=0: 37.00032
$3\ Be + 2\ L \leftrightarrows Be_3(OH)_3L_2 + 3\ H$	-0.7	3.0		$3\ Be + 2\ L \leftrightarrows Be_3(OH)_3L_2 + 3\ H$ -0.7 3.0 $3\ H + 3\ OH \leftrightarrows 3\ H_2O$ (3*14.26723) 42.80169 3.0 $3\ Be + 3\ OH + 2\ L \leftrightarrows Be_3(OH)_3L_2$ 42.10169 3.0 I=0: 39.93986
$Mg + L \leftrightarrows MgL$	1.9			
$Ca + L \leftrightarrows CaL$	0.6	0.5		I=0: 1.13678
$Sr + L \leftrightarrows SrL$	0.15	1.0		I=0: 0.55632
$Ba + L \leftrightarrows BaL$	-0.2	1.0		I=0: 0.20632
$Sc + L \leftrightarrows ScL$	7.08			
$Sc + 2\ L \leftrightarrows ScL_2$	12.89			
$Sc + 3\ L \leftrightarrows ScL_3$	17.4			
$Sc + 4\ L \leftrightarrows ScL_4$	20.2			
$2\ Sc + 3\ L \leftrightarrows Sc_2L_3$	19.0	0.5		I=0: 20.61033
$Y + L \leftrightarrows YL$	4.81			
$Y + 2\ L \leftrightarrows YL_2$	8.54			
$Y + 3\ L \leftrightarrows YL_3$	12.14			
$La + L \leftrightarrows LaL$	3.62			
$La + 2\ L \leftrightarrows LaL_2$	5.08	0.5		I=0: 6.42194
$Ce + L \leftrightarrows CeL$	3.90			
$Pr + L \leftrightarrows PrL$	4.05			
$Nd + L \leftrightarrows NdL$	4.17			
$Pm + L \leftrightarrows PmL$	3.56	0.1		I=0: 4.20073
$Pm + 2\ L \leftrightarrows PmL_2$	5.60	1.0		I=0: 6.61580
$Sm + L \leftrightarrows SmL$	4.19			
$Eu + L \leftrightarrows EuL$	4.27			
$Eu + 2\ L \leftrightarrows EuL_2$	5.90	1.0		I=0: 6.9158
$Gd + L \leftrightarrows GdL$	4.32			
$Tb + L \leftrightarrows TbL$	4.43			
$Dy + L \leftrightarrows DyL$	4.46			
$Ho + L \leftrightarrows HoL$	4.57			
$Er + L \leftrightarrows ErL$	4.59			
$Tm + L \leftrightarrows TmL$	4.61			
$Yb + L \leftrightarrows YbL$	4.63			
$Lu + L \leftrightarrows LuL$	4.66			
$(UO_2) + L \leftrightarrows (UO_2)L$	5.14			
$(UO_2) + 2\ L \leftrightarrows (UO_2)L_2$	8.60			

Equilibrium	Log (K)	I	T	Conversion or remarks
$(UO_2) + 3\ L \leftrightarrows (UO_2)L_3$	11.0			
$(UO_2) + 4\ L \leftrightarrows (UO_2)L_4$	11.9			
$Mn(II) + L \leftrightarrows Mn(II)L$	1.5			
$Fe(II) + L \leftrightarrows Fe(II)L$	0.8	1.0		I=0: 1.20632
$Co(II) + L \leftrightarrows Co(II)L$	1.4			
$Ni + L \leftrightarrows NiL$	1.3			
$Cu(II) + L \leftrightarrows Cu(II)L$	1.7			
$Cr(III) + L \leftrightarrows Cr(III)L$	5.2			
$Cr(III) + 2\ L \leftrightarrows Cr(III)L_2$	7.7	0.5		I=0: 9.04194
$Cr(III) + 3\ L \leftrightarrows Cr(III)L_3$	10.1	0.5		I=0: 11.71033
$Fe(III) + L \leftrightarrows Fe(III)L$	6.03			
$Fe(III) + 2\ L \leftrightarrows Fe(III)L_2$	10.66			
$Fe(III) + 3\ L \leftrightarrows Fe(III)L_3$	13.7			
$Zr + L \leftrightarrows ZrL$	9.8			
$Zr + 2\ L \leftrightarrows ZrL_2$	16.36	2.0		I=0: 16.25893
$Zr + 3\ L \leftrightarrows ZrL_3$	22.31	2.0		I=0: 22.18006
$Zr + 4\ L \leftrightarrows ZrL_4$	29.59	4.0		I=0: 24.17240
$Hf + L \leftrightarrows HfL$	9.04	4.0		I=0: 6.87296
$Hf + 2\ L \leftrightarrows HfL_2$	16.60	4.0		I=0: 12.80768
$Hf + 3\ L \leftrightarrows HfL_3$	23.15	4.0		I=0: 18.27416
$Hf + 4\ L \leftrightarrows HfL_4$	28.81	4.0		I=0: 23.39240
$Ag + L \leftrightarrows AgL$	0.4			
$Zn + L \leftrightarrows ZnL$	1.3			
$Cd + L \leftrightarrows CdL$	1.2			
$Hg(II) + L \leftrightarrows Hg(II)L$	1.6			
$Sn(II) + L \leftrightarrows Sn(II)L$	4.08	1.0		I=0: 4.48632
$Sn(II) + 2\ L \leftrightarrows Sn(II)L_2$	6.68	1.0		I=0: 7.28948
$Sn(II) + 3\ L \leftrightarrows Sn(II)L_3$	9.46	1.0		I=0: 10.06948
$Pb(II) + L \leftrightarrows Pb(II)L$	1.72	0.1		I=0: 2.14715
$Pb(II) + 2\ L \leftrightarrows Pb(II)L_2$	2.53	1.0		I=0: 3.13948
$B(OH)_3$				(four complexes for $B(OH)_3$ not entered; not likely to be of environmental significance)
$Al + L \leftrightarrows AlL$	7.01			
$Al + 2\ L \leftrightarrows AlL_2$	12.63			
$Al + 3\ L \leftrightarrows AlL_3$	16.7			
$Al + 4\ L \leftrightarrows AlL_4$	19.4			
$Ga + L \leftrightarrows GaL$	4.47	0.5		I=0: 5.27516
$Ga + 2\ L \leftrightarrows GaL_2$	8.00	0.5		I=0: 9.34194
$Ga + 3\ L \leftrightarrows GaL_3$	10.47	0.5		I=0: 12.08033
$In + L \leftrightarrows InL$	4.65			
$In + 2\ L \leftrightarrows InL_2$	8.0			
$In + 3\ L \leftrightarrows InL_3$	10.3			
$In + 4\ L \leftrightarrows InL_4$	11.4			
$As(OH)_3$				(a complex for $As(OH)_3$ not entered; not likely to be of environmental significance)
$Bi + L \leftrightarrows BiL$	4.48	2.0	30	I=0: 4.43669
$Si(OH)_4$				(two complexes for $Si(OH)_4$ not entered; not likely to be of environmental significance)

Solids:

Equilibrium	Log (K)	I	T	Conversion or remarks
$Li + L \leftrightarrows LiL$	2.77			
$Na + L \leftrightarrows NaL$	0.49			
$Mg + L \leftrightarrows MgL$	8.11			
$Ca + 2\ L \leftrightarrows CaL_2$	10.50			
$Sr + 2\ L \leftrightarrows SrL_2$	8.58			
$Ba + 2\ L \leftrightarrows BaL_2$	5.82			
$Y + 3\ L \leftrightarrows YL_3$	18.3			
$La + 3\ L \leftrightarrows LaL_3$	18.7			

Equilibrium	Log (K)	I	T	Conversion or remarks
$Ce + 3\ L \leftrightarrows CeL_3$	19.1			
$Pr + 3\ L \leftrightarrows PrL_3$	18.9	0.1		I=0: 20.18145
$Nd + 3\ L \leftrightarrows NdL_3$	20.3			
$Sm + 3\ L \leftrightarrows SmL_3$	17.9	0.1		I=0: 19.18145
$Eu + 3\ L \leftrightarrows EuL_3$	21.9			
$Gd + 3\ L \leftrightarrows GdL_3$	16.8	0.1		I=0: 18.08145
$Tb + 3\ L \leftrightarrows TbL_3$	16.7	0.1		I=0: 17.98145
$Dy + 3\ L \leftrightarrows DyL_3$	16.3	0.1		I=0: 17.58145
$Ho + 3\ L \leftrightarrows HoL_3$	15.8	0.1		I=0: 17.08145
$Er + 3\ L \leftrightarrows ErL_3$	18.0			
$Tm + 3\ L \leftrightarrows TmL_3$	15.8	0.1		I=0: 17.08145
$Yb + 3\ L \leftrightarrows YbL_3$	15.0	0.1		I=0: 16.28145
$Lu + 3\ L \leftrightarrows LuL_3$	15.0	0.1		I=0: 16.28145
$Pb(II) + 2\ L \leftrightarrows Pb(II)L_2$	7.44			
$Al(OH) + 2\ L \leftrightarrows AlL_2(OH)$	13.59			$Al(OH) + 2\ L \leftrightarrows AlL_2(OH)$ 13.59 $Al + OH \leftrightarrows Al(OH)$ 9.00 $Al + OH + 2\ L \leftrightarrows AlL_2(OH)$ 22.59

Silicate ($H_2SiO_4^{2-}$)

Note: in many equilibria water is produced. This is not always mentioned here (see page 7).

Equilibrium	Log (K)	I	T	Conversion or remarks
$H + L \leftrightarrows HL$	13.2			
$H + HL \leftrightarrows H_2L$	9.84			$H + HL \leftrightarrows H_2L$ 9.84 $H + L \leftrightarrows HL$ 13.2 $2\ H + L \leftrightarrows H_2L$ 23.04
$2\ H_2L \leftrightarrows Si_2O_3(OH)_4 + 2\ H$	-18.00	0.5		$2\ H_2L \leftrightarrows Si_2O_3(OH)_4 + 2\ H + H_2O$ -18.00 0.5 $4\ H + 2\ L \leftrightarrows 2\ H_2L$ (2*22.23484) 44.46968 0.5 $2\ H + 2\ L \leftrightarrows Si_2O_3(OH)_4 + H_2O$ 26.46968 0.5 I=0: 27.27484
$Si_2O_3(OH)_4 + H \leftrightarrows Si_2O_2(OH)_5$	10.25	0.5		$Si_2O_3(OH)_4 + H \leftrightarrows Si_2O_2(OH)_5$ 10.25 0.5 $2\ H + 2\ L \leftrightarrows Si_2O_3(OH)_4$ 26.46968 0.5 $3\ H + 2\ L \leftrightarrows Si_2O_2(OH)_5$ 36.71968 0.5 I=0: 38.06162
$2\ Si(OH)_4 \leftrightarrows Si_2O(OH)_6$	1.2	0.5		$2\ Si(OH)_4 \leftrightarrows Si_2O(OH)_6$ 1.2 0.5 $4\ H + 2\ L \leftrightarrows 2\ H_2L$ (2*22.23484) 44.46968 0.5 $4\ H + 2\ L \leftrightarrows Si_2O(OH)_6$ 45.66968 0.5 I=0: 47.28001
$3\ H_2L \leftrightarrows 3\ H + Si_3O_6(OH)_3$ (cyclo)	-26.43	0.5		$3\ H_2L \leftrightarrows 3\ H + Si_3O_6(OH)_3$ (cyclo) + 3 H_2O -26.43 0.5 $6\ H + 3\ L \leftrightarrows 3\ H_2L$ (3*22.23484) 66.70452 0.5 $3\ H + 3\ L \leftrightarrows Si_3O_6(OH)_3$ (cyclo) + H_2O 40.27452 0.5 I=0: 41.07968
$3\ H_2L \leftrightarrows 3\ H + Si_3O_5(OH)_5$ (linear)	-25.40	0.5		$3\ H_2L \leftrightarrows 3\ H + Si_3O_5(OH)_5$ (linear) + 2 H_2O -25.40 0.5 $6\ H + 3\ L \leftrightarrows 3\ H_2L$ (3*22.23484) 66.70452 0.5 $3\ H + 3\ L \leftrightarrows Si_3O_5(OH)_5$ (linear) + 2 H_2O 41.30452 0.5 I=0: 42.10968
$4\ H_2L \leftrightarrows 3\ H + Si_4O_7(OH)_5$ (cyclo)	-23.42	0.5		$4\ H_2L \leftrightarrows 3\ H + Si_4O_7(OH)_5$ (cyclo) + 4 H_2O -23.42 0.5 $8\ H + 4\ L \leftrightarrows 4\ H_2L$ (4*22.23484) 88.93936 0.5 $5\ H + 4\ L \leftrightarrows Si_4O_7(OH)_5$ (cyclo) + 4 H_2O 63.53936 0.5 I=0: 65.14969
$Si_4O_7(OH)_5$ (cyclo) $\leftrightarrows Si_4O_8(OH)_4 + H$	-9.39	0.5		$Si_4O_7(OH)_5$ (cyclo) $\leftrightarrows Si_4O_8(OH)_4 + H$ -9.39 0.5 $5\ H + 4\ L \leftrightarrows Si_4O_7(OH)_5$ (cyclo) + 4 H_2O 63.53936 0.5 $4\ H + 4\ L \leftrightarrows Si_4O_8(OH)_4 + 4\ H_2O$ 54.14936 0.5 I=0: 54.68614
$Mg + H_2L \leftrightarrows MgHL + H$	-8.8	1.0		$Mg + H_2L \leftrightarrows MgHL + H$ -8.8 1.0 $2\ H + L \leftrightarrows H_2L$ 22.43052 1.0 $Mg + H + L \leftrightarrows MgHL$ 13.63052 1.0 I=0: 14.44316
$MgHL + H_2L \leftrightarrows MgH_2L_2 + H$	-6.3	1.0		$MgHL + H_2L \leftrightarrows MgH_2L_2 + H$ -6.3 1.0 $Mg + H + L \leftrightarrows MgHL$ 13.63052 1.0 $2\ H + L \leftrightarrows H_2L$ 22.43052 1.0 $Mg + 2\ H + 2\ L \leftrightarrows MgH_2L_2$ 29.76104 1.0 I=0: 31.18316
$MgL + H \leftrightarrows MgHL$	9.06	1.0		$MgL + H \leftrightarrows MgHL$ 9.06 1.0 invert: $MgHL \leftrightarrows MgL + H$ -9.06 1.0 $Mg + H + L \leftrightarrows MgHL$ 13.63052 1.0 $Mg + L \leftrightarrows MgL$ 4.57052 1.0 I=0: 5.38316

Equilibrium	Log (K)	I	T	Conversion or remarks
$Ca + H_2L \leftrightarrows CaHL + H$	−9.1	1.0		$Ca + H_2L \leftrightarrows CaHL + H$ -9.1 1.0 $2\ H + L \leftrightarrows H_2L$ 22.43052 1.0 $Ca + H + L \leftrightarrows CaHL$ 13.33052 1.0 I=0: 14.14316
$CaHL + H_2L \leftrightarrows CaH_2L_2 + H$	-7.0	1.0		$CaHL + H_2L \leftrightarrows CaH_2L_2 + H$ -7.0 1.0 $Ca + H + L \leftrightarrows CaHL$ 13.33052 1.0 $2\ H + L \leftrightarrows H_2L$ 22.43052 1.0 $Ca + 2\ H + 2\ L \leftrightarrows CaH_2L_2$ 28.76104 1.0 I=0: 30.18316
$CaL + H \leftrightarrows CaHL$	9.89	1.0		$CaL + H \leftrightarrows CaHL$ 9.89 1.0 invert: $CaHL \leftrightarrows CaL + H$ -9.89 1.0 $Ca + H + L \leftrightarrows CaHL$ 13.33052 1.0 $Ca + L \leftrightarrows CaL$ 3.44052 1.0 I=0: 4.25316
$Eu + H_2L \leftrightarrows EuHL + H$	-2.3	0.1		$Eu + H_2L \leftrightarrows EuHL + H$ -2.3 0.1 $2\ H + L \leftrightarrows H_2L$ 22.39927 0.1 $Eu + H + L \leftrightarrows EuHL$ 20.09927 0.1 I=0: 21.16715
$EuHL + H_2L \leftrightarrows EuH_2L_2 + H$	-5.2	0.1		$EuHL + H_2L \leftrightarrows EuH_2L_2 + H$ -5.2 0.1 $Eu + H + L \leftrightarrows EuHL$ 20.09927 0.1 $2\ H + L \leftrightarrows H_2L$ 22.39927 0.1 $Eu + 2\ H + 2\ L \leftrightarrows EuH_2L_2$ 37.29854 0.1 I=0: 39.22072
$(UO_2) + H_2L \leftrightarrows (UO_2)HL + H$	-1.8			$(UO_2) + H_2L \leftrightarrows (UO_2)HL + H$ -1.8 $2\ H + L \leftrightarrows H_2L$ 23.04 $(UO_2) + H + L \leftrightarrows (UO_2)HL$ 21.24
$Fe(III)+ H_2L \leftrightarrows Fe(III)HL + H$	-0.6	0.1		$Fe(III) + H_2L \leftrightarrows Fe(III)HL + H$ -0.6 0.1 $2\ H + L \leftrightarrows H_2L$ 22.39927 0.1 $Fe(III) + H + L \leftrightarrows Fe(III)HL$ 21.79927 0.1 I=0: 22.86715
$Al + H_2L \leftrightarrows AlHL + H$	-2.5	0.1		$Al + H_2L \leftrightarrows Al\ HL + H$ -2.5 0.1 $2\ H + L \leftrightarrows H_2L$ 22.39927 0.1 $Al + H + L \leftrightarrows AlHL$ 19.89927 0.1 I=0: 20.96715

Solids:

Equilibrium	Log (K)	I	T	Conversion or remarks
$H_2L \leftrightarrows SiO_2$	4.0 (quartz)			$H_2L \leftrightarrows SiO_2$ 4.0 $2\ H + L \leftrightarrows H_2L$ 23.04 $2\ H + L \leftrightarrows SiO_2$ 27.04
$2\ Mg + 3\ H_4L + 4\ OH \leftrightarrows Mg_2Si_3O_8(H_2O)_{3.5} + 4.5\ H_2O$	38.8		50	H-balance is not correct. Personal communication with Dr. Martell: should read: $2\ Mg + 3\ H_2L + 4\ OH \leftrightarrows Mg_2Si_3O_8(H_2O)_{3.5} + 4.5\ H_2O$ 38.8 $2\ H + L \leftrightarrows H_2L$ (3*23.04) 69.12 $H_2O \leftrightarrows H + OH$ (4*-13.997) -55.988 $2\ Mg + 2\ H + 3\ L \leftrightarrows Mg_2Si_3O_8(H_2O)_{3.5}$ 51.932
$Ca + L \leftrightarrows CaL$	7.2			
$2\ (UO_2) + L \leftrightarrows (UO_2)_2L$	6.0	0.1		Not correct: charge of solid is not zero! Therefore solid NOT entered.

Phosphate (PO_4^{3-})

Equilibrium	Log (K)	I	T	Conversion or remarks
$H + L \leftrightarrows HL$	12.375			
$HL + H \leftrightarrows H_2L$	7.198			$HL + H \leftrightarrows H_2L$ 7.198 $H + L \leftrightarrows HL$ 12.375 $2\ H + L \leftrightarrows H_2L$ 19.573
$H_2L + H \leftrightarrows H_3L$	2.148			$H_2L + H \leftrightarrows H_3L$ 2.148 $2\ H + L \leftrightarrows H_2L$ 19.573 $3\ H + L \leftrightarrows H_3L$ 21.721
$H_3L + H \leftrightarrows H_4L$	0.0	3.0		$H_3L + H \leftrightarrows H_4L$ 0.0 3.0 $3\ H + L \leftrightarrows H_3L$ 23.34237 3.0 $4\ H + L \leftrightarrows H_4L$ 23.34237 3.0 I=0: 21.721
$Li + L \leftrightarrows LiL$	0.95	0.15	37	I=0: 1.66362
$Li + HL \leftrightarrows LiHL$	0.73	0.1		$Li + HL \leftrightarrows LiHL$ 0.73 0.1 $H + L \leftrightarrows HL$ 11.73427 0.1 $Li + H + L \leftrightarrows LiHL$ 12.46427 0.1 I=0: 13.53215
$Li + H_2L \leftrightarrows LiH_2L$	0.2	0.5	37	$Li + H_2L \leftrightarrows LiH_2L$ 0.2 0.5 $2\ H + L \leftrightarrows H_2L$ 18.23106 0.5 $Li + 2\ H + L \leftrightarrows LiH_2L$ 18.43106 0.5 I=0: 20.04139
$Na + L \leftrightarrows NaL$	1.43			
$Na + HL \leftrightarrows NaHL$	1.07			$Na + HL \leftrightarrows NaHL$ 1.07 $H + L \leftrightarrows HL$ 12.375 $Na + H + L \leftrightarrows NaHL$ 13.445
$Na + H_2L \leftrightarrows NaH_2L$	0.3			$Na + H_2L \leftrightarrows NaH_2L$ 0.3 $2\ H + L \leftrightarrows H_2L$ 19.573 $Na + 2\ H + L \leftrightarrows NaH_2L$ 19.873
$NaL + Na \leftrightarrows Na_2L$	1.16			
$Na_2L + H \leftrightarrows Na_2HL$	10.73			$Na_2L + H \leftrightarrows Na_2HL$ 10.73 $NaL + Na \leftrightarrows Na_2L$ 1.16 $Na + L \leftrightarrows NaL$ 1.43 $2\ Na + H + L \leftrightarrows Na_2HL$ 13.32
$K + L \leftrightarrows KL$	1.43			
$K + HL \leftrightarrows KHL$	0.88			$K + HL \leftrightarrows KHL$ 0.88 $H + L \leftrightarrows HL$ 12.375 $K + H + L \leftrightarrows KHL$ 13.255
$K + H_2L \leftrightarrows KH_2L$	0.3			$K + H_2L \leftrightarrows KH_2L$ 0.3 $2\ H + L \leftrightarrows H_2L$ 19.573 $K + 2\ H + L \leftrightarrows KH_2L$ 19.873
$KL + L \leftrightarrows K_2L$	0.83			
$K_2L + H \leftrightarrows K_2HL$	11.24			$K_2L + H \leftrightarrows K_2HL$ 11.24 $KL + K \leftrightarrows K_2L$ 0.83 $K + L \leftrightarrows KL$ 1.37 $2\ K + H + L \leftrightarrows K_2HL$ 13.44
$NH_4 + HL \leftrightarrows NH_4HL$	0.8	0.15	37	$NH_4 + HL \leftrightarrows NH_4HL$ 0.8 0.15 $NH_3 + H \leftrightarrows NH_4$ 9.244 0.15 $H + L \leftrightarrows HL$ 11.66138 0.15 $NH_3 + 2\ H + L \leftrightarrows NH_4HL$ 21.70538 0.15 I=0: 22.89475
$NH_4 + H_2L \leftrightarrows NH_4H_2L$	-0.1	0.15	37	$NH_4 + H_2L \leftrightarrows NH_4H_2L$ -0.1 0.15 $NH_3 + H \leftrightarrows NH_4$ 9.244 0.15 $2\ H + L \leftrightarrows H_2L$ 18.38363 0.15 $NH3 + 3\ H + L \leftrightarrows NH_4H_2L$ 27.52763 0.15 I=0: 28.95488
$Be + H_2L \leftrightarrows BeH_2L$	1.86	3.0		$Be + H_2L \leftrightarrows BeH_2L$ 1.86 3.0 $2\ H + L \leftrightarrows H_2L$ 20.92414 3.0 $Be + 2\ H + L \leftrightarrows BeH_2L$ 22.78414 3.0 I=0: 20.89254

Equilibrium	Log (K)	I	T	Conversion or remarks
$Be + 2\ H_2L \leftrightarrows Be(H_2L)_2$	4.31	3.0		$Be + 2\ H_2L \leftrightarrows Be(H_2L)_2$ 4.31 3.0 $2\ H + L \leftrightarrows H_2L$ (*2) (=2*20.92414) 41.84828 3.0 $Be + 4\ H + 2\ L \leftrightarrows Be(H_2L)_2$ 46.15828 3.0 I=0: 42.64531
$2\ Be + 2\ H_3L \leftrightarrows Be_2H_5L_2 + H$	-0.43	3.0		$2\ Be + 2\ H_3L \leftrightarrows Be_2H_5L_2 + H$ -0.43 3.0 $3\ H + L \leftrightarrows H_3L$ (*2) (=2*23.34237) 46.68474 3.0 $2\ Be + 5\ H + 2\ L \leftrightarrows Be_2H_5L_2$ 46.25474 3.0 I=0: 43.28223
$3\ Be + 6\ H_3L \leftrightarrows Be_3H_{17}L_6 + H$	-12.12	3.0		$3\ Be + 6\ H_3L \leftrightarrows Be_3H_{17}L_6 + H$ -12.12 3.0 $3\ H + L \leftrightarrows H_3L$ (*6) (=6*23.34237) 140.05422 3.0 $3\ Be + 17\ H + 6\ L \leftrightarrows Be_3H_{17}L_6$ 127.93422 3.0 I=0: 120.09759
$Be_3H_{15}L_6 + 2\ H \leftrightarrows Be_3H_{17}L_6$	10.06	3.0		$Be_3H_{15}L_6 + 2\ H \leftrightarrows Be_3H_{17}L_6$ 10.06 3.0 invert: $Be_3H_{17}L_6 \leftrightarrows Be_3H_{15}L_6 + 2\ H$ -10.06 3.0 $3\ Be + 17\ H + 6\ L \leftrightarrows Be_3H_{17}L_6$ 127.93422 3.0 $3\ Be + 15\ H + 6\ L \leftrightarrows Be_3H_{15}L_6$ 117.87422 3.0 I=0: 108.14599
$3\ Be + 8\ H_3L \leftrightarrows Be_3H_{18}L_8 + 6\ H$	1.57	3.0		$3\ Be + 8\ H_3L \leftrightarrows Be_3H_{18}L_8 + 6\ H$ 1.57 3.0 $3\ H + L \leftrightarrows H_3L$ (*8) (=8*23.34237) 186.73896 3.0 $3\ Be + 18\ H + 8\ L \leftrightarrows Be_3H_{18}L_8$ 188.30896 3.0 I=0: 174.52730
$Mg + HL \leftrightarrows MgHL$	2.80			$Mg + HL \leftrightarrows MgHL$ 2.80 $H + L \leftrightarrows HL$ 12.375 $Mg + H + L \leftrightarrows MgHL$ 15.175
$Mg + H_2L \leftrightarrows MgH_2L$	0.16	3.0		$Mg + H_2L \leftrightarrows MgH_2L$ 0.16 3.0 $2\ H + L \leftrightarrows H_2L$ 20.92414 3.0 $Mg + 2\ H + L \leftrightarrows MgH_2L$ 21.08414 3.0 I=0: 19.19254
$Mg + 2\ H_2L \leftrightarrows Mg(H_2L)_2$	0.64	3.0		$Mg + 2\ H_2L \leftrightarrows Mg(H_2L)_2$ 0.64 3.0 $2\ H + L \leftrightarrows H_2L$ (*2) (=2*20.92414) 41.84828 3.0 $Mg + 4\ H + 2\ L \leftrightarrows Mg(H_2L)_2$ 42.48828 3.0 I=0: 38.97531
$MgH_3L_2 + H \leftrightarrows Mg(H_2L)_2$	4.99	3.0		$MgH_3L_2 + H \leftrightarrows Mg(H_2L)_2$ 4.99 3.0 invert: $Mg(H_2L)_2 \leftrightarrows MgH_3L_2 + H$ -4.99 3.0 $Mg + 4\ H + 2\ L \leftrightarrows Mg(H_2L)_2$ 42.48828 3.0 $Mg + 3\ H + 2\ L \leftrightarrows MgH_3L_2$ 37.49828 3.0 I=0: 34.25554
$Ca + HL \leftrightarrows CaHL$	2.66			$Ca + HL \leftrightarrows CaHL$ 2.66 $H + L \leftrightarrows HL$ 12.375 $Ca + H + L \leftrightarrows CaHL$ 15.035
$Ca + H_2L \leftrightarrows CaH_2L$	1.35			$Ca + H_2L \leftrightarrows CaH_2L$ 1.35 $2\ H + L \leftrightarrows H_2L$ 19.573 $Ca + 2\ H + L \leftrightarrows CaH_2L$ 20.923
$Ca + 2\ H_2L \leftrightarrows Ca(H_2L)_2$	0.67	3.0		$Ca + 2\ H_2L \leftrightarrows Ca(H_2L)_2$ 0.67 3.0 $2\ H + L \leftrightarrows H_2L$ (*2) (=2*20.92414) 41.84828 3.0 $Ca + 4\ H + 2\ L \leftrightarrows Ca(H_2L)_2$ 42.51828 3.0 I=0: 39.00531

Equilibrium	Log (K)	I	T	Conversion or remarks
$Sr + HL \leftrightarrows SrHL$	1.64 1.38	0.1		1.64 is when using tetraalkyl ammonium salt as background electrolyte; 1.38 when using Na-salt as background electrolyte; used: average of 1.51 $Sr + HL \leftrightarrows SrHL$ 1.51 0.1 $H + L \leftrightarrows HL$ 11.73427 0.1 $Sr + H + L \leftrightarrows SrHL$ 13.24427 0.1 I=0: 14.73930
$Sr + H_2L \leftrightarrows SrH_2L$	0.4	0.1	20	$Sr + H_2L \leftrightarrows SrH_2L$ 0.4 0.1 $2\ H + L \leftrightarrows H_2L$ 18.50512 0.1 $Sr + 2\ H + L \leftrightarrows SrH_2L$ 18.90512 0.1 I=0: 20.40015
$Ba + HL \leftrightarrows BaHL$	1.36	0.1		$Ba + HL \leftrightarrows BaHL$ 1.36 0.1 $H + L \leftrightarrows HL$ 11.73427 0.1 $Ba + H + L \leftrightarrows BaHL$ 13.09427 0.1 I=0: 14.58930
$Ba + H_2L \leftrightarrows Ba(H_2L)$	0.00	3.0		$Ba + H_2L \leftrightarrows Ba(H_2L)$ 0.00 3.0 $2\ H + L \leftrightarrows H_2L$ 20.92414 3.0 $Ba + 2\ H + L \leftrightarrows Ba(H_2L)$ 20.92414 3.0 I=0: 19.03254
$Ba + 2\ H_2L \leftrightarrows Ba(H_2L)_2$	-0.01	3.0		$Ba + 2\ H_2L \leftrightarrows Ba(H_2L)_2$ -0.01 3.0 $2\ H + L \leftrightarrows H_2L$ (*2) (=2*20.92414) 41.84828 3.0 $Ba + 4\ H + 2\ L \leftrightarrows Ba(H_2L)_2$ 41.83828 3.0 I=0: 38.32531
$Y + H_2L \leftrightarrows YH_2L$	2.65			$Y + H_2L \leftrightarrows YH_2L$ 2.65 $2\ H + L \leftrightarrows H_2L$ 19.573 $Y + 2\ H + L \leftrightarrows YH_2L$ 22.223
$La + H_2L \leftrightarrows LaH_2L$	1.61	0.5		$La + H_2L \leftrightarrows LaH_2L$ 1.61 0.5 $2\ H + L \leftrightarrows H_2L$ 18.23106 0.5 $La + 2\ H + L \leftrightarrows H_2L$ 19.84106 0.5 I=0: 21.98817
$Ce + L \leftrightarrows CeL$	11.73			
$Ce + H_2L \leftrightarrows CeH_2L$	2.33			$Ce + H_2L \leftrightarrows CeH_2L$ 2.33 $2\ H + L \leftrightarrows H_2L$ 19.573 $Ce + 2\ H + L \leftrightarrows CeH_2L$ 21.903
$Pm + H_2L \leftrightarrows PmH_2L$	2.51			$Pm + H_2L \leftrightarrows PmH_2L$ 2.51 $2\ H + L \leftrightarrows H_2L$ 19.573 $Pm + 2\ H + L \leftrightarrows PmH_2L$ 22.083
$Gd + L \leftrightarrows GdL$	12.19			
$Gd + HL \leftrightarrows GdHL$	5.91			$Gd + HL \leftrightarrows GdHL$ 5.91 $H + L \leftrightarrows HL$ 12.375 $Gd + H + L \leftrightarrows GdHL$ 18.285
$Gd + 2\ HL \leftrightarrows GdH_2L_2$	9.97			$Gd + 2\ HL \leftrightarrows GdH_2L_2$ 9.97 $H + L \leftrightarrows HL$ (2*12.375) 24.750 $Gd + 2\ H + 2\ L \leftrightarrows GdH_2L_2$ 34.720
$Gd + H_2L \leftrightarrows GdH_2L$	2.74			$Gd + H_2L \leftrightarrows GdH_2L$ 2.74 $2\ H + L \leftrightarrows H_2L$ 19.573 $Gd + 2\ H + L \leftrightarrows GdH_2L$ 22.313
$(UO_2) + L \leftrightarrows (UO_2)L$	13.25			
$(UO_2) + HL \leftrightarrows (UO_2)HL$	7.28			$(UO_2) + HL \leftrightarrows (UO_2)HL$ 7.2 $H + L \leftrightarrows HL$ 12.375 $(UO_2) + H + L \leftrightarrows (UO_2)HL$ 19.575
$(UO_2) + H_2L \leftrightarrows (UO_2)H_2L$	3.26			$(UO_2) + H_2L \leftrightarrows (UO_2)H_2L$ 3.26 $2\ H + L \leftrightarrows H_2L$ 19.573 $(UO_2) + 2\ H + L \leftrightarrows (UO_2)H_2L$ 22.833
$(UO_2)H_2L + H \leftrightarrows (UO_2)H_3L$	0.8			$(UO_2)H_2L + H \leftrightarrows (UO_2)H_3L$ 0.8 $(UO_2) + 2\ H + L \leftrightarrows (UO_2)H_2L$ 22.833 $(UO_2) + 3\ H + L \leftrightarrows (UO_2)H_3L$ 23.633

Equilibrium	Log (K)	I	T	Conversion or remarks
$Mn(II) + HL \leftrightarrows Mn(II)HL$	2.70 2.45	0.1		2.70 is when using tetraalkyl ammonium salt as background electrolyte; 2.45 when using Na-salt as background electrolyte; used: average of 2.575 $Mn(II) + HL \leftrightarrows Mn(II)HL$ 2.575 0.1 $H + L \leftrightarrows HL$ 11.73427 0.1 $Mn(II) + H + L \leftrightarrows Mn(II)HL$ 14.30927 0.1 I=0: 15.80430
$Fe(II) + HL \leftrightarrows Fe(II)HL$	2.46	3.0		$Fe(II) + HL \leftrightarrows Fe(II)HL$ 2.46 3.0 $H+ L \leftrightarrows HL$ 13.18569 3.0 $Fe(II) + H + L \leftrightarrows Fe(II)HL$ 15.64569 3.0 I=0: 13.75409
$Fe(II) + H_2L \leftrightarrows Fe(II)H_2L$	0.55	3.0		$Fe(II) + H_2L \leftrightarrows Fe(II)H_2L$ 0.55 3.0 $2\ H + L \leftrightarrows H_2L$ 20.92414 3.0 $Fe(II) + 2\ H + L \leftrightarrows Fe(II)H_2L$ 21.47414 3.0 I=0: 19.58254
$Fe(II) + 2\ H_2L \leftrightarrows Fe(II)(H_2L)_2$	1.82	3.0		$Fe(II) + 2\ H_2L \leftrightarrows Fe(II)(H_2L)_2$ 1.82 3.0 $2\ H + L \leftrightarrows H_2L$ (*2) (=2*20.92414) 41.84828 3.0 $Fe(II) + 4\ H + 2\ L \leftrightarrows Fe(II)(H_2L)_2$ 43.66828 3.0 I=0: 40.15531
$Fe(II)H_3L_2 + H \leftrightarrows Fe(II)(H_2L)_2$	5.29	3.0		$Fe(II)H_3L_2 + H \leftrightarrows Fe(II)(H_2L)_2$ 5.29 3.0 invert: $Fe(II)(H_2L)_2 \leftrightarrows Fe(II)H_3L_2 + H$ -5.29 3.0 $Fe(II) + 4\ H + 2\ L \leftrightarrows Fe(II)(H_2L)_2$ 43.66828 3.0 $Fe(II) + 3\ H + 2\ L \leftrightarrows Fe(II)H_3L_2$ 38.37828 3.0 I=0: 35.13554
$Co(II) + HL \leftrightarrows Co(II)HL$	2.20	0.1		$Co(II) + HL \leftrightarrows Co(II)HL$ 2.20 0.1 $H + L \leftrightarrows HL$ 11.73427 0.1 $Co(II) + H + L \leftrightarrows Co(II)HL$ 13.93427 0.1 I=0: 15.42930
$Co(II) + H_2L \leftrightarrows Co(II)H_2L$	0.51	3.0		$Co(II) + H_2L \leftrightarrows Co(II)H_2L$ 0.51 3.0 $2\ H + L \leftrightarrows H_2L$ 20.92414 3.0 $Co(II) + 2\ H + L \leftrightarrows Co(II)H_2L$ 21.43414 3.0 I=0: 19.54254
$Co(II) + 2\ H_2L \leftrightarrows Co(II)(H_2L)_2$	1.03	3.0		$Co(II) + 2\ H_2L \leftrightarrows Co(II)(H_2L)_2$ 1.03 3.0 $2\ H + L \leftrightarrows H_2L$ (*2) (=2*20.92414) 41.84828 3.0 $Co(II) + 4\ H + 2\ L \leftrightarrows Co(II)(H_2L)_2$ 42.87828 3.0 I=0: 39.36531
$Ni + HL \leftrightarrows NiHL$	2.10	0.1		$Ni + HL \leftrightarrows NiHL$ 2.10 0.1 $H + L \leftrightarrows HL$ 11.73427 0.1 $Ni + H + L \leftrightarrows NiHL$ 13.83427 0.1 I=0: 15.32930
$Ni + H_2L \leftrightarrows NiH_2L$	0.5	0.1		$Ni + H_2L \leftrightarrows NiH_2L$ 0.5 0.1 $2\ H + L \leftrightarrows H_2L$ 18.50512 0.1 $Ni + 2\ H + L \leftrightarrows NiH_2L$ 19.00512 0.1 I=0: 20.50015
$Cu(II) + HL \leftrightarrows Cu(II)HL$	3.27	0.1		$Cu(II) + HL \leftrightarrows Cu(II)HL$ 3.27 0.1 $H + L \leftrightarrows HL$ 11.73427 0.1 $Cu(II) + H + L \leftrightarrows Cu(II)HL$ 15.00427 0.1 I=0: 16.49930

Equilibrium	Log (K)	I	T	Conversion or remarks
$Cu(II) + H_2L \leftrightarrows Cu(II)H_2L$	0.64	3.0		$Cu(II) + H_2L \leftrightarrows Cu(II)H_2L$ 0.64 3.0 $2\ H + L \leftrightarrows H_2L$ 20.92414 3.0 $Cu(II) + 2\ H + L \leftrightarrows Cu(II)H_2L$ 21.56414 3.0 I=0: 19.67254
$Cu(II) + 2\ H_2L \leftrightarrows Cu(II)(H_2L)_2$	1.03	3.0		$Cu(II) + 2\ H_2L \leftrightarrows Cu(II)(H_2L)_2$ 1.03 3.0 $2\ H + L \leftrightarrows H_2L$ (*2) (=2*20.92414) 41.84828 3.0 $Cu(II) + 4\ H + 2\ L \leftrightarrows Cu(II)(H_2L)_2$ 42.87828 3.0 I=0: 39.36531
$Cu(II)H_3L_2 + H \leftrightarrows Cu(II)(H_2L)_2$	3.80	3.0		$Cu(II)H_3L_2 + H \leftrightarrows Cu(II)(H_2L)_2$ 3.80 3.0 invert: $Cu(II)(H_2L)_2 \leftrightarrows Cu(II)H_3L_2 + H$ -3.80 3.0 $Cu(II) + 4\ H + 2\ L \leftrightarrows Cu(II)(H_2L)_2$ 42.87828 3.0 $Cu(II) + 3\ H + 2\ L \leftrightarrows Cu(II)H_3L_2$ 39.07828 3.0 I=0: 35.83554
$Cu(II)H_2L_2 + H \leftrightarrows Cu(II)H_3L_2$	4.8	3.0		$Cu(II)H_2L_2 + H \leftrightarrows Cu(II)H_3L_2$ 4.8 3.0 invert: $Cu(II)H_3L_2 \leftrightarrows Cu(II)H_2L_2 + H$ -4.8 3.0 $Cu(II) + 3\ H + 2\ L \leftrightarrows Cu(II)H_3L_2$ 39.07828 3.0 $Cu(II) + 2\ H + 2\ L \leftrightarrows Cu(II)H_2L_2$ 34.27828 3.0 I=0: 31.57599
$Cr(III) + HL \leftrightarrows Cr(III)HL$	2.56	0.1		$Cr(III) + HL \leftrightarrows Cr(III)HL$ 2.56 0.1 $H + L \leftrightarrows HL$ 11.73427 0.1 $Cr(III) + H + L \leftrightarrows Cr(III)HL$ 14.29427 0.1 I=0: 16.21645
$Fe(III) + HL \leftrightarrows Fe(III)HL$	8.30	0.5		$Fe(III) + HL \leftrightarrows Fe(III)HL$ 8.30 0.5 $H + L \leftrightarrows HL$ 11.56984 0.5 $Fe(III) + H + L \leftrightarrows Fe(III)HL$ 19.86984 0.5 I=0: 22.28533
$Fe(III) + H_2L \leftrightarrows Fe(III)H_2L$	3.47	0.5		$Fe(III) + H_2L \leftrightarrows Fe(III)H_2L$ 3.47 0.5 $2\ H + L \leftrightarrows H_2L$ 18.23106 0.5 $Fe(III) + 2\ H + L \leftrightarrows Fe(III)H_2L$ 21.70106 0.5 I=0: 23.84817
$Fe(III) + 2\ H_2L \leftrightarrows Fe(III)(H_2L)_2$	6.03	3.0		$Fe(III) + 2\ H_2L \leftrightarrows Fe(III)(H_2L)_2$ 6.03 3.0 $2\ H + L \leftrightarrows H_2L$ (*2) (=2*20.92414) 41.84828 3.0 $Fe(III) + 4\ H + 2\ L \leftrightarrows Fe(III)(H_2L)_2$ 47.87828 3.0 I=0: 43.82485
$Fe(III) + 3\ H_2L \leftrightarrows Fe(III)(H_2L)_3$	8.1	3.0		$Fe(III) + 3\ H_2L \leftrightarrows Fe(III)(H_2L)_3$ 8.1 3.0 $2\ H + L \leftrightarrows H_2L$ (*3) (=3*20.92414) 62.77242 3.0 $Fe(III) + 6\ H + 3\ L \leftrightarrows Fe(III)(H_2L)_3$ 70.87242 3.0 I=0: 65.19762
$Fe(III)H_2L + H \leftrightarrows Fe(III)H_3L$	0.6	3.0		$Fe(III)H_2L + H \leftrightarrows Fe(III)H_3L$ 0.6 3.0 $Fe(III) + 2\ H + L \leftrightarrows Fe(III)H_2L$ 26.01 3.0 $Fe(III) + 3\ H + L \leftrightarrows Fe(III)H_3L$ 26.61 3.0 I=0: 24.98863

Equilibrium	Log (K)	I	T	Conversion or remarks
$Cu(I) + H_2L \leftrightarrows Cu(I)H_2L$	0.5	3.0		$Cu(I) + H_2L \leftrightarrows Cu(I)H_2L$ 0.5 3.0 $2\ H + L \leftrightarrows H_2L$ 20.92414 3.0 $Cu(I) + 2\ H + L \leftrightarrows Cu(I)H_2L$ 21.42414 3.0 I=0: 19.80277
$Cu(I) + 2\ H_2L \leftrightarrows Cu(I)(H_2L)_2$	1.48	3.0		$Cu(I) + 2\ H_2L \leftrightarrows Cu(I)(H_2L)_2$ 1.48 3.0 $2\ H + L \leftrightarrows H_2L$ (*2) (=2*20.92414) 41.84828 3.0 $Cu(I) + 4\ H + 2\ L \leftrightarrows Cu(I)(H_2L)_2$ 43.32828 3.0 I=0: 40.35577
$Cu(I)H_2L_2 + H \leftrightarrows Cu(I)H_3L_2$	4.3	3.0		Can not be related to components; not entered
$Ag + H_2L \leftrightarrows AgH_2L$	-0.17	3.0		$Ag + H_2L \leftrightarrows AgH_2L$ -0.17 3.0 $2\ H + L \leftrightarrows H_2L$ 20.92414 3.0 $Ag + 2\ H + L \leftrightarrows AgH_2L$ 20.75414 3.0 I=0: 19.13277
$Ag + 2\ H_2L \leftrightarrows Ag(H_2L)_2$	-0.1	3.0		$Ag + 2\ H_2L \leftrightarrows Ag(H_2L)_2$ -0.1 3.0 $2\ H + L \leftrightarrows H_2L$ (*2) (=2*20.92414) 41.84828 3.0 $Ag + 4\ H + 2\ L \leftrightarrows Ag(H_2L)_2$ 41.74828 3.0 I=0: 38.77577
$AgHL + H \leftrightarrows AgH_2L$	5.39	3.0		$AgHL + H \leftrightarrows AgH_2L$ 5.39 3.0 invert: $AgH_2L \leftrightarrows AgHL + H$ -5.39 3.0 $Ag + 2\ H + L \leftrightarrows AgH_2L$ 20.75414 3.0 $Ag + H + L \leftrightarrows AgHL$ 15.36414 3.0 I=0: 14.01300
$AgH_2L_2 + H \leftrightarrows AgH_3L_2$	4.45	3.0		Can not be related to components; not entered
$Zn + HL \leftrightarrows ZnHL$	2.46	0.1		$Zn + HL \leftrightarrows ZnHL$ 2.46 0.1 $H + L \leftrightarrows HL$ 11.73427 0.1 $Zn + H + L \leftrightarrows ZnHL$ 14.19427 0.1 I=0: 15.68930
$Zn + H_2L \leftrightarrows ZnH_2L$	0.37	3.0		$Zn + H_2L \leftrightarrows ZnH_2L$ 0.37 3.0 $2\ H + L \leftrightarrows H_2L$ 20.92414 3.0 $Zn + 2\ H + L \leftrightarrows ZnH_2L$ 21.29414 3.0 I=0: 19.40254
$Zn + 2\ H_2L \leftrightarrows Zn(H_2L)_2$	1.10	3.0		$Zn + 2\ H_2L \leftrightarrows Zn(H_2L)_2$ 1.10 3.0 $2\ H + L \leftrightarrows H_2L$ (*2) (=2*20.92414) 41.84828 3.0 $Zn + 4\ H + 2\ L \leftrightarrows Zn(H_2L)_2$ 42.94828 3.0 I=0: 39.43531
$ZnH_3L_2 + H \leftrightarrows Zn(H_2L)_2$	4.9	3.0		$ZnH_3L_2 + H \leftrightarrows Zn(H_2L)_2$ 4.9 3.0 invert: $Zn(H_2L)_2 \leftrightarrows ZnH_3L_2 + H$ -4.9 3.0 $Zn + 4\ H + 2\ L \leftrightarrows Zn(H_2L)_2$ 42.94828 3.0 $Zn + 3\ H + 2\ L \leftrightarrows ZnH_3L_2$ 38.04828 3.0 I=0: 34.80554
$ZnH_2L_2 + H \leftrightarrows ZnH_3L_2$	3.3	3.0		$ZnH_2L_2 + H \leftrightarrows ZnH_3L_2$ 3.3 3.0 invert: $ZnH_3L_2 \leftrightarrows ZnH_2L_2 + H$ -3.3 3.0 $Zn + 3\ H + 2\ L \leftrightarrows ZnH_3L_2$ 38.04828 3.0 $Zn + 2\ H + 2\ L \leftrightarrows ZnH_2L_2$ 34.74828 3.0 I=0: 32.04599
$ZnHL_2 + H \leftrightarrows ZnH_2L_2$	5.76	3.0		$ZnHL_2 + H \leftrightarrows ZnH_2L_2$ 5.76 3.0 invert: $ZnH_2L_2 \leftrightarrows ZnHL_2 + H$ -5.76 3.0 $Zn + 2\ H + 2\ L \leftrightarrows ZnH_2L_2$ 34.74828 3.0 $Zn + H + 2\ L \leftrightarrows ZnHL_2$ 28.98828 3.0 I=0: 27.09668
$Cd + HL \leftrightarrows CdHL$	2.85	0.1		$Cd + HL \leftrightarrows CdHL$ 2.85 0.1 $H + L \leftrightarrows HL$ 11.73427 0.1 $Cd + H + L \leftrightarrows CdHL$ 14.58427 0.1 I=0: 16.07930

Equilibrium	Log (K)	I	T	Conversion or remarks
$Cd + H_2L \leftrightarrows CdH_2L$	0.76	3.0		$Cd + H_2L \leftrightarrows CdH_2L$ 0.76 3.0 $2\ H + L \leftrightarrows H_2L$ 20.92414 3.0 $Cd + 2\ H + L \leftrightarrows CdH_2L$ 21.68414 3.0 I=0: 19.79254
$Cd + 2\ H_2L \leftrightarrows Cd(H_2L)_2$	1.01	3.0		$Cd + 2\ H_2L \leftrightarrows Cd(H_2L)_2$ 1.01 3.0 $2\ H + L \leftrightarrows H_2L$ (*2) (=2*20.92414) 41.84828 3.0 $Cd + 4\ H + 2\ L \leftrightarrows Cd(H_2L)_2$ 42.85828 3.0 I=0: 39.34531
$CdH_3L_2 + H \leftrightarrows Cd(H_2L)_2$	4.03	3.0		$CdH_3L_2 + H \leftrightarrows Cd(H_2L)_2$ 4.03 3.0 invert: $Cd(H_2L)_2 \leftrightarrows CdH_3L_2 + H$ -4.03 3.0 $Cd + 4\ H + 2\ L \leftrightarrows Cd(H_2L)_2$ 42.85828 3.0 $Cd + 3\ H + 2\ L \leftrightarrows CdH_3L_2$ 38.82828 3.0 I=0: 35.58554
$CdH_2L_2 + H \leftrightarrows CdH_3L_2$	5.67	3.0		$CdH_2L_2 + H \leftrightarrows CdH_3L_2$ 5.67 3.0 invert: $CdH_3L_2 \leftrightarrows CdH_2L_2 + H$ -5.67 3.0 $Cd + 3\ H + 2\ L \leftrightarrows CdH_3L_2$ 38.82828 3.0 $Zn + 2\ H + 2\ L \leftrightarrows ZnH_2L_2$ 33.15828 3.0 I=0: 30.45599
$Hg(II) + L \leftrightarrows Hg(II)L$	14.0	3.0		I=0: 12.37863
$Hg(II) + HL \leftrightarrows Hg(II)HL$	8.8	3.0		$Hg(II) + HL \leftrightarrows Hg(II)HL$ 8.8 3.0 $H + L \leftrightarrows HL$ 13.18569 3.0 $Hg(II) + H + L \leftrightarrows Hg(II)HL$ 21.98569 3.0 I=0: 20.09409
$Pb(II) + HL \leftrightarrows Pb(II)HL$	3.1			$Pb(II) + HL \leftrightarrows Pb(II)HL$ 3.1 $H+ L \leftrightarrows HL$ 12.375 $Pb(II) + H + L \leftrightarrows Pb(II)HL$ 15.475
$Pb(II) + H_2L \leftrightarrows Pb(II)H_2L$	1.5			$Pb(II) + H_2L \leftrightarrows Pb(II)H_2L$ 1.5 $2\ H + L \leftrightarrows H_2L$ 19.573 $Pb(II) + 2\ H + L \leftrightarrows Pb(II)H_2L$ 21.073
$Al + L \leftrightarrows AlL$	15.32	0.15	37	I=0: 17.46087
$2\ Al + L \leftrightarrows Al_2L$	16.7	0.2		I=0: 18.97656
$Al + HL \leftrightarrows AlHL$	6.12	0.2		$Al + HL \leftrightarrows AlHL$ 6.12 0.2 $H + L \leftrightarrows HL$ 11.61615 0.2 $Al + H + L \leftrightarrows AlHL$ 17.73615 0.2 I=0: 20.01271
$Al + H_2L \leftrightarrows AlH_2L$	2.02	3.0		$Al + H_2L \leftrightarrows AlH_2L$ 2.02 3.0 $2\ H + L \leftrightarrows H_2L$ 20.92414 3.0 $Al + 2\ H + L \leftrightarrows AlH_2L$ 22.94414 3.0 I=0: 20.78231
$Al + 2\ H_2L \leftrightarrows Al(H_2L)_2$	4.82	3.0		$Al + 2\ H_2L \leftrightarrows Al(H_2L)_2$ 4.82 3.0 $2\ H + L \leftrightarrows H_2L$ (*2) (=2*20.92414) 41.84828 3.0 $Al + 4\ H + 2\ L \leftrightarrows Al(H_2L)_2$ 46.66828 3.0 I=0: 42.61485
$Al_2(OH)L + H \leftrightarrows Al_2L$	2.44	0.2		$Al_2(OH)L + H \leftrightarrows Al_2L$ 2.44 0.2 invert: $Al_2L \leftrightarrows Al_2(OH)L + H$ -2.44 0.2 $2\ Al + L \leftrightarrows Al_2L$ 16.7 0.2 $OH + H \leftrightarrows H_2O$ 13.74405 0.2 $2\ Al + OH + L \leftrightarrows Al_2(OH)L$ 28.00405 0.2 I=0: 31.03947
$Al_2L \leftrightarrows Al_2(OH)_2L + 2\ H$	-6.79	0.2		$Al_2L \leftrightarrows Al_2(OH)_2L + 2\ H$ -6.79 0.2 $2\ Al + L \leftrightarrows Al_2L$ 16.7 0.2 $OH + H \leftrightarrows H_2O$ (2*13.74405) 27.48810 0.2 $2\ Al + 2\ OH + L \leftrightarrows Al_2(OH)_2L$ 37.39810 0.2 I=0: 40.93942

Equilibrium	Log (K)	I	T	Conversion or remarks
Ga + HL ⇆ GaHL	7.26	1.0		Ga + HL ⇆ GaHL 7.26 1.0 H + L ⇆ HL 11.67552 1.0 Ga + H + L ⇆ GaHL 18.93552 1.0 I=0: 20.76396
Ga + H_2L ⇆ GaH_2L	1.48	1.0		Ga + H_2L ⇆ GaH_2L 1.48 1.0 2 H + L ⇆ H_2L 18.55720 1.0 Ga + 2 H + L ⇆ GaH_2L 20.03720 1.0 I=0: 21.66248
In + H_2L ⇆ InH_2L	2.43	1.0	20	In + H_2L ⇆ InH_2L 2.43 1.0 2 H + L ⇆ H_2L 18.55720 1.0 In + 2 H + L ⇆ InH_2L 20.98720 1.0 I=0: 22.61248

Solids:

Equilibrium	Log (K)	I	T	Conversion or remarks
Mg + HL ⇆ $MgHL(H_2O)_3$	5.80			Mg + HL ⇆ $MgHL(H_2O)_3$ 5.80 H + L ⇆ HL 12.375 Mg + H + L ⇆ MgHL 18.175
3 Mg + 2 L ⇆ Mg_3L_2	23.28			
Ca + HL ⇆ CaHL	6.90			Ca + HL ⇆ $CaHL(H_2O)_2$ 6.90 H + L ⇆ HL 12.375 Ca + H + L ⇆ CaHL 19.275
3 Ca + 2 L ⇆ Ca_3L_2	28.92			
4 Ca + H + 3 L ⇆ $Ca_4HL_3(H_2O)_3$	47.08			
5 Ca + OH + 3 L ⇆ $Ca_5(OH)L_3(H_2O)$	58.33			
Sr + HL ⇆ SrHL	6.92		20	Sr + HL ⇆ SrHL 6.92 H + L ⇆ HL 12.375 Sr + H + L ⇆ SrHL 19.295
Ba + HL ⇆ BaHL	7.40		20	Ba + HL ⇆ BaHL 7.4 H + L ⇆ HL 12.375 Ba + H + L ⇆ BaHL 19.775
Y + L ⇆ YL	25.02			
La + L ⇆ LaL	25.75			
Ce + L ⇆ CeL	26.3			
Pr + L ⇆ PrL	26.4			
Nd + L ⇆ NdL	26.20			
Sm + L ⇆ SmL	26.19			
Eu + L ⇆ EuL	25.96			
Gd + L ⇆ GdL	25.6			
Tb + L ⇆ TbL	25.39			
Dy + L ⇆ DyL	25.2			
Ho + L ⇆ HoL	25.1			
Er + L ⇆ ErL	25.1			
Tm + L ⇆ TmL	25.0			
Yb + L ⇆ YbL	24.9			
Lu + L ⇆ LuL	24.8			
(UO_2) + HL ⇆ $(UO_2)HL$	11.85			(UO_2) + HL ⇆ $(UO_2)HL$ 11.85 H + L ⇆ HL 12.375 (UO_2) + H + L ⇆ $(UO_2)HL$ 24.225
3 (UO_2) + 2 L ⇆ $(UO_2)_3L_2$	49.4			
3 Fe(II) + 2 L ⇆ $Fe(II)_3L_2(H_2O)_8$	37.76			
Fe(III) + L ⇆ $Fe(III)L(H_2O)_2$	26.4			
3 Ag + L ⇆ Ag_3L	17.59			
3 Zn + 2 L ⇆ $Zn_3L_2(H_2O)_4$	35.42			
5 Cd + 4 HL ⇆ 2 H + $Cd_5H_2L_4(H_2O)_4$	25.4	3.0		5 Cd + 4 HL ⇆ 2 H + $Cd_5H_2L_4(H_2O)_4$ 25.4 3.0 4 H + 4 L ⇆ 4 HL (4*13.18569) 52.74276 3.0 5 Cd + 2 H + 4 L ⇆ $Cd_5H_2L_4(H_2O)_4$ 78.14276 3.0 I=0: 70.30613

Equilibrium	Log (K)	I	T	Conversion or remarks
Hg(II) + HL ⇆ Hg(II)HL	13.1	3.0		Hg(II) + HL ⇆ Hg(II)HL 13.1 3.0 H + L ⇆ HL 13.18569 3.0 Hg(II) + H + L ⇆ Hg(II)HL 26.28569 3.0 I=0: 24.39409
3 Hg(II) + 2 HL ⇆ 2 H + $Hg(II)_3L_2$	24.6	3.0		3 Hg(II) + 2 HL ⇆ 2 H + $Hg(II)_3L_2$ 24.6 3.0 2 H + 2 L ⇆ 2 HL (2*13.18569) 26.37138 3.0 3 Hg(II) + 2 L ⇆ $Hg(II)_3L_2$ 50.97138 3.0 I=0: 46.91795
3 Hg(II) + HL ⇆ 4 H + $Hg(II)_3(OH)_3L$	9.4	3.0		3 Hg(II) + HL ⇆ 4 H + $Hg(II)_3(OH)_3L$ 9.4 3.0 H + L ⇆ HL 13.18569 3.0 3 H + 3 OH ⇆ 3 H_2O (3*14.26723) 42.80169 3.0 3 Hg(II) + L + 3 OH ⇆ $Hg(II)_3(OH)_3L$ 65.38738 3.0 I=0: 62.14464
Pb(II) + HL ⇆ Pb(II)HL	11.43			Pb(II) + HL ⇆ Pb(II)HL 11.43 H + L ⇆ HL 12.375 Pb(II) + H + L ⇆ Pb(II)HL 23.805
3 Pb(II) + 2 L ⇆ $Pb(II)_3L_2$	43.53		37	
Al + L ⇆ AlL	18.34	0.15	37	I=0: 20.48087
Ga + L ⇆ GaL	21.0	1.0		I=0: 22.82844
In + L ⇆ InL	21.63	1.0		I=0: 23.45844

Sulfide (S^{2-})

Equilibrium	Log (K)	I	T	Conversion or remarks
$HL + H \leftrightarrows H_2L$	7.02			From Morel (see page 93): $H + L \leftrightarrows HL$ 13.9 $HL + H \leftrightarrows H_2L$ 7.02 $2\ H + L \leftrightarrows H_2L$ 20.92
$Na + HL \leftrightarrows NaHL$	-0.8			$Na + HL \leftrightarrows NaHL$ -0.8 $H + L \leftrightarrows HL$ 13.9 $Na + H + L \leftrightarrows NaHL$ 13.1
$Ag + HL \leftrightarrows AgHL$	13.6	0.1	20	$Ag + HL \leftrightarrows AgHL$ 13.6 0.1 $H + L \leftrightarrows HL$ 13.47285 0.1 $Ag + H + L \leftrightarrows AgHL$ 27.07285 0.1 I=0: 27.71358
$Ag + 2\ HL \leftrightarrows AgH_2L_2$	17.7	0.1	20	$Ag + 2\ HL \leftrightarrows AgH_2L_2$ 17.7 0.1 $2\ H + 2\ L \leftrightarrows 2\ HL$ (2*13.47285) 26.94570 0.1 $Ag + 2\ H + 2\ L \leftrightarrows AgH_2L_2$ 44.64570 0.1 I=0: 45.71358
$AgHL \leftrightarrows AgL + H$	-8.3	0.1	20	$AgHL \leftrightarrows AgL + H$ -8.3 0.1 $Ag + H + L \leftrightarrows AgHL$ 27.07285 0.1 $Ag + L \leftrightarrows AgL$ 18.77285 0.1 I=0: 19.2
$AgHL_2 + H \leftrightarrows AgH_2L_2$	9.5	0.1	20	$AgHL_2 + H \leftrightarrows AgH_2L_2$ 9.5 0.1 $AgH_2L_2 \leftrightarrows Ag + 2\ H + 2\ L$ -44.64570 0.1 $AgHL_2 \leftrightarrows Ag + H + 2\ L$ -35.14570 0.1 invert: $Ag + H + 2\ L \leftrightarrows AgHL_2$ 35.14570 0.1 I=0: 35.78643
$Ag_2H_2L_3 + H_2L \leftrightarrows Ag_2H_4L_4$	-3.2	1.0	20	(can not be related to components; not entered)
$Zn + HL \leftrightarrows ZnL + H$	5.0	1.0		$Zn + HL \leftrightarrows ZnL + H$ 5.0 1.0 $H + L \leftrightarrows HL$ 13.49368 1.0 $Zn + L \leftrightarrows ZnL$ 18.49368 1.0 I=0: 19.30632
$Cd + HL \leftrightarrows CdHL$	7.6	1.0		$Cd + HL \leftrightarrows CdHL$ 7.6 1.0 $H + L \leftrightarrows HL$ 13.49368 1.0 $Cd + H + L \leftrightarrows CdHL$ 21.09368 1.0 I=0: 21.90632
$Cd + 2\ HL \leftrightarrows CdH_2L_2$	14.6	1.0		analogous: 14.6 + (2*13.49368) = 41.58736 (1.0) I=0: 43.00948
$Cd + 3\ HL \leftrightarrows CdH_3L_3$	16.5	1.0		analogous: 16.5 + (3*13.49368) = 56.98104 (1.0) I=0: 58.80948
$Cd + 4\ HL \leftrightarrows CdH_4L_4$	18.9	1.0		analogous: 18.9 + (4*13.49368) = 72.87472 (1.0) I=0: 74.90632
$Hg(II) + 2\ HL \leftrightarrows Hg(II)H_2L_2$	37.71	1.0	20	analogous: 37.71 + (2*13.49368) = 64.69736 (1.0) I=0: 66.11948
$Hg(II)H_2L_2 \leftrightarrows Hg(II)HL_2 + H$	-6.19	1.0	20	$Hg(II)H_2L_2 \leftrightarrows Hg(II)HL_2 + H$ -6.19 1.0 $Hg(II) + 2\ H + 2\ L \leftrightarrows Hg(II)H_2L_2$ 64.69736 1.0 $Hg(II) + H + 2\ L \leftrightarrows Hg(II)HL_2$ 58.50736 1.0 I=0: 59.72632
$Hg(II)HL_2 \leftrightarrows Hg(II)L_2 + H$	-8.30	1.0	20	$Hg(II)HL_2 \leftrightarrows Hg(II)L_2 + H$ -8.30 1.0 $Hg(II) + H + 2\ L \leftrightarrows Hg(II)HL_2$ 58.50736 1.0 $Hg(II) + 2\ L \leftrightarrows Hg(II)L_2$ 50.20736 1.0 I=0: 51.02
$In + HL \leftrightarrows InHL$	11	1.0	20	$In + HL \leftrightarrows InHL$ 11 1.0 $H + L \leftrightarrows HL$ 13.49368 1.0

Equilibrium	Log (K)	I	T	Conversion or remarks
				In + H + L ⇆ InHL 24.49368 1.0 I=0: 25.50948
In + 2 HL ⇆ InH_2L_2	17	1.0	20	analogous: 17 + (2*13.49368) = 43.98736 (1.0) I=0: 45.81580

Solids:

Equilibrium	Log (K)	I	T	Conversion or remarks
Be + H_2L ⇆ 2 H + BeL	-26.4			Be + H_2L ⇆ 2 H + BeL -26.4 2 H + L ⇆ H_2L 20.92 Be + L ⇆ BeL -5.48
Mg + H_2L ⇆ 2 H + MgL	-24.7			Analogous: -24.7 + 20.92 = -3.78
Ca + H_2L ⇆ 2 H + CaL	-18.2			Analogous: -18.2 + 20.92 = 2.72
Sr + H_2L ⇆ 2 H + SrL	-20.9			Analogous: -20.9 + 20.92 = 0.02
Ba + H_2L ⇆ 2 H + BaL	-23.2			Analogous: -23.2 + 20.92 = -2.28
Mn(II) + H_2L ⇆ 2 H + Mn(II)L	-7.0			Analogous: -7 + 20.92 = 13.92
Fe(II) + H_2L ⇆ 2 H + Fe(II)L	-3.0			Analogous: -3.0 + 20.92 = 17.92
Co(II) + H_2L ⇆ 2 H + Co(II)L	4.7			Analogous: 4.7 + 20.92 = 25.62
Ni + H_2L ⇆ 2 H + NiL	5.7			Analogous: 5.7 + 20.92 = 26.62
Cu(II) + H_2L ⇆ 2 H + Cu(II)L	15.2			Analogous: 15.2 + 20.92 = 36.12
2 Cu(I) + H_2L ⇆ 2 H + $Cu(I)_2L$	27.9			Analogous: 27.9 + 20.92 = 48.82
2 Ag + H_2L ⇆ 2 H + Ag_2L	29.2			Analogous: 29.2 + 20.92 = 50.12
Zn + H_2L ⇆ 2 H + ZnL	3.8			Analogous: 3.8 + 20.92 = 24.72
Cd + H_2L ⇆ 2 H + CdL	7.0			Analogous: 7.0 + 20.92 = 27.92
Hg(II) + H_2L ⇆ 2 H + Hg(II)L	32.1			Analogous: 32.1 + 20.92 = 53.02
Sn(II) + H_2L ⇆ 2 H + Sn(II)L	5.0			Analogous: 5.0 + 20.92 = 25.92
Pb(II) + H_2L ⇆ 2 H + Pb(II)L	7.9			Analogous: 7.9 + 20.92 = 28.82
2 In + 3 H_2L ⇆ In_2L_3 + 6 H	15	1.0	20	2 In + 3 H_2L ⇆ 6 H + In_2L_3 15 1.0 6 H + 3 L ⇆ 3 H_2L 1.0 (3*20.31052) 60.93156 2 In + 3 L ⇆ In_2L_3 75.93156 1.0 I=0: 78.97896
2 $As(III)_3L_6$ + 6 H ⇆ 3 H_2L + $As(III)_6L_9$	35	1.0	22	(can not be related to components; not entered)
2 Bi + 3 H_2L ⇆ Bi_2L_3 + 6 H	20			2 Bi + 3 H_2L ⇆ 6 H + Bi_2L_3 20 6 H + 3 L ⇆ 3 H_2L (3*20.92) 62.76 2 Bi + 3 L ⇆ Bi_2L_3 82.76

Gases:

Equilibrium	Log (K)	I	T	Conversion or remarks
H_2L (aq) ⇆ H_2L (g)	0.99			H_2L (aq) ⇆ H_2L (g) 0.99 2 H + L ⇆ H_2L (aq) 20.92 2 H + L ⇆ H_2L (g) 21.91

Sulfite (SO_3^{2-})

Equilibrium	Log (K)	I	T	Conversion or remarks
H + L ⇆ HL	7.19			
HL + H ⇆ H_2L	1.85			HL + H ⇆ H_2L 1.85 H + L ⇆ HL 7.19 2 H + L ⇆ H_2L 9.04
2 HL ⇆ S_2O_5	1.49			2 HL ⇆ S_2O_5 1.49 2 H + 2 L ⇆ 2 HL (2*7.19) 14.38 2 H + 2 L ⇆ S_2O_5 15.87
Na + L ⇆ NaL	0.42	1.0		I=0: 0.82632
K + L ⇆ KL	0.22	1.0		I=0: 0.62632
Mg + L ⇆ MgL	2.36			
Ca + L ⇆ CaL	2.62			
Ce + L ⇆ CeL	8.04			
$(U(VI)O_2)$ + L ⇆ $(U(VI)O_2)L$	6.7			
Mn(II) + L ⇆ Mn(II)L	3.00			
Co(II) + L ⇆ Co(II)L	3.08			
Co(II) + 2 L ⇆ $Co(II)L_2$	4.34	2.0		I=0: 4.28225
Co(II) + 3 L ⇆ $Co(II)L_3$	6.48	2.0		I=0: 6.48000
Ni + L ⇆ NiL	2.88			
Cu(II) + L ⇆ Cu(II)L	4.26	0.5	20	I=0: 5.33355
Fe(III) + L ⇆ Fe(III)L	6.6	0.5	20	I=0: 8.21033
Fe(III)(OH) + L ⇆ Fe(III)(OH)L	7.3	0.5	20	Fe(III)(OH) + L ⇆ Fe(III)(OH)L 7.3 0.5 Fe(III) + (OH) ⇆ Fe(III)(OH) 11.00484 0.5 Fe(III) + (OH) + L ⇆ Fe(III)(OH)L 18.30484 0.5 I=0: 20.18356
Cu(I) + L ⇆ Cu(I)L	7.85	1.0		I=0: 8.25632
Cu(I) + 2 L ⇆ $Cu(I)L_2$	8.7	1.0		I=0: 8.7
Cu(I) + 3 L ⇆ $Cu(I)L_3$	9.4	1.0		I=0: 8.18104
Ag + L ⇆ AgL	5.60			
Ag + 2 L ⇆ AgL_2	8.68			
Ag + 3 L ⇆ AgL_3	9.00			
Pd + 4 L ⇆ PdL_4	29.1	0.7		I=0: 27.10470
Cd + L ⇆ CdL	3.29			
Cd + 2 L ⇆ CdL_2	4.2	1.0		I=0: 5.01264
Hg(II) + 2 L ⇆ $Hg(II)L_2$	22.33	0.5		I=0: 23.40355
Hg(II) + 3 L ⇆ $Hg(II)L_3$	24.1	0.5		I=0: 24.1

Solids:

Equilibrium	Log (K)	I	T	Conversion or remarks
Ca + L ⇆ $CaL(H_2O)_{0.5}$	6.64			
2 Ag + L ⇆ Ag_2L	13.82			

Gases:

Equilibrium	Log (K)	I	T	Conversion or remarks
H_2L ⇆ SO_2 (g)	-0.09			H_2L (aq) ⇆ SO_2 (g) -0.09 2 H + L ⇆ H_2L (aq) 9.05 2 H + L ⇆ SO_2 (g) 8.96

Sulfate (SO_4^{2-})

Equilibrium	Log (K)	I	T	Conversion or remarks
H + L ⇆ HL	1.99			
NH_4 + L ⇆ NH_4L	1.03			NH_4 + L ⇆ NH_4L 1.03 NH_3 + H ⇆ NH_4 9.244 H + NH_3 + L ⇆ NH_4L 10.274
Li + L ⇆ LiL	0.64			
Na + L ⇆ NaL	0.74			
K + L ⇆ KL	0.85			
Rb + L ⇆ RbL	0.94		37	
Cs + L ⇆ CsL	1.04		37	
Be + L ⇆ BeL	2.19			
Be + 2 L ⇆ BeL_2	1.78	1.0		I=0: 2.59264
Be + 3 L ⇆ BeL_3	2.08	1.0		I=0: 2.08
Mg + L ⇆ MgL	2.26			
Ca + L ⇆ CaL	2.36			
Sr + L ⇆ SrL	2.30			
Ba + L ⇆ BaL	2.13			
Sc + L ⇆ ScL	4.18			
Sc + 2 L ⇆ ScL_2	5.6			
Y + L ⇆ YL	3.48			
Y + 2 L ⇆ YL_2	5.2			
La + L ⇆ LaL	3.64			
La + 2 L ⇆ LaL_2	5.3			
Ce + L ⇆ CeL	3.64			
Ce + 2 L ⇆ CeL_2	5.1			
Pr + L ⇆ PrL	3.64			
Pr + 2 L ⇆ PrL_2	4.9			
Nd + L ⇆ NdL	3.66			
Nd + 2 L ⇆ NdL_2	5.1			
Pm + L ⇆ PmL	1.34	2.0		I=0: 1.25337
Pm + 2 L ⇆ PmL_2	1.9	2.0		I=0: 1.78449
Sm + L ⇆ SmL	3.67			
Sm + 2 L ⇆ SmL_2	5.1			
Eu + L ⇆ EuL	3.67			
Eu + 2 L ⇆ EuL_2	5.4			
Gd + L ⇆ GdL	3.66			
Gd + 2 L ⇆ GdL_2	5.2			
Tb + L ⇆ TbL	3.64			
Tb + 2 L ⇆ TbL_2	5.1			
Dy + L ⇆ DyL	3.61			
Dy + 2 L ⇆ DyL_2	4.8			
Ho + L ⇆ HoL	3.59			
Ho + 2 L ⇆ HoL_2	4.9			
Er + L ⇆ ErL	3.59			
Er + 2 L ⇆ ErL_2	5.1			
Tm + L ⇆ TmL	3.59			
Tm + 2 L ⇆ TmL_2	5.1			
Yb + L ⇆ YbL	3.55			
Yb + 2 L ⇆ YbL_2	5.2			
Lu + L ⇆ LuL	3.52			
Lu + 2 L ⇆ LuL_2	5.2			
$(U(VI)O_2)$ + L ⇆ $(U(VI)O_2)L$	3.18			
$(U(VI)O_2)$ + 2 L ⇆ $(U(VI)O_2)L_2$	4.3			

Equilibrium	Log (K)	I	T	Conversion or remarks
2 $(U(VI)O_2)$ + 2 L ⇆ $(U(VI)O_2)_2(OH)_2L_2$ + 2 H	-2.73	3.5		2 $(U(VI)O_2)$ + 2 L ⇆ $(U(VI)O_2)_2(OH)_2L_2$ + 2 H -2.73 3.5 H + OH ⇆ H_2O (2*14.40163) 28.80326 3.5 2 $(U(VI)O_2)$ + 2 L + 2 OH ⇆ $(U(VI)O_2)_2(OH)_2L_2$ 26.07326 3.5 I=0: 23.24088
3 $(U(VI)O_2)$ + 3 L ⇆ $(U(VI)O_2)_3(OH)_4L_3$ + 4 H	-8.2	3.5		3 $(U(VI)O_2)$ + 3 L ⇆ $(U(VI)O_2)_3(OH)_4L_3$ + 4 H -8.2 3.5 H + OH ⇆ H_2O (4*14.40163) 57.60652 3.5 3 $(U(VI)O_2)$ + 3 L + 4 OH ⇆ $(U(VI)O_2)_3(OH)_4L_3$ 49.40652 3.5 I=0: 46.97877
3 $(U(VI)O_2)$ + 4 L ⇆ $(U(VI)O_2)_3(OH)_4L_4$ + 4 H	-7.8	3.5		3 $(U(VI)O_2)$ + 4 L ⇆ $(U(VI)O_2)_3(OH)_4L_4$ + 4 H -7.8 3.5 H + OH ⇆ H_2O (4*14.40163) 57.60652 3.5 3 $(U(VI)O_2)$ + 4 L + 4 OH ⇆ $(U(VI)O_2)_3(OH)_4L_4$ 49.80652 3.5 I=0: 50.61577
5 $(U(VI)O_2)$ + 6 L ⇆ $(U(VI)O_2)_5(OH)_8L_6$ + 8 H	-18.5	3.5		5 $(U(VI)O_2)$ + 6 L ⇆ $(U(VI)O_2)_5(OH)_8L_6$ + 8 H -18.5 3.5 H + OH ⇆ H_2O (8*14.40163) 115.21304 3.5 5 $(U(VI)O_2)$ + 6 L + 8 OH ⇆ $(U(VI)O_2)_5(OH)_8L_6$ 96.71304 3.5 I=0: 106.42404
Mn(II) + L ⇆ Mn(II)L	2.25			
Fe(II) + L ⇆ Fe(II)L	2.39			
Co(II) + L ⇆ Co(II)L	2.30			
Ni + L ⇆ NiL	2.30			
Cu(II) + L ⇆ Cu(II)L	2.36			
Cr(III) + L ⇆ Cr(III)L	2.60	1.0	50	I=0: 3.81896
Cr(III)L ⇆ Cr(III)L(OH) + H	-4.65	0.1		Cr(III)L ⇆ Cr(III)L(OH) + H -4.65 0.1 Cr(III) + L ⇆ Cr(III)L 2.53751 0.1 OH + H ⇆ H_2O 13.78342 0.1 Cr(III) + OH + L ⇆ Cr(III)OHL 11.67093 0.1 I=0: 13.16596
Fe(III) + L ⇆ Fe(III)L	4.05			
Zr + L ⇆ ZrL	3.67	2.0		I=0: 3.55449
Zr + 2 L ⇆ ZrL_2	6.40	2.0		I=0: 6.22674
Zr + 3 L ⇆ ZrL_3	7.4	2.0		I=0: 7.22674
Hf + L ⇆ HfL	3.04	2.0		I=0: 2.92449
Hf + 2 L ⇆ HfL_2	5.44	2.0		I=0: 5.26674
Ag + L ⇆ AgL	1.3			
Pd + L ⇆ PdL	1.28	1.0		I=0: 2.09264
Zn + L ⇆ ZnL	2.34			
Cd + L ⇆ CdL	2.37			
Hg(II) + L ⇆ Hg(II)L	1.34	0.5		I=0: 2.41355
Hg(II) + 2 L ⇆ $Hg(II)L_2$	2.4	0.5		I=0: 3.47355
Pb(II) + L ⇆ Pb(II)L	2.69			
Al + L ⇆ AlL	3.89			
In + L ⇆ InL	1.80	1.0	20	I=0: 3.01896
In + 2 L ⇆ InL_2	2.55	1.0	20	I=0: 4.17528
In + 3 L ⇆ InL_3	3.0	1.0	20	I=0: 4.21896
Si				Complex with $Si(IV)(OH)_4$ not included
Bi + L ⇆ BiL	1.98	3.0		I=0: 0.35863
Bi + 2 L ⇆ BiL_2	3.41	3.0		I=0: 1.24817
Bi + 3 L ⇆ BiL_3	4.08	3.0		I=0: 2.45863
Bi + 4 L ⇆ BiL_4	4.34	3.0		I=0: 4.34
Bi + 5 L ⇆ BiL_5	4.60	3.0		I=0: 7.30229

Solids:

Equilibrium	Log (K)	I	T	Conversion or remarks
Ca + L ⇆ $CaL(H_2O)_2$	4.61			
Sr + L ⇆ SrL	6.62			
Ba + L ⇆ BaL	9.98			
Cu(II) + 1.5 (OH) + 0.25 L ⇆ $Cu(II)(OH)_{1.5}L_{0.25}$	17.19			Cu(II) + 1.5 (OH) + 0.25 L ⇆ $Cu(II)(OH)_{1.5}L_{0.25}$ Multiply by 4: 4 Cu(II) + 6 (OH) + L ⇆ $Cu(II)_4(OH)_6L$ log K=4*17.19=68.76
2 Ag + L ⇆ Ag_2L	4.82			
Pb(II) + L ⇆ Pb(II)L	7.79			

Chloride (Cl^-)

Equilibrium	Log (K)	I	T	Conversion or remarks
Li + L ⇆ LiL	-0.16			
Na + L ⇆ NaL	-0.3			
K + L ⇆ KL	-0.3			
Rb + L ⇆ RbL	-0.3			
Cs + L ⇆ CsL	-0.1			
Be + L ⇆ BeL	-0.85	4.0		I=0: -1.93352
Mg + L ⇆ MgL	0.6			
Ca + L ⇆ CaL	0.4			
Sr + L ⇆ SrL	-0.22	1.0		I=0: 0.18632
Ba + L ⇆ BaL	-0.44	1.0		I=0: -0.03368
Sc + L ⇆ ScL	-0.12	4.0		I=0: -1.74528
Y + L ⇆ YL	-0.03	1.0		I=0: 0.57948
La + L ⇆ LaL	-0.04 -0.12	1.0		-0.04 is for $HClO_4$ as background electrolyte; -0.12 for $NaClO_4$. Used: average of -0.08. I=0: 0.52948
Ce + L ⇆ CeL	-0.04	1.0		I=0: 0.56948
Pr + L ⇆ PrL	-0.04	1.0		I=0: 0.56948
Sm + L ⇆ SmL	-0.39	3.0	20	I=0: -1.20069
Eu + L ⇆ EuL	-0.04	1.0		I=0: 0.56948
Gd + L ⇆ GdL	-0.25	3.0	20	I=0: -1.06069
Tb + L ⇆ TbL	-0.35	3.0	20	I=0: -1.16069
Tm + L ⇆ TmL	-0.1	1.0	20	I=0: 0.50948
Yb + L ⇆ YbL	-0.2	1.0	20	I=0: 0.40948
Lu + L ⇆ LuL	-0.35	4.0		I=0: -1.97528
$U(VI)O_2$ + L ⇆ $U(VI)O_2L$	0.30			
Mn(II) + L ⇆ Mn(II)L	0.0			
Fe(II) + L ⇆ Fe(II)L	-0.3			
Co(II) + L ⇆ Co(II)L	-0.35			
Ni + L ⇆ NiL	-0.43			
Cu(II) + L ⇆ Cu(II)L	0.3			
Cr(III) + L ⇆ Cr(III)L	-1.0	1.0		I=0: -0.39052
Fe(III) + L ⇆ Fe(III)L	1.4			
Co(III) + L ⇆ Co(III)L	1.5	0.5		I=0: 2.30516
Zr + L ⇆ ZrL	0.2	2.0		I=0: 0.14225
Zr + 2 L ⇆ ZrL_2	1.32	6.0	20	These data are valid for such high ionic strengths and charges that extrapolation becomes too tricky; NOT entered; instead data taken from Turner, Whitfield & Dickson; see page 95.
Zr + 3 L ⇆ ZrL_3	1.51	6.0	20	
Hf + L ⇆ HfL	0.34	3.0	20	
Cu(I) + L ⇆ Cu(I)L	3.1			
Cu(I) + 2 L ⇆ $Cu(I)L_2$	5.42			
$Cu(I)L_2$ + L ⇆ $Cu(I)L_3$	-0.67			$Cu(I)L_2$ + L ⇆ $Cu(I)L_3$ -0.67 Cu(I) + 2 L ⇆ $Cu(I)L_2$ 5.42 Cu(I) + 3 L ⇆ $Cu(I)L_3$ 4.75
2 Cu(I) + 4 L ⇆ $Cu(I)_2L_4$	13.0	5.0		I=0: 12.17820
Ag + L ⇆ AgL	3.31			
Ag + 2 L ⇆ AgL_2	5.25			
Ag + 3 L ⇆ AgL_3	5.2			
Ag + 4 L ⇆ AgL_4	5.32	5.0		I=0: 6.96360
Pd + L ⇆ PdL	6.1			
Pd + 2 L ⇆ PdL_2	10.7			
Pd + 3 L ⇆ PdL_3	13.1			
Pd + 4 L ⇆ PdL_4	15.4			
PdL_2 (cis) ⇆ PdL_2 (trans)	-0.32	1.0		not clear how this one relates to the other one three lines up; NOT entered

Equilibrium	Log (K)	I	T	Conversion or remarks
Zn + L ⇆ ZnL	0.46			
Cd + L ⇆ CdL	1.98			
Cd + 2 L ⇆ CdL_2	2.60			
Cd + 3 L ⇆ CdL_3	1.96	2.0		1.96 using $NaClO_4$ as background electrolyte; 2.13 using $LiClO_4$; used: average of 2.045 I=0: 2.00169
Hg(II) + L ⇆ Hg(II)L	7.30			
Hg(II) + 2 L ⇆ $Hg(II)L_2$	14.00			
Hg(II) + 3 L ⇆ $Hg(II)L_3$	15.0			
Hg(II) + 4 L ⇆ $Hg(II)L_4$	15.6			
Hg(II)L ⇆ Hg(II)OHL+ H	-3.05	1		Hg(II)L ⇆ Hg(II)OHL+ H -3.05 1 OH + H ⇆ H_2O 13.79384 1 Hg(II) + L ⇆ Hg(II)L 6.89368 1 Hg(II) + L + OH ⇆ Hg(II)OHL 17.63752 1 I=0: 18.247
Sn(II) + L ⇆ Sn(II)L	1.64			
Sn(II) + 2 L ⇆ $Sn(II)L_2$	2.40			
Sn(II) + 3 L ⇆ $Sn(II)L_3$	1.3	2.0		I=0: 1.25669
Pb(II) + L ⇆ Pb(II)L	1.56			
Pb(II) + 2 L ⇆ $Pb(II)L_2$	1.9			
Pb(II) + 3 L ⇆ $Pb(II)L_3$	1.8			
Al + L ⇆ AlL	-1.0	1.0		I=0: -0.39052
Ga + L ⇆ GaL	0.00	1.0		I=0: 0.60948
In + L ⇆ InL	2.33	1.0		I=0: 2.93948
In + 2 L ⇆ InL_2	3.4	1.0		I=0: 4.41580
In + 3 L ⇆ InL_3	3.8	1.0		I=0: 5.01896
InL ⇆ InOHL + H	-3.9	3.0		InL ⇆ InOHL + H -3.9 3.0 In + L ⇆ InL 3.75017 3.0 H + OH ⇆ H_2O 14.26723 3.0 In + OH + L ⇆ InOHL 14.11740 3.0 I=0: 12.76626
InOHL + In ⇆ In_2OHL	1.6	3.0		InOHL + In ⇆ In_2OHL 1.6 3.0 In + OH + L ⇆ InOHL 14.11740 3.0 2 In + OH + L ⇆ In_2OHL 15.71740 3.0 I=0: 15.17694
Bi + L ⇆ BiL	3.6			
Bi + 2 L ⇆ BiL_2	5.5			
Bi + 3 L ⇆ BiL_3	7.1			
Bi + 4 L ⇆ BiL_4	8.1			
Bi + 5 L ⇆ BiL_5	6.7	2.0		I=0: 6.62781

Solids:

Equilibrium	Log (K)	I	T	Conversion or remarks
Li + L ⇆ LiL	6.89			
Na + L ⇆ NaL	-1.55			
K + L ⇆ KL	-0.90			
$Cu(II)(OH)_{1.5}L_{0.5}$ ⇆ $Cu(II)(OH)_{1.5}L_{0.5}$ (s)	17.3			(can not be related to components; not entered)
Cu(I) + L ⇆ Cu(I)L	6.73			
Ag + L ⇆ AgL	9.750			
$Zn(OH)_{1.5}L_{0.5}$ ⇆ $Zn(OH)_{1.5}L_{0.5}$ (s)	13.4			(can not be related to components; not entered)
Pb(II) + 2 L ⇆ $Pb(II)L_2$	4.78			
Bi + L ⇆ BiOL + 2 H	7.80			Bi + L ⇆ BiOL + 2 H 7.80 H + OH ⇆ H_2O (2*13.997) 27.996 Bi + 2 OH + L ⇆ BiOL (+H_2O) 35.796

Vanadate (VO_4^{3-})

Note: many polynuclear complexes have NOT been entered because they are not likely to occur in significant concentrations at ambient V-levels.

Equilibrium	Log (K)	I	T	Conversion or remarks
$H + L \leftrightarrows HL$	14.3			
$HL + H \leftrightarrows H_2L$	8.55			$HL + H \leftrightarrows H_2L$ 8.55 $H + L \leftrightarrows HL$ 14.3 $2\ H + L \leftrightarrows H_2L$ 22.85
$H_2L + 2\ H \leftrightarrows VO_2$	7.3			$H_2L + 2\ H \leftrightarrows VO_2$ 7.3 $2\ H + L \leftrightarrows H_2L$ 22.85 $4\ H + L \leftrightarrows VO_2$ 30.15
(many polynuclear complexes for H Li Na K Rb Cs) special case: $4\ H_2L \leftrightarrows V_4O_{12}$ calculated for solids below but not entered as such	8.64			$4\ H + 4\ HL \leftrightarrows V_4O_{12}$ 42.8 $4\ H + 4\ L \leftrightarrows 4\ HL$ $(4*14.3)$ 57.2 $8\ H + 4\ L \leftrightarrows V_4O_{12}$ 100.0

Solids:

Equilibrium	Log (K)	I	T	Conversion or remarks
$VO_2 \leftrightarrows (V_2O_5)_{0.5} + H$	0.68			$VO_2 \leftrightarrows (V_2O_5)_{0.5} + H$ 0.68 $4\ H + L \leftrightarrows VO_2$ 30.15 $3\ H + L \leftrightarrows (V_2O_5)_{0.5}$ 30.83 multiply by 2: $6\ H + 2\ L \leftrightarrows (V_2O_5)$ 61.66
$NH_4 + H_2L \leftrightarrows (NH_4)VO_3$	3.5			$NH_4 + H_2L \leftrightarrows (NH_4)VO_3$ 3.5 $NH_3 + H \leftrightarrows NH_4$ 9.244 $2\ H + L \leftrightarrows H_2L$ 22.85 $NH3 + 3\ H + L \leftrightarrows (NH_4)VO_3$ 35.594
$Ca + 0.5\ V_4O_{12} \leftrightarrows Ca(VO_3)_2(H_2O)_4$	4.10	1.0	20	$Ca + 0.5\ V_4O_{12} \leftrightarrows Ca(VO_3)_2(H_2O)_4$ 4.10 1.0 multiply by 2: $2\ Ca + V_4O_{12} \leftrightarrows 2\ Ca(VO_3)_2(H_2O)_4$ 8.20 1.0 $8\ H + 4\ L \leftrightarrows V_4O_{12}$ 97.15576 1.0 $2\ Ca + 8\ H + 4\ L \leftrightarrows 2\ Ca(VO_3)_2(H_2O)_4$ 105.35576 1.0 divide by 2: $Ca + 4\ H + 2\ L \leftrightarrows Ca(VO_3)_2(H_2O)_4$ 52.67788 1.0 I=0: 55.31896
$3\ Ca + 2\ VO_4 \leftrightarrows Ca_3(VO_4)_2(H_2O)_4$	17.48	1.0	20	I=0: 20.52740
$Sr + 0.5\ V_4O_{12} \leftrightarrows Sr(VO_3)_2(H_2O)_4$	9.00	1.0	20	like Ca: $2\ Sr + V_4O_{12} \leftrightarrows 2\ Sr(VO_3)_2(H_2O)_4$ 18.00 1.0 $8\ H + 4\ L \leftrightarrows V_4O_{12}$ 97.15576 1.0 $2\ Sr + 8\ H + 4\ L \leftrightarrows 2\ Sr(VO_3)_2(H_2O)_4$ 115.15576 1.0 divide by 2: $Sr + 4\ H + 2\ L \leftrightarrows Sr(VO_3)_2(H_2O)_4$ 57.57788 1.0 I=0: 60.21896
$3\ Sr + 2\ VO_4 \leftrightarrows Sr_3(VO_4)_2(H_2O)_4$	20.60	1.0	20	I=0: 23.64740
$Ba + 0.5\ V_4O_{12} \leftrightarrows Ba(VO_3)_2(H_2O)_4$	11.92	1.0	20	like Ca: $2\ Ba + V_4O_{12} \leftrightarrows 2\ Ba(VO_3)_2(H_2O)_4$ 23.84 1.0 $8\ H + 4\ L \leftrightarrows V_4O_{12}$ 97.19576 1.0 $2\ Ba + 8\ H + 4\ L \leftrightarrows 2\ Ba(VO_3)_2(H_2O)_4$ 120.99576 1.0 divide by 2: $Ba + 4\ H + 2\ L \leftrightarrows Ba(VO_3)_2(H_2O)_4$ 60.49788 1.0 I=0: 63.13896

Equilibrium	Log (K)	I	T	Conversion or remarks
3 Ba + 2 VO_4 ⇆ $Ba_3(VO_4)_2(H_2O)_4$	24.40	1.0	20	I=0: 27.44740
(several polynuclear solids for Ca Sr Ba)				

Chromate (CrO_4^{2-})

Equilibrium	Log (K)	I	T	Conversion or remarks
$H + L \leftrightarrows HL$	6.51			
$HL + H \leftrightarrows H_2L$	-0.7	1.0		$HL + H \leftrightarrows H_2L$ -0.7 1.0 $H + L \leftrightarrows HL$ 6.10368 1.0 $2\ H + L \leftrightarrows H_2L$ 5.40368 1.0 I=0: 6.01316
$2\ HL \leftrightarrows Cr_2O_7$	1.52			$2\ HL \leftrightarrows Cr_2O_7$ 1.52 $2\ H + 2\ L \leftrightarrows 2\ HL$ (2*6.51) 13.02 $2\ H + 2\ L \leftrightarrows Cr_2O_7$ 14.54
$K + L \leftrightarrows KL$	0.57		18	
$K + Cr_2O_7 \leftrightarrows KCr_2O_7$	0.76			$K + Cr_2O_7 \leftrightarrows KCr_2O_7$ 0.76 $2\ H + 2\ L \leftrightarrows Cr_2O_7$ 14.56 $K + 2\ H + 2\ L \leftrightarrows KCr_2O_7$ 15.32
$NH_4 + Cr_2O_7 \leftrightarrows NH_4Cr_2O_7$	0.88			$NH_4 + Cr_2O_7 \leftrightarrows NH_4Cr_2O_7$ 0.88 $NH_3 + H \leftrightarrows NH_4$ 9.244 $2\ H + 2\ L \leftrightarrows Cr_2O_7$ 14.56 $NH_3 + 3\ H + 2\ L \leftrightarrows NH_4Cr_2O_7$ 24.684
$Ni + L \leftrightarrows NiL$	2.40			
$Cu(II) + L \leftrightarrows Cu(II)L$	3.3			
$Fe(III) + L \leftrightarrows Fe(III)L$	7.8			

Solids:

Equilibrium	Log (K)	I	T	Conversion or remarks
$2\ Na + Cr_2O_7 \leftrightarrows Na_2Cr_2O_7(H_2O)_2$	-2.42			$2\ Na + Cr_2O_7 \leftrightarrows Na_2Cr_2O_7(H_2O)_2$ -2.42 $2\ H + 2\ L \leftrightarrows Cr_2O_7$ 14.54 $2\ Na + 2\ H + 2\ L \leftrightarrows Na_2Cr_2O_7(H_2O)_2$ 12.12
$Ba + L \leftrightarrows BaL$	9.67			
$Cu(II) + L \leftrightarrows Cu(II)L$	5.44			
$3\ Fe(III) + L \leftrightarrows 6\ H + Fe(III)_3(OH)_6L$	18.4			Charge of solid is not zero... Not entered...
$2\ Ag + L \leftrightarrows Ag_2L$	11.59			
$Pb(II) + L \leftrightarrows Pb(II)L$	12.60			

Permanganate (MnO_4^-)

Solids:

Equilibrium	Log (K)	I	T	Conversion or remarks
Ag + L ⇆ AgL	9.88			

Arsenite ($H_2AsO_3^-$)

Note: the deprotonated ligand is in fact AsO_3^{3-}, but this ion can not be entered as component because not all protonation constants are given in NIST. Therefore $H_2AsO_3^-$ was chosen as component.

Equilibrium	Log (K)	I	T	Conversion or remarks
$H + L \leftrightarrows HL$	9.32			
$2\ HL \leftrightarrows H_2L_2$	-0.92			$2\ HL \leftrightarrows H_2L_2$ -0.92 $2\ H + 2\ L \leftrightarrows 2\ HL$ (2*9.32) 18.64 $2\ H + 2\ L \leftrightarrows H_2L_2$ 17.72
$H_2L_2 \leftrightarrows HL_2 + H$	-8.31	0.5		$H_2L_2 \leftrightarrows HL_2 + H$ -8.31 0.5 $2\ H + 2\ L \leftrightarrows 2\ H_2L_2$ 17.18322 0.5 $H + 2\ L \leftrightarrows HL_2$ 8.87322 0.5 I=0: 9.14161
$Ca + L \leftrightarrows CaL$	1.36			

Solids:

Equilibrium	Log (K)	I	T	Conversion or remarks
$H_3L \leftrightarrows (As_4O_6)_{0.25}$	0.69			charges are not OK; personal communication with Dr. Smith: should read: $HL \leftrightarrows (As_4O_6)_{0.25}$ 0.69 Multiply by 4: $4\ HL \leftrightarrows As_4O_6$ 2.76 $H + L \leftrightarrows HL$ (4*9.32) 37.28 $4\ H + 4\ L \leftrightarrows As_4O_6$ 40.04
$3\ Ag + AsO_3^{3-} \leftrightarrows Ag_3AsO_3$	31.3	0.1	20	charges are not OK; personal communication with Dr. Smith: should read: $3\ Ag + L \leftrightarrows Ag_3AsO_3 + 2\ H$ 31.3 0.1 $H + OH \leftrightarrows H_2O$ (2*13.99668) 27.99336 0.1 $3\ Ag + L + 2\ OH \leftrightarrows Ag_2AsO_3$ 59.29336 0.1 I=0: 59.93409

Arsenate (AsO_4^{3-})

Equilibrium	Log (K)	I	T	Conversion or remarks
H + L ⇆ HL	11.54			
H + HL ⇆ H_2L	7.00			H + HL ⇆ H_2L 7.00 H + L ⇆ HL 11.54 2 H + L ⇆ H_2L 18.54
H + H_2L ⇆ H_3L	2.22			H + H_2L ⇆ H_3L 2.22 2 H + L ⇆ H_2L 18.54 3 H + L ⇆ H_3L 20.76
Ca + L ⇆ CaL	4.3		40	
Ca + HL ⇆ CaHL	2.75		40	Ca + HL ⇆ CaHL 2.75 H + L = HL 11.54 Ca + H + L ⇆ CaHL 14.29
Ca + H_2L ⇆ CaH_2L	1.39		40	Ca + H_2L ⇆ CaH_2L 1.39 2 H + L ⇆ H_2L 18.54 Ca + 2 H + L ⇆ CaH_2L 19.93

Solids:

Equilibrium	Log (K)	I	T	Conversion or remarks
Sc + L ⇆ ScL	26.7			
Y + L ⇆ YL	22.6			
La + L ⇆ LaL	21.4			
Pr + L ⇆ PrL	22.0			
Nd + L ⇆ NdL	21.9			
Sm + L ⇆ SmL	22.7			
Eu + L ⇆ EuL	22.5			
Gd + L ⇆ GdL	21.7			
Tb + L ⇆ TbL	23.1			
Dy + L ⇆ DyL	23.8			
Ho + L ⇆ HoL	22.9			
Er + L ⇆ ErL	22.5			
Tm + L ⇆ TmL	23.1			
Yb + L ⇆ YbL	22.7			
Lu + L ⇆ LuL	22.7			
3 Ag + L ⇆ AgL	22.2	0.1	20	I=0: 23.48145

Selenite (SeO_3^{2-})

Equilibrium	Log (K)	I	T	Conversion or remarks
H + L ⇆ HL	8.40			
HL + H ⇆ H_2L	2.63			HL + H ⇆ H_2L 2.63 H + L ⇆ HL 8.40 2 H + L ⇆ H_2L 11.03
Fe(III) + HL ⇆ Fe(III)HL	2.81	1.0		Fe(III) + HL ⇆ Fe(III)HL 2.81 1.0 H + L ⇆ HL 7.99368 1.0 Fe(III) + H + L ⇆ Fe(III)HL 10.80368 1.0 I=0: 11.81948
Ag + L ⇆ AgL	2.4	1.0		I=0: 2.80632
Ag + 2 L ⇆ AgL_2	3.76	1.0		I=0: 3.76
Cd + 2 L ⇆ CdL_2	5.1	1.0		I=0: 5.91264
Hg(II) + 2 L ⇆ $Hg(II)L_2$	12.5	1.0		I=0: 13.31264

Solids:

Equilibrium	Log (K)	I	T	Conversion or remarks
2 Na + L ⇆ $Na_2L(H_2O)_5$	-1.90			
Mg + L ⇆ $MgL(H_2O)_6$	5.36		20	
Sr + L ⇆ SrL	6.10		20	
Ba + L ⇆ BaL	6.57			
Mn(II) + L ⇆ Mn(II)L	7.27		20	
Co(II) + L ⇆ Co(II)L	7.08		20	
Cu(II) + L ⇆ $Cu(II)L(H_2O)_2$	7.78		20	
2 Ag + L ⇆ Ag_2L	15.55			
Hg(II) + L ⇆ Hg(II)L	13.82	1.0		I=0: 14.63264

Selenate (SeO_4^{2-})

Equilibrium	Log (K)	I	T	Conversion or remarks
$H + L \leftrightarrows HL$	1.70			
$Ca + L \leftrightarrows CaL$	2.0			
$Sc + L \leftrightarrows ScL$	1.78	0.5		I=0: 3.39033
$Sc + 2\ L \leftrightarrows ScL_2$	2.64	0.5		I=0: 4.78711
$Mn(II) + L \leftrightarrows Mn(II)L$	2.43			
$Co(II) + L \leftrightarrows Co(II)L$	2.70			
$Ni + L \leftrightarrows NiL$	2.67			
$Zn + L \leftrightarrows ZnL$	2.19			
$Zn + 2\ L \leftrightarrows ZnL_2$	1.38	1.0		I=0: 2.19264
$Cd + L \leftrightarrows CdL$	2.27			

Solids:

Equilibrium	Log (K)	I	T	Conversion or remarks
$2\ Li + L \leftrightarrows Li_2L(H_2O)$	-2.05			
$2\ Na + L \leftrightarrows Na_2L$	-1.28			
$2\ K + L \leftrightarrows K_2L$	0.73			
$2\ Rb + L \leftrightarrows Rb_2L$	0.97			
$2\ (NH_4) + L \leftrightarrows (NH_4)_2L$	-0.45			$2\ (NH_4) + L \leftrightarrows (NH_4)_2L$ -0.45 $H + NH_3 \leftrightarrows NH_4$ (2*9.244) 18.488 $2\ H + 2\ NH_3 + L \leftrightarrows (NH_4)_2L$ 18.038
$Be + L \leftrightarrows BeL(H_2O)_4$	2.94			
$Mg + L \leftrightarrows MgL(H_2O)_6$	1.20			
$Ca + L \leftrightarrows CaL(H_2O)_2$	3.02			
$Sr + L \leftrightarrows SrL$	4.40			
$Ba + L \leftrightarrows BaL$	7.46			
$(UO_2) + L \leftrightarrows (UO_2)L(H_2O)_4$	2.25			
$Mn(II) + L \leftrightarrows Mn(II)L(H_2O)_5$	2.05			
$Co(II) + L \leftrightarrows Co(II)L(H_2O)_6$	1.53			
$Ni + L \leftrightarrows NiL(H_2O)_6$	1.52			
$Cu(II) + L \leftrightarrows Cu(II)L(H_2O)_5$	2.44			
$2\ Ag + L \leftrightarrows Ag_2L$	8.91			
$Zn + L \leftrightarrows ZnL(H_2O)_6$	1.52			
$Cd + L \leftrightarrows CdL(H_2O)_2$	1.85			
$Pb(II) + L \leftrightarrows Pb(II)L$	6.84			

Bromide (Br^-)

Equilibrium	Log (K)	I	T	Conversion or remarks
Cs + L ⇆ CsL	0.03			
Be + L ⇆ BeL	-0.7	4.0		I=0: -1.78352
Be + 2 L ⇆ BeL_2	-0.8	4.0		I=0: -2.42528
Mg + L ⇆ MgL	-1.4	3.0		I=0: -1.94046
Sc + L ⇆ ScL	-0.07	0.7	20	I=0: 0.67824
Sc + 2 L ⇆ ScL_2	-0.3	0.7	20	I=0: 0.94706
Y + L ⇆ YL	-0.15	1.0		I=0: 0.45948
Ce + L ⇆ CeL	-0.2	1.0		I=0: 0.40948
Pr + L ⇆ PrL	-0.2	3.0		I=0: -1.01069
Sm + L ⇆ SmL	-0.2	3.0		I=0: -1.01069
Eu + L ⇆ EuL	-0.2	1.0		I=0: 0.40948
Eu + 2 L ⇆ EuL_2	-0.4	1.0		I=0: 0.61580
Gd + L ⇆ GdL	-0.4	3.0	20	I=0: -1.21069
Tb + L ⇆ TbL	-0.4	3.0	20	I=0: -1.21069
Ho + L ⇆ HoL	-0.6	3.0		I=0: -1.41069
Er + L ⇆ ErL	-0.5	3.0		I=0: -1.31069
(UO_2) + L ⇆ $(UO_2)L$	0.2			
Mn(II) + L ⇆ Mn(II)L	-0.4	0.5		I=0: 0.13678
Co(II) + L ⇆ Co(II)L	-0.7	3.0		I=0: -1.24046
Ni + L ⇆ NiL	-0.8	3.0		I=0: -1.34046
Cu(II) + L ⇆ Cu(II)L	-0.04			
Cr(III) + L ⇆ Cr(III)L	2.52			
Cr(III) + 2 L ⇆ $Cr(III)L_2$	3.46			
Cr(III) + 3 L ⇆ $Cr(III)L_3$	4.4			
Fe(III) + L ⇆ Fe(III)L	0.6			
Cu(I) + L ⇆ Cu(I)L	3.53			
Cu(I) + 2 L ⇆ $Cu(I)L_2$	5.86			
Cu(I) + 3 L ⇆ $Cu(I)L_3$	6.43			
Ag + L ⇆ AgL	4.6			
Ag + 2 L ⇆ AgL_2	7.5			
Ag + 3 L ⇆ AgL_3	8.1			
Ag + 4 L ⇆ AgL_4	8.7			
Pd + L ⇆ PdL	5.17	1.0		I=0: 5.57632
Pd + 2 L ⇆ PdL_2	9.42	1.0		I=0: 10.02948
Pd + 3 L ⇆ PdL_3	12.7	1.0		I=0: 13.30948
Pd + 4 L ⇆ PdL_4	14.7	0.1		I=0: 15.12715
PdL_2 (cis) ⇆ PdL_2 (trans)	-0.78	1.0		not clear how this one relates to the other one three lines up; NOT entered
Zn + L ⇆ ZnL	-0.07			
Cd + L ⇆ CdL	2.15			
Cd + 2 L ⇆ CdL_2	3.0			
Cd + 3 L ⇆ CdL_3	3.0			
Cd + 4 L ⇆ CdL_4	2.9			
Hg(II) + L ⇆ Hg(II)L	9.07	0.5		I=0: 9.60678
Hg(II) + 2 L ⇆ $Hg(II)L_2$	17.27	0.5		I=0: 18.07516
Hg(II) + 3 L ⇆ $Hg(II)L_3$	19.7	0.5		I=0: 20.50516
Hg(II) + 4 L ⇆ $Hg(II)L_4$	21.2	0.5		I=0: 21.73678
Hg(II)L ⇆ Hg(II)(OH)L + H	-3.37	0.5		Hg(II)L ⇆ Hg(II)(OH)L + H -3.37 0.5 Hg(II) + L ⇆ Hg(II)L 9.07 0.5 H + OH ⇆ H_2O 13.72861 0.5 Hg(II) + L + OH ⇆ Hg(II)(OH)L 19.42861 0.5 I=0: 20.23377
Sn(II) + L ⇆ Sn(II)L	1.16			
Sn(II) + 2 L ⇆ $Sn(II)L_2$	1.7			
Sn(II) + 3 L ⇆ $Sn(II)L_3$	1.2	3.0		I=0: 0.38931
Pb(II) + L ⇆ Pb(II)L	1.7			

Equilibrium	Log (K)	I	T	Conversion or remarks
$Pb(II) + 2\ L \leftrightarrows Pb(II)L_2$	2.6			
$Pb(II) + 3\ L \leftrightarrows Pb(II)L_3$	2.2	0.5		I=0: 3.00516
$Pb(II) + 4\ L \leftrightarrows Pb(II)L_4$	2.4	2.0		I=0: 2.37112
$Ga + L \leftrightarrows GaL$	-0.10	0.7	20	I=0: 0.64824
$In + L \leftrightarrows InL$	1.99	2.0		I=0: 1.94669
$In + 2\ L \leftrightarrows InL_2$	2.6	2.0		I=0: 2.52781
$Bi + L \leftrightarrows BiL$	3.24			
$Bi + 2\ L \leftrightarrows BiL_2$	5.5			
$Bi + 3\ L \leftrightarrows BiL_3$	7.7			
$Bi + 4\ L \leftrightarrows BiL_4$	9.0			
$Bi + 5\ L \leftrightarrows BiL_5$	9.9			
$Bi + 6\ L \leftrightarrows BiL_6$	8.7			

Solids:

Equilibrium	Log (K)	I	T	Conversion or remarks
$Cu(II)(OH)_{1.5}L_{0.5} \leftrightarrows Cu(II)(OH)_{1.5}L_{0.5}$	16.70	1.0		(can not be related to components; not entered)
$Cu(I) + L \leftrightarrows Cu(I)L$	8.3			
$Ag + L \leftrightarrows AgL$	12.30			
$Pb(II) + 2\ L \leftrightarrows Pb(II)L_2$	5.3			
$Bi + L \leftrightarrows BiOL + 2\ H$	7.45			$Bi + L \leftrightarrows BiOL + 2\ H$ 7.45 $H + OH \leftrightarrows H_2O$ (2*13.997) 27.996 $Bi + 2\ OH + L \leftrightarrows BiOL\ (+H_2O)$ 35.446

Molybdate (MoO_4^{2-})

Equilibrium	Log (K)	I	T	Conversion or remarks
$H + L \leftrightarrows HL$	3.78	0.1		I=0: 4.20715
$HL + H \leftrightarrows H_2L$	3.77	0.1		$HL + H \leftrightarrows H_2L$ 3.77 0.1 $H + L \leftrightarrows HL$ 3.78 0.1 $2\ H + L \leftrightarrows H_2L$ 7.55 0.1 I=0: 8.19073
$8\ H + 7\ L \leftrightarrows Mo_7O_{24}$	52.99	0.1		$8\ H + 7\ L \leftrightarrows Mo_7O_{24} + 4\ H_2O$ Note 4 H_2O as product. I=0: 52.99
$Mo_7O_{24} + H \leftrightarrows HMo_7O_{24}$	5.10	0.1		$Mo_7O_{24} + H \leftrightarrows HMo_7O_{24}$ 5.10 0.1 $8\ H + 7\ L \leftrightarrows Mo_7O_{24}$ 52.99 0.1 $9\ H + 7\ L \leftrightarrows HMo_7O_{24}$ 58.09 0.1 I=0: 59.37145
$HMo_7O_{24} + H \leftrightarrows H_2Mo_7O_{24}$	3.71	0.1		$HMo_7O_{24} + H \leftrightarrows H_2Mo_7O_{24}$ 3.71 0.1 $9\ H + 7\ L \leftrightarrows HMo_7O_{24}$ 58.09 0.1 $10\ H + 7\ L \leftrightarrows H_2Mo_7O_{24}$ 61.80 0.1 I=0: 64.14933
$H_2Mo_7O_{24} + H \leftrightarrows H_3Mo_7O_{24}$	2.43	1.0		$H_2Mo_7O_{24} + H \leftrightarrows H_3Mo_7O_{24}$ 2.43 1.0 $10\ H + 7\ L \leftrightarrows H_2Mo_7O_{24}$ 61.91457 1.0 $11\ H + 7\ L \leftrightarrows H_3Mo_7O_{24}$ 64.34457 1.0 I=0: 67.39197
$34\ H + 19\ L \leftrightarrows Mo_{19}O_{59}$	196.3	3.0		$34\ H + 19\ L \leftrightarrows Mo_{19}O_{59} + 17\ H_2O$ I=0: 183.59926
$Al + 6\ H + 6\ L \leftrightarrows AlMo_6O_{21}$	50.95	0.5		$Al + 6\ H + 6\ L \leftrightarrows AlMo_6O_{21} + 3\ H_2O$ I=0: 54.97582

Solids:

Equilibrium	Log (K)	I	T	Conversion or remarks
$2\ H + L \leftrightarrows MoO_3$	8.0			
$Mg + L \leftrightarrows MgL$	1.85			
$Ca + L \leftrightarrows CaL$	7.95			
$2\ Ag + L \leftrightarrows Ag_2L$	11.55			
$Pb(II) + L \leftrightarrows Pb(II)L$	15.62			

Iodide (I^-)

Equilibrium	Log (K)	I	T	Conversion or remarks
$K + L \leftrightarrows KL$	-0.4			
$Rb + L \leftrightarrows RbL$	0.04			
$Cs + L \leftrightarrows CsL$	-0.03			
$Eu + L \leftrightarrows EuL$	-0.4	1.0		I=0: 0.20948
$Hf + L \leftrightarrows HfL$	-0.5	3.0	20	I=0: -1.58091
$Cu(I) + L \leftrightarrows Cu(I)L$	5.7	1.0		I=0: 5.90316
$Cu(I) + 2\ L \leftrightarrows Cu(I)L_2$	8.9			
$Cu(I) + 3\ L \leftrightarrows Cu(I)L_3$	10.43	5.0		I=0: 10.43
$Cu(I) + 4\ L \leftrightarrows Cu(I)L_4$	9.4	5.0		I=0: 11.04360
$2\ Cu(I) + 6\ L \leftrightarrows Cu(I)_2L_6$	22.0	5.0		I=0: 25.28720
$Ag + L \leftrightarrows AgL$	8.1	4.0		I=0: 7.55824
$Ag + 2\ L \leftrightarrows AgL_2$	11.0	4.0		I=0: 10.45824
$Ag + 3\ L \leftrightarrows AgL_3$	12.6			
$Ag + 4\ L \leftrightarrows AgL_4$	14.2	2.0		I=0: 14.22888
$2\ Ag + 6\ L \leftrightarrows Ag_2L_6$	29.7	4.0		I=0: 31.86704
$3\ Ag + 8\ L \leftrightarrows Ag_3L_8$	46.4	4.0		I=0: 50.19232
$Pd + L \leftrightarrows PdL$	6.08	1.0		I=0: 6.48632
$Pd + 2\ L \leftrightarrows PdL_2$	22	1.0		I=0: 22.60948
$Pd + 3\ L \leftrightarrows PdL_3$	25.8	1.0		I=0: 26.40948
$Pd + 4\ L \leftrightarrows PdL_4$	28.3	1.0		I=0: 28.70632
$PdL_3 + L \leftrightarrows PdL_4$	2.56	1.0		not entered; already covered by two equilibria above this one
$2\ PdL_4 \leftrightarrows Pd_2L_6 + 2\ L$	1.32	1.0		$2\ PdL_4 \leftrightarrows Pd_2L_6 + 2\ L$ 1.32 1.0 $Pd + 4\ L \leftrightarrows PdL_4$ (2*28.3) 56.6 1.0 $2\ Pd + 6\ L \leftrightarrows Pd_2L_6$ 57.92 1.0 I=0: 58.93580
$Zn + L \leftrightarrows ZnL$	-1.5	3.0		I=0: -2.04046
$Cd + L \leftrightarrows CdL$	2.28			
$Cd + 2\ L \leftrightarrows CdL_2$	3.92			
$Cd + 3\ L \leftrightarrows CdL_3$	5.0			
$Cd + 4\ L \leftrightarrows CdL_4$	6.0			
$Hg(II) + L \leftrightarrows Hg(II)L$	12.87	0.5		I=0: 13.40678
$Hg(II) + 2\ L \leftrightarrows Hg(II)L_2$	23.82	0.5		I=0: 24.62516
$Hg(II) + 3\ L \leftrightarrows Hg(II)L_3$	27.6	0.5		I=0: 28.40516
$Hg(II) + 4\ L \leftrightarrows Hg(II)L_4$	29.8	0.5		I=0: 30.33678
$Hg(II)L \leftrightarrows Hg(II)OHL + H$	-4.0	0.5		$Hg(II)L \leftrightarrows Hg(II)OHL + H$ −4.0 0.5 $Hg(II) + L \leftrightarrows Hg(II)L$ 12.87 0.5 $OH + H \leftrightarrows H_2O$ 13.72861 0.5 $Hg(II) + OH + L \leftrightarrows Hg(II)OHL$ 22.59861 0.5 I=0: 23.40377
$Sn(II) + L \leftrightarrows Sn(II)L$	0.70	4.0		I=0: -0.38352
$Sn(II) + 2\ L \leftrightarrows Sn(II)L_2$	1.13	4.0		I=0: -0.49528
$Sn(II) + 3\ L \leftrightarrows Sn(II)L_3$	2.1	4.0		I=0: 0.47472
$Sn(II) + 4\ L \leftrightarrows Sn(II)L_4$	2.3	4.0		I=0: 1.21648
$Sn(II) + 6\ L \leftrightarrows Sn(II)L_6$	2.6	4.0		I=0: 4.22528
$Sn(II) + 8\ L \leftrightarrows Sn(II)L_8$	2.1	4.0		I=0: 8.60112
$Pb(II) + L \leftrightarrows Pb(II)L$	2.0			
$Pb(II) + 2\ L \leftrightarrows Pb(II)L_2$	3.2			
$Pb(II) + 3\ L \leftrightarrows Pb(II)L_3$	3.9			
$Pb(II) + 4\ L \leftrightarrows Pb(II)L_4$	4.5			
$Ga + L \leftrightarrows GaL$	-0.2	0.7	20	I=0: 0.54824
$In + L \leftrightarrows InL$	0.99	2.0		I=0: 0.94669
$In + 2\ L \leftrightarrows InL_2$	2.26	2.0		I=0: 2.18781
$Bi + L \leftrightarrows BiL$	3.63	0.5		I=0: 4.43516
$Bi + 4\ L \leftrightarrows BiL_4$	15.0	2.0	20	I=0: 14.91337
$Bi + 5\ L \leftrightarrows BiL_5$	16.8	2.0		I=0: 16.72781

Equilibrium	Log (K)	I	T	Conversion or remarks
$Bi + 6\ L \leftrightarrows BiL_6$	18.8	2.0		I=0: 18.75669

Solids:

Equilibrium	Log (K)	I	T	Conversion or remarks
$Cu(I) + L \leftrightarrows Cu(I)L$	12.0			
$Ag + L \leftrightarrows AgL$	16.08			
$Pd + 2\ L \leftrightarrows PdL_2$	31.15	1.0		I=0: 31.75948
$Hg(II) + 2\ L \leftrightarrows Hg(II)L_2$	27.95	0.5		I=0: 28.75516
$Sn(II) + 2\ L \leftrightarrows Sn(II)L_2$	5.08	4.0		I=0: 3.45472
$Pb(II) + 2\ L \leftrightarrows Pb(II)L_2$	8.10			
$Bi + 3\ L \leftrightarrows BiL_3$	18.09	2.0	20	I=0: 18.00337

Tungstate (WO_4^{2-})

NOTE: polynuclear complexes have NOT been entered because they are not likely to occur in significant concentrations at ambient W-levels.

Equilibrium	Log (K)	I	T	Conversion or remarks
$H + L \leftrightarrows HL$	3.6			
$2\ H + L \leftrightarrows H_2L$	5.8			

Solids:

Equilibrium	Log (K)	I	T	Conversion or remarks
$2\ H + L \leftrightarrows WO_3$	14.05			
$2\ Ag + L \leftrightarrows Ag_2L$	12.12			
$Pb(II) + L \leftrightarrows Pb(II)L$	16.07			

Cyanide (CN^-)

Equilibrium	Log (K)	I	T	Conversion or remarks
$H + L \leftrightarrows HL$	9.21			
$Mn(II) + L \leftrightarrows Mn(II)L$	1.9	1.0		I=0: 2.30632
$Mn(II) + 2\ L \leftrightarrows Mn(II)L_2$	3.36	1.0		I=0: 3.96948
$Fe(II) + 6\ L \leftrightarrows Fe(II)L_6$	35.4			
$Co(II) + 3\ L \leftrightarrows Co(II)L_3$	13.7	1.0		I=0: 14.30948
$Co(II) + 5\ L \leftrightarrows Co(II)L_5$	23.0	1.0		I=0: 23.0
$Ni + 4\ L \leftrightarrows NiL_4$	30.2			
$NiL_4 + H \leftrightarrows NiHL_4$	5.4	0.1		$NiL_4 + H \leftrightarrows NiHL_4$ 5.4 0.1 $Ni + 4\ L \leftrightarrows NiL_4$ 29.77285 0.1 $Ni + H + 4\ L \leftrightarrows NiHL_4$ 35.17285 0.1 I=0: 36.02715
$NiHL_4 + H \leftrightarrows NiH_2L_4$	4.5	0.1		$NiHL_4 + H \leftrightarrows NiH_2L_4$ 4.5 0.1 $Ni + H + 4\ L \leftrightarrows NiHL_4$ 35.17285 0.1 $Ni + 2\ H + 4\ L \leftrightarrows NiH_2L_4$ 39.67285 0.1 I=0: 40.74073
$NiH_2L_4 + H \leftrightarrows NiH_3L_4$	2.6	0.1		$NiH_2L_4 + H \leftrightarrows NiH_3L_4$ 2.6 0.1 $Ni + 2\ H + 4\ L \leftrightarrows NiH_2L_4$ 39.67285 0.1 $Ni + 3\ H + 4\ L \leftrightarrows NiH_3L_4$ 42.27285 0.1 I=0: 43.34073
$Fe(III) + 6\ L \leftrightarrows Fe(III)L_6$	43.6			
$Cu(I) + 2\ L \leftrightarrows Cu(I)L_2$	23.9			
$Cu(I)L_2 + L \leftrightarrows Cu(I)L_3$	5.30			$Cu(I)L_2 + L \leftrightarrows Cu(I)L_3$ 5.30 $Cu(I) + 2\ L \leftrightarrows Cu(I)L_2$ 23.9 $Cu(I) + 3\ L \leftrightarrows Cu(I)L_3$ 29.2
$Cu(I)L_3 + L \leftrightarrows Cu(I)L_4$	1.6			$Cu(I)L_3 + L \leftrightarrows Cu(I)L_4$ 1.6 $Cu(I) + 3\ L \leftrightarrows Cu(I)L_3$ 29.2 $Cu(I) + 4\ L \leftrightarrows Cu(I)L_4$ 30.8
$Ag + 2\ L \leftrightarrows AgL_2$	20.48			
$Ag + 3\ L \leftrightarrows AgL_3$	21.7			
$Ag + OH + L \leftrightarrows AgOHL$	13.22			
$Pd + 4\ L \leftrightarrows PdL_4$	42.4			
$Pd + 5\ L \leftrightarrows PdL_5$	45.3			
$Zn + L \leftrightarrows ZnL$	4.98 5.26	3.0		4.98 with NaCl-background electrolyte; 5.26 with $NaClO_4$-background electrolyte; used: average (5.12) I=0: 4.57954
$Zn + 2\ L \leftrightarrows ZnL_2$	11.07			
$Zn + 3\ L \leftrightarrows ZnL_3$	16.05			
$Zn + 4\ L \leftrightarrows ZnL_4$	19.62			
$Cd + L \leftrightarrows CdL$	6.01			
$Cd + 2\ L \leftrightarrows CdL_2$	11.12			
$Cd + 3\ L \leftrightarrows CdL_3$	15.65			
$Cd + 4\ L \leftrightarrows CdL_4$	17.92			
$Hg(II) + L \leftrightarrows Hg(II)L$	17.00			
$Hg(II) + 2\ L \leftrightarrows Hg(II)L_2$	32.75			
$Hg(II) + 3\ L \leftrightarrows Hg(II)L_3$	36.31			
$Hg(II) + 4\ L \leftrightarrows Hg(II)L_4$	38.97			
$Hg(II) + OH + L \leftrightarrows Hg(II)OHL$	28.9	2.0	30	I=0: 28.85669

Solids:

Equilibrium	Log (K)	I	T	Conversion or remarks
$Cu(I) + L \leftrightarrows Cu(I)L$	19.5			
$Ag + L \leftrightarrows AgL$	15.74			
$2\ Ag + 2\ L \leftrightarrows Ag_2L_2$	10.9	0.1	20	This solid is better soluble than the one above and therefore not entered.
$Zn + 2\ L \leftrightarrows ZnL_2$	15.5	3.0		I=0: 14.68931

Acetate (CH_3COO^-, ethanoic acid)

Equilibrium	Log (K)	I	T	Conversion or remarks
H + L ⇆ HL	4.757			
Li + L ⇆ LiL	0.28			
Na + L ⇆ NaL	-0.12			
K + L ⇆ KL	-0.27			
Rb + L ⇆ RbL	-0.37	0.1		I=0: -0.15642
Cs + L ⇆ CsL	-0.33	0.1		I=0: -0.11642
Be + L ⇆ BeL	1.62	0.1		I=0: 2.04715
Be + 2 L ⇆ BeL_2	2.36	0.1		I=0: 3.00073
Mg + L ⇆ MgL	1.26			
Ca + L ⇆ CaL	1.18			
Sr + L ⇆ SrL	1.12			
Ba + L ⇆ BaL	1.07			
Sc + L ⇆ ScL	3.48	0.1		I=0: 4.12073
Y + L ⇆ YL	1.68	0.1		I=0: 2.32073
Y + 2 L ⇆ YL_2	3.17	0.1		I=0: 4.23788
Y + 3 L ⇆ YL_3	3.5	2.0		I=0: 3.41337
La + L ⇆ LaL	2.55			
La + 2 L ⇆ LaL_2	4.12			
La + 3 L ⇆ LaL_3	3.53	0.1		I=0: 4.81145
Ce + L ⇆ CeL	1.91	0.1		I=0: 2.55073
Ce + 2 L ⇆ CeL_2	3.09	0.1		I=0: 4.15788
Ce + 3 L ⇆ CeL_3	3.68	0.1		I=0: 4.96145
Pr + L ⇆ PrL	2.01	0.1		I=0: 2.65073
Pr + 2 L ⇆ PrL_2	3.41	0.1		I=0: 4.47788
Pr + 3 L ⇆ PrL_3	3.33	2.0		I=0: 3.24337
Nd + L ⇆ NdL	2.67			
Nd + 2 L ⇆ NdL_2	4.54			
Nd + 3 L ⇆ NdL_3	3.60	2.0		I=0: 3.51337
Sm + L ⇆ SmL	2.84			
Sm + 2 L ⇆ SmL_2	4.80			
Sm + 3 L ⇆ SmL_3	3.90	2.0		I=0: 3.81337
Eu + L ⇆ EuL	2.13	0.1		I=0: 2.77073
Eu + 2 L ⇆ EuL_2	3.64	0.1		I=0: 4.70788
Eu + 3 L ⇆ EuL_3	4.24	0.1		I=0: 5.52145
Gd + L ⇆ GdL	2.02	0.1		I=0: 2.66073
Gd + 2 L ⇆ GdL_2	3.47	0.1		I=0: 4.53788
Gd + 3 L ⇆ GdL_3	4.26	0.1		I=0: 5.54145
Tb + L ⇆ TbL	1.91	0.1		I=0: 2.55073
Tb + 2 L ⇆ TbL_2	3.23	0.1		I=0: 4.29788
Tb + 3 L ⇆ TbL_3	4.39	0.1		I=0: 5.67145
Dy + L ⇆ DyL	1.85	0.1		I=0: 2.49073
Dy + 2 L ⇆ DyL_2	3.16	0.1		I=0: 4.22788
Dy + 3 L ⇆ DyL_3	4.30	0.1		I=0: 5.58145
Dy + 4 L ⇆ DyL_4	3.9	2.0	20	I=0: 3.81337
Ho + L ⇆ HoL	1.81	0.1		I=0: 2.45073
Ho + 2 L ⇆ HoL_2	3.11	0.1		I=0: 4.17788
Ho + 3 L ⇆ HoL_3	4.27	0.1		I=0: 5.55145
Er + L ⇆ ErL	1.79	0.1		I=0: 2.43073
Er + 2 L ⇆ ErL_2	3.06	0.1		I=0: 4.12788
Er + 3 L ⇆ ErL_3	4.20	0.1		I=0: 5.48145
Er + 4 L ⇆ ErL_4	3.7	2.0	20	I=0: 3.61337
Tm + L ⇆ TmL	1.83	0.1		I=0: 2.47073
Tm + 2 L ⇆ TmL_2	3.02	0.1		I=0: 4.08788
Tm + 3 L ⇆ TmL_3	4.17	0.1		I=0: 5.45145
Yb + L ⇆ YbL	2.56			
Yb + 2 L ⇆ YbL_2	4.36			
Yb + 3 L ⇆ YbL_3	4.15	0.1		I=0: 5.43145

Equilibrium	Log (K)	I	T	Conversion or remarks
$Lu + L \leftrightarrows LuL$	1.85	0.1		I=0: 2.49073
$Lu + 2\ L \leftrightarrows LuL_2$	3.16	0.1		I=0: 4.22788
$Lu + 3\ L \leftrightarrows LuL_3$	4.02	0.1		I=0: 5.30145
$(U(VI)O_2) + L \leftrightarrows (U(VI)O_2)L$	2.68	0.1		I=0: 3.10715
$(U(VI)O_2) + 2\ L \leftrightarrows (U(VI)O_2)L_2$	4.43	1.0		I=0: 5.03948
$(U(VI)O_2) + 3\ L \leftrightarrows (U(VI)O_2)L_3$	6.45	1.0		I=0: 7.05948
$Mn(II) + L \leftrightarrows Mn(II)L$	1.40			
$Fe(II) + L \leftrightarrows Fe(II)L$	0.54	3.0		I=0: -0.00046
$Co(II) + L \leftrightarrows Co(II)L$	1.38			
$Co(II) + 2\ L \leftrightarrows Co(II)L_2$	0.8	2.0		I=0: 0.75669
$Ni + L \leftrightarrows NiL$	1.44			
$Ni + 2\ L \leftrightarrows NiL_2$	2.40			
$Cu(II) + L \leftrightarrows Cu(II)L$	2.21			
$Cu(II) + 2\ L \leftrightarrows Cu(II)L_2$	3.4			
$Cu(II) + 3\ L \leftrightarrows Cu(II)L_3$	3.3	0.1		I=0: 3.94073
$Cr(III) + L \leftrightarrows Cr(III)L$	4.63	0.5		I=0: 5.43516
$Cr(III) + 2\ L \leftrightarrows Cr(III)L_2$	7.08	0.5		I=0: 8.42194
$Cr(III) + 3\ L \leftrightarrows Cr(III)L_3$	9.6	0.5		I=0: 11.21033
$Fe(III) + L \leftrightarrows Fe(III)L$	3.6	0.1		I=0: 4.24073
$Fe(III) + 2\ L \leftrightarrows Fe(III)L_2$	6.5	0.1		I=0: 7.56788
$3\ Fe(III) + 6\ L \leftrightarrows Fe(III)_3(OH)_2L_6 + 2\ H$	20.0	1.0		$3\ Fe(III) + 6\ L \leftrightarrows Fe(III)_3(OH)_2L_6 + 2\ H$ 20.0 1 $OH + H \leftrightarrows H_2O$ $(2*13.79384)$ 27.58768 1 $3\ Fe(III) + 2\ OH + 6\ L \leftrightarrows Fe(III)_3(OH)_2L_6$ 47.58768 1 I=0: 51.04140
$3\ Fe(III) + 2\ L \leftrightarrows Fe(III)_3(OH)_3L_2 + 3\ H$	5.87	3.0		$3\ Fe(III) + 2\ L \leftrightarrows Fe(III)_3(OH)_3L_2 + 3\ H$ 5.87 3 $OH + H \leftrightarrows H_2O$ $(3*14.26723)$ 42.80169 3 $3\ Fe(III) + 3\ OH + 2\ L \leftrightarrows Fe(III)_3(OH)_3L_2$ 48.67169 3 I=0: 46.50986
$7\ Fe(III) + 6\ L \leftrightarrows Fe(III)_7(OH)_9L_6 + 9\ H$	17.26	3.0		$7\ Fe(III) + 6\ L \leftrightarrows Fe(III)_7(OH)_9L_6 + 9\ H$ 17.26 3 $OH + H \leftrightarrows H_2O$ $(9*14.26723)$ 128.40507 3 $7\ Fe(III) + 9\ OH + 6\ L \leftrightarrows Fe(III)_7(OH)_9L_6$ 145.66507 3 I=0: 139.99027
$Ag + L \leftrightarrows AgL$	0.73			
$Ag + 2\ L \leftrightarrows AgL_2$	0.64			
$Pd + L \leftrightarrows PdL$	4.34	1.0		I=0: 4.74632
$Zn + L \leftrightarrows ZnL$	1.57			
$Zn + 2\ L \leftrightarrows ZnL_2$	1.1	0.5		I=0: 1.90516
$Zn + 3\ L \leftrightarrows ZnL_3$	1.57	3.0		I=0: 0.75931
$Cd + L \leftrightarrows CdL$	1.92			
$Cd + 2\ L \leftrightarrows CdL_2$	1.91	0.5		I=0: 2.71516
$Cd + 3\ L \leftrightarrows CdL_3$	2.18	0.5		I=0: 2.98516
$Hg(II) + L \leftrightarrows Hg(II)L$	4.3			
$Hg(II) + 2\ L \leftrightarrows Hg(II)L_2$	8.45	3.0		I=0: 7.63931
$Sn(II) + L \leftrightarrows Sn(II)L$	3.47	3.0		I=0: 2.92954
$Sn(II) + 2\ L \leftrightarrows Sn(II)L_2$	6.04	3.0		I=0: 5.22931
$Sn(II) + 3\ L \leftrightarrows Sn(II)L_3$	7.27	3.0		I=0: 6.45931
$Pb(II) + L \leftrightarrows Pb(II)L$	2.58			
$Pb(II) + 2\ L \leftrightarrows Pb(II)L_2$	4.02			
$Pb(II) + 3\ L \leftrightarrows Pb(II)L_3$	3.42	2.0		I=0: 3.37669
$B(OH)_3 + L \leftrightarrows B(OH)_3L$	-0.43			$B(OH)_3 + L \leftrightarrows B(OH)_3L$ $B(OH)_3$ does not occur as a component in the database, but $H_2BO_3^-$ does. $H + H_2BO_3 \leftrightarrows H_3BO_3$ (=$B(OH)_3$) 9.236 $B(OH)_3 + L \leftrightarrows B(OH)_3L$ -0.43 $H + H_2BO_3 + L \leftrightarrows B(OH)_3L$ 8.806

Equilibrium	Log (K)	I	T	Conversion or remarks
Al + L ⇆ AlL	2.75			
Al + 2 L ⇆ AlL_2	4.6			
AlL ⇆ AlOHL + H	-3.1	1.0		AlL ⇆ AlOHL + H -3.1 1.0 Al + L ⇆ AlL 2.14052 1.0 OH + H ⇆ H_2O 13.79384 1.0 Al + L + OH ⇆ AlOHL 12.83436 1.0 I=0: 13.85016
2 Al + L ⇆ $Al_2(OH)_2L$ + 2 H	-3.49	0.5		2 Al + L ⇆ $Al_2(OH)_2L$ + 2 H -3.49 0.5 2 OH + 2 H ⇆ 2 H_2O (2*13.72861) 27.45722 0.5 2 Al + L + 2 OH ⇆ $Al_2(OH)_2L$ 23.96722 0.5 I=0: 25.57755
In + L ⇆ InL	3.50	2.0	20	I=0: 3.45669
In + 2 L ⇆ InL_2	5.95	2.0	20	I=0: 5.87781
In + 3 L ⇆ InL_3	7.90	2.0	20	I=0: 7.81337
In + 4 L ⇆ InL_4	9.08	2.0	20	I=0: 8.99337

Solids:

Equilibrium	Log (K)	I	T	Conversion or remarks
Ag + L ⇆ AgL	2.71			

Catechol ($C_6H_4O_2^{2-}$, 1,2-dihydroxybenzene)

Equilibrium	Log (K)	I	T	Conversion or remarks
$H + L \leftrightarrows HL$	13.3	0.1		I=0: 13.72715
$HL + H \leftrightarrows H_2L$	9.45			$HL + H \leftrightarrows H_2L$ 9.45 $H + L \leftrightarrows HL$ 13.72715 $2\ H + L \leftrightarrows H_2L$ 23.17715
$Be + H_2L \leftrightarrows BeL + 2\ H$	-9.55	0.1	20	$Be + H_2L \leftrightarrows BeL + 2\ H$ -9.55 0.1 $2\ H + L \leftrightarrows H_2L$ 22.53642 0.1 $Be + L \leftrightarrows BeL$ 12.98642 0.1 I=0: 13.84072
$BeL + H_2L \leftrightarrows BeL_2 + 2\ H$	-13.06	0.1	20	$BeL + H_2L \leftrightarrows BeL_2 + 2\ H$ -13.06 0.1 $Be + L \leftrightarrows BeL$ 12.98642 0.1 $2\ H + L \leftrightarrows H_2L$ 22.53642 0.1 $Be + 2\ L \leftrightarrows BeL_2$ 22.46284 0.1 I=0: 23.31714
$BeL + H \leftrightarrows BeHL$	5.16	0.1	20	$BeL + H \leftrightarrows BeHL$ 5.16 0.1 $Be + L \leftrightarrows BeL$ 12.98642 0.1 $Be + H + L \leftrightarrows BeHL$ 18.14642 0.1 I=0: 19.00072
$BeL_2 + H \leftrightarrows BeHL_2$	6.69	0.1	20	$BeL_2 + H \leftrightarrows BeHL_2$ 6.69 0.1 $Be + 2\ L \leftrightarrows BeL_2$ 22.46284 0.1 $Be + H + 2\ L \leftrightarrows BeHL_2$ 29.15284 0.1 I=0: 30.43429
$Sc + H_2L \leftrightarrows ScL + 2\ H$	-4.90	0.1		$Sc + H_2L \leftrightarrows ScL + 2\ H$ -4.90 0.1 $2\ H + L \leftrightarrows H_2L$ 22.53642 0.1 $Sc + L \leftrightarrows ScL$ 17.63642 0.1 I=0: 18.91787
$La + H_2L \leftrightarrows LaL + 2\ H$	-12.48	0.1		$La + H_2L \leftrightarrows LaL + 2\ H$ -12.48 0.1 $2\ H + L \leftrightarrows H_2L$ 22.53642 0.1 $La + L \leftrightarrows LaL$ 10.05642 0.1 I=0: 11.33787
$Pr + H_2L \leftrightarrows PrL + 2\ H$	-11.63	0.1		$Pr + H_2L \leftrightarrows PrL + 2\ H$ -11.63 0.1 $2\ H + L \leftrightarrows H_2L$ 22.53642 0.1 $Pr + L \leftrightarrows PrL$ 10.90642 0.1 I=0: 12.18787
$Nd + H_2L \leftrightarrows NdL + 2\ H$	-11.44	0.1		$Nd + H_2L \leftrightarrows NdL + 2\ H$ -11.44 0.1 $2\ H + L \leftrightarrows H_2L$ 22.53642 0.1 $Nd + L \leftrightarrows NdL$ 11.09642 0.1 I=0: 12.37787
$Sm + H_2L \leftrightarrows SmL + 2\ H$	-10.44	0.1		$Sm + H_2L \leftrightarrows SmL + 2\ H$ -10.44 0.1 $2\ H + L \leftrightarrows H_2L$ 22.53642 0.1 $Sm + L \leftrightarrows SmL$ 12.09642 0.1 I=0: 13.37787
$Eu + H_2L \leftrightarrows EuL + 2\ H$	-10.88	0.1		$Eu + H_2L \leftrightarrows EuL + 2\ H$ -10.88 0.1 $2\ H + L \leftrightarrows H_2L$ 22.53642 0.1 $Eu + L \leftrightarrows EuL$ 11.65642 0.1 I=0: 12.93787
$Gd + H_2L \leftrightarrows GdL + 2\ H$	-10.74	0.1		$Gd + H_2L \leftrightarrows GdL + 2\ H$ -10.74 0.1 $2\ H + L \leftrightarrows H_2L$ 22.53642 0.1 $Gd + L \leftrightarrows GdL$ 11.79642 0.1 I=0: 13.07787
$Dy + H_2L \leftrightarrows DyL + 2\ H$	-10.60	0.1		$Dy + H_2L \leftrightarrows DyL + 2\ H$ -10.60 0.1 $2\ H + L \leftrightarrows H_2L$ 22.53642 0.1 $Dy + L \leftrightarrows DyL$ 11.93642 0.1 I=0: 13.21787
$Ho + H_2L \leftrightarrows HoL + 2\ H$	-10.52	0.1		$Ho + H_2L \leftrightarrows HoL + 2\ H$ -10.52 0.1 $2\ H + L \leftrightarrows H_2L$ 22.53642 0.1 $Ho + L \leftrightarrows HoL$ 12.01642 0.1 I=0: 13.29787
$Er + H_2L \leftrightarrows ErL + 2\ H$	-10.51	0.1		$Er + H_2L \leftrightarrows ErL + 2\ H$ -10.51 0.1 $2\ H + L \leftrightarrows H_2L$ 22.53642 0.1 $Er + L \leftrightarrows ErL$ 12.02642 0.1 I=0: 13.30787

Equilibrium	Log (K)	I	T	Conversion or remarks
$Tm + H_2L \leftrightarrows TmL + 2\ H$	-10.38	0.1		$Tm + H_2L \leftrightarrows TmL + 2\ H$ -10.38 0.1 $2\ H + L \leftrightarrows H_2L$ 22.53642 0.1 $Tm + L \leftrightarrows TmL$ 12.15642 0.1 I=0: 13.43787
$Yb + H_2L \leftrightarrows YbL + 2\ H$	-10.27	0.1		$Yb + H_2L \leftrightarrows YbL + 2\ H$ -10.27 0.1 $2\ H + L \leftrightarrows H_2L$ 22.53642 0.1 $Yb + L \leftrightarrows YbL$ 12.26642 0.1 I=0: 13.54787
$Lu + H_2L \leftrightarrows LuL + 2\ H$	-10.63	0.1		$Lu + H_2L \leftrightarrows LuL + 2\ H$ -10.63 0.1 $2\ H + L \leftrightarrows H_2L$ 22.53642 0.1 $Lu + L \leftrightarrows LuL$ 11.90642 0.1 I=0: 13.18787
$(UO_2) + H_2L \leftrightarrows (UO_2)L + 2\ H$	-7.14	0.1	20	$(UO_2) + H_2L \leftrightarrows (UO_2)L + 2\ H$ -7.14 0.1 $2\ H + L \leftrightarrows H_2L$ 22.53642 0.1 $(UO_2) + L \leftrightarrows (UO_2)L$ 15.39642 0.1 I=0: 16.25072
$(UO_2)L + H \leftrightarrows (UO_2)HL$	3.93	0.1	20	$(UO_2)L + H \leftrightarrows (UO_2)HL$ 3.93 0.1 $(UO_2) + L \leftrightarrows (UO_2)L$ 15.39642 0.1 $(UO_2) + H + L \leftrightarrows (UO_2)HL$ 19.32642 0.1 I=0: 20.18072
$(UO_2)L + H_2L \leftrightarrows (UO_2)HL_2 + H$	-4.38	0.1	20	$(UO_2)L + H_2L \leftrightarrows (UO_2)HL_2 + H$ -4.38 0.1 $(UO_2) + L \leftrightarrows (UO_2)L$ 15.39642 0.1 $2\ H + L \leftrightarrows H_2L$ 22.53642 0.1 $(UO_2) + 2\ L + H \leftrightarrows (UO_2)HL_2$ 33.55284 0.1 I=0: 34.83429
$(UO_2)HL_2 + H_2L \leftrightarrows (UO_2)H_2L_3 + H$	-5.60	0.1	20	$(UO_2)HL_2 + H_2L \leftrightarrows (UO_2)H_2L_3 + H$ -5.60 0.1 $(UO_2) + 2\ L + H \leftrightarrows (UO_2)HL_2$ 33.55284 0.1 $2\ H + L \leftrightarrows H_2L$ 22.53642 0.1 $(UO_2) + 3\ L + 2\ H \leftrightarrows (UO_2)H_2L_3$ 50.48926 0.1 I=0: 51.98429
$Mn(II) + H_2L \leftrightarrows Mn(II)L + 2\ H$	-14.70	0.1		$Mn(II) + H_2L \leftrightarrows Mn(II)L + 2\ H$ -14.70 0.1 $2\ H + L \leftrightarrows H_2L$ 22.53642 0.1 $Mn(II) + L \leftrightarrows Mn(II)L$ 7.83642 0.1 I=0: 8.69072
$Mn(II)L + H_2L \leftrightarrows Mn(II)L_2 + 2\ H$	-17.1	0.1		$Mn(II)L + H_2L \leftrightarrows Mn(II)L_2 + 2\ H$ -17.1 0.1 $Mn(II) + L \leftrightarrows Mn(II)L$ 7.83642 0.1 $2\ H + L \leftrightarrows H_2L$ 22.53642 0.1 $Mn(II) + 2\ L \leftrightarrows Mn(II)L_2$ 13.27284 0.1 I=0: 14.12714
$Fe(II) + H_2L \leftrightarrows Fe(II)L + 2\ H$	-14.3	0.1		$Fe(II) + H_2L \leftrightarrows Fe(II)L + 2\ H$ -14.3 0.1 $2\ H + L \leftrightarrows H_2L$ 22.53642 0.1 $Fe(II) + L \leftrightarrows Fe(II)L$ 8.23642 0.1 I=0: 9.09072
$Fe(II)L + H_2L \leftrightarrows Fe(II)L_2 + 2\ H$	-16.7	1.0		$Fe(II)L + H_2L \leftrightarrows Fe(II)L_2 + 2\ H$ -16.7 1.0 $Fe(II) + L \leftrightarrows Fe(II)L$ 8.27808 1.0 $2\ H + L \leftrightarrows H_2L$ 22.56767 1.0 $Fe(II) + 2\ L \leftrightarrows Fe(II)L_2$ 14.14575 1.0 I=0: 14.95839
$2\ Fe(II) + 2\ HL \leftrightarrows Fe(II)_2HL_2 + H$	10.9	0.1		$2\ Fe(II) + 2\ HL \leftrightarrows Fe(II)_2HL_2 + H$ 10.9 0.1 $2\ H + 2\ L \leftrightarrows 2HL$ (2*13.3) 26.6 0.1 $2\ Fe(II) + 2\ H + 2\ L \leftrightarrows Fe(II)_2HL_2$ 37.5 0.1 I=0: 39.20860

Equilibrium	Log (K)	I	T	Conversion or remarks
$Co(II) + H_2L \leftrightarrows Co(II)L + 2\ H$	-13.72	0.1		$Co(II) + H_2L \leftrightarrows Co(II)L + 2\ H$ -13.72 0.1 $2\ H + L \leftrightarrows H_2L$ 22.53642 0.1 $Co(II) + L \leftrightarrows Co(II)L$ 8.81642 0.1 I=0: 9.67072
$Co(II)L + H_2L \leftrightarrows Co(II)L_2 + 2\ H$	-16.1	0.1		$Co(II)L + H_2L \leftrightarrows Co(II)L_2 + 2\ H$ -16.1 0.1 $Co(II) + L \leftrightarrows Co(II)L$ 8.81642 0.1 $2\ H + L \leftrightarrows H_2L$ 22.53642 0.1 $Co(II) + 2\ L \leftrightarrows Co(II)L_2$ 15.25284 0.1 I=0: 16.10714
$Ni + H_2L \leftrightarrows NiL + 2\ H$	-13.33	0.1		$Ni + H_2L \leftrightarrows NiL + 2\ H$ -13.33 0.1 $2\ H + L \leftrightarrows H_2L$ 22.53642 0.1 $Ni + L \leftrightarrows NiL$ 9.20642 0.1 I=0: 10.06072
$NiL + H_2L \leftrightarrows NiL_2 + 2\ H$	-16.4	0.1		$NiL + H_2L \leftrightarrows NiL_2 + 2\ H$ -16.4 0.1 $Ni + L \leftrightarrows NiL$ 9.20642 0.1 $2\ H + L \leftrightarrows H_2L$ 22.53642 0.1 $Ni + 2\ L \leftrightarrows NiL_2$ 15.34284 0.1 I=0: 16.19714
$Cu(II) + H_2L \leftrightarrows Cu(II)L + 2\ H$	-8.10			$Cu(II) + H_2L \leftrightarrows Cu(II)L + 2\ H$ -8.10 $2\ H + L \leftrightarrows H_2L$ 23.17715 $Cu(II) + L \leftrightarrows Cu(II)L$ 15.07715
$Cu(II)L + H_2L \leftrightarrows Cu(II)L_2 + 2\ H$	-11.75			$Cu(II)L + H_2L \leftrightarrows Cu(II)L_2 + 2\ H$ -11.75 $Cu(II) + L \leftrightarrows Cu(II)L$ 15.07715 $2\ H + L \leftrightarrows H_2L$ 23.17715 $Cu(II) + 2\ L \leftrightarrows Cu(II)L_2$ 26.50430
$Cu(II)L + H \leftrightarrows Cu(II)HL$	0.85	0.1		$Cu(II)L + H \leftrightarrows Cu(II)HL$ 0.85 0.1 $Cu(II) + L \leftrightarrows Cu(II)L$ 14.22285 0.1 $Cu(II) + L + H \leftrightarrows Cu(II)HL$ 15.07285 0.1 I=0: 15.92715
$Fe(III) + H_2L \leftrightarrows Fe(III)L + 2\ H$	-2.2	0.1		$Fe(III) + H_2L \leftrightarrows Fe(III)L + 2\ H$ -2.2 0.1 $2\ H + L \leftrightarrows H_2L$ 22.53642 0.1 $Fe(III) + L \leftrightarrows Fe(III)L$ 20.33642 0.1 I=0: 21.61787
$Fe(III)L + H_2L \leftrightarrows Fe(III)L_2 + 2\ H$	-7.53	0.1		$Fe(III)L + H_2L \leftrightarrows Fe(III)L_2 + 2\ H$ -7.53 0.1 $Fe(III) + L \leftrightarrows Fe(III)L$ 20.33642 0.1 $2\ H + L \leftrightarrows H_2L$ 22.53642 0.1 $Fe(III) + 2\ L \leftrightarrows Fe(III)L_2$ 35.34284 0.1 I=0: 37.05144
$Fe(III)L_2 + H_2L \leftrightarrows Fe(III)L_3 + 2\ H$	-13.16	0.1		$Fe(III)L_2 + H_2L \leftrightarrows Fe(III)L_3 + 2\ H$ -13.16 0.1 $Fe(III) + 2\ L \leftrightarrows Fe(III)L_2$ 35.34284 0.1 $2\ H + L \leftrightarrows H_2L$ 22.53642 0.1 $Fe(III) + 3\ L \leftrightarrows Fe(III)L_3$ 44.71926 0.1 I=0: 46.00071
$Pd + H_2L \leftrightarrows PdL + 2\ H$	-2.22	0.1		$Pd + H_2L \leftrightarrows PdL + 2\ H$ -2.22 0.1 $2\ H + L \leftrightarrows H_2L$ 22.53642 0.1 $Pd + L \leftrightarrows PdL$ 20.31642 0.1 I=0: 21.17072
$Zn + H_2L \leftrightarrows ZnL + 2\ H$	-12.5	0.1		$Zn + H_2L \leftrightarrows ZnL + 2\ H$ -12.5 0.1 $2\ H + L \leftrightarrows H_2L$ 22.53642 0.1 $Zn + L \leftrightarrows ZnL$ 10.03642 0.1 I=0: 10.89072
$ZnL + H_2L \leftrightarrows ZnL_2 + 2\ H$	-14.5	0.1		$ZnL + H_2L \leftrightarrows ZnL_2 + 2\ H$ -14.5 0.1 $Zn + L \leftrightarrows ZnL$ 10.03642 0.1 $2\ H + L \leftrightarrows H_2L$ 22.53642 0.1 $Zn + 2\ L \leftrightarrows ZnL_2$ 18.07284 0.1 I=0: 18.92714

Equilibrium	Log (K)	I	T	Conversion or remarks
$Cd + H_2L \leftrightarrows CdL + 2\ H$	-13.7	0.1	30	$Cd + H_2L \leftrightarrows CdL + 2\ H$ -13.7 0.1 $2\ H + L \leftrightarrows H_2L$ 22.53642 0.1 $Cd + L \leftrightarrows CdL$ 8.83642 0.1 I=0: 9.69072
two complexes with B(III)				(not entered)
$Al + H_2L \leftrightarrows AlL + 2\ H$	-6.08	0.1		$Al + H_2L \leftrightarrows AlL + 2\ H$ -6.08 0.1 $2\ H + L \leftrightarrows H_2L$ 22.53642 0.1 $Al + L \leftrightarrows AlL$ 16.45642 0.1 I=0: 17.73787
$AlL + H_2L \leftrightarrows AlL_2 + 2\ H$	-9.20	0.1		$AlL + H_2L \leftrightarrows AlL_2 + 2\ H$ -9.20 0.1 $Al + L \leftrightarrows AlL$ 16.45642 0.1 $2\ H + L \leftrightarrows H_2L$ 22.53642 0.1 $Al + 2\ L \leftrightarrows AlL_2$ 29.79284 0.1 I=0: 31.50144
$AlL_2 + H_2L \leftrightarrows AlL_3 + 2\ H$	-13.56	0.1		$AlL_2 + H_2L \leftrightarrows AlL_3 + 2\ H$ -13.56 0.1 $Al + 2\ L \leftrightarrows AlL_2$ 29.79284 0.1 $2\ H + L \leftrightarrows H_2L$ 22.53642 0.1 $Al + 3\ L \leftrightarrows AlL_3$ 38.76926 0.1 I=0: 40.05071
$AlL_2 + H \leftrightarrows AlHL_2$	6.05	0.1		$AlL_2 + H \leftrightarrows AlHL_2$ 6.05 0.1 $Al + 2\ L \leftrightarrows AlL_2$ 29.79284 0.1 $Al + H + 2\ L \leftrightarrows AlHL_2$ 35.84284 0.1 I=0: 37.76502
$AlL_3 + H \leftrightarrows AlHL_3$	8.05	0.1		$AlL_3 + H \leftrightarrows AlHL_3$ 8.05 0.1 $Al + 3\ L \leftrightarrows AlL_3$ 38.76926 0.1 $Al + 3\ L + H \leftrightarrows AlHL_3$ 46.81926 0.1 I=0: 48.74144
$2\ Al + 2\ L \leftrightarrows Al_2(OH)_2L_2 + 2\ H$	24.05	0.1		$2\ Al + 2\ L \leftrightarrows Al_2(OH)_2L_2 + 2\ H$ 24.05 0.1 $2\ OH + 2\ H \leftrightarrows 2\ H_2O$ (2*13.78342) 27.56684 0.1 $2\ Al + 2\ L + 2\ OH \leftrightarrows Al_2(OH)_2L_2$ 51.61684 0.1 I=0: 54.60689.
$3\ Al + 3\ H_2L \leftrightarrows Al_3(OH)_3L_3 + 9\ H$	-29.91	0.5		$3\ Al + 3\ H_2L \leftrightarrows Al_3(OH)_3L_3 + 9\ H$ -29.91 0.5 $6\ H + 3\ L \leftrightarrows 3\ H_2L$ (3*22.37199) 67.11597 0.5 $3\ OH + 3\ H \leftrightarrows 3\ H_2O$ (3*13.72861) 41.18583 0.5 $3\ Al + 3\ OH + 3\ L \leftrightarrows Al_3(OH)_3L_3$ 78.39180 0.5 I=0: 84.02795
$Ga + H_2L \leftrightarrows GaL + 2\ H$	-3.0	0.1	20	$Ga + H_2L \leftrightarrows GaL + 2\ H$ -3.0 0.1 $2\ H + L \leftrightarrows H_2L$ 22.53642 0.1 $Ga + L \leftrightarrows GaL$ 19.53642 0.1 I=0: 20.81787
two complexes with As(III), one with Si(IV) and two with As(V)				(not entered)

Salicylate ($C_7H_6O_3^{2-}$, 2-hydroxybenzoic acid)

Equilibrium	Log (K)	I	T	Conversion or remarks
$H + L \leftrightarrows HL$	13.7			
$HL + H \leftrightarrows H_2L$	2.972			$HL + H \leftrightarrows H_2L$ 2.972 $H + L \leftrightarrows HL$ 13.7 $2\ H + L \leftrightarrows H_2L$ 16.672
$Na + HL \leftrightarrows NaHL$	-0.5	0.1		$Na + HL \leftrightarrows NaHL$ -0.5 0.1 $H + L \leftrightarrows HL$ 13.27285 0.1 $Na + H + L \leftrightarrows NaHL$ 12.77285 0.1 I=0: 13.41358
$K + HL \leftrightarrows KHL$	-0.5	0.1		$K + HL \leftrightarrows KHL$ -0.5 0.1 $H + L \leftrightarrows HL$ 13.27285 0.1 $K + H + L \leftrightarrows KHL$ 12.77285 0.1 I=0: 13.41358
$Be + HL \leftrightarrows BeL + H$	-0.63	0.1		$Be + HL \leftrightarrows BeL + H$ -0.63 0.1 $H + L \leftrightarrows HL$ 13.27285 0.1 $Be + L \leftrightarrows BeL$ 12.64285 0.1 I=0: 13.49715
$BeL + HL \leftrightarrows BeL_2 + H$	-3.4	0.1		$BeL + HL \leftrightarrows BeL_2 + H$ -3.4 0.1 $Be + L \leftrightarrows BeL$ 12.64285 0.1 $H + L \leftrightarrows HL$ 13.27285 0.1 $Be + 2\ L \leftrightarrows BeL_2$ 22.51570 0.1 I=0: 23.37000
$Be + HL \leftrightarrows BeHL$	1.6	1.0		$Be + HL \leftrightarrows BeHL$ 1.6 1.0 $H + L \leftrightarrows HL$ 13.29368 1.0 $Be + H + L \leftrightarrows BeHL$ 14.89368 1.0 I=0: 15.70632
$Be + 2\ HL \leftrightarrows BeH_2L_2$	3.8	1.0		$Be + 2\ HL \leftrightarrows BeH_2L_2$ 3.8 1.0 $2\ H + 2\ L \leftrightarrows 2\ HL$ (2*13.29368) 26.58736 1.0 $Be + 2\ H + 2\ L \leftrightarrows BeH_2L_2$ 30.38736 1.0 I=0: 31.80948
$BeL \leftrightarrows BeOHL + H$	-7.1	1.0		$BeL \leftrightarrows BeOHL + H$ -7.1 1.0 $Be + L \leftrightarrows BeL$ 12.68451 1.0 $OH + H \leftrightarrows H_2O$ 13.79384 1.0 $Be + L + OH \leftrightarrows BeOHL$ 19.37835 1.0 I=0: 20.19099
$BeHL_2 + H \leftrightarrows BeH_2L_2$	2.9	1.0		$BeHL_2 + H \leftrightarrows BeH_2L_2$ 2.9 1.0 invert: $BeH_2L_2 \leftrightarrows BeHL_2 + H$ -2.9 1.0 $Be + 2\ H + 2\ L \leftrightarrows BeH_0L_2$ 30.38736 1.0 $Be + H + 2\ L \leftrightarrows BeHL_2$ 27.48736 1.0 I=0: 28.70632
$3\ Be + 3\ HL \leftrightarrows Be_3L_3(OH)_3 + 6\ H$	-16.2	1.0		$3\ Be + 3\ HL \leftrightarrows Be_3L_3(OH)_3 + 6\ H$ -16.2 1.0 $3\ H + 3\ L \leftrightarrows 3\ HL$ (3*13.29368) 39.88104 1.0 $3\ OH + 3\ H \leftrightarrows 3\ H_2O$ (3*13.79384) 41.38152 1.0 $3\ Be + 3\ L + 3\ OH \leftrightarrows Be_3L_3(OH)_3$ 65.06256 1.0 I=0: 66.89100
$Mg + HL \leftrightarrows MgL + H$	-8.48	0.5		$Mg + HL \leftrightarrows MgL + H$ -8.48 0.5 $H + L \leftrightarrows HL$ 13.16322 0.5 $Mg + L \leftrightarrows MgL$ 4.68322 0.5 I=0: 5.75677
$Mg + HL \leftrightarrows MgHL$	0.4			$Mg + HL \leftrightarrows MgHL$ 0.4 $H + L \leftrightarrows HL$ 13.7 $Mg + H + L \leftrightarrows MgHL$ 14.1
$Ca + HL \leftrightarrows CaL + H$	-10.19	0.5		$Ca + HL \leftrightarrows CaL + H$ -10.19 0.5 $H + L \leftrightarrows HL$ 13.16322 0.5 $Ca + L \leftrightarrows CaL$ 2.97322 0.5 I=0: 4.04677

Equilibrium	Log (K)	I	T	Conversion or remarks
Ca + HL ⇆ CaHL	0.5			Ca + HL ⇆ CaHL 0.5 H + L ⇆ HL 13.7 Ca + H + L ⇆ CaHL 14.2
Ba + HL ⇆ BaHL	0.3			Ba + HL ⇆ BaHL 0.3 H + L ⇆ HL 13.7 Ba + H + L ⇆ BaHL 14.0
La + HL ⇆ LaHL	2.08			La + HL ⇆ LaHL 2.08 H + L ⇆ HL 13.7 La + H + L ⇆ LaHL 15.78
La + 2 HL ⇆ LaH_2L_2	3.6	0.1		La + 2 HL ⇆ LaH_2L_2 3.6 0.1 2 H + 2 L ⇆ 2 HL (2*13.27285) 26.54570 0.1 La + 2 H + 2 L ⇆ LaH_2L_2 30.14570 0.1 I=0: 32.06788
Pr + HL ⇆ PrHL	1.9	0.1		Pr + HL ⇆ PrHL 1.9 0.1 H + L ⇆ HL 13.27285 0.1 Pr + H + L ⇆ PrHL 15.17285 0.1 I=0: 16.24073
Pr + 2 HL ⇆ PrH_2L_2	3.7	0.1		Pr + 2 HL ⇆ PrH_2L_2 3.7 0.1 2 H + 2 L ⇆ 2 HL (2*13.27285) 26.54570 0.1 Pr + 2 H + 2 L ⇆ PrH_2L_2 30.24570 0.1 I=0: 32.16788
Nd + HL ⇆ NdHL	1.9	0.1		Nd + HL ⇆ NdHL 1.9 0.1 H + L ⇆ HL 13.27285 0.1 Nd + H + L ⇆ NdHL 15.17285 0.1 I=0: 16.24073
Nd + 2 HL ⇆ NdH_2L_2	3.6	0.1		Nd + 2 HL ⇆ NdH_2L_2 3.6 0.1 2 H + 2 L ⇆ 2 HL (2*13.27285) 26.54570 0.1 Nd + 2 H + 2 L ⇆ NdH_2L_2 30.14570 0.1 I=0: 32.06788
Sm + HL ⇆ SmHL	2.1	0.1		Sm + HL ⇆ SmHL 2.1 0.1 H + L ⇆ HL 13.27285 0.1 Sm + H + L ⇆ SmHL 15.37285 0.1 I=0: 16.44073
Sm + 2 HL ⇆ SmH_2L_2	3.8	0.1		Sm + 2 HL ⇆ H_2L_2 3.8 0.1 2 H + 2 L ⇆ 2 HL (2*13.27285) 26.54570 0.1 Sm + 2 H + 2 L ⇆ H_2L_2 30.34570 0.1 I=0: 32.26788
Eu + HL ⇆ EuHL	2.0	0.1		Eu + HL ⇆ EuHL 2.0 0.1 H + L ⇆ HL 13.27285 0.1 Eu + H + L ⇆ EuHL 15.27285 0.1 I=0: 16.34073
Eu + 2 HL ⇆ EuH_2L_2	3.8	0.1		Eu + 2 HL ⇆ EuH_2L_2 3.8 0.1 2 H + 2 L ⇆ 2 HL (2*13.27285) 26.54570 0.1 Eu + 2 H + 2 L ⇆ EuH_2L_2 30.34570 0.1 I=0: 32.26788
Gd + HL ⇆ GdHL	1.9	0.1		Gd + HL ⇆ GdHL 1.9 0.1 H + L ⇆ HL 13.27285 0.1 Gd + H + L ⇆ Gd HL 15.17285 0.1 I=0: 16.24073
Gd + 2 HL ⇆ GdH_2L_2	3.8	0.1		Gd + 2 HL ⇆ GdH_2L_2 3.8 0.1 2 H + 2 L ⇆ 2 HL (2*13.27285) 26.54570 0.1 Gd + 2 H + 2 L ⇆ GdH_2L_2 30.34570 0.1 I=0: 32.26788
Tb + HL ⇆ TbHL	1.9	0.1		Tb + HL ⇆ TbHL 1.9 0.1 H + L ⇆ HL 13.27285 0.1 Tb + H + L ⇆ TbHL 15.17285 0.1 I=0: 16.24073

Equilibrium	Log (K)	I	T	Conversion or remarks
$Tb + 2\ HL \leftrightarrows TbH_2L_2$	3.9	0.1		$Tb + 2\ HL \leftrightarrows TbH_2L_2$ 3.9 0.1 $2\ H + 2\ L \leftrightarrows 2\ HL$ (2*13.27285) 26.54570 0.1 $Tb + 2\ H + 2\ L \leftrightarrows TbH_2L_2$ 30.44570 0.1 I=0: 32.36788
$Dy + HL \leftrightarrows DyHL$	1.7	0.1		$Dy + HL \leftrightarrows DyHL$ 1.7 0.1 $H + L \leftrightarrows HL$ 13.27285 0.1 $Dy + H + L \leftrightarrows DyHL$ 14.97285 0.1 I=0: 16.04073
$Dy + 2\ HL \leftrightarrows DyH_2L_2$	3.8	0.1		$Dy + 2\ HL \leftrightarrows DyH_2L_2$ 3.8 0.1 $2\ H + 2\ L \leftrightarrows 2\ HL$ (2*13.27285) 26.54570 0.1 $Dy + 2\ H + 2\ L \leftrightarrows DyH_2L_2$ 30.34570 0.1 I=0: 32.26788
$Ho + HL \leftrightarrows HoHL$	1.8	0.1		$Ho + HL \leftrightarrows HoHL$ 1.8 0.1 $H + L \leftrightarrows HL$ 13.27285 0.1 $Ho + H + L \leftrightarrows HoHL$ 15.07285 0.1 I=0: 16.14073
$Ho + 2\ HL \leftrightarrows HoH_2L_2$	3.8	0.1		$Ho + 2\ HL \leftrightarrows HoH_2L_2$ 3.8 0.1 $2\ H + 2\ L \leftrightarrows 2\ HL$ (2*13.27285) 26.54570 0.1 $Ho + 2\ H + 2\ L \leftrightarrows HoH_2L_2$ 30.34570 0.1 I=0: 32.26788
$Er + HL \leftrightarrows ErHL$	1.8	0.1		$Er + HL \leftrightarrows ErHL$ 1.8 0.1 $H + L \leftrightarrows HL$ 13.27285 0.1 $Er + H + L \leftrightarrows ErHL$ 15.07285 0.1 I=0: 16.14073
$Er + 2\ HL \leftrightarrows ErH_2L_2$	3.6	0.1		$Er + 2\ HL \leftrightarrows ErH_2L_2$ 3.6 0.1 $2\ H + 2\ L \leftrightarrows 2\ HL$ (2*13.27285) 26.54570 0.1 $Er + 2\ H + 2\ L \leftrightarrows HEr_2L_2$ 30.14570 0.1 I=0: 32.06788
$Tm + HL \leftrightarrows TmHL$	1.8	0.1		$Tm + HL \leftrightarrows TmHL$ 1.8 0.1 $H + L \leftrightarrows HL$ 13.27285 0.1 $Tm + H + L \leftrightarrows TmHL$ 15.07285 0.1 I=0: 16.14073
$Tm + 2\ HL \leftrightarrows TmH_2L_2$	3.7	0.1		$Tm + 2\ HL \leftrightarrows TmH_2L_2$ 3.7 0.1 $2\ H + 2\ L \leftrightarrows 2\ HL$ (2*13.27285) 26.54570 0.1 $Tm + 2\ H + 2\ L \leftrightarrows TmH_2L_2$ 30.24570 0.1 I=0: 32.16788
$Yb + HL \leftrightarrows YbHL$	1.8	0.1		$Yb + HL \leftrightarrows YbHL$ 1.8 0.1 $H + L \leftrightarrows HL$ 13.27285 0.1 $Yb + H + L \leftrightarrows YbHL$ 15.07285 0.1 I=0: 16.14073
$Yb + 2\ HL \leftrightarrows YbH_2L_2$	3.5	0.1		$Yb + 2\ HL \leftrightarrows YbH_2L_2$ 3.5 0.1 $2\ H + 2\ L \leftrightarrows 2\ HL$ (2*13.27285) 26.54570 0.1 $Yb + 2\ H + 2\ L \leftrightarrows YbH_2L_2$ 30.04570 0.1 I=0: 31.96788
$Lu + HL \leftrightarrows LuHL$	1.7	0.1		$Lu + HL \leftrightarrows LuHL$ 1.7 0.1 $H + L \leftrightarrows HL$ 13.27285 0.1 $Lu + H + L \leftrightarrows LuHL$ 14.97285 0.1 I=0: 16.04073
$Lu + 2\ HL \leftrightarrows Lu\ H_2L_2$	3.7	0.1		$Lu + 2\ HL \leftrightarrows LuH_2L_2$ 3.7 0.1 $2\ H + 2\ L \leftrightarrows 2\ HL$ (2*13.27285) 26.54570 0.1 $Lu + 2\ H + 2\ L \leftrightarrows LuH_2L_2$ 30.24570 0.1 I=0: 32.16788
$(UO_2) + HL \leftrightarrows (UO_2)L + H$	-0.57			$(UO_2) + HL \leftrightarrows (UO_2)L + H$ -0.57 $H + L \leftrightarrows HL$ 13.7 $(UO_2) + L \leftrightarrows (UO_2)L$ 13.13

Equilibrium	Log (K)	I	T	Conversion or remarks
$(UO_2)L + HL \leftrightarrows (UO_2)L_2 + H$	-3.0	0.1		$(UO_2)L + HL \leftrightarrows (UO_2)L_2 + H$ -3.0 0.1 $(UO_2) + L \leftrightarrows (UO_2)L$ 12.27570 0.1 $H + L \leftrightarrows HL$ 13.27285 0.1 $(UO_2) + 2\ L \leftrightarrows (UO_2)L_2$ 22.54855 0.1 I=0: 23.40285
$(UO_2) + HL \leftrightarrows (UO_2)HL$	1.61	0.1		$(UO_2) + HL \leftrightarrows (UO_2)HL$ 1.61 0.1 $H + L \leftrightarrows HL$ 13.27285 0.1 $(UO_2) + H + L \leftrightarrows (UO_2)HL$ 14.88285 0.1 I=0: 15.73715
$Mn(II) + HL \leftrightarrows Mn(II)L + H$	-7.5	0.1	20	$Mn(II) + HL \leftrightarrows Mn(II)L + H$ -7.5 0.1 $H + L \leftrightarrows HL$ 13.27285 0.1 $Mn(II) + L \leftrightarrows Mn(II)L$ 5.77285 0.1 I=0: 6.62715
$Mn(II)L + HL \leftrightarrows Mn(II)L_2 + H$	-9.7	0.1	20	$Mn(II)L + HL \leftrightarrows Mn(II)L_2 + H$ -9.7 0.1 $Mn(II) + L \leftrightarrows Mn(II)L$ 5.77285 0.1 $H + L \leftrightarrows HL$ 13.27285 0.1 $Mn(II) + 2\ L \leftrightarrows Mn(II)L_2$ 9.34570 0.1 I=0: 10.20000
$Fe(II) + HL \leftrightarrows Fe(II)L + H$	-6.8	0.1	20	$Fe(II) + HL \leftrightarrows Fe(II)L + H$ -6.8 0.1 $H + L \leftrightarrows HL$ 13.27285 0.1 $Fe(II) + L \leftrightarrows Fe(II)L$ 6.47285 0.1 I=0: 7.32715
$Fe(II)L + HL \leftrightarrows Fe(II)L_2 + H$	-8.9	0.1	20	$Fe(II)L + HL \leftrightarrows Fe(II)L_2 + H$ -8.9 0.1 $Fe(II) + L \leftrightarrows Fe(II)L$ 6.47285 0.1 $H + L \leftrightarrows HL$ 13.27285 0.1 $Fe(II) + 2\ L \leftrightarrows Fe(II)L_2$ 10.84570 0.1 I=0: 11.70000
$Co(II) + HL \leftrightarrows Co(II)L + H$	-6.2	0.1		$Co(II) + HL \leftrightarrows Co(II)L + H$ -6.2 0.1 $H + L \leftrightarrows HL$ 13.27285 0.1 $Co(II) + L \leftrightarrows Co(II)L$ 7.07285 0.1 I=0: 7.92715
$Co(II)L + HL \leftrightarrows Co(II)L_2 + H$	-8.9	0.1	20	$Co(II)L + HL \leftrightarrows Co(II)L_2 + H$ -8.9 0.1 $Co(II) + L \leftrightarrows Co(II)L$ 7.07285 0.1 $H + L \leftrightarrows HL$ 13.27285 0.1 $Co(II) + 2\ L \leftrightarrows Co(II)L_2$ 11.44570 0.1 I=0: 12.30000
$Ni + HL \leftrightarrows NiL + H$	-6.0	0.1		$Ni + HL \leftrightarrows NiL + H$ -6.0 0.1 $H + L \leftrightarrows HL$ 13.27285 0.1 $Ni + L \leftrightarrows NiL$ 7.27285 0.1 I=0: 8.12715
$NiL + HL \leftrightarrows NiL_2 + H$	-8.8	0.1	20	$NiL + HL \leftrightarrows NiL_2 + H$ -8.8 0.1 $Ni + L \leftrightarrows NiL$ 7.27285 0.1 $H + L \leftrightarrows HL$ 13.27285 0.1 $Ni + 2\ L \leftrightarrows NiL_2$ 11.74570 0.1 I=0: 12.60000
$Cu(II) + HL \leftrightarrows Cu(II)L + H$	-2.78	0.1		$Cu(II) + HL \leftrightarrows Cu(II)L + H$ -2.78 0.1 $H + L \leftrightarrows HL$ 13.27285 0.1 $Cu(II) + L \leftrightarrows Cu(II)L$ 10.49285 0.1 I=0: 11.34715
$Cu(II)L + HL \leftrightarrows Cu(II)L_2 + H$	-5.0	0.1		$Cu(II)L + HL \leftrightarrows Cu(II)L_2 + H$ -5.0 0.1 $Cu(II) + L \leftrightarrows Cu(II)L$ 10.49285 0.1 $H + L \leftrightarrows HL$ 13.27285 0.1 $Cu(II) + 2\ L \leftrightarrows Cu(II)L_2$ 18.76570 0.1 I=0: 19.62000
$Fe(III) + HL \leftrightarrows Fe(III)L + H$	3.85			$Fe(III) + HL \leftrightarrows Fe(III)L + H$ 3.85 $H + L \leftrightarrows HL$ 13.7 $Fe(III) + L \leftrightarrows Fe(III)L$ 17.55

Equilibrium	Log (K)	I	T	Conversion or remarks
$Fe(III)L + HL \leftrightarrows Fe(III)L_2 + H$	-1.7	0.1		$Fe(III)L + HL \leftrightarrows Fe(III)L_2 + H$ -1.7 0.1 $Fe(III) + L \leftrightarrows Fe(III)L$ 16.26855 0.1 $H + L \leftrightarrows HL$ 13.27285 0.1 $Fe(III) + 2\ L \leftrightarrows Fe(III)L_2$ 27.84140 0.1 I=0: 29.55000
$Fe(III) + HL \leftrightarrows Fe(III)HL$	4.4	0.1		$Fe(III) + HL \leftrightarrows Fe(III)HL$ 4.4 0.1 $H + L \leftrightarrows HL$ 13.27285 0.1 $Fe(III) + H + L \leftrightarrows Fe(III)HL$ 17.67285 0.1 I=0: 18.74073
$Zn + HL \leftrightarrows ZnL + H$	-6.5	0.1	20	$Zn + HL \leftrightarrows ZnL + H$ -6.5 0.1 $H + L \leftrightarrows HL$ 13.27285 0.1 $Zn + L \leftrightarrows ZnL$ 6.77285 0.1 I=0: 7.62715
$Cd + HL \leftrightarrows CdL + H$	-7.8	0.1	20	$Cd + HL \leftrightarrows CdL + H$ -7.8 0.1 $H + L \leftrightarrows HL$ 13.27285 0.1 $Cd + L \leftrightarrows CdL$ 5.47285 0.1 I=0: 6.32715
one complex with B(III)				(not entered)
$Al + HL \leftrightarrows AlL + H$	-0.18	0.1		$Al + HL \leftrightarrows AlL + H$ -0.18 0.1 $H + L \leftrightarrows HL$ 13.27285 0.1 $Al + L \leftrightarrows AlL$ 13.09285 0.1 I=0: 14.37430
$AlL + HL \leftrightarrows AlL_2 + H$	-2.89	0.1		$AlL + HL \leftrightarrows AlL_2 + H$ -2.89 0.1 $Al + L \leftrightarrows AlL$ 13.09285 0.1 $H + L \leftrightarrows HL$ 13.27285 0.1 $Al + 2\ L \leftrightarrows AlL_2$ 23.47570 0.1 I=0: 25.18430
$AlL_2 \leftrightarrows Al(OH)L_2 + H$	-7.13	0.1		$AlL_2 \leftrightarrows Al(OH)L_2 + H$ -7.13 0.1 $Al + 2\ L \leftrightarrows AlL_2$ 23.47570 0.1 $OH + H \leftrightarrows H_2O$ 13.78342 0.1 $Al + 2\ L + OH \leftrightarrows Al(OH)L_2$ 30.12912 0.1 I=0: 31.62415
$Al(OH)L_2 \leftrightarrows Al(OH)_2L_2 + H$	-9.3	0.5		$Al(OH)L_2 \leftrightarrows Al(OH)_2L_2 + H$ -9.3 0.5 $Al + 2\ L + OH \leftrightarrows Al(OH)L_2$ 29.74543 0.5 $OH + H \leftrightarrows H_2O$ 13.72861 0.5 $Al + 2\ L + 2\ OH \leftrightarrows Al(OH)_2L_2$ 34.17404 0.5 I=0: 35.51598
$2\ Al + 2\ L \leftrightarrows Al_2(OH)_2L_2 + 2\ H$	17.9	0.1		$2\ Al + 2\ L \leftrightarrows Al_2(OH)_2L_2 + 2\ H$ 17.9 0.1 $2\ OH + 2\ H \leftrightarrows 2\ H_2O$ (2*13.78342) 27.56684 0.1 $2\ Al + 2\ L + 2\ OH \leftrightarrows Al_2(OH)_2L_2$ 45.46684 0.1 I=0: 48.45689
$Ga + HL \leftrightarrows GaL + H$	0.73	0.1		$Ga + HL \leftrightarrows GaL + H$ 0.73 0.1 $H + L \leftrightarrows HL$ 13.27285 0.1 $Ga + L \leftrightarrows GaL$ 14.00285 0.1 I=0: 15.28430
$Ga + HL \leftrightarrows GaHL$	1.9	0.1		$Ga + HL \leftrightarrows GaHL$ 1.9 0.1 $H + L \leftrightarrows HL$ 13.27285 0.1 $Ga + H + L \leftrightarrows GaHL$ 15.17285 0.1 I=0: 16.24073

Phthalate ($C_8H_6O_4^{2-}$, benzene-1,2-dicarboxylic acid)

Equilibrium	Log (K)	I	T	Conversion or remarks
H + L ⇆ HL	5.411			
HL + H ⇆ H_2L	2.950			HL + H ⇆ H_2L 2.950 H + L ⇆ HL 5.411 2 H + L ⇆ H_2L 8.361
Li + L ⇆ LiL	0.9			
Na + L ⇆ NaL	0.8			
K + L ⇆ KL	0.7			
NH_4 + L ⇆ NH_4L	1.3			NH_4 + L ⇆ NH_4L 1.3 NH_3 + H ⇆ NH_4 9.244 H + NH_3 + L ⇆ NH_4L 10.544
Be + L ⇆ BeL	3.17	0.5		I=0: 4.24355
Be + 2 L ⇆ BeL_2	5.32	0.5		I=0: 6.39355
$Be_3(OH)_3$ + L ⇆ $Be_3(OH)_3L$	2.44	0.5		$Be_3(OH)_3$ + L ⇆ $Be_3(OH)_3L$ 2.44 0.5 3 Be + 3 OH ⇆ Be_3OH_3 32.29484 0.5 3 Be + 3 OH + L ⇆ $Be_3(OH)_3L$ 34.73484 0.5 I=0: 37.15033
Mg + L ⇆ MgL	2.52			
Ca + L ⇆ CaL	2.45			
Ca + HL ⇆ CaHL	1.02			Ca + HL ⇆ CaHL 1.02 H + L ⇆ HL 5.411 Ca + H + L ⇆ CaHL 6.431
Sr + L ⇆ SrL	2.38			
Ba + L ⇆ BaL	2.30			
Y + L ⇆ YL	3.46	0.1		I=0: 4.74145
La + L ⇆ LaL	4.74			
Pr + L ⇆ PrL	3.56	0.1		I=0: 4.84145
Nd + L ⇆ NdL	3.88	0.1		I=0: 5.16145
Sm + L ⇆ SmL	3.70	0.1		I=0: 4.98145
Eu + L ⇆ EuL	3.70	0.1		I=0: 4.98145
Gd + L ⇆ GdL	3.63	0.1		I=0: 4.91145
Tb + L ⇆ TbL	3.46	0.1		I=0: 4.74145
Dy + L ⇆ DyL	3.48	0.1		I=0: 4.76145
Ho + L ⇆ HoL	3.55	0.1		I=0: 4.83145
Er + L ⇆ ErL	3.76	0.1		I=0: 5.04145
Tm + L ⇆ TmL	3.53	0.1		I=0: 4.81145
Yb + L ⇆ YbL	3.48	0.1		I=0: 4.76145
Lu + L ⇆ LuL	3.65	0.1		I=0: 4.93145
$(U(VI)O_2)$+ L ⇆ $(U(VI)O_2)L$	4.81	0.1		I=0: 5.66430
$(U(VI)O_2)$ + 2 L ⇆ $(U(VI)O_2)L_2$	7.73	0.1		I=0: 8.58430
2 $(U(VI)O_2)$ + 2 L ⇆ $(U(VI)O_2)_2(OH)_2L_2$ + 2 H	2.37	0.1		2 $(U(VI)O_2)$ + 2 L ⇆ $(U(VI)O_2)_2(OH)_2L_2$ + 2 H 2.37 0.1 2 H + 2 OH ⇆ 2 H_2O (2*13.78342) 27.56684 0.1 2 $(U(VI)O_2)$ + 2 L + 2 OH ⇆ $(U(VI)O_2)_2L_2(OH)_2$ 29.93684 0.1 I=0: 31.43187
Mn(II) + L ⇆ Mn(II)L	2.74			
Co(II) + L ⇆ Co(II)L	2.83			
Co(II) + HL ⇆ Co(II)HL	1.28	0.5		Co(II) + HL ⇆ Co(II)HL 1.28 0.5 H + L ⇆ HL 4.87422 0.5 Co(II) + H + L ⇆ Co(II)HL 6.15422 0.5 I=0: 7.22777
Ni + L ⇆ NiL	2.95			
Ni + HL ⇆ NiHL	0.7	0.5		Ni + HL ⇆ NiHL 0.7 0.5 H + L ⇆ HL 4.87422 0.5 Ni + H + L ⇆ NiHL 5.57422 0.5 I=0: 6.64777
Cu(II) + L ⇆ Cu(II)L	4.02			

Equilibrium	Log (K)	I	T	Conversion or remarks
$Cu(II) + 2\ L \leftrightarrows Cu(II)L_2$	5.3			
$Cu(II) + HL \leftrightarrows Cu(II)HL$	1.3	0.1		$Cu(II) + HL \leftrightarrows Cu(II)HL$ 1.3 0.1 $H + L \leftrightarrows HL$ 4.98385 0.1 $Cu(II) + H + L \leftrightarrows Cu(II)HL$ 6.28385 0.1 I=0: 7.13815
$Fe(III) + L \leftrightarrows Fe(III)L$	6.07	0.1	30	I=0: 7.35145
$Fe(III) + 2\ L \leftrightarrows Fe(III)L_2$	10.56	0.1	30	I=0: 12.26860
$Fe(III) + 3\ L \leftrightarrows Fe(III)L_3$	13.26	0.1	30	I=0: 14.54145
$Zn + L \leftrightarrows ZnL$	2.91			
$Zn + 2\ L \leftrightarrows ZnL_2$	4.2			
$Cd + L \leftrightarrows CdL$	2.5	0.1		I=0: 3.35430
$Cd + 2\ L \leftrightarrows CdL_2$	2.88	1.0		I=0: 3.69264
$Cd + HL \leftrightarrows CdHL$	0.48	1.0		$Cd + HL \leftrightarrows CdHL$ 0.48 1.0 $H + L \leftrightarrows HL$ 5.00468 1.0 $Cd + H + L \leftrightarrows CdHL$ 5.48468 1.0 I=0: 6.29732
$CdL_2 + H \leftrightarrows CdHL_2$	3.60	1.0		$CdL_2 + H \leftrightarrows CdHL_2$ 3.60 1.0 $Cd + 2\ L \leftrightarrows CdL_2$ 2.88 1.0 $Cd + 2\ L + H \leftrightarrows CdHL_2$ 6.48 1.0 I=0: 7.76145
$Pb(II) + L \leftrightarrows Pb(II)L$	2.78	1.0		I=0: 3.59264
$Pb(II) + 2\ L \leftrightarrows Pb(II)L_2$	4.01	1.0		I=0: 4.82264
$Pb(II) + HL \leftrightarrows Pb(II)HL$	1.16	1.0		$Pb(II) + HL \leftrightarrows Pb(II)HL$ 1.16 1.0 $H + L \leftrightarrows HL$ 5.00468 1.0 $Pb(II) + H + L \leftrightarrows Pb(II)HL$ 6.16468 1.0 I=0: 6.97732
$Pb(II)L_2 + H \leftrightarrows Pb(II)HL_2$	3.77	1.0		$Pb(II)L_2 + H \leftrightarrows Pb(II)HL_2$ 3.77 1.0 $Pb(II) + 2\ L \leftrightarrows Pb(II)L_2$ 4.01 1.0 $Pb(II) + 2\ L \leftrightarrows H \leftrightarrows Pb(II)HL_2$ 7.78 1.0 I=0: 8.99896
$B(OH)_3 + L \leftrightarrows B(OH)_3L$	-0.07			$B(OH)_3 + L \leftrightarrows B(OH)_3L$ -0.07 $H + H_2BO_3 \leftrightarrows H_3BO_3$ 9.236 $H + H_2BO_3 + L \leftrightarrows B(OH)_3L$ 9.166
$B(OH)_3 + HL \leftrightarrows B(OH)_3HL$	-1			$B(OH)_3 + HL \leftrightarrows B(OH)_3HL$ -1 $H + H_2BO_3 \leftrightarrows H_3BO_3$ 9.236 $H + L \leftrightarrows HL$ 5.411 $2\ H + H_2BO_3 + L \leftrightarrows B(OH)_3HL$ 13.647
$Al + L \leftrightarrows AlL$	2.94	0.5		I=0: 4.55033
$Al + 2\ L \leftrightarrows AlL_2$	5.0	0.5		I=0: 7.14711
$2\ Al + L \leftrightarrows Al_2(OH)_2L + 2\ H$	-2.50	0.5		$2\ Al + L \leftrightarrows Al_2(OH)_2L + 2\ H$ -2.50 0.5 $2\ OH + 2\ H \leftrightarrows 2\ H_2O$ (2*13.72861) 27.45722 0.5 $2\ Al + L + 2\ OH \leftrightarrows Al_2(OH)_2L$ 24.95722 0.5 I=0: 27.64110
$3\ Al + L \leftrightarrows Al_3(OH)_4L + 4\ H$	-8.47	0.5		$3\ Al + L \leftrightarrows Al_3(OH)_4L + 4\ H$ -8.47 0.5 $4\ OH + 4\ H \leftrightarrows 4\ H_2O$ (4*13.72861) 54.91444 0.5 $3\ Al + L + 4\ OH \leftrightarrows Al_3(OH)_4L$ 46.44444 0.5 I=0: 49.93349
$2\ Al + 2\ L \leftrightarrows Al_2(OH)_2L_2 + 2\ H$	-0.07	0.5		$2\ Al + 2\ L \leftrightarrows Al_2(OH)_2L_2 + 2\ H$ -0.07 0.5 $2\ OH + 2\ H \leftrightarrows 2\ H_2O$ (2*13.72861) 27.45722 0.5 $2\ Al + 2\ L + 2\ OH \leftrightarrows Al_2(OH)_2L_2$ 27.38722 0.5 I=0: 31.14465
$Ga + L \leftrightarrows GaL$	5.15	0.1		I=0: 6.43145

NTA ($C_6H_6NO_6^{3-}$, nitrilotriacetic acid)

Equilibrium	Log (K)	I	T	Conversion or remarks
H + L ⇆ HL	9.46 9.66 9.84	0.1		Values are for three background electrolytes (Na/K/N(alkyl)$_4$); the average is used (28.96/3 = 9.65333 at I=0.1) I=0: 10.29406
HL + H ⇆ H_2L	2.52	0.1		HL + H ⇆ H_2L 2.52 0.1 H + L ⇆ HL 9.65333 0.1 2 H + L ⇆ H_2L 12.17333 0.1 I=0: 13.24121
H_2L + H ⇆ H_3L	2.0			H_2L + H ⇆ H_3L 2.0 2 H + L ⇆ H_2L 13.24121 3 H + L ⇆ H_3L 15.24121
H_3L + H ⇆ H_4L	1.0	0.1		H_3L + H ⇆ H_4L 1.0 0.1 3 H + L ⇆ H_3L 13.95976 0.1 4 H + L ⇆ H_4L 14.95976 0.1 I=0: 16.24121
Li + L ⇆ LiL	2.45	0.1		I=0: 3.09073
Na + L ⇆ NaL	1.2	0.1		I=0: 1.84073
K + L ⇆ KL	0.6	0.1		I=0: 1.24073
Rb + L ⇆ RbL	0.4	0.1		I=0: 1.04073
Cs + L ⇆ CsL	0.2	0.1		I=0: 0.84073
Be + L ⇆ BeL	7.79	0.1		I=0: 9.07145
Mg + L ⇆ MgL	5.50	0.1		I=0: 6.78145
Ca + L ⇆ CaL	6.3 6.44 6.64	0.1		as for the first equilibrium: three different background electrolytes; used: average: 6.46 I=0: 7.74145
Ca + 2 L ⇆ CaL_2	8.81 9.27	0.1		similarly: values for K and N(alkyl)$_4$ background; used: 9.04 I=0: 9.68073
Sr + L ⇆ SrL	4.99	0.1		I=0: 6.27145
Ba + L ⇆ BaL	4.81	0.1		I=0: 6.09145
Sc + L ⇆ ScL	12.7	0.1		I=0: 14.62218
Sc + 2 L ⇆ ScL_2	24.1	0.1	20	I=0: 26.02218
ScL + OH ⇆ Sc(OH)L	7.44	0.1	20	ScL + OH ⇆ Sc(OH)L 7.44 0.1 Sc + L ⇆ ScL 12.7 0.1 Sc + L + OH ⇆ Sc(OH)L 20.14 0.1 I=0: 22.06218
Y + L ⇆ YL	11.42	0.1		I=0: 13.34218
Y + 2 L ⇆ YL_2	20.41	0.1		I=0: 22.33218
YL + OH ⇆ Y(OH)L	6.39	0.1		YL + OH ⇆ Y(OH)L 6.39 0.1 Y + L ⇆ YL 11.42 0.1 Y + OH + L ⇆ Y(OH)L 17.81 0.1 I=0: 19.73218
La + L ⇆ LaL	10.47	0.1		I=0: 12.39218
La + 2 L ⇆ LaL_2	17.84	0.1		I=0: 19.76218
LaL + OH ⇆ La(OH)L	5.9	0.1		LaL + OH ⇆ La(OH)L 5.9 0.1 La + L ⇆ LaL 10.47 0.1 La + OH + L ⇆ La(OH)L 16.37 0.1 I=0: 18.29218
Ce + L ⇆ CeL	10.70	0.1		I=0: 12.62218
Ce + 2 L ⇆ CeL_2	18.66	0.1		I=0: 20.58218
CeL + OH ⇆ Ce(OH)L	5.78	0.1	20	CeL + OH ⇆ Ce(OH)L 5.78 0.1 Ce + L ⇆ CeL 10.70 0.1 Ce + OH + L ⇆ Ce(OH)L 16.48 0.1 I=0: 18.40218
Pr + L ⇆ PrL	10.87	0.1		I=0: 12.79218
Pr + 2 L ⇆ PrL_2	19.02	0.1		I=0: 20.94218
PrL + OH ⇆ Pr(OH)L	5.72	0.1		PrL + OH ⇆ Pr(OH)L 5.72 0.1 Pr + L ⇆ PrL 10.87 0.1 Pr + OH + L ⇆ Pr(OH)L 16.59 0.1 I=0: 18.51218

Equilibrium	Log (K)	I	T	Conversion or remarks		
Nd + L ⇆ NdL	11.10	0.1		I=0: 13.02218		
Nd + 2 L ⇆ NdL_2	19.51	0.1		I=0: 21.43218		
NdL + OH ⇆ Nd(OH)L	5.86	0.1		NdL + OH ⇆ Nd(OH)L	5.86	0.1
				Nd + L ⇆ NdL	11.10	0.1
				Nd + OH + L ⇆ Nd(OH)L	16.96	0.1
				I=0: 18.88218		
Pm + 2 L ⇆ PmL_2	19.7	0.1	20	I=0: 21.62218		
Sm + L ⇆ SmL	11.32	0.1		I=0: 13.24218		
Sm + 2 L ⇆ SmL_2	20.43	0.1		I=0: 22.35218		
SmL + OH ⇆ Sm(OH)L	6.59	0.1		SmL + OH ⇆ Sm(OH)L	6.59	0.1
				Sm + L ⇆ SmL	11.32	0.1
				Sm + OH + L ⇆ Sm(OH)L	17.91	0.1
				I=0: 19.83218		
Eu + L ⇆ EuL	11.32	0.1		I=0: 13.24218		
Eu + 2 L ⇆ EuL_2	20.64	0.1		I=0: 22.56218		
EuL + OH ⇆ Eu(OH)L	6.84	0.1		EuL + OH ⇆ Eu(OH)L	6.84	0.1
				Eu + L ⇆ EuL	11.32	0.1
				Eu + OH + L ⇆ Eu(OH)L	18.16	0.1
				I=0: 20.08218		
Gd + L ⇆ GdL	11.35	0.1		I=0: 13.27218		
Gd + 2 L ⇆ GdL_2	20.66	0.1		I=0: 22.58218		
GdL + OH ⇆ Gd(OH)L	6.54	0.1		GdL + OH ⇆ Gd(OH)L	6.54	0.1
				Gd + L ⇆ GdL	11.35	0.1
				Gd + OH + L ⇆ Gd(OH)L	17.89	0.1
				I=0: 19.81218		
Tb + L ⇆ TbL	11.50	0.1		I=0: 13.42218		
Tb + 2 L ⇆ TbL_2	20.95	0.1		I=0: 22.87218		
TbL + OH ⇆ Tb(OH)L	6.67	0.1		TbL + OH ⇆ Tb(OH)L	6.67	0.1
				Tb + L ⇆ TbL	11.50	0.1
				Tb + OH + L ⇆ Tb(OH)L	18.17	0.1
				I=0: 20.09218		
Dy + L ⇆ DyL	11.63	0.1		I=0: 13.55218		
Dy + 2 L ⇆ DyL_2	20.98	0.1		I=0: 22.90218		
DyL + OH ⇆ Dy(OH)L	6.84	0.1		DyL + OH ⇆ Dy(OH)L	6.84	0.1
				Dy + L ⇆ DyL	11.63	0.1
				Dy + OH + L ⇆ Dy(OH)L	18.47	0.1
				I=0: 20.39218		
Ho + L ⇆ HoL	11.76	0.1		I=0: 13.68218		
Ho + 2 L ⇆ HoL_2	21.06	0.1		I=0: 22.98218		
HoL + OH ⇆ Ho(OH)L	6.66	0.1		HoL + OH ⇆ Ho(OH)L	6.66	0.1
				Ho + L ⇆ HoL	11.76	0.1
				Ho + OH + L ⇆ Ho(OH)L	18.42	0.1
				I=0: 20.34218		
Er + L ⇆ ErL	11.90	0.1		I=0: 13.82218		
Er + 2 L ⇆ ErL_2	21.09	0.1		I=0: 23.01218		
ErL + OH ⇆ Er(OH)L	6.56	0.1		ErL + OH ⇆ Er(OH)L	6.56	0.1
				Er + L ⇆ ErL	11.90	0.1
				Er + OH + L ⇆ Er(OH)L	18.46	0.1
				I=0: 20.38218		
Tm + L ⇆ TmL	12.07	0.1		I=0: 13.99218		
Tm + 2 L ⇆ TmL_2	21.22	0.1		I=0: 23.14218		
TmL + OH ⇆ Tm(OH)L	6.24	0.1		TmL + OH ⇆ Tm(OH)L	6.24	0.1
				Tm + L ⇆ TmL	12.07	0.1
				Tm + OH + L ⇆ Tm(OH)L	18.31	0.1
				I=0: 20.23218		
Yb + L ⇆ YbL	12.21	0.1		I=0: 14.13218		
Yb + 2 L ⇆ YbL_2	21.41	0.1		I=0: 23.33218		
YbL + OH ⇆ Yb(OH)L	6.29	0.1		YbL + OH ⇆ Yb(OH)L	6.29	0.1
				Yb + L ⇆ YbL	12.21	0.1
				Yb + OH + L ⇆ Yb(OH)L	18.50	0.1
				I=0: 20.42218		
Lu + L ⇆ LuL	12.32	0.1		I=0: 14.24218		
Lu + 2 L ⇆ LuL_2	21.65	0.1		I=0: 23.57218		

Equilibrium	Log (K)	I	T	Conversion or remarks
LuL + OH ⇆ Lu(OH)L	6.30	0.1		LuL + OH ⇆ Lu(OH)L 6.30 0.1 Lu + L ⇆ LuL 12.32 0.1 Lu + OH + L ⇆ Lu(OH)L 18.62 0.1 I=0: 20.54218
(UO_2) + L ⇆ (UO_2)L	9.50	0.1		I=0: 10.78145
Mn(II) + L ⇆ Mn(II)L	7.27 7.46	0.1		7.46 is for K as background electrolyte; 7.27 for Na as background electrolyte; used: average 7.365 I=0: 8.64645
Mn(II) + 2 L ⇆ Mn(II)L_2	10.44 10.94	0.1		for resp. Na and K as background electrolyte; used: average 10.69 I=0: 11.33073
Fe(II) + L ⇆ Fe(II)L	8.90	0.1		I=0: 10.18145
Fe(II) + 2 L ⇆ Fe(II)L_2	11.98	0.1		I=0: 12.62073
Fe(II)L ⇆ Fe(II)(OH)L + H	-10.82	0.1		Fe(II)L ⇆ Fe(II)(OH)L + H -10.82 0.1 OH + H ⇆ H_2O 13.78342 0.1 Fe(II) + L ⇆ Fe(II)L 8.90 0.1 Fe(II) + L + OH ⇆ Fe(II)(OH)L 11.86342 0.1 I=0: 12.93130
Co(II) + L ⇆ Co(II)L	10.38	0.1		I=0: 11.66145
Co(II) + 2 L ⇆ Co(II)L_2	14.33	0.1		I=0: 14.97073
Co(II)L ⇆ Co(II)(OH)L + H	-10.80	0.1		Co(II)L ⇆ Co(II)(OH)L + H -10.80 0.1 OH + H ⇆ H_2O 13.78342 0.1 Co(II) + L ⇆ Co(II)L 10.38 0.1 Co(II) + L + OH ⇆ Co(II)(OH)L 13.36342 0.1 I=0: 14.43130
Ni + L ⇆ NiL	11.51	0.1		I=0: 12.79145
Ni + 2 L ⇆ NiL_2	16.32	0.1		I=0: 16.96073
NiL ⇆ Ni(OH)L + H	-10.86	0.1		NiL ⇆ Ni(OH)L + H -10.86 0.1 OH + H ⇆ H_2O 13.78342 0.1 Ni + L ⇆ NiL 11.50 0.1 Ni + L + OH ⇆ Ni(OH)L 14.42342 0.1 I=0: 15.49130
Cu(II) + L ⇆ Cu(II)L	12.7 13.0 13.3	0.1		three values for resp. Na as background electrolyte; "corrected for background electrolyte" and K as background electrolyte; used: average: 13.0 I=0: 14.28145
Cu(II) + 2 L ⇆ Cu(II)L_2	17.4	0.1		I=0: 18.04073
Cu(II)L + H ⇆ Cu(II)HL	1.6	0.1		Cu(II)L + H ⇆ Cu(II)HL 1.6 0.1 Cu(II) + L ⇆ Cu(II)L 13.0 0.1 Cu(II) + L + H ⇆ Cu(II)HL 14.6 0.1 I=0: 16.09503
Cu(II)L ⇆ Cu(II)(OH)L + H	-9.2	0.1		Cu(II)L ⇆ Cu(II)(OH)L + H -9.2 0.1 OH + H ⇆ H_2O 13.78342 0.1 Cu(II) + L ⇆ Cu(II)L 13.0 0.1 Cu(II) + L + OH ⇆ Cu(II)(OH)L 17.58342 0.1 I=0: 18.65130
Cr(III)L ⇆ Cr(III)(OH)L + H	-6.23	0.1	20	(can not be related to components; not entered)
Cr(III)(OH)L ⇆ Cr(III)$(OH)_2$L + H	-8.45	0.1	20	(can not be related to components; not entered)
Fe(III) + L ⇆ Fe(III)L	16.00	0.1		I=0: 17.92218
Fe(III) + 2 L ⇆ Fe(III)L_2	24.0	0.1		I=0: 25.92218
Fe(III)L + H ⇆ Fe(III)HL	1.0	0.5		Fe(III)L + H ⇆ Fe(III)HL 1.0 0.5 Fe(III) + L ⇆ Fe(III)L 15.50669 0.5 Fe(III) + L + H ⇆ Fe(III)HL 16.50669 0.5 I=0: 18.92218

Equilibrium	Log (K)	I	T	Conversion or remarks
$Fe(III)L \leftrightarrows Fe(III)(OH)L + H$	-4.36	0.1		$Fe(III)L \leftrightarrows Fe(III)(OH)L + H$ -4.36 0.1 $OH + H \leftrightarrows H_2O$ 13.78342 0.1 $Fe(III) + L \leftrightarrows Fe(III)L$ 16.00 0.1 $Fe(III) + L + OH \leftrightarrows Fe(III)(OH)L$ 25.42342 0.1 I=0: 27.34560
$Fe(III)(OH)L \leftrightarrows Fe(III)(OH)_2L + H$	-7.58	0.1		$Fe(III)(OH)L \leftrightarrows Fe(III)(OH)_2L + H$ -7.58 0.1 $Fe(III) + L + OH \leftrightarrows Fe(III)(OH)L$ 25.42342 0.1 $OH + H \leftrightarrows H_2O$ 13.78342 0.1 $Fe(III) + 2\ OH + L \leftrightarrows Fe(III)(OH)_2L$ 31.62684 0.1 I=0: 33.33544
$Fe(III)(OH)_2L \leftrightarrows Fe(III)(OH)_3L + H$	-10.72	0.1		$Fe(III)(OH)_2L \leftrightarrows Fe(III)(OH)_3L + H$ -10.72 0.1 $Fe(III) + 2\ OH + L \leftrightarrows Fe(III)(OH)_2L$ 31.62684 0.1 $OH + H \leftrightarrows H_2O$ 13.78342 0.1 $Fe(III) + 3\ OH + L \leftrightarrows Fe(III)(OH)_3L$ 34.69026 0.1 I=0: 35.97171
$2\ Fe(III) + 2\ L \leftrightarrows Fe(III)_2L_2$	30.9	0.5		I=0: 35.73099
$2\ Fe(III)(OH)L \leftrightarrows Fe(III)_2(OH)_2L_2$	9.14	0.5		$2\ Fe(III)(OH)L \leftrightarrows Fe(III)_2(OH)_2L_2$ 9.14 0.5 $2\ Fe(III) + 2\ L + 2\ OH \leftrightarrows 2\ Fe(III)(OH)L$ (2*24.93011) 49.86022 0.5 $2\ Fe(III) + 2\ L + 2\ OH \leftrightarrows Fe(III)_2(OH)_2L_2$ 59.00022 0.5 I=0: 63.56282
$Co(III)L \leftrightarrows Co(III)(OH)L + H$	-6.84	0.1	20	(can not be related to components; not entered)
$Co(III)(OH)L \leftrightarrows Co(III)(OH)_2L + H$	-9.66	0.1	20	(can not be related to components; not entered)
$Zr + L \leftrightarrows ZrL$	24.1			
$Hf + L \leftrightarrows HfL$	23.6			
$Ag + L \leftrightarrows AgL$	4.85 5.08	0.1		for resp. Na and K background; used: average (9.93/2=4.965) I=0: 5.60573
$AgL + H \leftrightarrows AgHL$	7.0	1.0		$AgL + H \leftrightarrows AgHL$ 7.0 1.0 $Ag + L \leftrightarrows AgL$ 4.99625 1.0 $Ag + H + L \leftrightarrows AgHL$ 11.99625 1.0 I=0: 13.01205
$Pd + L \leftrightarrows PdL$	17.0	1.0	20	I=0: 18.21896
$Pd + 2\ L \leftrightarrows PdL_2$	23.7	1.0	20	I=0: 24.30948
$PdL + H \leftrightarrows PdHL$	7.82	1.0	20	$PdL + H \leftrightarrows PdHL$ 7.82 1.0 $Pd + L \leftrightarrows PdL$ 17.0 1.0 $Pd + H + L \leftrightarrows PdHL$ 24.82 1.0 I=0: 26.24212
$PdHL + H \leftrightarrows PdH_2L$	0.5	1.0	20	$PdHL + H \leftrightarrows PdH_2L$ 0.5 1.0 $Pd + H + L \leftrightarrows PdHL$ 24.82 1.0 $Pd + 2\ H + L \leftrightarrows PdH_2L$ 25.32 1.0 I=0: 26.74212
$2\ PdL \leftrightarrows Pd_2L_2$	2	1.0	20	$2\ PdL \leftrightarrows Pd_2L_2$ 2 1.0 $Pd + L \leftrightarrows PdL$ (2*17.0) 34.0 1.0 $2\ Pd + 2\ L \leftrightarrows Pd_2L_2$ 36.0 1.0 I=0: 38.23476
$PdL + PdOHL \leftrightarrows Pd_2OHL_2$	3.1	1.0	20	constant for PdOHL is not given; therefore Pd_2OHL_2 can not be calculated
$Zn + L \leftrightarrows ZnL$	10.45 10.66	0.1		10.45 for KCl as background electrolyte; 10.66 for KNO_3; used: average of 10.555 I=0: 11.83645
$Zn + 2\ L \leftrightarrows ZnL_2$	14.24	0.1		I=0: 14.88073

Equilibrium	Log (K)	I	T	Conversion or remarks
$ZnL \leftrightarrows Zn(OH)L + H$	-10.1 -10.06	0.1		-10.1 for $NaNO_3$ as background electrolyte; -10.06 for KNO_3; used: average of –10.08 $ZnL \leftrightarrows Zn(OH)L + H$ -10.08 0.1 $Zn + L \leftrightarrows ZnL$ 10.66 0.1 $OH + H \leftrightarrows H_2O$ 13.78342 0.1 $Zn + L + OH \leftrightarrows Zn(OH)L$ 14.36342 0.1 I=0: 15.43130
$Cd + L \leftrightarrows CdL$	9.76	0.1		I=0: 11.04145
$Cd + 2\ L \leftrightarrows CdL_2$	14.47	0.1		I=0: 15.11073
$CdL \leftrightarrows Cd(OH)L + H$	-11.25	0.1		$CdL \leftrightarrows Cd(OH)L + H$ -11.25 0.1 $Cd + L \leftrightarrows CdL$ 9.76 0.1 $OH + H \leftrightarrows H_2O$ 13.78342 0.1 $Cd + L + OH \leftrightarrows Cd(OH)L$ 12.29342 0.1 I=0: 13.36130
$Hg(II) + L \leftrightarrows Hg(II)L$	14.3	0.1		I=0: 15.58145
$Pb(II) + L \leftrightarrows Pb(II)L$	11.48	0.1		I=0: 12.76145
$Pb(II) + 2\ L \leftrightarrows Pb(II)L_2$	12.8	0.1	20	I=0: 13.44073
$Pb(II)L + H \leftrightarrows Pb(II)HL$	2.3	0.5		$Pb(II)L + H \leftrightarrows Pb(II)HL$ 2.3 0.5 $Pb(II) + L \leftrightarrows Pb(II)L$ 11.15112 0.5 $Pb(II) + H + L \leftrightarrows Pb(II)HL$ 13.45112 0.5 I=0: 15.32984
$Al + L \leftrightarrows AlL$	11.4	0.1		I=0: 13.32218
$AlL + H \leftrightarrows AlHL$	1.90	0.1		$AlL + H \leftrightarrows AlHL$ 1.90 0.1 $Al + L \leftrightarrows AlL$ 11.4 0.1 $Al + H + L \leftrightarrows AlHL$ 13.3 0.1 I=0: 15.22218
$AlL \leftrightarrows Al(OH)L + H$	-5.09	0.1		$AlL \leftrightarrows Al(OH)L + H$ -5.09 0.1 $Al + L \leftrightarrows AlL$ 11.4 0.1 $OH + H \leftrightarrows H_2O$ 13.78342 0.1 $Al + L + OH \leftrightarrows Al(OH)L$ 20.09342 0.1 I=0: 22.01560
$Al(OH)L \leftrightarrows Al(OH)_2L + H$	-8.28	0.1		$Al(OH)L \leftrightarrows Al(OH)_2L + H$ -8.28 0.1 $Al + L + OH \leftrightarrows Al(OH)L$ 20.09342 0.1 $OH + H \leftrightarrows H_2O$ 13.78342 0.1 $Al + L + 2\ OH \leftrightarrows Al(OH)_2L$ 25.59684 0.1 I=0: 27.30544
$2\ Al(OH)L \leftrightarrows Al_2(OH)_2L_2$	1.82	0.5		$2\ Al(OH)L \leftrightarrows Al_2(OH)_2L_2$ 1.82 0.5 $2\ Al + 2\ OH + 2\ L \leftrightarrows 2\ Al(OH)L$ (2*19.60011) 39.20022 0.5 $2\ Al + 2\ OH + 2\ L \leftrightarrows Al_2(OH)_2L_2$ 41.02022 0.5 I=0: 45.58282
$Ga + L \leftrightarrows GaL$	13.6 13.9	0.1	20	13.6 for Na as background electrolyte; 13.9 for K used: average (13.75) I=0: 15.67218
$GaL \leftrightarrows GaOHL + H$	-4.27	0.1		$GaL \leftrightarrows GaOHL + H$ -4.27 0.1 $Ga + L \leftrightarrows GaL$ 13.75 0.1 $OH + H \leftrightarrows H_2O$ 13.78342 0.1 $Ga + L + OH \leftrightarrows GaOHL$ 23.26342 0.1 I=0: 25.18560
$GaOHL \leftrightarrows Ga(OH)_2L + H$	-7.64	0.1		$GaOHL \leftrightarrows Ga(OH)_2L + H$ -7.64 0.1 $Ga + L + OH \leftrightarrows GaOHL$ 23.26342 0.1 $OH + H \leftrightarrows H_2O$ 13.78342 0.1 $Ga + 2\ OH + L \leftrightarrows Ga(OH)_2L$ 29.40684 0.1 I=0: 31.11544
$In + L \leftrightarrows InL$	13.81	0.1		I=0: 15.73218
$In + 2\ L \leftrightarrows InL_2$	23.70	0.1		I=0: 25.62218
$InL_2 + H \leftrightarrows InHL_2$	2.87	0.1		$InL_2 + H \leftrightarrows InHL_2$ 2.87 0.1 $In + 2\ L \leftrightarrows InL_2$ 23.70 0.1 $In + H + 2\ L \leftrightarrows InHL2$ 26.57 0.1 I=0: 29.13290
$Bi + L \leftrightarrows BiL$	18.2	0.1		I-0: 20.12218
$Bi + 2\ L \leftrightarrows BiL_2$	26.6	1.0	20	I=0: 28.42844

Equilibrium	Log (K)	I	T	Conversion or remarks
$As(III)(OH)_2 + H + L \leftrightarrows As(III)(OH)_2HL$	15.3	0.1		(can not be related to components; not entered)

HEDTA ($C_{10}H_{15}N_2O_7^{3-}$, N-(2-hydroxyethyl)ethylenedinitrilotriacetic acid)

Equilibrium	Log (K)	I	T	Conversion or remarks
H + L ⇆ HL	9.70 9.87	0.1		Values are for two background electrolytes (Na/K); the average is used (19.57/2 = 9.785 at I=0.1) I=0: 10.42573
HL + H ⇆ H_2L	5.38	0.1		HL + H ⇆ H_2L 5.38 0.1 H + L ⇆ HL 9.785 0.1 2 H + L ⇆ H_2L 15.165 0.1 I=0: 16.23288
H_2L + H ⇆ H_3L	2.62	0.1		H_2L + H ⇆ H_3L 2.62 0.1 2 H + L ⇆ H_2L 15.165 0.1 3 H + L ⇆ H_3L 17.785 0.1 I=0: 19.06645
H_3L + H ⇆ H_4L	1.6	1.0		H_3L + H ⇆ H_4L 1.6 1.0 3 H + L ⇆ H_3L 17.84749 1.0 4 H + L ⇆ H_4L 19.44749 1.0 I=0: 20.66645
Mg + L ⇆ MgL	7.0	0.1		I=0: 8.28145
Ca + L ⇆ CaL	8.1	0.1		I=0: 9.38145
Sr + L ⇆ SrL	6.8	0.1		I=0: 8.08145
Ba + L ⇆ BaL	6.2	0.1		I=0: 7.48145
Sc + L ⇆ ScL	17.3	0.1		I=0: 19.22218
Y + L ⇆ YL	14.72	0.1		I=0: 16.64218
YL + OH ⇆ YOHL	4.76	0.1	20	YL + OH ⇆ YOHL 4.76 0.1 Y + L ⇆ YL 14.72 0.1 Y + OH + L ⇆ YOHL 19.48 0.1 I=0: 21.40218
La + L ⇆ LaL	13.48	0.1		I=0: 15.40218
LaL + OH ⇆ LaOHL	3.46	0.1	20	LaL + OH ⇆ LaOHL 3.46 0.1 La + L ⇆ LaL 13.48 0.1 La + OH + L ⇆ LaOHL 16.94 0.1 I=0: 18.86218
Ce + L ⇆ CeL	14.09	0.1		I=0: 16.01218
Pr + L ⇆ PrL	14.61	0.1		I=0: 16.53218
PrL + OH ⇆ PrOHL	3.69	0.1	20	PrL + OH ⇆ PrOHL 3.69 0.1 Pr + L ⇆ PrL 14.61 0.1 Pr + OH + L ⇆ PrOHL 18.40 0.1 I=0: 20.32218
Nd + L ⇆ NdL	14.88	0.1		I=0: 16.80218
NdL + OH ⇆ NdOHL	3.59	0.1	20	NdL + OH ⇆ NdOHL 3.59 0.1 Nd + L ⇆ NdL 14.88 0.1 Nd + OH + L ⇆ NdOHL 18.47 0.1 I=0: 20.39218
Sm + L ⇆ SmL	15.31	0.1		I=0: 17.23218
SmL + OH ⇆ SmOHL	3.70	0.1	20	SmL + OH ⇆ SmOHL 3.70 0.1 Sm + L ⇆ SmL 15.31 0.1 Sm + OH + L ⇆ SmOHL 19.01 0.1 I=0: 20.93218
Eu + L ⇆ EuL	15.34	0.1		I=0: 17.26218
EuL + OH ⇆ EuOHL	4.03	0.1	20	EuL + OH ⇆ EuOHL 4.03 0.1 Eu + L ⇆ EuL 15.34 0.1 Eu + OH + L ⇆ EuOHL 19.37 0.1 I=0: 21.29218
Gd + L ⇆ GdL	15.20	0.1		I=0: 17.12218
GdL + OH ⇆ GdOHL	3.98	0.1	20	GdL + OH ⇆ GdOHL 3.98 0.1 Gd + L ⇆ GdL 15.20 0.1 Gd + OH + L ⇆ GdOHL 19.18 0.1 I=0: 21.10218
Tb + L ⇆ TbL	15.28	0.1		I=0: 17.20218

Equilibrium	Log (K)	I	T	Conversion or remarks
TbL + OH ⇆ TbOHL	4.52	0.1	20	TbL + OH ⇆ TbOHL 4.52 0.1 Tb + L ⇆ TbL 15.28 0.1 Tb + OH + L ⇆ TbOHL 19.80 0.1 I=0: 21.72218
Dy + L ⇆ DyL	15.26	0.1		I=0: 17.18218
DyL + OH ⇆ DyOHL	4.88	0.1	20	DyL + OH ⇆ DyOHL 4.88 0.1 Dy + L ⇆ DyL 15.26 0.1 Dy + OH + L ⇆ DyOHL 20.14 0.1 I=0: 22.06218
Ho + L ⇆ HoL	15.28	0.1		I=0: 17.20218
HoL + OH ⇆ HoOHL	5.12	0.1	20	HoL + OH ⇆ HoOHL 5.12 0.1 Ho + L ⇆ HoL 15.28 0.1 Ho + OH + L ⇆ HoOHL 20.40 0.1 I=0: 22.32218
Er + L ⇆ ErL	15.38	0.1		I=0: 17.30218
ErL + OH ⇆ ErOHL	5.14	0.1	20	ErL + OH ⇆ ErOHL 5.14 0.1 Er + L ⇆ ErL 15.38 0.1 Er + OH + L ⇆ ErOHL 20.52 0.1 I=0: 22.44218
Tm + L ⇆ TmL	15.56	0.1		I=0: 17.48218
TmL + OH ⇆ TmOHL	5.11	0.1	20	TmL + OH ⇆ TmOHL 5.11 0.1 Tm + L ⇆ TmL 15.56 0.1 Tm + OH + L ⇆ TmOHL 20.67 0.1 I=0: 22.59218
Yb + L ⇆ YbL	15.83	0.1		I=0: 17.75218
YbL + OH ⇆ YbOHL	5.21	0.1	20	YbL + OH ⇆ YbOHL 5.21 0.1 Yb + L ⇆ YbL 15.83 0.1 Yb + OH + L ⇆ YbOHL 21.04 0.1 I=0: 22.96218
Lu + L ⇆ LuL	15.93	0.1		I=0: 17.85218
LuL + OH ⇆ LuOHL	5.13	0.1	20	LuL + OH ⇆ LuOHL 5.13 0.1 Lu + L ⇆ LuL 15.93 0.1 Lu + OH + L ⇆ LuOHL 21.06 0.1 I=0: 22.98218
Mn(II) + L ⇆ Mn(II)L	11.1	0.1		I=0: 12.38145
Fe(II) + L ⇆ Fe(II)L	12.2	0.1		I=0: 13.48145
Fe(II) + HL ⇆ Fe(II)HL	5.12	0.1		Fe(II) + HL ⇆ Fe(II)HL 5.12 0.1 H + L ⇆ HL 9.785 0.1 Fe(II) + H + L ⇆ Fe(II)HL 14.905 0.1 I=0: 16.40003
Co(II) + L ⇆ Co(II)L	14.5	0.1		I=0: 15.78145
Co(II)L + H ⇆ Co(II)HL	2.24	0.1		Co(II)L + H ⇆ Co(II)HL 2.24 0.1 Co(II) + L ⇆ Co(II)L 14.5 0.1 Co(II) + H + L ⇆ Co(II)HL 16.74 0.1 I=0: 18.23503
Ni + L ⇆ NiL	17.1	0.1		I-0: 18.38145
NiL + H ⇆ NiHL	2.54	1.0		NiL + H ⇆ NiHL 2.54 1.0 Ni + L ⇆ NiL 17.16249 1.0 Ni + H + L ⇆ NiHL 19.80249 1.0 I=0: 21.22461
Cu(II) + L ⇆ Cu(II)L	17.4	0.1		I=0: 18.68145
Cu(II)L + H ⇆ Cu(II)HL	2.45	0.1		Cu(II)L + H ⇆ Cu(II)HL 2.45 0.1 Cu(II) + L ⇆ Cu(II)L 17.4 0.1 Cu(II) + H + L ⇆ Cu(II)HL 19.85 0.1 I=0: 21.34503
Cr(III)OHL + H ⇆ Cr(III)L	6.08	0.1		(can not be related to components; not entered)
Cr(III)(OH)L ⇆ Cr(III)$(OH)_2$L + H	-9.85	0.1		(can not be related to components; not entered)
Fe(III) + L ⇆ Fe(III)L	19.7	0.1		I=0: 21.62218

Equilibrium	Log (K)	I	T	Conversion or remarks
$Fe(III)L \leftrightarrows Fe(III)OHL + H$	-3.88	0.1		$Fe(III)L \leftrightarrows Fe(III)OHL + H$ -3.88 0.1 $OH + H \leftrightarrows H_2O$ 13.78342 0.1 $Fe(III) + L \leftrightarrows Fe(III)L$ 19.7 0.1 $Fe(III) + L + OH \leftrightarrows Fe(III)OHL$ 29.60342 0.1 I=0: 31.52560
$Fe(III)OHL \leftrightarrows Fe(III)(OH)_2L + H$	-8.83	0.1		$Fe(III)OHL \leftrightarrows Fe(III)(OH)_2L + H$ -8.83 0.1 $Fe(III) + L + OH \leftrightarrows Fe(III)OHL$ 29.60342 0.1 $OH + H \leftrightarrows H_2O$ 13.78342 0.1 $Fe(III) + L + 2\ OH \leftrightarrows Fe(III)(OH)_2L$ 34.55684 0.1 I=0: 36.26544
$Fe(III)(OH)_2L \leftrightarrows Fe(III)(OH)_3L + H$	-10.00	0.1		$Fe(III)(OH)_2L \leftrightarrows Fe(III)(OH)_3L + H$ -10.00 0.1 $Fe(III) + 2\ OH + L \leftrightarrows Fe(III)(OH)_2L$ 34.55684 0.1 $OH + H \leftrightarrows H_2O$ 13.78342 0.1 $Fe(III) + 3\ OH + L \leftrightarrows Fe(III)(OH)_3L$ 38.34026 0.1 I=0: 39.62171
$2\ Fe(III)OHL \leftrightarrows Fe(III)_2(OH)_2L_2$	2.38	1.0		$2\ Fe(III)OHL \leftrightarrows Fe(III)_2(OH)_2L_2$ 2.38 1.0 $2\ Fe(III) + 2\ OH + 2\ L \leftrightarrows 2\ Fe(III)OHL$ (2*29.69716) 59.39432 1.0 $2\ Fe(III) + 2\ OH + 2\ L \leftrightarrows Fe(III)_2(OH)_2L_2$ 61.77432 1.0 I=0: 65.22804
$Co(III) + L \leftrightarrows Co(III)L$	37.2	0.1		I=0: 39.12218
$Ag + L \leftrightarrows AgL$	6.67	0.1		I=0: 7.31073
$Zn + L \leftrightarrows ZnL$	14.6	0.1		I=0: 15.88145
$Cd + L \leftrightarrows CdL$	13.7	0.1		I=0: 14.98145
$CdL + H \leftrightarrows CdHL$	2.30	1.0		$CdL + H \leftrightarrows CdHL$ 2.30 1.0 $Cd + L \leftrightarrows CdL$ 13.76249 1.0 $Cd + H + L \leftrightarrows CdHL$ 16.06249 1.0 I=0: 17.55752
$Hg(II) + L \leftrightarrows Hg(II)L$	20.1	0.1		I=0: 21.38145
$Hg(II)L \leftrightarrows Hg(II)OHL + H$	-8.4	0.1		$Hg(II)L \leftrightarrows Hg(II)OHL + H$ -8.4 0.1 $Hg(II) + L \leftrightarrows Hg(II)L$ 20.1 0.1 $OH + H \leftrightarrows H_2O$ 13.78342 0.1 $Hg(II) + OH + L \leftrightarrows Hg(II)OHL$ 25.48342 0.1 I=0: 26.55130
$Pb(II) + L \leftrightarrows Pb(II)L$	15.6	0.1		I=0: 16.88145
$Pb(II)L + H \leftrightarrows Pb(II)HL$	2.14	1.0		$Pb(II)L + H \leftrightarrows Pb(II)HL$ 2.14 1.0 $Pb(II) + L \leftrightarrows Pb(II)L$ 15.66249 1.0 $Pb(II) + L + H \leftrightarrows Pb(II)HL$ 17.80249 1.0 I=0: 19.22461
$Al + L \leftrightarrows AlL$	14.4	0.1		I=0: 16.32218
$AlL + H \leftrightarrows AlHL$	2.14	0.1		$AlL + H \leftrightarrows AlHL$ 2.14 0.1 $Al + L \leftrightarrows AlL$ 14.4 0.1 $Al + L + H \leftrightarrows AlHL$ 16.54 0.1 I=0: 18.46218
$AlL \leftrightarrows AlOHL + H$	-4.89	0.1		$AlL \leftrightarrows AlOHL + H$ -4.89 0.1 $Al + L \leftrightarrows AlL$ 14.4 0.1 $OH + H \leftrightarrows H_2O$ 13.78342 0.1 $Al + L + OH \leftrightarrows AlOHL$ 23.29342 0.1 I=0: 26.21560
$AlOHL \leftrightarrows Al(OH)_2L + H$	-9.19	0.1		$AlOHL \leftrightarrows Al(OH)_2L + H$ -9.19 0.1 $Al + L + OH \leftrightarrows AlOHL$ 23.29342 0.1 $OH + H \leftrightarrows H2O$ 13.78342 0.1 $Al + L + 2\ OH \leftrightarrows Al(OH)_2L$ 27.88684 0.1 I=0: 29.59544

Equilibrium	Log (K)	I	T	Conversion or remarks
Ga + L ⇆ GaL	18.1	0.1		I=0: 20.02218
GaL ⇆ GaOHL + H	-4.38	0.1		GaL ⇆ GaOHL + H -4.38 0.1 Ga + L ⇆ GaL 18.1 0.1 OH + H ⇆ H_2O 13.78342 0.1 Ga + L + OH ⇆ GaOHL 27.50342 0.1 I=0: 29.42560
In + L ⇆ InL	20.2	0.1	20	I=0: 22.12218
Bi + L ⇆ BiL	22.3	1.0		I=0: 24.12844
BiL ⇆ BiOHL + H	-5.45	1.0		BiL ⇆ BiOHL + H -5.45 1.0 Bi + L ⇆ BiL 22.3 1.0 OH + H ⇆ H_2O 13.79384 1.0 Bi + OH + L ⇆ BiOHL 30.64384 1.0 I=0: 32.47228

EDTA ($C_{10}H_{12}N_2O_8^{4-}$, ethylenedinitrilotetraacetic acid)

Equilibrium	Log (K)	I	T	Conversion or remarks
H + L ⇆ HL	10.948			
HL + H ⇆ H_2L	6.273			HL + H ⇆ H_2L 6.273 H + L ⇆ HL 10.948 2 H + L ⇆ H_2L 17.221
H_2L + H ⇆ H_3L	2.69	0.1		H_2L + H ⇆ H_3L 2.69 0.1 2 H + L ⇆ H_2L 15.72597 0.1 3 H + L ⇆ H_3L 18.41597 0.1 I=0: 20.33815
H_3L + H ⇆ H_4L	2.00	0.1		H_3L + H ⇆ H_4L 2.00 0.1 3 H + L ⇆ H_3L 18.41597 0.1 4 H + L ⇆ H_4L 20.41597 0.1 I=0: 22.55172
H_4L + H ⇆ H_5L	1.5	0.1		H_4L + H ⇆ H_5L 1.5 0.1 4 H + L ⇆ H_4L 20.41597 0.1 5 H + L ⇆ H_5L 21.91597 0.1 I=0: 24.05172
H_5L + H ⇆ H_6L	0.0	1.0		H_5L + H ⇆ H_6L 0.0 1.0 5 H + L ⇆ H_5L 22.02012 1.0 6 H + L ⇆ H_6L 22.02012 1.0 I=0: 23.94230
Li + L ⇆ LiL	2.95	0.1		I=0: 3.80430
Na + L ⇆ NaL	1.86	0.1		I=0: 2.71430
K + L ⇆ KL	0.8	0.1		I=0: 1.65430
Rb + L ⇆ RbL	0.6	0.1		I=0: 1.45430
Cs + L ⇆ CsL	0.2	0.1		I=0: 1.05430
Be + L ⇆ BeL	9.7	0.1		I=0: 11.40860
Mg + L ⇆ MgL	8.79 8.96	0.1		for two background electrolytes: K and tetraalkyl ammonium; used: average (8.79+8.96=17.75/2=8.875) I=0: 10.58360
MgL + H ⇆ MgHL	4.0	0.1		MgL + H ⇆ MgHL 4.0 0.1 Mg + L ⇆ MgL 8.875 0.1 Mg + H + L ⇆ MgHL 12.875 0.1 I=0: 15.01075
Ca + L ⇆ CaL	10.65 10.81			for two background electrolytes: K and tetraalkyl ammonium; used: average (10.65+10.81=21.46/2=10.73) I=0: 12.43860
CaL + H ⇆ CaHL	3.1	0.1		CaL + H ⇆ CaHL 3.1 0.1 Ca + L ⇆ CaL 10.73 0.1 Ca + H + L ⇆ CaHL 13.83 0.1 I=0: 15.96575
Sr + L ⇆ SrL	8.72	0.1		I=0: 10.42860
SrL + H ⇆ SrHL	3.93	0.1	20	SrL + H ⇆ SrHL 3.93 0.1 Sr + L ⇆ SrL 8.72 0.1 Ca + H + L ⇆ CaHL 12.65 0.1 I=0: 14.78575
Ba + L ⇆ BaL	7.88	0.1		I=0: 9.58860
Sc + L ⇆ ScL	23.1	0.1	20	I=0: 25.66290
ScL + H ⇆ ScHL	2.0	0.1	20	ScL + H ⇆ ScHL 2.0 0.1 Sc + L ⇆ ScL 23.1 0.1 Sc + H + L ⇆ ScHL 25.1 0.1 I=0: 27.87648
ScL ⇆ Sc(OH)L + H	-10.66	0.1	20	ScL ⇆ Sc(OH)L + H -10.66 0.1 OH + H ⇆ H_2O 13.78342 0.1 Sc + L ⇆ ScL 23.1 0.1 Sc + L + OH ⇆ Sc(OH)L 26.22342 0.1 I=0: 28.57275
Y + L ⇆ YL	18.08	0.1		I=0: 20.64290
La + L ⇆ LaL	15.36	0.1		I=0: 17.92290

Equilibrium	Log (K)	I	T	Conversion or remarks
LaL + H ⇆ LaHL	2.24	0.1		LaL + H ⇆ LaHL 2.24 0.1 La + L ⇆ LaL 15.36 0.1 La + H + L ⇆ LaHL 17.60 0.1 I=0: 20.37648
Ce + L ⇆ CeL	15.93	0.1		I=0: 18.49290
CeL + H ⇆ CeHL	1.7	1.0		CeL + H ⇆ CeHL 1.7 1.0 Ce + L ⇆ CeL 16.05498 1.0 Ce + H + L ⇆ CeHL 17.75498 1.0 I=0: 20.39606
Pr + L ⇆ PrL	16.30	0.1		I=0: 18.86290
PrL + H ⇆ PrHL	1.6	1.0		PrL + H ⇆ PrHL 1.6 1.0 Pr + L ⇆ PrL 16.42498 1.0 Pr + H + L ⇆ PrHL 18.02498 1.0 I=0: 20.66606
Nd + L ⇆ NdL	16.51	0.1		I=0: 19.07290
NdL + H ⇆ NdHL	1.5	1.0		NdL + H ⇆ NdHL 1.5 1.0 Nd + L ⇆ NdL 16.63498 1.0 Nd + H + L ⇆ NdHL 18.13498 1.0 I=0: 20.77606
Pm + L ⇆ PmL	16.9	0.1		I=0: 19.46290
Sm + L ⇆ SmL	17.06	0.1		I=0: 19.62290
SmL + H ⇆ SmHL	1.5	1.0		SmL + H ⇆ SmHL 1.5 1.0 Sm + L ⇆ SmL 17.18498 1.0 Sm + H + L ⇆ SmHL 18.68498 1.0 I=0: 21.32606
Eu + L ⇆ EuL	17.25	0.1		I=0: 19.81290
EuL + H ⇆ EuHL	1.4	1.0		EuL + H ⇆ EuHL 1.4 1.0 Sc + L ⇆ ScL 17.37498 1.0 Sc + H + L ⇆ ScHL 18.77498 1.0 I=0: 21.41606
Gd + L ⇆ GdL	17.35	0.1		I=0: 19.91290
GdL + H ⇆ GdHL	1.3	1.0		GdL + H ⇆ GdHL 1.3 1.0 Gd + L ⇆ GdL 17.47498 1.0 Gd + H + L ⇆ GdHL 18.77498 1.0 I=0: 21.41606
Tb + L ⇆ TbL	17.87	0.1		I=0: 20.43290
TbL + H ⇆ TbHL	0.9	1.0		TbL + H ⇆ TbHL 0.9 1.0 Tb + L ⇆ TbL 17.99498 1.0 Tb + H + L ⇆ TbHL 18.89498 1.0 I=0: 21.53606
Dy + L ⇆ DyL	18.30	0.1		I=0: 20.86290
DyL + H ⇆ DyHL	0.7	1.0		DyL + H ⇆ DyHL 0.7 1.0 Dy + L ⇆ DyL 18.42498 1.0 Dy + H + L ⇆ DyHL 19.12498 1.0 I=0: 21.76606
Ho + L ⇆ HoL	18.56	0.1		I=0: 21.12290
HoL + H ⇆ HoHL	0.5	1.0		HoL + H ⇆ HoHL 0.5 1.0 Ho + L ⇆ HoL 18.68498 1.0 Ho + H + L ⇆ HoHL 19.18498 1.0 I=0: 21.82606
Er + L ⇆ ErL	18.89	0.1		I=0: 21.45290
Tm + L ⇆ TmL	19.32	0.1		I=0: 21.88290
Yb + L ⇆ YbL	19.49	0.1		I=0: 22.05290
Lu + L ⇆ LuL	19.74	0.1		I=0: 22.30290
(UO_2) + L ⇆ (UO_2)L	9.28	1.0		I=0: 10.90528
(UO_2) + HL ⇆ (UO_2)HL	7.40	0.1		(UO_2) + HL ⇆ (UO_2)HL 7.40 0.1 H + L ⇆ HL 10.09370 0.1 (UO_2) + H + L ⇆ (UO_2)HL 17.49370 0.1 I=0: 19.62945
2 (UO_2) + L ⇆ $(UO_2)_2$L	17.87	0.1		I=0: 20.43290

Equilibrium	Log (K)	I	T	Conversion or remarks
$(UO_2)_2L \leftrightarrows (UO_2)_2(OH)L + H$	-4.81	1.0		$(UO_2)_2L \leftrightarrows (UO_2)_2(OH)L + H$ -4.81 1.0 $2\ (UO_2) + L \leftrightarrows (UO_2)_2L$ 17.99498 1.0 $OH + H \leftrightarrows H_2O$ 13.79384 1.0 $2\ (UO_2) + L + OH \leftrightarrows (UO_2)_2(OH)L$ 26.97882 1.0 I=0: 29.41674
$(UO_2)_2L + L \leftrightarrows (UO_2)_2L_2$	8.90	1.0		$(UO_2)_2L + L \leftrightarrows (UO_2)_2L_2$ 8.90 1.0 $2\ (UO_2) + L \leftrightarrows (UO_2)_2L$ 17.99498 1.0 $2\ (UO_2) + 2\ L \leftrightarrows (UO_2)_2L_2$ 26.89498 1.0 I=0: 29.33290
$4\ (UO_2) + 2\ L \leftrightarrows (UO_2)_4(OH)_4L_2 + 4\ H$	15.34	1.0		$4\ (UO_2) + 2\ L \leftrightarrows (UO_2)_4(OH)_4L_2 + 4\ H$ 15.34 1.0 $4\ OH + 4\ H \leftrightarrows 4\ H_2O$ (4*13.79384) 55.17536 1.0 $4\ (UO_2) + 2\ L + 4\ (OH) \leftrightarrows (UO_2)_4(OH)_4L_2$ 70.51536 1.0 I=0: 74.17224
$6\ (UO_2) + 3\ L \leftrightarrows (UO_2)_6(OH)_4L_3 + 4\ H$	34.3	1.0		$6\ (UO_2) + 3\ L \leftrightarrows (UO_2)_6(OH)_4L_3 + 4\ H$ 34.3 1.0 $4\ OH + 4\ H \leftrightarrows 4\ H_2O$ (4*13.79384) 55.17536 1.0 $6\ (UO_2) + 3\ L + 4\ (OH) \leftrightarrows (UO_2)_6(OH)_4L_3$ 89.47536 1.0 I=0: 95.57016
$Mn(II) + L \leftrightarrows Mn(II)L$	13.89	0.1		I=0: 15.59860
$Mn(II)L + H \leftrightarrows Mn(II)HL$	3.1	0.1		$Mn(II)L + H \leftrightarrows Mn(II)HL$ 3.1 0.1 $Mn(II) + L \leftrightarrows Mn(II)L$ 13.89 0.1 $Mn(II) + H + L \leftrightarrows Mn(II)HL$ 16.99 0.1 I=0: 19.12575
$Fe(II) + L \leftrightarrows Fe(II)L$	14.30	0.1		I=0: 16.00860
$Fe(II) + HL \leftrightarrows Fe(II)HL$	6.82	0.1		$Fe(II) + HL \leftrightarrows Fe(II)HL$ 6.82 0.1 $H + L \leftrightarrows HL$ 10.09370 0.1 $Fe(II) + H + L \leftrightarrows Fe(II)HL$ 16.91370 0.1 I=0: 19.04945
$Co(II) + L \leftrightarrows Co(II)L$	16.45	0.1		I=0: 18.15860
$Co(II)L + H \leftrightarrows Co(II)HL$	3.0	0.1		$Co(II)L + H \leftrightarrows Co(II)HL$ 3.0 0.1 $Co(II) + L \leftrightarrows Co(II)L$ 16.45 0.1 $Co(II) + H + L \leftrightarrows Co(II)HL$ 19.45 0.1 I=0: 21.58575
$Co(II)HL + H \leftrightarrows Co(II)H_2L$	1.7	1.0		$Co(II)HL + H \leftrightarrows Co(II)H_2L$ 1.7 1.0 $Co(II) + H + L \leftrightarrows Co(II)HL$ 19.55415 1.0 $Co(II) + 2\ H + L \leftrightarrows Co(II)H_2L$ 21.25415 1.0 I=0: 23.48891
$Ni + L \leftrightarrows NiL$	18.4	0.1		I=0: 20.10860
$NiL + H \leftrightarrows NiHL$	3.1	0.1		$NiL + H \leftrightarrows NiHL$ 3.1 0.1 $Ni + L \leftrightarrows NiL$ 18.4 0.1 $Ni + H + L \leftrightarrows NiHL$ 21.5 0.1 I=0: 23.63575
$NiHL + H \leftrightarrows NiH_2L$	0.9	1.0		$NiHL + H \leftrightarrows NiH_2L$ 0.9 1.0 $Ni + H + L \leftrightarrows NiHL$ 21.60415 1.0 $Ni + 2\ H + L \leftrightarrows NiH_2L$ 22.50415 1.0 I=0: 24.73891
$NiL \leftrightarrows NiOHL + H$	-11.9	0.1		$NiL \leftrightarrows NiOHL + H$ -11.9 0.1 $Ni + L \leftrightarrows NiL$ 18.4 0.1 $OH + H \leftrightarrows H_2O$ 13.78342 0.1 $Ni + L + OH \leftrightarrows NiOHL$ 20.28342 0.1 I=0: 21.56487
$Cu(II) + L \leftrightarrows Cu(II)L$	18.78	0.1		I=0: 20.48860

Equilibrium	Log (K)	I	T	Conversion or remarks
$Cu(II)L + H \leftrightarrows Cu(II)HL$	3.1	0.1		$Cu(II)L + H \leftrightarrows Cu(II)HL$ 3.1 0.1 $Cu(II) + L \leftrightarrows Cu(II)L$ 18.78 0.1 $Cu(II) + H + L \leftrightarrows Cu(II)HL$ 21.88 0.1 I=0: 24.01575
$Cu(II)HL + H \leftrightarrows Cu(II)H_2L$	2.0	0.1		$Cu(II)HL + H \leftrightarrows Cu(II)H_2L$ 2.0 0.1 $Cu(II) + H + L \leftrightarrows Cu(II)HL$ 21.88 0.1 $Cu(II) + 2\ H + L \leftrightarrows Cu(II)H_2L$ 23.88 0.1 I=0: 26.22933
$Cu(II)L \leftrightarrows Cu(II)OHL + H$	-11.4	0.1		$Cu(II)L \leftrightarrows Cu(II)OHL + H$ -11.4 0.1 $Cu(II) + L \leftrightarrows Cu(II)L$ 18.78 0.1 $OH + H \leftrightarrows H_2O$ 13.78342 0.1 $Cu(II) + L + OH \leftrightarrows Cu(II)OHL$ 21.16342 0.1 I=0: 22.44487
$Cr(III) + L \leftrightarrows Cr(III)L$	23.4	0.1	20	I=0: 25.96290
$Cr(III)L + H \leftrightarrows Cr(III)HL$	1.7	0.1		$Cr(III)L + H \leftrightarrows Cr(III)HL$ 1.7 0.1 $Cr(III) + L \leftrightarrows Cr(III)L$ 23.4 0.1 $Cr(III) + H + L \leftrightarrows Cr(III)HL$ 25.1 0.1 I=0: 27.87648
$Cr(III)L \leftrightarrows Cr(III)OHL + H$	-7.37	0.1		$Cr(III)L \leftrightarrows Cr(III)OHL + H$ -7.37 0.1 $Cr(III) + L \leftrightarrows Cr(III)L$ 23.4 0.1 $OH + H \leftrightarrows H_2O$ 13.78342 0.1 $Cr(III) + L + OH \leftrightarrows Cr(III)OHL$ 29.81342 0.1 I=0: 32.16275
$Fe(III) + L \leftrightarrows Fe(III)L$	25.1	0.1		I=0: 27.66290
$Fe(III)L + H \leftrightarrows Fe(III)HL$	1.3	0.1		$Fe(III)L + H \leftrightarrows Fe(III)HL$ 1.3 0.1 $Fe(III) + L \leftrightarrows Fe(III)L$ 25.1 0.1 $Fe(III) + L + H \leftrightarrows Fe(III)HL$ 26.4 0.1 I=0: 29.17648
$Fe(III)L \leftrightarrows Fe(III)OHL + H$	-7.39	0.1		$Fe(III)L \leftrightarrows Fe(III)OHL + H$ -7.39 0.1 $Fe(III) + L \leftrightarrows Fe(III)L$ 25.1 0.1 $OH + H \leftrightarrows H_2O$ 13.78342 0.1 $Fe(III) + L + OH \leftrightarrows Fe(III)OHL$ 31.49342 0.1 I=0: 33.84275
$2\ Fe(III)OHL \leftrightarrows Fe(III)_2(OH)_2L_2$	2.8	1.0		$2\ Fe(III)OHL \leftrightarrows Fe(III)_2(OH)_2L_2$ 2.8 1.0 $2\ Fe(III) + 2\ OH + 2\ L \leftrightarrows 2\ Fe(III)OHL$ (2*31.60799) 63.21598 1.0 $2\ Fe(III) + 2\ OH + 2\ L \leftrightarrows Fe(III)_2(OH)_2L_2$ 66.01598 1.0 I=0: 69.67286
$Co(III) + L \leftrightarrows Co(III)L$	41.4	0.1		I=0: 43.96290
$Co(III)L + H \leftrightarrows Co(III)HL$	2.98	0.1	20	$Co(III)L + H \leftrightarrows Co(III)HL$ 2.98 0.1 $Co(III) + L \leftrightarrows Co(III)L$ 41.4 0.1 $Co(III) + H + L \leftrightarrows Co(III)HL$ 44.38 0.1 I=0: 47.15648
$Zr + L \leftrightarrows ZrL$	32.8			
$ZrL \leftrightarrows ZrOHL + H$	-6.2	0.1		$ZrL \leftrightarrows ZrOHL + H$ -6.2 0.1 $Zr + L \leftrightarrows ZrL$ 29.38280 0.1 $H + OH \leftrightarrows H_2O$ 13.78342 0.1 $Zr + OH + L \leftrightarrows ZrOHL$ 36.96622 0.1 I=0: 40.38342

Equilibrium	Log (K)	I	T	Conversion or remarks
$2\ ZrOHL \leftrightarrows Zr_2(OH)_2L_2$	3.5	0.1		$2\ ZrOHL \leftrightarrows Zr_2(OH)_2L_2$ 3.5 0.1 $2\ Zr + 2\ OH + 2\ L \leftrightarrows 2\ ZrOHL$ (2*36.96622) 73.93244 0.1 $2\ Zr + 2\ OH + 2\ L \leftrightarrows Zr_2(OH)_2L_2$ 77.43244 0.1 I=0: 84.05327
$Hf + L \leftrightarrows HfL$	33.7			
$Ag + L \leftrightarrows AgL$	7.20	0.1		I=0: 8.05430
$AgL + H \leftrightarrows AgHL$	6.04	0.1		$AgL + H \leftrightarrows AgHL$ 6.04 0.1 $Ag + L \leftrightarrows AgL$ 7.20 0.1 $Ag + H + L \leftrightarrows AgHL$ 13.24 0.1 I=0: 14.73503
$2\ Ag + L \leftrightarrows Ag_2L$	7.6	1.0		I=0: 9.02212
$Pd + L \leftrightarrows PdL$	25.6	0.1	20	I=0: 27.30860
$PdL + H \leftrightarrows PdHL$	3.01	1.0	20	$PdL + H \leftrightarrows PdHL$ 3.01 1.0 $Pd + L \leftrightarrows PdL$ 25.68332 1.0 $Pd + H + L \leftrightarrows PdHL$ 28.69332 1.0 I=0: 30.72492
$PdHL + H \leftrightarrows PdH_2L$	2.31	1.0	20	$PdHL + H \leftrightarrows PdH_2L$ 2.31 1.0 $Pd + H + L \leftrightarrows PdHL$ 28.69332 1.0 $Pd + 2\ H + L \leftrightarrows PdH_2L$ 31.00332 1.0 I=0: 33.23808
$PdH_2L + H \leftrightarrows PdH_3L$	0.9	1.0	20	$PdH_2L + H \leftrightarrows PdH_3L$ 0.9 1.0 $Pd + 2\ H + L \leftrightarrows PdH_2L$ 31.00332 1.0 $Pd + 3\ H + L \leftrightarrows PdH_3L$ 31.90332 1.0 I=0: 34.13808
$Zn + L \leftrightarrows ZnL$	18.0			
$ZnL + H \leftrightarrows ZnHL$	3.0	0.1		$ZnL + H \leftrightarrows ZnHL$ 3.0 0.1 $Zn + L \leftrightarrows ZnL$ 16.29140 0.1 $Zn + H + L \leftrightarrows ZnHL$ 19.29140 0.1 I=0: 21.42715
$ZnHL + H \leftrightarrows ZnH_2L$	1.2	1.0		$ZnHL + H \leftrightarrows ZnH_2L$ 1.2 1.0 $Zn + H + L \leftrightarrows ZnHL$ 19.39555 1.0 $Zn + 2\ H + L \leftrightarrows ZnH_2L$ 20.59555 1.0 I=0: 22.83031
$ZnL \leftrightarrows ZnOHL + H$	-11.6	0.1		$ZnL \leftrightarrows ZnOHL + H$ -11.6 0.1 $Zn + L \leftrightarrows ZnL$ 16.29140 0.1 $OH + H \leftrightarrows H_2O$ 13.78342 0.1 $Zn + L + OH \leftrightarrows ZnOHL$ 18.47482 0.1 I=0: 19.75627
$Cd + L \leftrightarrows CdL$	18.1			
$CdL + H \leftrightarrows CdHL$	2.9	0.1		$CdL + H \leftrightarrows CdHL$ 2.9 0.1 $Cd + L \leftrightarrows CdL$ 16.39140 0.1 $Cd + H + L \leftrightarrows CdHL$ 19.29140 0.1 I=0: 21.42715
$CdHL + H \leftrightarrows CdH_2L$	1.6	1.0		$CdHL + H \leftrightarrows CdH_2L$ 1.6 1.0 $Cd + H + L \leftrightarrows CdHL$ 19.39555 1.0 $Cd + 2\ H + L \leftrightarrows CdH_2L$ 20.99555 1.0 I=0: 23.23031
$CdL \leftrightarrows CdOHL + H$	-13.2	1.0		$CdL \leftrightarrows CdOHL + H$ -13.2 1.0 $Cd + L \leftrightarrows CdL$ 16.47472 1.0 $OH + H \leftrightarrows H_2O$ 13.79384 1.0 $Cd + OH + L \leftrightarrows CdOHL$ 17.06856 1.0 I=0: 18.28752
$Hg(II) + L \leftrightarrows Hg(II)L$	21.5	0.1		I=0: 23.20860
$Hg(II)L + H \leftrightarrows Hg(II)HL$	3.2	0.1		$Hg(II)L + H \leftrightarrows Hg(II)HL$ 3.2 0.1 $Hg(II) + L \leftrightarrows Hg(II)L$ 21.5 0.1 $Hg(II) + H + L \leftrightarrows Hg(II)HL$ 24.7 0.1 I=0: 26.83575
$Hg(II)HL + H \leftrightarrows Hg(II)H_2L$	2.1	1.0		$Hg(II)HL + H \leftrightarrows Hg(II)H_2L$ 2.1 1.0 $Hg(II) + H + L \leftrightarrows Hg(II)HL$ 24.80415 1.0 $Hg(II) + 2\ H + L \leftrightarrows Hg(II)H_2L$ 26.90415 1.0 I=0: 29.13891

Equilibrium	Log (K)	I	T	Conversion or remarks
Hg(II)L ⇆ Hg(II)OHL + H	-8.9	0.1		Hg(II)L ⇆ Hg(II)OHL + H -8.9 0.1 Hg(II) + L ⇆ Hg(II)L 21.5 0.1 OH + H ⇆ H_2O 13.78342 0.1 Hg(II) + L + OH ⇆ Hg(II)(OH)L 26.38342 0.1 I=0: 27.66487
Sn(II) + L ⇆ Sn(II)L	18.3	1.0	20	I=0: 19.92528
Sn(II)L + H ⇆ Sn(II)HL	2.5	1.0	20	Sn(II)L + H ⇆ Sn(II)HL 2.5 1.0 Sn + L ⇆ SnL 18.3 1.0 Sn + H + L ⇆ SnHL 20.8 1.0 I=0: 22.83160
Sn(II)HL + H ⇆ Sn(II)H_2L	1.5	1.0	20	Sn(II)HL + H ⇆ Sn(II)H_2L 1.5 1.0 Sn + H + L ⇆ SnHL 20.8 1.0 Sn + 2 H + L ⇆ SnH_2L 22.3 1.0 I=0: 24.53476
Pb(II) + L ⇆ Pb(II)L	18.0	0.1		I=0: 19.70860
Pb(II)L + H ⇆ Pb(II)HL	2.4	1.0		Pb(II)L + H ⇆ Pb(II)HL 2.4 0.1 Pb + L ⇆ PbL 18.0 0.1 Pb + H + L ⇆ PbHL 20.4 0.1 I=0: 22.53575
Pb(II)HL + H ⇆ Pb(II)H_2L	1.7	1.0		Pb(II)HL + H ⇆ Pb(II)H_2L 1.7 1.0 Pb + H + L ⇆ PbHL 20.50415 1.0 Pb + 2 H + L ⇆ PbH_2L 22.20415 1.0 I=0: 24.43891
Pb(II)H_2L + H ⇆ Pb(II)H_3L	1.2	1.0		Pb(II)H_2L + H ⇆ Pb(II)H_3L 1.2 1.0 Pb + 2 H + L ⇆ PbH_2L 22.20415 1.0 Pb + 3 H + L ⇆ PbH_3L 23.40415 1.0 I=0: 25.63891
Al + L ⇆ AlL	16.4	0.1		I=0: 18.96290
AlL + H ⇆ AlHL	2.6	0.1		AlL + H ⇆ AlHL 2.6 0.1 Al + L ⇆ AlL 16.4 0.1 Al + H + L ⇆ AlHL 19.0 0.1 I=0: 21.77648
AlL ⇆ AlOHL + H	-5.9	0.1		AlL ⇆ AlOHL + H -5.9 0.1 Al + L ⇆ AlL 16.4 0.1 OH + H ⇆ H_2O 13.78342 0.1 Al + OH + L ⇆ AlOHL 24.28342 0.1 I=0: 26.63275
AlOHL ⇆ Al(OH)$_2$L + H	-10.31	0.1		AlOHL ⇆ Al(OH)$_2$L + H -10.31 0.1 Al + OH + L ⇆ AlOHL 24.28342 0.1 OH + H ⇆ H_2O 13.78342 0.1 Al + 2 OH + L ⇆ Al(OH)$_2$L 27.75684 0.1 I=0: 29.67902
Ga + L ⇆ GaL	21.7	0.1		I=0: 24.26290
GaL + H ⇆ GaHL	1.7	0.1		GaL + H ⇆ GaHL 1.7 0.1 Ga + L ⇆ GaL 21.7 0.1 Ga + H + L ⇆ GaHL 23.4 0.1 I=0: 26.17648
GaL ⇆ GaOHL + H	-5.58	0.1		GaL ⇆ GaOHL + H -5.58 0.1 Ga + L ⇆ GaL 21.7 0.1 OH + H ⇆ H_2O 13.78342 0.1 Ga + L + OH ⇆ GaOHL 29.90342 0.1 I=0: 32.25275
In + L ⇆ InL	25.0	0.1		I=0: 27.56290
InL + H ⇆ InHL	0.7	0.5		InL + H ⇆ InHL 0.7 0.5 In + L ⇆ InL 24.34224 0.5 In + H + L ⇆ InHL 25.04224 0.5 I=0: 28.53129
InL ⇆ InOHL + H	-8.43	0.1		InL ⇆ InOHL + H -8.43 0.1 In + L ⇆ InL 25.0 0.1 OH + H ⇆ H_2O 13.78342 0.1 In + L + OH ⇆ InOHL 30.35342 0.1 I=0: 32.70275

Equilibrium	Log (K)	I	T	Conversion or remarks
$As(III)(OH)_2 + HL \leftrightarrows As(III)(OH)_2HL$	9.2	0.1	20	(can not be related to components; not entered)
$Bi + L \leftrightarrows BiL$	26.5	1.0		I=0: 28.93792
$BiL + H \leftrightarrows BiHL$	1.4	0.1		$BiL + H \leftrightarrows BiHL$ 1.4 0.1 $Bi + L \leftrightarrows BiL$ 26.37502 0.1 $Bi + H + L \leftrightarrows BiHL$ 27.77502 0.1 I=0: 30.55150
$BiL \leftrightarrows BiOHL + H$	-10.6	0.1		$BiL \leftrightarrows BiOHL + H$ -10.6 0.1 $Bi + L \leftrightarrows BiL$ 26.37502 0.1 $OH + H \leftrightarrows H_2O$ 13.78342 0.1 $Bi + L + OH \leftrightarrows BiOHL$ 29.55844 0.1 I=0: 31.90777

Part II: other references

As already stated in the introduction, the NIST data were extended with data from other sources. In part II, you will find these data, grouped by (1) type of equilibria/species and (2) source. See the appendix for comparison of common data between the NIST and these sources.

II.1 Complexes

II.1.1 Turner et al.

Since Turner *et al.* state their values with two decimals, all calculations were done with two decimals.

Equilibrium	Log (K)	I	T	Conversion or remarks
$Be + 3\ H_2O \leftrightarrows Be(OH)_3 + 3\ H$	-23.25			$Be + 3\ H_2O \leftrightarrows Be(OH)_3 + 3\ H$ -23.25 $3\ H + 3\ OH \leftrightarrows 3\ H_2O$ (3*14.00) 42.00 $Be + 3\ OH \leftrightarrows Be(OH)_3$ 18.75
$Be + 4\ H_2O \leftrightarrows Be(OH)_4 + 4\ H$	-37.41			$Be + 4\ H_2O \leftrightarrows Be(OH)_4 + 4\ H$ -37.41 $4\ H + 4\ OH \leftrightarrows 4\ H_2O$ (4*14.00) 56.00 $Be + 4\ OH \leftrightarrows Be(OH)_4$ 18.59
$Be + 2\ Cl \leftrightarrows BeCl_2$	-0.54			
$Na + HVO_4 \leftrightarrows NaHVO_4$	1.16			$Na + HVO_4 \leftrightarrows NaHVO_4$ 1.16 $H + VO_4 \leftrightarrows HVO_4$ 14.3 $Na + H + VO_4 \leftrightarrows NaHVO_4$ 15.46
$Na + (CrO_4) \leftrightarrows Na(CrO_4)$	0.70			
$Mg + (PO_4) \leftrightarrows Mg(PO_4)$	4.85			
$Al + CO_3 \leftrightarrows Al(CO_3)$	8.43			
$Al + 5\ F \leftrightarrows AlF_5$	20.73			
$Al + 6\ F \leftrightarrows AlF_6$	20.46			
$K + HVO_4 \leftrightarrows KHVO_4$				$K + HVO_4 \leftrightarrows KHVO_4$ 0.90 $H + VO_4 \leftrightarrows HVO_4$ 14.3 $K + H + VO_4 \leftrightarrows KHVO_4$ 15.20
$Ca + (PO_4) \leftrightarrows Ca(PO_4)$	6.46			
$Sc + CO_3 \leftrightarrows Sc(CO_3)$	10.10			
$Sc + 2\ Cl \leftrightarrows ScCl_2$	1.57			
$Cr(III) + 3\ H_2O \leftrightarrows Cr(III)(OH)_3 + 3\ H$	-18.00			$Cr(III) + 3\ H_2O \leftrightarrows Cr(III)(OH)_3 + 3\ H$ -18.00 $3\ H + 3\ OH \leftrightarrows 3\ H_2O$ (3*14.00) 42.00 $Cr(III) + 3\ OH \leftrightarrows Cr(III)(OH)_3$ 24.00
$Cr(III) + 4\ H_2O \leftrightarrows Cr(III)(OH)_4 + 4\ H$	-27.40			$Cr(III) + 4\ H_2O \leftrightarrows Cr(III)(OH)_4 + 4\ H$ -27.40 $4\ H + 4\ OH \leftrightarrows 4\ H_2O$ (4*14.00) 56.00 $Cr(III) + 4\ OH \leftrightarrows Cr(III)(OH)_4$ 28.60
$Mn(II) + 2\ H_2O \leftrightarrows Mn(II)(OH)_2 + 2\ H$	-22.20			$Mn(II) + 2\ H_2O \leftrightarrows Mn(II)(OH)_2 + 2\ H$ -22.20 $2\ H + 2\ OH \leftrightarrows 2\ H_2O$ (2*14.00) 28.00 $Mn(II) + 2\ OH \leftrightarrows Mn(II)(OH)_2$ 5.80

Equilibrium	Log (K)	I	T	Conversion or remarks
$Mn(II) + 3\ H_2O \leftrightarrows Mn(II)(OH)_3 + 3\ H$	-34.80			$Mn(II) + 3\ H_2O \leftrightarrows Mn(II)(OH)_3 + 3\ H$ -34.80 $3\ H + 3\ OH \leftrightarrows 3\ H_2O$ (3*14.00) 42.00 $Mn(II) + 3\ OH \leftrightarrows Mn(II)(OH)_3$ 7.20
$Fe(II) + 4\ H_2O \leftrightarrows Fe(II)(OH)_4 + 4\ H$	-46.00			$Fe(II) + 4\ H_2O \leftrightarrows Fe(II)(OH)_4 + 4\ H$ -46.00 $4\ H + 4\ OH \leftrightarrows 4\ H_2O$ (4*14.00) 56.00 $Fe(II) + 4\ OH \leftrightarrows Fe(II)(OH)_4$ 10.00
$Fe(II) + CO_3 \leftrightarrows Fe(II)(CO_3)$	4.73			
$Fe(III) + CO_3 \leftrightarrows Fe(III)(CO_3)$	9.72			
$Fe(III) + 2\ (SO_4)2 \leftrightarrows Fe(III)(SO_4)_2$	5.38			
$Fe(III) + 3\ Cl \leftrightarrows Fe(III)Cl_3$	0.99			
$Co(II) + 4\ H_2O \leftrightarrows Co(II)(OH)_4 + 4\ H$	-46.30			$Co(II) + 4\ H_2O \leftrightarrows Co(II)(OH)_4 + 4\ H$ -46.30 $4\ H + 4\ OH \leftrightarrows 4\ H_2O$ (4*14.00) 56.00 $Co(II) + 4\ OH \leftrightarrows Co(II)\ (OH)_4$ 9.70
$Ni + 4\ H_2O \leftrightarrows Ni(OH)_4 + 4\ H$	-44.00			$Ni + 4\ H_2O \leftrightarrows Ni(OH)_4 + 4\ H$ -44.00 $4\ H + 4\ OH \leftrightarrows 4\ H_2O$ (4*14.00) 56.00 $Ni + 4\ OH \leftrightarrows Ni(OH)_4$ 12.00
$Ni + 2\ SO_4 \leftrightarrows Ni(SO_4)_2$	3.2			
$Cu(II) + 2\ H_2O \leftrightarrows Cu(II)\ (OH)_2 + 2\ H$	-17.30			$Cu(II) + 2\ H_2O \leftrightarrows Cu(II)\ (OH)_2 + 2\ H$ -17.30 $2\ H + 2\ OH \leftrightarrows 2\ H_2O$ (2*14.00) 28.00 $Cu(II) + 2\ OH \leftrightarrows Cu(II)\ (OH)_2$ 10.70
$Cu(II) + 3\ H_2O \leftrightarrows Cu(II)\ (OH)_3 + 3\ H$	-27.80			$Cu(II) + 3\ H_2O \leftrightarrows Cu(II)\ (OH)_3 + 3\ H$ -27.80 $3\ H + 3\ OH \leftrightarrows 3\ H_2O$ (3*14.00) 42.00 $Cu(II) + 3\ OH \leftrightarrows Cu(II)\ (OH)_3$ 14.20
$Cu(II) + 4\ H_2O \leftrightarrows Cu(II)\ (OH)_4 + 4\ H$	-39.60			$Cu(II) + 4\ H_2O \leftrightarrows Cu(II)\ (OH)_4 + 4\ H$ -39.60 $4\ H + 4\ OH \leftrightarrows 4\ H_2O$ (4*14.00) 56.00 $Cu(II) + 4\ OH \leftrightarrows Cu(II)\ (OH)_4$ 16.40
$Zn + 2\ SO_4 \leftrightarrows Zn(SO_4)_2$	3.63			
$Zn + 3\ SO_4 \leftrightarrows Zn(SO_4)_3$	2.70			
$Zn + 4\ SO_4 \leftrightarrows Zn(SO_4)_4$	-0.82			
$Zn + 2\ Cl \leftrightarrows ZnCl_2$	0.62			
$Zn + 3\ Cl \leftrightarrows ZnCl_3$	0.51			
$Zn + 4\ Cl \leftrightarrows ZnCl_4$	0.20			
$Ga + 3\ H_2O \leftrightarrows Ga(OH)_3 + 3\ H$	-10.30			$Ga + 3\ H_2O \leftrightarrows Ga(OH)_3 + 3\ H$ -10.30 $3\ H + 3\ OH \leftrightarrows 3\ H_2O$ (3*14.00) 42.00 $Ga + 3\ OH \leftrightarrows Ga(OH)_3$ 31.70
$Ga + 4\ H_2O \leftrightarrows Ga(OH)_4 + 4\ H$	-16.60			$Ga + 4\ H_2O \leftrightarrows Ga(OH)_4 + 4\ H$ -16.60 $4\ H + 4\ OH \leftrightarrows 4\ H_2O$ (4*14.00) 56.00 $Ga + 4\ OH \leftrightarrows Ga(OH)_4$ 39.40
$Ga + CO_3 \leftrightarrows Ga(CO_3)$	8.79			

Equilibrium	Log (K)	I	T	Conversion or remarks
$Y + 2\ H_2O \leftrightarrows Y(OH)_2 + 2\ H$	-16.40			$Y + 2\ H_2O \leftrightarrows Y(OH)_2 + 2\ H$ -16.40 $2\ H + 2\ OH \leftrightarrows 2\ H_2O$ (2*14.00) 28.00 $Y + 2\ OH \leftrightarrows Y(OH)_2$ 11.60
$Y + 3\ H_2O \leftrightarrows Y(OH)_3 + 3\ H$	-26.00			$Y + 3\ H_2O \leftrightarrows Y(OH)_3 + 3\ H$ -26.00 $3\ H + 3\ OH \leftrightarrows 3\ H_2O$ (3*14.00) 42.00 $Y + 3\ OH \leftrightarrows Y(OH)_3$ 16.00
$Y + 4\ H_2O \leftrightarrows Y(OH)_4 + 4\ H$	-36.50			$Y + 4\ H_2O \leftrightarrows Y(OH)_4 + 4\ H$ -36.50 $4\ H + 4\ OH \leftrightarrows 4\ H_2O$ (4*14.00) 56.00 $Y + 4\ OH \leftrightarrows Y(OH)_4$ 19.50
$Zr + 2\ H_2O \leftrightarrows Zr(OH)_2 + 2\ H$	-1.70			$Zr + 2\ H_2O \leftrightarrows Zr(OH)_2 + 2\ H$ -1.70 $2\ H + 2\ OH \leftrightarrows 2\ H_2O$ (2*14.00) 28.00 $Zr + 2\ OH \leftrightarrows Zr(OH)_2$ 26.30
$Zr + 3\ H_2O \leftrightarrows Zr(OH)_3 + 3\ H$	-5.10			$Zr + 3\ H_2O \leftrightarrows Zr(OH)_3 + 3\ H$ -5.10 $3\ H + 3\ OH \leftrightarrows 3\ H_2O$ (3*14.00) 42.00 $Zr + 3\ OH \leftrightarrows Zr(OH)_3$ 36.90
$Zr + 2\ Cl \leftrightarrows ZrCl_2$	1.47			Note: data for these equilibria do occur in the NIST database but for ionic strengths of 6.5 M; see page 45.
$Zr + 3\ Cl \leftrightarrows ZrCl_3$	0.80			
$Cd + 2\ F \leftrightarrows CdF_2$	1.41			
$Cd + 2\ SO_4 \leftrightarrows Cd(SO_4)_2$	3.44			
$Cd + 3\ SO_4 \leftrightarrows Cd(SO_4)_3$	3.09			
$Cd + 4\ SO_4 \leftrightarrows Cd(SO_4)_4$	-0.72			
$Cd + 4\ Cl \leftrightarrows CdCl_4$	1.47			
$In + CO_3 \leftrightarrows InCO_3$	7.60			
$Sn(IV) + H_2O \leftrightarrows Sn(IV)(OH) + H$	1.50			$Sn(IV) + H_2O \leftrightarrows Sn(IV)(OH) + H$ 1.50 $H + OH \leftrightarrows H_2O$ 14.00 $Sn(IV) + OH \leftrightarrows Sn(IV)(OH)$ 15.50
$Sn(IV) + 2\ H_2O \leftrightarrows Sn(IV)(OH)_2 + 2\ H$	1.31			$Sn(IV) + 2\ H_2O \leftrightarrows Sn(IV)(OH)_2 + 2\ H$ 1.31 $2\ H + 2\ OH \leftrightarrows 2\ H_2O$ (2*14.00) 28.00 $Sn(IV) + 2\ OH \leftrightarrows Sn(IV)(OH)_2$ 29.31
$Sn(IV) + 3\ H_2O \leftrightarrows Sn(IV)(OH)_3 + 3\ H$	1.70			$Sn(IV) + 3\ H_2O \leftrightarrows Sn(IV)(OH)_3 + 3\ H$ 1.70 $3\ H + 3\ OH \leftrightarrows 3\ H_2O$ (3*14.00) 42.00 $Sn(IV) + 3\ OH \leftrightarrows Sn(IV)(OH)_3$ 43.70
$Sn(IV) + 4\ H_2O \leftrightarrows Sn(IV)(OH)_4 + 4\ H$	0.51			$Sn(IV) + 4\ H_2O \leftrightarrows Sn(IV)(OH)_4 + 4\ H$ 0.51 $4\ H + 4\ OH \leftrightarrows 4\ H_2O$ (4*14.00) 56.00 $Sn(IV) + 4\ OH \leftrightarrows Sn(IV)(OH)_4$ 56.51
$Ba + 2\ SO_4 \leftrightarrows Ba(SO_4)_2$	3.20			
$La + 2\ H_2O \leftrightarrows La(OH)_2 + 2\ H$	-17.40			$La + 2\ H_2O \leftrightarrows La(OH)_2 + 2\ H$ -17.40 $2\ H + 2\ OH \leftrightarrows 2\ H_2O$ (2*14.00) 28.00 $La + 2\ OH \leftrightarrows La(OH)_2$ 10.60

Equilibrium	Log (K)	I	T	Conversion or remarks
$La + 3\ H_2O \leftrightarrows La(OH)_3 + 3\ H$	-27.50			$La + 3\ H_2O \leftrightarrows La(OH)_3 + 3\ H$ -27.50 $3\ H + 3\ OH \leftrightarrows 3\ H_2O$ (3*14.00) 42.00 $La + 3\ OH \leftrightarrows La(OH)_3$ 14.50
$La + 4\ H_2O \leftrightarrows La(OH)_4 + 4\ H$	-38.80			$La + 4\ H_2O \leftrightarrows La(OH)_4 + 4\ H$ -38.80 $4\ H + 4\ OH \leftrightarrows 4\ H_2O$ (4*14.00) 56.00 $La + 4\ OH \leftrightarrows La(OH)_4$ 17.20
$La + 2\ Cl \leftrightarrows LaCl_2$	-0.29			
$Ce + 2\ H_2O \leftrightarrows Ce(OH)_2 + 2\ H$	-17.10			$Ce + 2\ H_2O \leftrightarrows Ce(OH)_2 + 2\ H$ -17.10 $2\ H + 2\ OH \leftrightarrows 2\ H_2O$ (2*14.00) 28.00 $Ce + 2\ OH \leftrightarrows Ce(OH)_2$ 10.90
$Ce + 3\ H_2O \leftrightarrows Ce(OH)_3 + 3\ H$	-26.80			$Ce + 3\ H_2O \leftrightarrows Ce(OH)_3 + 3\ H$ -26.80 $3\ H + 3\ OH \leftrightarrows 3\ H_2O$ (3*14.00) 42.00 $Ce + 3\ OH \leftrightarrows Ce(OH)_3$ 15.20
$Ce + 4\ H_2O \leftrightarrows Ce(OH)_4 + 4\ H$	-37.60			$Ce + 4\ H_2O \leftrightarrows Ce(OH)_4 + 4\ H$ -37.60 $4\ H + 4\ OH \leftrightarrows 4\ H_2O$ (4*14.00) 56.00 $Ce + 4\ OH \leftrightarrows Ce(OH)_4$ 18.40
$Ce + 2\ Cl \leftrightarrows CeCl_2$	1.19			
$Pr + 2\ H_2O \leftrightarrows Pr(OH)_2 + 2\ H$	-17.00			$Pr + 2\ H_2O \leftrightarrows Pr\ (OH)_2 + 2\ H$ -17.00 $2\ H + 2\ OH \leftrightarrows 2\ H_2O$ (2*14.00) 28.00 $Pr + 2\ OH \leftrightarrows Pr(OH)_2$ 11.00
$Pr + 3\ H_2O \leftrightarrows Pr(OH)_3 + 3\ H$	-26.60			$Pr + 3\ H_2O \leftrightarrows Pr(OH)_3 + 3\ H$ -26.60 $3\ H + 3\ OH \leftrightarrows 3\ H_2O$ (3*14.00) 42.00 $Pr + 3\ OH \leftrightarrows Pr(OH)_3$ 15.40
$Pr + 4\ H_2O \leftrightarrows Pr(OH)_4 + 4\ H$	-37.20			$Pr + 4\ H_2O \leftrightarrows Pr(OH)_4 + 4\ H$ -37.20 $4\ H + 4\ OH \leftrightarrows 4\ H_2O$ (4*14.00) 56.00 $Pr + 4\ OH \leftrightarrows Pr(OH)_4$ 18.80
$Pr + 2\ Cl \leftrightarrows PrCl_2$	-0.29			
$Nd + 2\ H_2O \leftrightarrows Nd(OH)_2 + 2\ H$	-16.90			$Nd + 2\ H_2O \leftrightarrows Nd(OH)_2 + 2\ H$ -16.90 $2\ H + 2\ OH \leftrightarrows 2\ H_2O$ (2*14.00) 28.00 $Nd + 2\ OH \leftrightarrows Nd(OH)_2$ 11.10
$Nd + 3\ H_2O \leftrightarrows Nd(OH)_3 + 3\ H$	-26.50			$Nd + 3\ H_2O \leftrightarrows Nd(OH)_3 + 3\ H$ -26.50 $3\ H + 3\ OH \leftrightarrows 3\ H_2O$ (3*14.00) 42.00 $Nd + 3\ OH \leftrightarrows Nd(OH)_3$ 15.50
$Nd + Cl \leftrightarrows NdCl$	0.80			
$Nd + 2\ Cl \leftrightarrows NdCl_2$	-0.29			
$Sm + 2\ H_2O \leftrightarrows Sm(OH)_2 + 2\ H$	-16.60			$Sm + 2\ H_2O \leftrightarrows Sm(OH)_2 + 2\ H$ -16.60 $2\ H + 2\ OH \leftrightarrows 2\ H_2O$ (2*14.00) 28.00 $Sm + 2\ OH \leftrightarrows Sm(OH)_2$ 11.40
$Sm + 3\ H_2O \leftrightarrows Sm(OH)_3 + 3\ H$	-25.80			$Sm + 3\ H_2O \leftrightarrows Sm(OH)_3 + 3\ H$ -25.80 $3\ H + 3\ OH \leftrightarrows 3\ H_2O$ (3*14.00) 42.00 $Sm + 3\ OH \leftrightarrows Sm(OH)_3$ 16.20

Equilibrium	Log (K)	I	T	Conversion or remarks
$Sm + 4\ H_2O \leftrightarrows Sm(OH)_4 + 4\ H$	-35.70			$Sm + 4\ H_2O \leftrightarrows Sm(OH)_4 + 4\ H$ -35.70 $4\ H + 4\ OH \leftrightarrows 4\ H_2O$ (4*14.00) 56.00 $Sm + 4\ OH \leftrightarrows Sm(OH)_4$ 20.30
$Sm + 2\ Cl \leftrightarrows SmCl_2$	-0.29			
$Eu + 2\ H_2O \leftrightarrows Eu(OH)_2 + 2\ H$	-16.60			$Eu + 2\ H_2O \leftrightarrows Eu(OH)_2 + 2\ H$ -16.60 $2\ H + 2\ OH \leftrightarrows 2\ H_2O$ (2*14.00) 28.00 $Eu + 2\ OH \leftrightarrows Eu(OH)_2$ 11.40
$Eu + 3\ H_2O \leftrightarrows Eu(OH)_3 + 3\ H$	-25.60			$Eu + 3\ H_2O \leftrightarrows Eu(OH)_3 + 3\ H$ -25.60 $3\ H + 3\ OH \leftrightarrows 3\ H_2O$ (3*14.00) 42.00 $Eu + 3\ OH \leftrightarrows Eu(OH)_3$ 16.40
$Eu + 4\ H_2O \leftrightarrows Eu(OH)_4 + 4\ H$	-35.30			$Eu + 4\ H_2O \leftrightarrows Eu(OH)_4 + 4\ H$ -35.30 $4\ H + 4\ OH \leftrightarrows 4\ H_2O$ (4*14.00) 56.00 $Eu + 4\ OH \leftrightarrows Eu(OH)_4$ 20.70
$Eu + 2\ Cl \leftrightarrows EuCl_2$	0.99			
$Gd + 2\ H_2O \leftrightarrows Gd(OH)_2 + 2\ H$	-16.40			$Gd + 2\ H_2O \leftrightarrows Gd(OH)_2 + 2\ H$ -16.40 $2\ H + 2\ OH \leftrightarrows 2\ H_2O$ (2*14.00) 28.00 $Gd + 2\ OH \leftrightarrows Gd(OH)_2$ 11.60
$Gd + 3\ H_2O \leftrightarrows Gd(OH)_3 + 3\ H$	-25.20			$Gd + 3\ H_2O \leftrightarrows Gd(OH)_3 + 3\ H$ -25.20 $3\ H + 3\ OH \leftrightarrows 3\ H_2O$ (3*14.00) 42.00 $Gd + 3\ OH \leftrightarrows Gd(OH)_3$ 16.80
$Gd + 4\ H_2O \leftrightarrows Gd(OH)_4 + 4\ H$	-34.40			$Gd + 4\ H_2O \leftrightarrows Gd(OH)_4 + 4\ H$ -34.40 $4\ H + 4\ OH \leftrightarrows 4\ H_2O$ (4*14.00) 56.00 $Gd + 4\ OH \leftrightarrows Gd(OH)_4$ 21.60
$Gd + 2\ Cl \leftrightarrows GdCl_2$	-0.29			
$Tb + 2\ H_2O \leftrightarrows Tb(OH)_2 + 2\ H$	-16.30			$Tb + 2\ H_2O \leftrightarrows Tb(OH)_2 + 2\ H$ -16.30 $2\ H + 2\ OH \leftrightarrows 2\ H_2O$ (2*14.00) 28.00 $Tb + 2\ OH \leftrightarrows Tb(OH)_2$ 11.70
$Tb + 3\ H_2O \leftrightarrows Tb(OH)_3 + 3\ H$	-25.10			$Tb + 3\ H_2O \leftrightarrows Tb(OH)_3 + 3\ H$ -25.10 $3\ H + 3\ OH \leftrightarrows 3\ H_2O$ (3*14.00) 42.00 $Tb + 3\ OH \leftrightarrows Tb(OH)_3$ 16.90
$Tb + 4\ H_2O \leftrightarrows Tb(OH)_4 + 4\ H$	-34.30			$Tb + 4\ H_2O \leftrightarrows Tb(OH)_4 + 4\ H$ -34.30 $4\ H + 4\ OH \leftrightarrows 4\ H_2O$ (4*14.00) 56.00 $Tb + 4\ OH \leftrightarrows Tb(OH)_4$ 21.70
$Tb + 2\ Cl \leftrightarrows TbCl_2$	-0.29			
$Dy + 2\ H_2O \leftrightarrows Dy(OH)_2 + 2\ H$	-16.20			$Dy + 2\ H_2O \leftrightarrows Dy(OH)_2 + 2\ H$ -16.20 $2\ H + 2\ OH \leftrightarrows 2\ H_2O$ (2*14.00) 28.00 $Dy + 2\ OH \leftrightarrows Dy(OH)_2$ 11.80
$Dy + 3\ H_2O \leftrightarrows Dy(OH)_3 + 3\ H$	-24.70			$Dy + 3\ H_2O \leftrightarrows Dy(OH)_3 + 3\ H$ -24.70 $3\ H + 3\ OH \leftrightarrows 3\ H_2O$ (3*14.00) 42.00 $Dy + 3\ OH \leftrightarrows Dy(OH)_3$ 17.30

Equilibrium	Log (K)	I	T	Conversion or remarks
$Dy + 4\ H_2O \leftrightarrows Dy(OH)_4 + 4\ H$	-33.50			$Dy + 4\ H_2O \leftrightarrows Dy(OH)_4 + 4\ H$ -33.50 $4\ H + 4\ OH \leftrightarrows 4\ H_2O$ (4*14.00) 56.00 $Dy + 4\ OH \leftrightarrows Dy(OH)_4$ 22.50
$Dy + Cl \leftrightarrows DyCl$	0.80			
$Dy + 2\ Cl \leftrightarrows DyCl_2$	-0.29			
$Ho + 2\ H_2O \leftrightarrows Ho(OH)_2 + 2\ H$	-16.10			$Ho + 2\ H_2O \leftrightarrows Ho(OH)_2 + 2\ H$ -16.10 $2\ H + 2\ OH \leftrightarrows 2\ H_2O$ (2*14.00) 28.00 $Ho + 2\ OH \leftrightarrows Ho(OH)_2$ 11.90
$Ho + 3\ H_2O \leftrightarrows Ho(OH)_3 + 3\ H$	-24.60			$Ho + 3\ H_2O \leftrightarrows Ho(OH)_3 + 3\ H$ -24.60 $3\ H + 3\ OH \leftrightarrows 3\ H_2O$ (3*14.00) 42.00 $Ho + 3\ OH \leftrightarrows Ho(OH)_3$ 17.40
$Ho + 4\ H_2O \leftrightarrows Ho(OH)_4 + 4\ H$	-33.40			$Ho + 4\ H_2O \leftrightarrows Ho(OH)_4 + 4\ H$ -33.40 $4\ H + 4\ OH \leftrightarrows 4\ H_2O$ (4*14.00) 56.00 $Ho + 4\ OH \leftrightarrows Ho(OH)_4$ 22.60
$Ho + Cl \leftrightarrows HoCl$	0.80			
$Ho + 2\ Cl \leftrightarrows HoCl_2$	-0.29			
$Er + 2\ H_2O \leftrightarrows Er(OH)_2 + 2\ H$	-15.90			$Er + 2\ H_2O \leftrightarrows Er(OH)_2 + 2\ H$ -15.90 $2\ H + 2\ OH \leftrightarrows 2\ H_2O$ (2*14.00) 28.00 $Er + 2\ OH \leftrightarrows Er(OH)_2$ 12.10
$Er + 3\ H_2O \leftrightarrows Er(OH)_3 + 3\ H$	-24.20			$Er + 3\ H_2O \leftrightarrows Er(OH)_3 + 3\ H$ -24.20 $3\ H + 3\ OH \leftrightarrows 3\ H_2O$ (3*14.00) 42.00 $Er + 3\ OH \leftrightarrows Er(OH)_3$ 17.80
$Er + 4\ H_2O \leftrightarrows Er(OH)_4 + 4\ H$	-32.60			$Er + 4\ H_2O \leftrightarrows Er(OH)_4 + 4\ H$ -32.60 $4\ H + 4\ OH \leftrightarrows 4\ H_2O$ (4*14.00) 56.00 $Er + 4\ OH \leftrightarrows Er(OH)_4$ 23.40
$Er + Cl \leftrightarrows ErCl$	0.80			
$Er + 2\ Cl \leftrightarrows ErCl_2$	-0.29			
$Tm + 2\ H_2O \leftrightarrows Tm(OH)_2 + 2\ H$	-15.90			$Tm + 2\ H_2O \leftrightarrows Tm(OH)_2 + 2\ H$ -15.90 $2\ H + 2\ OH \leftrightarrows 2\ H_2O$ (2*14.00) 28.00 $Tm + 2\ OH \leftrightarrows Tm(OH)_2$ 12.10
$Tm + 3\ H_2O \leftrightarrows Tm(OH)_3 + 3\ H$	-24.10			$Tm + 3\ H_2O \leftrightarrows Tm(OH)_3 + 3\ H$ -24.10 $3\ H + 3\ OH \leftrightarrows 3\ H_2O$ (3*14.00) 42.00 $Tm + 3\ OH \leftrightarrows Tm(OH)_3$ 17.90
$Tm + 4\ H_2O \leftrightarrows Tm(OH)_4 + 4\ H$	-32.60			$Tm + 4\ H_2O \leftrightarrows Tm(OH)_4 + 4\ H$ -32.60 $4\ H + 4\ OH \leftrightarrows 4\ H_2O$ (4*14.00) 56.00 $Tm + 4\ OH \leftrightarrows Tm(OH)_4$ 23.40
$Tm + 2\ Cl \leftrightarrows TmCl_2$	-0.29			
$Yb + 2\ H_2O \leftrightarrows Yb(OH)_2 + 2\ H$	-15.80			$Yb + 2\ H_2O \leftrightarrows Yb(OH)_2 + 2\ H$ -15.80 $2\ H + 2\ OH \leftrightarrows 2\ H_2O$ (2*14.00) 28.00 $Yb + 2\ OH \leftrightarrows Yb(OH)_2$ 12.20
$Yb + 3\ H_2O \leftrightarrows Yb(OH)_3 + 3\ H$	-24.10			$Yb + 3\ H_2O \leftrightarrows Yb(OH)_3 + 3\ H$ -24.10 $3\ H + 3\ OH \leftrightarrows 3\ H_2O$ (3*14.00) 42.00 $Yb + 3\ OH \leftrightarrows Yb(OH)_3$ 17.90

Equilibrium	Log (K)	I	T	Conversion or remarks
$Yb + 4\ H_2O \leftrightarrows Yb(OH)_4 + 4\ H$	-32.70			$Yb + 4\ H_2O \leftrightarrows Yb(OH)_4 + 4\ H$ -32.70 $4\ H + 4\ OH \leftrightarrows 4\ H_2O$ (4*14.00) 56.00 $Yb + 4\ OH \leftrightarrows Yb(OH)_4$ 23.30
$Yb + 2\ Cl \leftrightarrows YbCl_2$	-0.29			
$Lu + 2\ H_2O \leftrightarrows Lu(OH)_2 + 2\ H$	-15.70			$Lu + 2\ H_2O \leftrightarrows Lu(OH)_2 + 2\ H$ -15.70 $2\ H + 2\ OH \leftrightarrows 2\ H_2O$ (2*14.00) 28.00 $Lu + 2\ OH \leftrightarrows Lu(OH)_2$ 12.30
$Lu + 3\ H_2O \leftrightarrows Lu(OH)_3 + 3\ H$	-23.70			$Lu + 3\ H_2O \leftrightarrows Lu(OH)_3 + 3\ H$ -23.70 $3\ H + 3\ OH \leftrightarrows 3\ H_2O$ (3*14.00) 42.00 $Lu + 3\ OH \leftrightarrows Lu(OH)_3$ 18.30
$Lu + 4\ H_2O \leftrightarrows Lu(OH)_4 + 4\ H$	-31.80			$Lu + 4\ H_2O \leftrightarrows Lu(OH)_4 + 4\ H$ -31.80 $4\ H + 4\ OH \leftrightarrows 4\ H_2O$ (4*14.00) 56.00 $Lu + 4\ OH \leftrightarrows Lu(OH)_4$ 24.20
$Lu + 2\ Cl \leftrightarrows LuCl_2$	-0.29			
$Hf + 2\ H_2O \leftrightarrows Hf(OH)_2 + 2\ H$	-2.40			$Hf + 2\ H_2O \leftrightarrows Hf(OH)_2 + 2\ H$ -2.40 $2\ H + 2\ OH \leftrightarrows 2\ H_2O$ (2*14.00) 28.00 $Hf + 2\ OH \leftrightarrows Hf(OH)_2$ 25.60
$Hf + 3\ H_2O \leftrightarrows Hf(OH)_3 + 3\ H$	-6.00			$Hf + 3\ H_2O \leftrightarrows Hf(OH)_3 + 3\ H$ -6.00 $3\ H + 3\ OH \leftrightarrows 3\ H_2O$ (3*14.00) 42.00 $Hf + 3\ OH \leftrightarrows Hf(OH)_3$ 36.00
$Hf + 4\ H_2O \leftrightarrows Hf(OH)_4 + 4\ H$	-10.70			$Hf + 4\ H_2O \leftrightarrows Hf(OH)_4 + 4\ H$ -10.70 $4\ H + 4\ OH \leftrightarrows 4\ H_2O$ (4*14.00) 56.00 $Hf + 4\ OH \leftrightarrows Hf(OH)_4$ 45.30
$Hf + 5\ F \leftrightarrows HfF_5$	36.36			
$Hf + 6\ F \leftrightarrows HfF_6$	39.53			
$Hf + 2\ Cl \leftrightarrows HfCl_2$	1.55			
$Hf + 3\ Cl \leftrightarrows HfCl_3$	0.88			
$Hg(II) + 3\ H_2O \leftrightarrows Hg(II)(OH)_3 + 3\ H$	-21.1			$Hg(II) + 3\ H_2O \leftrightarrows Hg(II)(OH)_3 + 3\ H$ $3\ H + 3\ OH \leftrightarrows 3\ H_2O$ -21.1 (3*14.00) 42.00 $Hg(II) + 3\ OH \leftrightarrows Hg(II)(OH)_3$ 20.9
$Pb(II) + 2\ SO_4 \leftrightarrows Pb(II)(SO_4)_2$	4.51			
$Pb(II) + 4\ Cl \leftrightarrows Pb(II)Cl_4$	1.40			
$Bi + 6\ Cl \leftrightarrows BiCl_6$	6.51			

II.1.2 Morel

Equilibrium	Log (K)	I	T	Conversion or remarks
$H + 3\ (H_2BO_3) \leftrightarrows H(H_2BO_3)_3$	10.4			
$4\ H + 5\ (H_2BO_3) \leftrightarrows H_4(H_2BO_3)_5$	38.8			
$6\ H + 4\ (H_2SiO_4) \leftrightarrows H_6(H_2SiO_4)_4$	78.2			
$H + S \leftrightarrows HS$	13.9			
$Al + 3$ (salicylate) $\leftrightarrows$ $Al(salicylate)_3$	32.8			
$Fe(III) + 3$ (salicylate) $\leftrightarrows$ $Fe(III)(salicylate)_3$	37.2			
$Fe(II) +$ (EDTA) + (OH) $\leftrightarrows$ $Fe(II)(EDTA)(OH)$	20.4			
$Fe(II)+$ (EDTA)+ 2 (OH) $\leftrightarrows$ $Fe(II)(EDTA)(OH)_2$	23.7			

Fe(III) + (EDTA) + 2 (OH) ⇆ $Fe(III)(EDTA)(OH)_2$	37.7			
Ni + (CN) ⇆ Ni(CN)	7.7			
Cu(II) + 2 (CN) ⇆ $Cu(II)(CN)_2$	16.3			
Cu(II) + 3 (CN) ⇆ $Cu(II)(CN)_3$	21.6			
Cu(II) + 4 (CN) ⇆ $Cu(II)(CN)_4$	23.1			
Sr + (PO_4) ⇆ $Sr(PO_4)$	5.5			
Cd + S ⇆ CdS	19.5			
Ba + (salicylate) ⇆ Ba(salicylate)	0.2			
Ba + H + (EDTA) ⇆ BaH(EDTA)	14.6			
Hg(II) + S ⇆ Hg(II)S	7.9			
Hg(II) + S + (OH) ⇆ Hg(II)S(OH)	18.5			
Hg(II) + 3 (acetate) ⇆ $Hg(II)(acetate)_3$	14.1			
Hg(II)+ 4 (acetate) ⇆ $Hg(II)(acetate)_4$	17.6			

II.1.3 Turner & Whitfield

Equilibrium	Log (K)	I	T	Conversion or remarks
Na + H + NTA ⇆ NaHNTA	10.808			
Na + H + EDTA ⇆ NaH(EDTA)	11.168			
K + H + NTA ⇆ KHNTA	10.788			

II.1.4 Method of Byrne & Miller for mixed complexes

The constant for $Cu(II)(CO_3)(OH)$ was calculated after Byrne & Miller (1985) (equation 27 on page 1842):

$$\beta^*_{11} = \frac{[Cu(CO_3)(OH)^-]*[H^+]}{[Cu^{2+}]*[CO_3^{2-}]} = 2(\beta^*_2\beta\ )^{1/2}$$

$ß^*_2$ is the constant for the equilibrium:
$Cu^{2+} + 2\ H_2O$ ⇆ $Cu(OH)_2 + 2\ H^+$ (see equation 8 in Byrne & Miller)
This constant can be obtained as follows:

Database of CHEAQS:
$Cu^{2+} + 2\ OH^-$ ⇆ $Cu(OH)_2$ 10.7
$2\ H_2O$ ⇆ $2\ H^+ + 2\ OH^-$
(=2*-13.997) -27.994
$Cu^{2+} + 2\ H_2O$ ⇆ $Cu(OH)_2 + 2\ H^+$ -17.294 ($=ß^*_2$)

$ß_2$ is the constant for the following equilibrium:
$Cu^{2+} + 2\ CO_3^{2-}$ ⇆ $Cu(CO_3)_2^{2-}$
Database of CHEAQS: 10.2

$ß^*_{11} = 2 * (ß^*_2\ ß_2)^{1/2} = 2 * (10^{-17.294} * 10^{10.2})^{1/2}$
$= 2 * (10^{-7.094})^{1/2} = 2 * 10^{-3.547}$
$\log(ß^*_{11}) = -3.24597$

$Cu^{2+} + CO_3^{2-} \leftrightarrows Cu(CO_3)(OH)^- + H^+$ -3.24597
$H^+ + OH^- \leftrightarrows H_2O$ 13.997
$Cu^{2+} + CO_3^{2-} + OH^- \leftrightarrows Cu(CO_3)(OH)^-$ 10.75103
which was entered in CHEAQS' database.

II.2 Adsorption complexes

The constants for the adsorption equilibria were arbitrarily (!) selected as described below. To reliably model adsorption, measurements are needed to determine the constants. CHEAQS' constants are included as examples of how to model adsorption. See also the item "Modelling adsorption" in the help file.

II.2.1 Acid-base-equilibria

Equilibrium	Log (K)	I	T	Conversion or remarks
$=S\text{-}OH \leftrightarrows (=S\text{-}O)^- + H^+$	-9.5			
$=S\text{-}OH + H^+ \leftrightarrows =S\text{-}OH_2^+$	7.2			

Here =S represents an adsorption site. Typical examples of =S are Si, Fe, Al, Ti. Data were taken from Schindler & Stumm (1987) for =S is Al (page 95). For other =S than Al other constants have to be used (see page 97 for other examples).

II.2.2 Constants for metals

For the adsorption of Fe(III), Cd, Cu(II), Pb(II) and Mg on silica the following relationship has been established:
$\log {}^*K^s_1 = -0.09 + 0.62 * \log {}^*K_1$ (see page 101 in Schindler & Stumm)
$\log {}^*K_1$ is the first hydrolysis constant; it can be derived from the constant in CHEAQS' database by adding 13.997 (formation constant of H_2O) (symbol for constant in CHEAQS: K_{G1})
So:

$$\log {}^*K^s_1 = -0.09 + 0.62 * (\log K_{G1} - 13.997)$$
$$= -0.09 + (0.62 * -13.997) + 0.62 * \log K_{G1}$$
$$= -0.09 - 8.67814 + 0.62 * \log K_{G1}$$
$$= -8.76814 + 0.62 * \log K_{G1}$$

This approach has been applied to *all* cations with a charge of 2 or more (see table below).

Similarly, for $(=S)_2$-M the constants can be derived as follows.

$$\log {}^*ß^s_2 = -0.09 + 0.62 * \log {}^*ß_2$$ (see page 101 in Schindler & Stumm)
$$\log {}^*ß^s_2 = -0.09 + 0.62 * (\log KG_2 - 27.994)$$
$$= -0.09 + (0.62 * -27.994) + 0.62 * \log K_{G2}$$
$$= -0.09 - 17.35628 + 0.62 * \log K_{G2}$$
$$= -17.44628 + 0.62 * \log K_{G2}$$

This approach has been applied to *all* cations with a charge of 2 or more (see table below). Note that the constant were calculated with five decimals (that's how they are given here as well) but displayed by the program with three decimals.

cation	log K_{compl} M(OH)	log K_{compl} $M(OH)_2$	log K_{ads}	log K_{ads}
Be^{2+}	7.63954	-4.03163	16.86073	-6.99263
Mg^{2+}	2.58000	-7.16854		
Al^{3+}	9.00000	-3.18814	17.70000	-6.47228
Ca^{2+}	1.30000	-7.96214		
Sc^{3+}	9.70000	-2.75414	18.30000	-6.10028
$Cr(III)^{3+}$	10.30000	-2.38214	18.30000	-6.10028
$Mn(II)^{2+}$	3.40000	-6.66014	5.80000	-13.85028
$Fe(II)^{2+}$	4.60000	-5.91614	7.50000	-12.85828
$Fe(III)^{3+}$	11.81000	-1.44594	22.40000	-3.55828
$Co(II)^{2+}$	4.30000	-6.10214	9.20000	-11.74228
$Co(III)^{3+}$	12.72931	-0.87597		
Ni^{2+}	4.10000	-6.22614	9.00000	-11.86628
$Cu(II)^{2+}$	6.50000	-4.73814	10.70000	-10.81228
Zn^{2+}	5.00000	-5.66814	11.10000	-10.56428
Ga^{3+}	11.10000	-1.88614	21.30000	-4.24028
Sr^{2+}	0.82000	-8.25974		
Y^{3+}	6.30000	-4.86214	11.60000	-10.25428
Zr^{4+}	14.30000	0.09786	26.30000	-1.14028
Pd^{2+}	11.20632	-1.82022		
Cd^{2+}	3.90000	-6.35014	7.70000	-12.67228
In^{3+}	10.07000	-2.52474	20.20000	-4.92228
$Sn(II)^{2+}$	10.60000	-2.19614	20.90000	-4.48828
$Sn(IV)^{4+}$	15.50000	0.84186	29.31000	0.72592
Ba^{2+}	0.64000	-8.37134		
La^{3+}	5.50000	-5.35814	10.60000	-10.87428
Ce^{3+}	5.70000	-5.23414	10.90000	-10.68828
Pr^{3+}	6.00516	-5.04494	11.00000	-10.62628
Nd^{3+}	6.00000	-5.04814	11.10000	-10.56428
Sm^{3+}	6.20516	-4.98614	11.40000	-10.37828
Eu^{3+}	6.20516	-4.92094	11.40000	-10.37828
Gd^{3+}	6.20516	-4.92094	11.60000	-10.25428
Tb^{3+}	6.40516	-4.98614	11.70000	-10.19228
Dy^{3+}	6.40516	-4.79694	11.80000	-10.13028
Ho^{3+}	6.50516	-4.73494	11.90000	-10.06828
Er^{3+}	6.50516	-4.73494	12.10000	-9.94428
Tm^{3+}	6.60516	-4.67294	12.10000	-9.94428
Yb^{3+}	6.60516	-4.67294	12.20000	-9.88228
Lu^{3+}	6.60516	-4.67294	12.30000	-9.82028
Hf^{4+}	13.80000	-0.21214	25.60000	-1.57428
$Hg(II)^{2+}$	10.60000	-2.19614	21.83000	-3.91168
$Pb(II)^{2+}$	6.40000	-4.80014	10.90000	-10.68828
Bi^{3+}	12.90000	-0.77014	24.51580	-2.24648
$U(VI)O_2^{2+}$	8.10000	-3.74614		

II.2.3 Constants for anions

Because no such straightforward relationship has been established for anions as for cations, no anion surface complexes have been entered; however, the program may be able to handle such equilibria. For advice, contact the author.

II.3 Saturation solids

Some solubility constants were taken from Morel, Stumm & Morgan and Van Riemsdijk & Keizer.

II.3.1 Morel

Equilibrium	Log (K)	I	T	Conversion or remarks
$2\ Zn + Cl + 3\ OH \leftrightarrows Zn_2Cl(OH)_3$	26.8			
$Hg(II) + CO_3 \leftrightarrows Hg(II)CO_3$	16.1			
$Hg(II) + 2\ Br \leftrightarrows Hg(II)Br_2$	19.8			

II.3.2 Stumm & Morgan

Equilibrium	Log (K)	I	T	Conversion or remarks
$Ca + Mg + 2\ CO_3 \leftrightarrows CaMg(CO_3)_2$	16.7			
$4\ Mg + 3\ CO_3 + 2\ OH \leftrightarrows Mg_4(CO_3)_3(OH)_2{\cdot}3H_2O$	29.5			
$Mg + NH_4 + PO_4 \leftrightarrows MgNH_4PO_4$	12.6			$Mg + NH_4 + PO_4 \leftrightarrows MgNH_4PO_4$ 12.6 $NH_3 + H \leftrightarrows NH_4$ 9.244 $Mg + NH_3 + H + PO_4 \leftrightarrows MgNH_4PO_4$ 21.844
$10\ Ca + 6\ PO_4 + 2\ F \leftrightarrows Ca_{10}(PO_4)_6F_2$	118			
$Ca_{10}(PO_4)_6(OH)_2 + 6\ H_2O \leftrightarrows 4\ Ca_2(HPO_4)(OH)_2 + 2\ Ca + 2\ HPO_4$	-17			$Ca_{10}(PO_4)_6(OH)_2 + 6\ H_2O \leftrightarrows 4\ Ca_2(HPO_4)(OH)_2 + 2\ Ca + 2\ HPO_4$ -17 $10\ Ca + 6\ PO_4 + 2\ OH \leftrightarrows Ca_{10}(PO_4)_6(OH)_2$ 116.66 $2\ HPO_4 \leftrightarrows 2\ PO_4 + 2\ H$ (2*-12.375) -24.75 $8\ Ca + 4\ PO_4 + 2\ OH + 6\ H_2O \leftrightarrows 4\ Ca_2(HPO_4)(OH)_2 + 2\ H$ 74.91 $2\ OH + 2\ H \leftrightarrows 2\ H_2O$ (2*13.997) 27.994 $8\ Ca + 4\ PO_4 + 4\ OH + 4\ H_2O \leftrightarrows 4\ Ca_2(HPO_4)(OH)_2$ 102.904 (note: in version L05 and L06 stated as 102.906)
$Fe(II) + NH_4 + PO_4 \leftrightarrows Fe(II)NH_4PO_4$	13			$Fe(II) + NH_4 + PO_4 \leftrightarrows Fe(II)NH_4PO_4$ 13 $NH_3 + H \leftrightarrows NH_4$ 9.244 $Fe(II) + NH_3 + H + PO_4 \leftrightarrows Fe(II)NH_4PO_4$ 22.244
$Zn + 1.6\ H_2O + 0.4\ CO_2\ (g) \leftrightarrows Zn(OH)_{1.2}(CO_3)_{0.4} + 2\ H$	-9.8			$Zn + 1.6\ H_2O + 0.4\ CO_2\ (g) \leftrightarrows Zn(OH)_{1.2}(CO_3)_{0.4} + 2\ H$ -9.8 Multiply by 5: $5\ Zn + 8\ H_2O + 2\ CO_2\ (g) \leftrightarrows Zn_5(OH)_6(CO_3)_2 + 10\ H$ -49 $4\ H + 2\ CO_3 \leftrightarrows 2\ H_2O + 2\ CO_2\ (g)$ (2*18.147) 36.294 $6\ OH + 6\ H \leftrightarrows 6\ H_2O$ (6*13.997) 83.982 $5\ Zn + 6\ OH + 2\ CO_3 \leftrightarrows Zn_5(OH)_6(CO_3)_2$ 71.276

II.3.3 Van Riemsdijk & Keizer

Equilibrium	Log (K)	I	T	Conversion or remarks
$Ca + 2\ H_2PO_4 + H_2O \leftrightarrows Ca(H_2PO_4)_2(H_2O)$	1.15			$Ca + 2\ H_2PO_4 + H_2O \leftrightarrows Ca(H_2PO_4)_2(H_2O)$ 1.15 $4\ H + 2\ PO_4 \leftrightarrows 2\ H_2PO_4$ (2* 19.573) 39.146 $Ca + 4\ H + 2\ PO_4 \leftrightarrows CaH_4(PO_4)_2$ 40.296

$Fe(III) + K + 2\ SO_4 + 6\ H_2O \leftrightarrows KFe_3(SO_4)_2(OH)_6 + 6\ H$	12.51			$Fe(III) + K + 2\ SO_4 + 6\ H_2O \leftrightarrows KFe_3(SO_4)_2(OH)_6 + 6\ H$ 12.51 $6\ OH + 6\ H \leftrightarrows 6\ H_2O$ $(6*13.997)$ 83.982 $Fe(III) + K + 2\ SO_4 + 6\ OH \leftrightarrows KFe_3(SO_4)_2(OH)_6$ 96.492
$5\ Pb + 3\ H_2PO_4 + H_2O \leftrightarrows Pb_5(PO_4)_3OH + 7\ H$	4.14			$5\ Pb + 3\ H_2PO_4 + H_2O \leftrightarrows Pb_5(PO_4)_3OH + 7\ H$ 4.14 $6\ H + 3\ PO_4 \leftrightarrows 3\ H_2PO_4$ $(3*\ 19.573)$ 58.719 $OH + H \leftrightarrows H_2O$ 13.997 $5\ Pb + 3\ PO_4 + OH \leftrightarrows Pb_5(PO_4)_3OH$ 76.856
$5\ Pb + 3\ H_2PO_4 + Cl \leftrightarrows Pb_5(PO_4)_3Cl + 6\ H$	25.05			$5\ Pb + 3\ H_2PO_4 + Cl \leftrightarrows Pb_5(PO_4)_3Cl + 6\ H$ 25.05 $6\ H + 3\ PO_4 \leftrightarrows 3H_2PO_4$ $(3*\ 19.573)$ 58.719 $5\ Pb + 3\ PO_4 + Cl \leftrightarrows Pb_5(PO_4)_3Cl$ 83.769
$3\ Al + 2\ PO_4 + 8\ H_2O \leftrightarrows Al_3(PO_4)_2(OH)_3(H_2O)_5 + 3\ H$	36.86			$3\ Al + 2\ PO_4 + 8\ H_2O \leftrightarrows Al_3(PO_4)_2(OH)_3(H_2O)5 + 3\ H$ 36.86 $3\ OH + 3\ H \leftrightarrows 3\ H_2O$ $(3*13.997)$ 41.991 $3\ Al + 2\ PO_4 + 3\ OH \leftrightarrows Al_3(PO_4)_2(OH)_3(H_2O)_5$ 78.851

II.4 Gas solution equilibria

II.4.1 Morel

Equilibrium	Log (K)	I	T	Conversion or remarks
$NH_3\ (aq) \leftrightarrows NH_3\ (g)$	-1.8			Note: this value was taken from page 242; at page 130 a value of -1.87 is given.

II.5 Redox couples

Redox couples were primarily selected from the Handbook of Chemistry and Physics. In a few cases, environmentally important equilibria are missing in that source; therefore, alternative sources were included.

II.5.1 Lide (Handbook)

Note: couples are given in volts; these can be converted to 10-base log constants by dividing by 0.0591595 and multiplying by the number of electrons involved.

Equilibrium	E (in V)	I	T	Conversion or remarks
$HCr(VI)O_4^- + 7\ H^+ + 3\ e \leftrightarrows Cr(III)^{3+} + 4\ H_2O$	1.350			log(K)= (1.350 / 0.0591595) * 3 = 68.45958 $HCr(VI)O_4^- + 7\ H^+ + 3\ e \leftrightarrows Cr(III)^{3+} + 4\ H_2O$ 68.45958 $Cr(VI)O_4^{2-} + H^+ \leftrightarrows HCr(VI)O_4^-$ 6.51 $Cr(VI)O_4^{2-} + 8\ H^+ + 3\ e \leftrightarrows Cr(III)^{3+} + 4\ H_2O$ 74.96958

$Mn(VII)O_4^-$ + 8 H^+ + 5 e ⇆ $Mn(II)^{2+}$ + 4 H_2O	1.507			log(K)= (1.507 / 0.0591595) * 5 = 127.36862
$Mn(IV)O_2$ (s) + 4 H^+ + 2 e ⇆ $Mn(II)^{2+}$ + 2 H_2O	1.224			log(K)= (1.224 / 0.0591595) * 2 = 41.38001
$Fe(III)^{3+}$ + e ⇆ $Fe(II)^{2+}$	0.771			log(K)= (0.771 / 0.0591595) = 13.03267
$Co(III)^{3+}$ + e ⇆ $Co(II)^{2+}$	1.92			log(K)= (1.92 / 0.0591595) = 32.45491
$Cu(II)^{2+}$ + e ⇆ $Cu(I)^+$	0.153			log(K)= (0.153 / 0.0591595) = 2.58625
$Cu(II)^{2+}$ + 2 e ⇆ Cu (s)	0.3419			log(K)= (0.3419 / 0.0591595) * 2 = 11.55868
$Sn(IV)^{4+}$ + 2 e ⇆ $Sn(II)^{2+}$	0.151			log(K)= (0.151 / 0.0591595) * 2 = 5.10489
$Pb(IV)O_2$ + 4 H^+ + 2 e ⇆ $Pb(II)^{2+}$ + 2 H_2O	1.455			log(K)= (1.455 / 0.0591595) * 2 = 49.18947
NO_3^- + 3 H^+ + 2 e ⇆ HNO_2 + H_2O	0.934			log(K)= (0.934 / 0.0591595) * 2 = 31.57592 NO_3^- + 3 H^+ + 2 e ⇆ HNO_2 + H_2O 31.57592 HNO_2 ⇆ H^+ + NO_2^- -3.15 NO_3^- + 2 H^+ + 2 e ⇆ NO_2^- + H_2O 28.42592 (see next couple)
NO_3^- + H_2O + 2e ⇆ NO_2^- + 2 OH^-	0.01			log(K)= (0.01 / 0.0591595) * 2 = 0.3380 NO_3^- + H_2O + 2e ⇆ NO_2^- + 2 OH^- 0.33807 2 H^+ + 2 OH^- ⇆ 2 H_2O (2*13.997) 27.994 NO_3^- + 2 H^+ 2e ⇆ H_2O + NO_2^- 28.33207 Average of this one and the previous one: (28.42592 + 28.33207)/2= 28.379 which was entered.
SO_4^{2-} + 4 H^+ + 2e ⇆ H_2SO_3 + H_2O	0.172			log(K)= (0.172 / 0.0591595) * 2 = 5.81484 SO_4^{2-} + 4 H^+ + 2e ⇆ H_2SO_3 + H_2O 5.81484 H_2SO_3 ⇆ 2 H^+ + SO_3^{2-} -9.05 SO_4^{2-} + 2 H^+ + 2e ⇆ SO_3^{2-} + H_2O -3.23516 (see next couple)
SO_4^{2-} + H_2O + 2 e ⇆ SO_3^{2-} + 2 OH^-	-0.93			log(K)= (-0.93 / 0.0591595) * 2 = 31.44069 SO_4^{2-} + H_2O + 2 e ⇆ SO_3^{2-} + 2 OH^- -31.44069 2 H^+ + 2 OH^- ⇆ 2 H_2O (2*13.997) 27.994 SO_4^{2-} + 2 H^+ + 2e ⇆ SO_3^{2-} + H_2O -3.44669 Average of this one and the previous one: (-3.23516 + -3.44669)/2= -3.340925 which was entered.
H_3AsO_4 + 2 H^+ + 2 e ⇆ $HAsO_2$ + 2 H_2O	0.560			log(K)= (0.560 / 0.0591595) * 2 = 19.93203 H_3AsO_4 + 2 H^+ + 2 e ⇆ $HAsO_2$ + 2 H_2O 18.93203 AsO_4^{3-} + 3 H^+ ⇆ H_3AsO_4 20.70 $HAsO_2$ ⇆ H^+ + AsO_2^- -9.29 AsO_4^{3-} + 4 H^+ + 2 e ⇆ AsO_2^- +2 H_2O 30.34203 (see next couple)

AsO_4^{3-} + 2 H_2O + 2 e ⇆ AsO_2^- + 4 OH^-	-0.71			log(K)= (-0.71 / 0.0591595) * 2 = -24.00311 AsO_4^{3-} + 2 H_2O + 2 e ⇆ AsO_2^- + 4 OH^- -24.00311 4 OH^- + 4 H^+ ⇆ 4 H_2O (4*13.997) 55.988 AsO_4^{3-} + 4 H^+ + 2 e⇆ AsO_2^- + 2 H_2O 31.98489 Average of this one and the previous one: (30.34203 + 31.98489)/2= 31.16346 which was entered.
$Se(VI)O_4^{2-}$ + 4 H^+ + 2e ⇆ $H_2Se(IV)O_3$ +H_2O	1.151			log(K)= (1.151 / 0.0591595) * 2 = 38.91208 $Se(VI)O_4^{2-}$ + 4 H^+ + 2e ⇆ $H_2Se(IV)O_3$ +H_2O 38.91208 $H_2Se(IV)O_3$ ⇆ 2 H + $Se(IV)O_3^{2-}$ -11.03 $Se(VI)O_4^{2-}$ + 2 H^+ + 2e ⇆ $Se(IV)O_3^{2-}$ 27.88208 (see next couple)
$Se(VI)O_4^{2-}$ + H_2O + 2e ⇆ $Se(IV)O_3^{2-}$ + 2 OH^-	0.05			log(K)= (0.05 / 0.0591595) * 2 = 1.69036 $Se(VI)O_4^{2-}$ + H_2O + 2e ⇆ $Se(IV)O_3^{2-}$ + 2 OH^- 1.69036 2 H+ + 2 OH- ⇆ 2 H_2O (2*13.997) 27.994 $Se(VI)O_4^{2-}$ + 2 H^+ + 2e ⇆ $Se(IV)O_3^{2-}$ 29.68436 Average of this one and the previous one: (27.88208 + 29.68436)/2= 28.78322 which was entered.

II.5.2 Morel

Equilibrium	Log(K)	I	T	Conversion or remarks
1/8 NO_3^- + 5/4 H^+ + e ⇆ 1/8 NH_4^+ + 3/8 H_2O	14.9			multiply by 8: NO_3^- + 10 H^+ + 8 e ⇆ NH_4^+ + 3 H_2O 119.2 NH_4^+ ⇆ NH_3 + H -9.244 NO_3^- + 9 H^+ + 8 e ⇆ NH_3 + 3H_2O 109.956
1/8 $S(VI)O_4^{2-}$ + 5/4 H^+ + e ⇆ 1/8 H_2S(-II) (aq) + 1/2 H_2O	5.13			multiply by 8: $S(VI)O_4^{2-}$ + 10 H^+ + 8 e ⇆ H_2S(-II) (aq) + 4 H_2O 41.04 H_2S ⇆ 2 H + S -20.92 $S(VI)O_4^{2-}$ + 8 H^+ + 8 e ⇆ $S(-II)^{2-}$ 20.12

II.5.3 Stumm & Morgan

Equilibrium	Log(K)	I	T	Conversion or remarks
S(s) + 2 H^+ + 2 e ⇆ H_2S	4.8			invert: H_2S (aq) ⇆ S(s) + 2 H^+ + 2 e -4.8 From Morel: $S(VI)O_4^{2-}$ + 10 H^+ + 8 e ⇆ H_2S(-II) (aq) + 4 H_2O 41.04 SO_4^{2-} + 8 H^+ + 6 e ⇆ S(s) 36.24

II.6 Organic complexation

Since version Pro 2012.4, four models for organic complexation are included, one published by Cabaniss and Shuman (1988a, 1988b), one by Tipping and Hurley (Model V or WHAM-W, 1992,

1994), one by Tipping (Model VI or WHAM 6; 1998), one by Tipping *et al.* (2011). This document contains the values of the equilibrium constants used in the models.
The help file of the program contains information about how to use and interpret the models. Please DO read that section before (and after) including organic complexation.
This document does not include that information.

II.6.1 Model of Cabaniss and Shuman

The model of Cabaniss and Shuman (1988a, 1988b) was derived for Cu(II). The constants are given below. CHEAQS offers the option to extrapolate these equilibria and constants to other metals. This extrapolation, including a discussion of the background and drawbacks, was discussed by Janssen & Verweij (2003).

Equilibrium	Log(K)
$Cu^{2+} + DOC^{5-} \leftrightarrows Cu(II)DOC^{3-}$	3.900
$Cu^{2+} + HDOC^{4-} \leftrightarrows Cu(II)DOC^{3-} + H^{+}$	1.494
$Cu^{2+} + HDOC^{4-} \leftrightarrows Cu(II)DOC^{3-} + H^{+}$	-0.364
$Cu^{2+} + H_2DOC^{3-} \leftrightarrows Cu(II)DOC^{3-} + 2\ H^{+}$	-7.483
$Cu^{2+} + H_2DOC^{3-} \leftrightarrows Cu(II)DOC^{3-} + 2\ H^{+}$	-10.050

II.6.2 Model of Tipping and Hurley

CHEAQS includes 'Model V', also known as WHAM-W(ater). In the table below, the 'basic' constants are given for each metal or metal hydroxides. These constants are used to calculate values for eight monodentate sites and twelve bidentate sites, for fulvic acids and humic acids. Details are given in Tipping & Hurley (1992) and Tipping (1994). The help file of CHEAQS also contains a summary of the model.

In the table the complexes with their constants are given in the following order. For each metal:

- complex of metal with fulvic acid (FA);
- complex of metal hydroxide with fulvic acid (FA);
- complex of metal with humic acid (HA);
- complex of metal hydroxide with humic acid (HA).

Note: for some metals, no constants for the metal hydroxides are given (e.g. Mg and Ca). Charges are omitted for clarity.

	Log(K) for:			
Metal	M-FA	M(OH)-FA	M-HA	M(OH)-HA
Be	0.4	0.4	1.7	1.7
Mg	2.2		3.3	
Al	0.4	0.4	1.3	1.3
Ca	2.2		3.2	
Cr(III)	0.1	0.1	0.5	0.5
Mn(II)	1.7	1.7	3.4	3.4
Fe(II)	1.3	1.3	2.1	2.1
Fe(III)	-0.2	-0.2	0.8	0.8
Co(II)	1.7	1.7	2.7	2.7
Ni	1.4	1.4	2.7	2.7
Cu(II)	0.8	0.8	1.5	1.5
Zn	1.3	1.3	2.3	2.3

Sr	2.3		2.8	
Cd	1.5	1.5	2.7	2.7
Ba	2.6		3.6	
Hg(II)	-0.3	-0.3	0.2	0.2
Pb(II)	0.9	0.9	1.7	1.7
$(U(VI)O_2)$	0.9	0.9	1.3	1.3

II.6.3 Tipping's Model VI (WHAM 6)

Since CHEAQS Pro 2011, CHEAQS also includes 'Model VI', also known as WHAM-6. In the table below, the 'basic' constants are given for each metal or metal hydroxides. These constants are used to calculate values for eight monodentate sites, eight bidentate sites (each with three sub-sites) and 16 tridentate sites (also each with three sub-sites), for fulvic acids and humic acids. Details are given in Tipping (1998). The help file of CHEAQS also contains a summary of the model.

In the table the complexes with their constants are given in the following order. For each metal:

- complex of metal with fulvic acid (FA);
- complex of metal hydroxide with fulvic acid (FA);
- complex of metal with humic acid (HA);
- complex of metal hydroxide with humic acid (HA).

Note: for some metals, no constants for the metal hydroxides are given (e.g. Mg and Ca). Charges are omitted for clarity.

	Log(K) for:			
Metal	M-FA	M(OH)-FA	M-HA	M(OH)-HA
Mg	1.1		0.7	
Al	2.5	2.5	2.6	2.6
Ca	1.3		0.7	
Cr(III)	2.2	2.2	2.2	2.2
Mn(II)	1.7	1.7	0.6	0.6
Fe(II)	1.6	1.6	1.3	1.3
Fe(III)	2.4	2.4	2.5	2.5
Co(II)	1.4	1.4	1.1	1.1
Ni	1.4	1.4	1.1	1.1
Cu(II)	2.1	2.1	2.0	2.0
Zn	1.6	1.6	1.5	1.5
Sr	1.2		1.1	
Cd	1.6	1.6	1.3	1.3
Ba	0.6		-0.2	
Eu	2.4	2.4	2.1	2.1
Hg(II)	3.5	3.5	3.5	3.5
Pb(II)	2.2	2.2	2.0	2.0
$(U(VI)O_2)$	2.1	2.1	2.2	2.2

II.6.3 Tipping's Model VII (7)

Since CHEAQS Pro 2012.4, CHEAQS also includes 'Model VII'. In the table below, the 'basic' constants are given for each metal or metal hydroxides. These constants are used to calculate

values for eight monodentate sites, six bidentate sites (each with three sub-sites) and eight tridentate sites (also each with three sub-sites), for fulvic acids and humic acids. Details are given in Tipping *et al.* (2011). The help file of CHEAQS also contains a summary of the model.

In the table the complexes with their constants are given in the following order. For each metal:

- complex of metal with fulvic acid (FA);
- complex of metal hydroxide with fulvic acid (FA);
- complex of metal with humic acid (HA);
- complex of metal hydroxide with humic acid (HA).

Note: for some metals, no constants for the metal hydroxides are given (e.g. Mg and Ca). Charges are omitted for clarity.

	Log(K) for:			
Metal	M-FA	M(OH)-FA	M-HA	M(OH)-HA
Be	2.02	2.02	2.27	2.27
Mg	0.99		1.14	
Al	2.57	2.57	2.82	2.82
Ca	1.13		1.26	
Sc	3.28	3.28	3.61	3.61
Cr(III)	2.89	2.89	3.07	3.07
Mn(II)	1.76	1.76	1.98	1.98
Fe(II)	1.46	1.46	1.76	1.76
Fe(III)	3.12	3.12	3.37	3.37
Co(II)	1.35	1.35	1.5	1.5
Ni	1.43	1.43	1.6	1.6
Cu(II)	2.16	2.16	2.38	2.38
Zn	1.68	1.68	1.87	1.87
Sr	1.13		1.32	
Y	2.76	2.76	3.03	3.03
Ag	1.27	1.27	1.44	1.44
Cd	1.51	1.51	1.67	1.67
Ba	0.97		1.3	
La	2.36	2.36	2.62	2.62
Ce	2.41	2.41	2.66	2.66
Pr	2.59	2.59	2.85	2.85
Nd	2.57	2.57	2.83	2.83
Sm	2.66	2.66	2.93	2.93
Eu	2.62	2.62	2.89	2.89
Gd	2.68	2.68	2.95	2.95
Tb	2.76	2.76	3.04	3.04
Dy	2.91	2.91	3.2	3.2
Ho	2.82	2.82	3.1	3.1
Er	2.92	2.92	3.21	3.21
Tm	2.94	2.94	3.23	3.23
Yb	2.94	2.94	3.24	3.24
Lu	2.99	2.99	3.29	3.29
Hg(II)	3.51	3.51	3.84	3.84
Pb(II)	2.15	2.15	2.37	2.37
(U(VI)O_2)	2.38	2.38	2.61	2.61

Part III: molecular weights

Part III contains the molecular weights that are included in the file COMPON.HF2. In the selection and calculation of the molecular weights some arbitrary choices were made. For the cations and inorganic ligands, the weight of the central atom was entered. For the organic ligands (including CN^-), the weight of the completely deprotonated anion was entered. Please check your own data before entering concentrations in $g.L^{-1}$.
Most data were taken from Loss (2003) except for a few cases which are stated below.

Component	Molecular weight	Conversion or remarks
H	1.00794	
Li	6.941	
Be	9.012182	
Na	22.989770	
Mg	24.3050	
Al	26.981538	
K	39.0983	
Ca	40.078	
Sc	44.955910	
Cr(III)	51.9961	
Mn(II)	54.938049	
Fe(II)	55.845	
Fe(III)	55.845	
Co(II)	58.933200	
Co(III)	58.933200	
Ni	58.6934	
Cu(I)	63.546	
Cu(II)	63.546	
Zn	65.409	
Ga	69.723	
Rb	85.4678	
Sr	87.62	
Y	88.90585	
Zr	91.224	
Pd	106.42	
Ag	107.8682	
Cd	112.411	
In	114.818	
Sn(II)	118.710	
Sn(IV)	118.710	
Cs	132.90545	
Ba	137.327	
La	138.9055	
Ce	140.116	
Pr	140.90765	
Nd	144.24	
Pm	145	taken from Lide (1999)
Sm	150.36	
Eu	151.964	
Gd	157.25	
Tb	158.92534	
Dy	162.500	
Ho	164.93032	
Er	167.259	
Tm	168.93421	
Yb	173.04	
Lu	174.967	
Hf	178.49	
Hg(II)	200.59	
Pb(II)	207.2	
Bi	208.98038	
$(U(VI)O_2)$	238.02891	is atomic weight of U
e	0	(not relevant; not used in the calculations)

Component	Molecular weight	Conversion or remarks
(OH)	15.9994	is atomic weight of O
(H_2BO_3)	10.811	is atomic weight of B
(CO_3)	12.0107	is atomic weight of C
(NH_3)	14.0067	is atomic weight of N
(NO_2)	14.0067	is atomic weight of N
(NO_3)	14.0067	is atomic weight of N
F	18.9984032	
(H_2SiO_4)	28.0855	is atomic weight of Si
(PO_4)	30.973761	is atomic weight of P
S	32.065	
(SO_3)	32.065	is atomic weight of S
(SO_4)	32.065	is atomic weight of S
Cl	35.453	
(VO_4)	50.9415	is atomic weight of V
(CrO_4)	51.9961	is atomic weight of Cr
(MnO_4)	54.938049	is atomic weight of Mn
(H_2AsO_3)	74.92160	is atomic weight of As
(AsO_4)	74.92160	is atomic weight of As
(SeO_3)	78.96	is atomic weight of Se
(SeO_4)	78.96	is atomic weight of Se
Br	79.904	
(MoO_4)	95.94	is atomic weight of Mo
I	126.90447	
(WO_4)	183.84	is atomic weight of W
(CN)	26.02206	HCN: 27.03 H: 1.00794 (-) CN: 26.02206 Note: HCN taken from Weast (1979)
(acetate)	59.04206	acetic acid: 60.05 H: 1.00794 (-) acetate: 59.04206 note: acetic acid taken from Weast (1979)
(catechol)	108.09412	catechol: 110.11 2*H (2*1.00794): 2.01588 (-) deprotonated catechol: 108.09412 note: catechol taken from Weast (1979)
(salicylate)	136.10412	salicylic acid: 138.12 2*H (2*1.00794): 2.01588 (-) salicylate: 136.10412 note: salicylic acid taken from Weast (1979)
(phthalate)	164.12412	phthalic acid: 166.14 2*H (2*1.00794): 2.01588 (-) phthalate: 164.12412 note: phthalic acid taken from Weast (1979)
(NTA)	188.11618	NTA: 191.14 3*H (3*1.00794): 3.02382 (-) deprotonated NTA: 188.11618 note: NTA taken from Weast (1979)
(HEDTA)	275.24618	HEDTA: 278.27 3*H (3*1.00794): 3.02382 (-) deprotonated HEDTA: 275.24618 note: HEDTA not found in Weast, but value for compound with same formula $C_{10}H_{18}N_2O_7$ taken from Weast (1979)
(EDTA)	288.21458	Na_2H_2EDTA: 336.21 2*H (2*1.00794): 2.01588 (-) 2*Na (2*22.98977) 45.97954 (-) deprotonated EDTA: 288.21458 note: Na_2H_2EDTA taken from Weast (1979)
(=S-OH)	10000	this is a purely arbitrary number!
MnO_2 (s)	86.94	taken from Weast (1979)
Cu (s)	63.546	
PbO_2 (s)	239.19	taken from Weast (1979)
S (s)	32.065	
CO_2 (g)	0	(molecular weights of gases are not used by the program, but for consistency reasons they do occur in the datafile COMPON.HF2)
NH_3 (g)	0	
H_2S (g)	0	
SO_2 (g)	0	

Appendix: compatibility of datasources

It is not trivial that data taken from different sources are comparable: many, sometimes undocumented conversions are done and assumptions made. As stated on page 93, some data were taken from other sources than the NIST database as well. In this appendix it is shown that the other sources are compatible with the NIST database. In addition, it is shown that redox couples taken from different sources are compatible with Lide (1999), the "default" source for redox couples.
Section A1 to A3 deal with complexes, A4 and A5 with solids and A6 and A7 with redox couples.
Note: for redox couples and solids one can not be as stringent as for complexes because for solids there often is a considerable range of data even within one source; for solids this is mainly caused by differences in cristalline forms.
Values are given with no more than three decimals (and rounded if necessary).

A.1 Turner *et al.*
Two cations were taken (the first two in Turner) with the first five complexes.
Note: M(OH)-data have been converted (see section II.1.1 for details).

Complex	NIST 46 v8	Turner et al.
Ag(OH)	2.000	2.00
$Ag(OH)_2$	3.990	4.00
AgF	0.400	0.40
AgCl	3.310	3.27
$AgCl_2$	5.250	5.23
Al(OH)	9.000	9.03
$Al(OH)_2$	17.700	18.70
$Al(OH)_3$	25.300	27.00
$Al(OH)_4$	33.300	33.00
AlF	7.010	7.01

A.2 Morel

Complex	NIST 46 v8	Morel
Ca(OH)	1.3	1.15
Mg(OH)	2.58	2.56
$Mg_4(OH)_4$	16.55954	16.28
Cr(III)(OH)	10.3	10.0
$H(CO_3)$	10.329	10.33
$H_2(CO_3)$	16.681	16.68
$Na(CO_3)$	1.27	1.27
$H(SO_4)$	1.99	1.99
$Na(SO_4)$	0.74	1.06
$K(SO_4)$	0.85	0.96

A.3 Turner & Whitfield

Complex	NIST 46 v8	Turner & Whitfield
HEDTA	10.948	11.094
H_2EDTA	17.221	17.807
NaEDTA	2.7143	2.544
KEDTA	1.6543	1.504
MgEDTA	10.5836	10.70
HNTA	10.29406	10.389
NaNTA	1.84073	1.899
KNTA	1.24073	1.339
MgNTA	6.78145	6.70
CaNTA	7.74145	7.67

A.4 Stumm & Morgan

Solid	NIST 46 v8	Stumm & Morgan
$Fe(III)(OH)_3$	38.6 39.3 (aged) 41.5 (FeOOH; alpha) 42.7 (Fe2O3; alpha)	41.5
$Fe(II)(OH)_2$	14.5 (amorf) 15.1 (crystalline)	14.43

A.5 Van Riemsdijk & Keizer

Solid	NIST 46 v8	Van Riemsdijk & Keizer
$CaSO_4$	4.61	4.64
CdS	27.92	27.07
Cu(II)S	36.12	36.10

A.6 Morel

Couple	Lide		Morel
	E (V)	Log(K)	Log(K)
Fe(III)/Fe(II)	0.771	13.03267	13.0
Cu(II)/Cu(I)	0.153	2.58625	2.6

A.7 Stumm & Morgan

Couple	Lide		Stumm & Morgan
	E (V)	Log(K)	Log(K)
Co(III)/Co(II)	1.92	32.45491	31
$Cu(II)/Cu^0$ *(s)*	0.3419	11.55868	11.4

References

This section contains two types of references; the first type gives details about the sources of constants as they are referred to in the database. This information can be found in the on-line help as well. The second part consists of the "normal" bibliographic references.

Part I: sources of the database

Abbreviation used in CHEAQS	Bibiographic reference
after Byrne & Miller	Byrne, R.H. & W.L. Miller (1985). Copper(II) carbonate complexation in seawater. Geochimica et Cosmochimica Acta *49*, 1837 - 1844.
after Schindler & Stumm	Schindler, P.W. & W. Stumm (1987). The surface chemistry of oxides, hydroxides, and oxide minerals. In: Aquatic surface chemistry, W. Stumm (ed.), John Wiley & Sons, New York.
Cabaniss & Shuman	Cabaniss, S.E. & M.S. Shuman (1988). a) Copper binding by dissolved organic matter: I. Suwannee River fulvic acid equilibria. Geochimica Cosmochimica Acta *52*, 185 - 193. b) Copper binding by dissolved organic matter: II. Variation in type and source of organic matter. Geochimica Cosmochimica Acta *52*, 195 - 200.
extrapolated from Cabaniss & Shuman	See help file, topic "Organic complexation"
Lide (Handbook)	Lide, D.R. (ed.) (1999). CRC Handbook of Chemistry and Physics, electronic version of the 79th edition. CRC Press LLC.
Morel	Morel, F.M.M. (1983). Principles of aquatic chemistry. John Wiley & Sons, New York.
NIST Database 46 Version 8.0	NIST Standard Reference Database 46 Version 8.0 (2004). A.E. Martell & R.M. Smith (eds.), NIST, Gaithersburg, USA.
Stumm & Morgan	Stumm, W. & J.J. Morgan (1981). Aquatic chemistry. John Wiley & Sons, New York.
Tipping (1994)	Tipping, E. (1994). WHAM - A chemical equilibrium model and computer code for waters, sediments, and soils incorporating a discrete site/electrostatic model of ion-binding by humic substances. Computers & Geosciences *20*, 973 - 1023.
Tipping (1998)	Tipping, E. (1998). Humic Ion-Binding Model VI: An Improved Description of the Interactions of Protons and Metal Ions with Humic Substances. Aquatic Geochemistry *4*, 3 - 48.

Abbreviation used in CHEAQS	Bibiographic reference
Tipping et al. (2011)	Tipping, E., S. Lofts & J.E. Sonke (2011). Humic Ion-Binding Model VII: a revised parameterisation of cation-binding by humic substances. Environmental Chemistry *8*, 228 - 235.
Turner et al.	Turner, D.R., M. Whitfield & A.G. Dickson (1981). The equilibrium speciation of dissolved components in freshwater and seawater at 25°C and 1 atm pressure. Geochimica et Cosmochimica Acta *45*, 855 - 881.
Turner & Whitfield	Turner, D.R. & M. Whitfield (1987). An equilibrium speciation model for copper in sea and estuarine waters at 25°C including complexation with glycine, EDTA and NTA. Geochimica et Cosmochimica Acta *51*, 3231 - 3239.
Van Riemsdijk & Keizer	Van Riemsdijk, W.H. & M.G. Keizer (1984). Computer assisted education. Chemical equilibria in soil-water-sediment (in Dutch). Department of Soil Science and Plant Nutrition, Agricultural University of Wageningen, The Netherlands.

Part II: other bibliographic references

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