

JÄMVIKTSKONSTANT- TABELL



KTH

Institutionen för kemi
Avdelningen för oorganisk kemi

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I. Bruksanvisning

De tabellerade jämviktskonstantvärdena har valts med hjälp av Sillén, L.G. och Martell, A.E., "Stability Constants of Metal-Ion Complexes", Spec. Publ. No. 17 (1964) och No. 25 (1971), The Chemical Society, London, samt Högfeldt, E. "Stability Constants of Metal-Ion Complexes: Part A - Inorganic Ligands", IUPAC Chemical Data Series No. 21, Pergamon Press, Oxford 1982. Om inget annat anges, avser värdena 25 °C och oändlig utspädning ($I = 0$).

När $\lg K$ har räknats om från jonstyrkan I till jonstyrkan 0 har följande aktivitetsfaktorvärden använts:

envärd jon	$-\lg f_1 = 0,5\sqrt{I}(1 + \sqrt{I})^{-1}$	$I \leq 0,25$
	$-\lg f_1 = 0,17$	$I > 0,25$
flervärd jon	$\lg f_z = z^2 \lg f_1$	

I många fall är de lösta komplexens formel ännu ej säkerställd. Även där noggranna mätningar finns, har här ofta några komplex utelämnats. I formeln för lösta komplex har koordinerade lösningsmedelsmolekyler inte tagits med.

Somliga av värdena är noggrant bestämda, andra är det inte. Denna lista, som är avsedd för undervisningen i oorganisk kemi vid KTH, är förhoppningsvis inte sämre än andra.

Tabellerna är ordnade på följande sätt

1. ligand = e^-

2. ligand = OH^-

Därefter följer liganderna (eller centralatomerna i liganderna) gruppvis från vänster till höger i periodiska systemet.

3. ligand = vanadat, niobat (5A)

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57. ligand = perjodat (7(B))

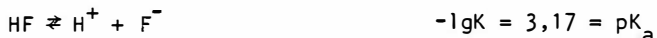
Inom varje tabell ordnas reaktionerna efter centralatomen på samma sätt, alltså väte först och jod sist.

För varje reaktion ges $\lg K$, för redoxjämvikter även e^0 (i V)
($e^0 = \frac{1}{n} \cdot 0,059159 \lg K_r$ vid 25 °C).

I syrabasjämvikter betraktas H^+ som centralatom, t ex



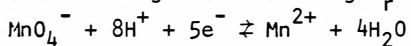
I allmänhet används $\lg K$ -värdet för den omvända reaktionen (dissociationen)



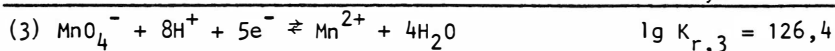
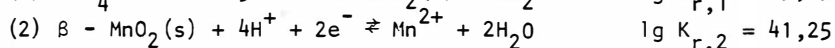
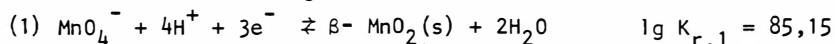
Det tabellerade $\lg K$ -värdet är alltså detsamma som pK_a .

Ibland måste flera reaktioner kombineras.

Tabellerna ger t ex inte $\lg K_r$ för



Denna reaktion erhålls genom addition av

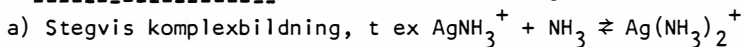


Observera att ne^0 , inte e^0 , är proportionell mot $\lg K_r$.

$$e_3^0 = \frac{1}{5}(3 \cdot 1,679 + 2 \cdot 1,220) = 1,495 \text{ V}$$

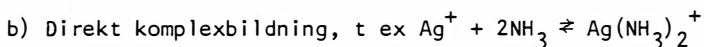
11. Nomenklatur för jämviktskonstanter

1. Homogena reaktioner (alla ämnen i lösning)



$$\text{Jämviktskonstant } K_2 = \frac{[\text{Ag}(\text{NH}_3)_2^+]}{[\text{AgNH}_3^+][\text{NH}_3]}$$

Konstantens index = antalet ligander i det bildade komplexet.

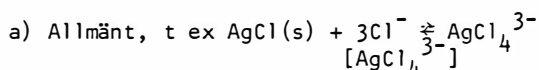


$$\text{Jämviktskonstant } \beta_2 = \frac{[\text{Ag}(\text{NH}_3)_2^+]}{[\text{Ag}^+][\text{NH}_3]^2}$$

Konstantens index = antalet ligander i det bildade komplexet.

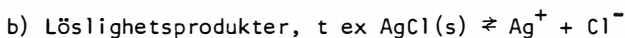
Lägg märke till att $K_1 = \beta_1$.

2. Heterogena reaktioner (jämvikt mellan t ex lösning och fast fas)



$$\text{Jämviktskonstant } K_{s4} = \frac{[\text{AgCl}_4^{3-}]}{[\text{Cl}^-]^3}$$

I konstantens index betyder s fast fas (solidus) och siffran anger antalet ligander i det bildade komplexet.



$$\text{Jämviktskonstant } K_{s0} = [\text{Ag}^+][\text{Cl}^-]$$

Metalljonen har inga ligander, och indexsiffran blir alltså 0 (uteslämnas ofta).

III. Jämviktskonstanttabeller

1. Elektron (redoxjämvikter)

	Reaktion	$\lg K_r$	e^0 (V)	Anm
<u>1 (A)</u>	$H^+ + e^- \rightleftharpoons 1/2H_2(g)$	0	0	enl def
	$Li^+ + e^- \rightleftharpoons Li(s)$	-51,39	-3,0401	
	$Na^+ + e^- \rightleftharpoons Na(s)$	-45,88	-2,713	
	$K^+ + e^- \rightleftharpoons K(s)$	-49,43	-2,924	
	$Rb^+ + e^- \rightleftharpoons Rb(s)$	-49,45	-2,924	
	$Cs^+ + e^- \rightleftharpoons Cs(s)$	-49,42	-2,923	
<u>2 (A)</u>	$Be^{2+} + 2e^- \rightleftharpoons Be(s)$	-66,6	-1,97	
	$Mg^{2+} + 2e^- \rightleftharpoons Mg(s)$	-80,1	-2,37	
	$Ca^{2+} + 2e^- \rightleftharpoons Ca(s)$	-96,79	-2,863	
	$Sr^{2+} + 2e^- \rightleftharpoons Sr(s)$	-97,58	-2,886	
	$Ba^{2+} + 2e^- \rightleftharpoons Ba(s)$	-98,45	-2,912	
	$Ra^{2+} + 2e^- \rightleftharpoons Ra(s)$	-98,6	-2,92	
<u>3A</u>	$Sc^{3+} + 3e^- \rightleftharpoons Sc(s)$	-105,3	-2,08	
	$Y^{3+} + 3e^- \rightleftharpoons Y(s)$	-120,3	-2,37	
(4f)	$M^{3+} + 3e^- \rightleftharpoons M(s)$	(La) -119,7	-2,36	
		(Lu) -115,1	-2,27	
	$Ce^{4+} + e^- \rightleftharpoons Ce^{3+}$	30,5	1,80	
	$Ce(IV) + e^- \rightleftharpoons Ce(III)$	29,47	1,743	1 M $HClO_4$
		24,4	1,443	1 M H_2SO_4
	$Pr^{4+} + e^- \rightleftharpoons Pr^{3+}$	49	2,9	
	$Sm^{3+} + e^- \rightleftharpoons Sm^{2+}$	-25	-1,5	
	$Eu^{3+} + e^- \rightleftharpoons Eu^{2+}$	-6	-0,35	
	$Yb^{3+} + e^- \rightleftharpoons Yb^{2+}$	-19	-1,1	

	Reaktion	lg K _r	e ⁰ (V)	Anm
<u>4A</u>	TiO ₂ (s) + 4H ⁺ + 4e ⁻ ⇌ Ti(s) + 2H ₂ O	-60,8	-0,86	
	Ti(IV) + e ⁻ ⇌ Ti(III)	2,15	0,125	4 M HCl
	Ti ³⁺ + e ⁻ ⇌ Ti ²⁺	-6,2	-0,37	
	Ti ²⁺ + 2e ⁻ ⇌ Ti(s)	-55	-1,63	
	ZrO ₂ (s) + 4H ⁺ + 4e ⁻ ⇌ Zr(s) + 2H ₂ O	-96,0	-1,43	
	Zr ⁴⁺ + 4e ⁻ ⇌ Zr(s)	-103?	-1,53	
	HfO ₂ (s) + 4H ⁺ + 4e ⁻ ⇌ Hf(s) + 2H ₂ O	-106	-1,57	
	Hf ⁴⁺ + 4e ⁻ ⇌ Hf(s)	-115	-1,70	
	Th ⁴⁺ + 4e ⁻ ⇌ Th(s)	-128,4	-1,90	
<u>5A</u>	VO ₂ ⁺ + 2H ⁺ + e ⁻ ⇌ VO ²⁺ + H ₂ O	16,90	0,9996	
	VO ²⁺ + 2H ⁺ + e ⁻ ⇌ V ³⁺ + H ₂ O	5,70	0,337	
	V ³⁺ + e ⁻ ⇌ V ²⁺	-4,31	-0,255	
	V ²⁺ + 2e ⁻ ⇌ V(s)	-40,1	-1,18	
	NbO ³⁺ + 2H ⁺ + 2e ⁻ ⇌ Nb ³⁺ + H ₂ O	-11,88	-0,343	
	1/2Nb ₂ O ₅ (s) + 5H ⁺ + 5e ⁻ ⇌ Nb(s) + 5/2H ₂ O	-54,4	-0,65	
	Nb ³⁺ + 3e ⁻ ⇌ Nb(s)	-56	-1,1	
	1/2Ta ₂ O ₅ (s) + 5H ⁺ + 5e ⁻ ⇌ Ta(s) + 5/2H ₂ O	-68,6	-0,81	
<u>6A</u>	1/2Cr ₂ O ₇ ²⁻ + 7H ⁺ + 3e ⁻ ⇌ Cr ³⁺ + 7/2H ₂ O	67,6	1,33	
	Cr ³⁺ + e ⁻ ⇌ Cr ²⁺	-6,9	-0,41	
	Cr ²⁺ + 2e ⁻ ⇌ Cr(s)	-30,9	-0,91	
	H ₂ MoO ₄ + 2H ⁺ + e ⁻ ⇌ MoO ₂ ⁺ + 2H ₂ O	7 ?	0,4	
	MoO ₄ ²⁻ + 4H ₂ O + 6e ⁻ ⇌ Mo(s) + 8OH ⁻	-92,30	-0,910	
	MoO ₂ ⁺ + 4H ⁺ + 2e ⁻ ⇌ Mo ³⁺ + 2H ₂ O	0	0	
	Mo ³⁺ + 3e ⁻ ⇌ Mo(s)	-10	-0,2	
	WO ₃ (s) + 6H ⁺ + 6e ⁻ ⇌ W(s) + 3H ₂ O	-9	-0,09	
	WO ₄ ²⁻ + 4H ₂ O + 6e ⁻ ⇌ W(s) + 8OH ⁻	-107	-1,05	
(5f)	UO ₂ ²⁺ + e ⁻ ⇌ UO ₂ ⁺	0,88	0,052	
	UO ₂ ²⁺ + 2e ⁻ ⇌ UO ₂ (s)	15,1	0,447	
	UO ₂ ²⁺ + 4H ⁺ + 2e ⁻ ⇌ U ⁴⁺ + 2H ₂ O	11,12	0,3288	
	U ⁴⁺ + e ⁻ ⇌ U ³⁺	-10,3	-0,61	
	U ³⁺ + 3e ⁻ ⇌ U(s)	-91	-1,80	
	NpO ₂ ²⁺ + e ⁻ ⇌ NpO ₂ ⁺	20,89	1,236	
		19,21	1,1364	1 M HClO ₄
	NpO ₂ ⁺ + 4H ⁺ + e ⁻ ⇌ Np ⁴⁺ + 2H ₂ O	10,5	0,62	
		12,49	0,7388	1 M HClO ₄
	Np ⁴⁺ + e ⁻ ⇌ Np ³⁺	3,4	0,20	
		2,37	0,140	1 M HClO ₄

	Reaktion	lg K _r	e ⁰ (V)	Anm
	$\text{Np}^{3+} + 3\text{e}^- \rightleftharpoons \text{Np}(\text{s})$	-94,1	-1,86	
	$\text{PuO}_2^{2+} + \text{e}^- \rightleftharpoons \text{PuO}_2^+$	17,12	1,013	
		15,49	0,9164	1 M HClO ₄
	$\text{PuO}_2^{2+} + 4\text{H}^+ + 2\text{e}^- \rightleftharpoons \text{Pu}^{4+} + 2\text{H}_2\text{O}$	35,2	1,04	
		35,26	1,043	1 M HClO ₄
	$\text{Pu}^{4+} + \text{e}^- \rightleftharpoons \text{Pu}^{3+}$	16,35	0,97	
		16,60	0,982	1 M HClO ₄
	$\text{Pu}^{3+} + 3\text{e}^- \rightleftharpoons \text{Pu}(\text{s})$	-103	-2,03	
	$\text{AmO}_2^{2+} + \text{e}^- \rightleftharpoons \text{AmO}_2^+$	28,74	1,70	
		27,7	1,64	1 M HClO ₄
	$\text{AmO}_2^{2+} + 4\text{H}^+ + 2\text{e}^- \rightleftharpoons \text{Am}^{3+} + 2\text{H}_2\text{O}$	62	1,83	
	$\text{Am}^{4+} + \text{e}^- \rightleftharpoons \text{Am}^{3+}$	41	2,4	
	$\text{Am}^{3+} + 3\text{e}^- \rightleftharpoons \text{Am}(\text{s})$	-121	-2,38	
7A	$\text{MnO}_4^- + \text{e}^- \rightleftharpoons \text{MnO}_4^{2-}$	9,74	0,576	
	$\text{MnO}_4^- + 4\text{H}^+ + 3\text{e}^- \rightleftharpoons \beta\text{-MnO}_2(\text{s}) + 2\text{H}_2\text{O}$	85,15	1,679	
	$\beta\text{-MnO}_2(\text{s}) + 4\text{H}^+ + 2\text{e}^- \rightleftharpoons \text{Mn}^{2+} + 2\text{H}_2\text{O}$	41,25	1,220	
	$\text{Mn}^{2+} + 2\text{e}^- \rightleftharpoons \text{Mn}(\text{s})$	-40,0	-1,182	
	$\text{Mn}(\text{OH})_3(\text{s}) + \text{e}^- \rightleftharpoons \text{Mn}(\text{OH})_2(\text{s}) + \text{OH}^-$	2,6	0,1	
	$\text{Mn}(\text{OH})_2(\text{s}) + 2\text{e}^- \rightleftharpoons \text{Mn}(\text{s}) + 2\text{OH}^-$	-52,6	-1,55	
	$\text{TcO}_4^- + 4\text{H}^+ + 3\text{e}^- \rightleftharpoons \text{TcO}_2(\text{s}) + 2\text{H}_2\text{O}$	37,6	0,738	
	$\text{TcO}_3(\text{s}) + 2\text{H}^+ + 2\text{e}^- \rightleftharpoons \text{TcO}_2(\text{s}) + \text{H}_2\text{O}$	27	0,8	
	$\text{TcO}_2(\text{s}) + 4\text{H}^+ + 4\text{e}^- \rightleftharpoons \text{Tc}(\text{s}) + 2\text{H}_2\text{O}$	18,4	0,272	
	$\text{ReO}_4^- + 2\text{H}^+ + \text{e}^- \rightleftharpoons \text{ReO}_3(\text{s}) + \text{H}_2\text{O}$	12,98	0,768	
	$\text{ReO}_4^- + 4\text{H}^+ + 3\text{e}^- \rightleftharpoons \text{ReO}_2(\text{s}) + 2\text{H}_2\text{O}$	25,9	0,51	
	$\text{ReO}_2(\text{s}) + 4\text{H}^+ + 4\text{e}^- \rightleftharpoons \text{Re}(\text{s}) + 2\text{H}_2\text{O}$	17,6	0,260	
8	$\text{FeO}_4^{2-} + 3\text{H}_2\text{O} + 3\text{e}^- \rightleftharpoons \text{FeOOH}(\text{s}) + 5\text{OH}^-$	36	0,71	
	$\text{Fe}^{3+} + \text{e}^- \rightleftharpoons \text{Fe}^{2+}$	13,02	0,7701	
	$\text{Fe}(\text{CN})_6^{3-} + \text{e}^- \rightleftharpoons \text{Fe}(\text{CN})_6^{4-}$	6,103	0,3610	
	$\text{Fe}^{2+} + 2\text{e}^- \rightleftharpoons \text{Fe}(\text{s})$	-14,89	-0,4402	
	$\text{Fe}(\text{OH})_2(\text{s}) + 2\text{e}^- \rightleftharpoons \text{Fe}(\text{s}) + 2\text{OH}^-$	-29,6	-0,875	
	$\text{Fe}_3\text{O}_4(\text{s}) + 8\text{H}^+ + 2\text{e}^- \rightleftharpoons 3\text{Fe}^{2+} + 4\text{H}_2\text{O}$	41,58	1,230	
	$\text{Co}^{3+} + \text{e}^- \rightleftharpoons \text{Co}^{2+}$	31,15	1,842	3 M HNO ₃
	$\text{CoOOH}(\text{s}) + \text{H}_2\text{O} + \text{e}^- \rightleftharpoons \text{Co}(\text{OH})_2(\text{s}) + \text{OH}^-$	2,90	0,17	
	$\text{Co}^{2+} + 2\text{e}^- \rightleftharpoons \text{Co}(\text{s})$	-9,70	-0,287	
	$\text{NiOOH}(\text{s}) + \text{H}_2\text{O} + \text{e}^- \rightleftharpoons \text{Ni}(\text{OH})_2(\text{s}) + \text{OH}^-$	8,1	0,48	

Reaktion	lg K _r	e ⁰ (V)	Anm
$\text{NiOOH(s)} + 3\text{H}^+ + \text{e}^- \rightleftharpoons \text{Ni}^{2+} + 2\text{H}_2\text{O}$	35,2	2,08	
$\text{Ni}^{2+} + 2\text{e}^- \rightleftharpoons \text{Ni(s)}$	-7,84	-0,232	
$\text{RuO}_4(\text{s}) + \text{e}^- \rightleftharpoons \text{RuO}_4^-$	16,9	1,00	
$\text{RuO}_4^- + \text{e}^- \rightleftharpoons \text{RuO}_4^{2-}$	10,0	0,59	
$\text{RuO}_4^{2-} + 2\text{H}_2\text{O} + 2\text{e}^- \rightleftharpoons \text{RuO}_2(\text{s}) + 4\text{OH}^-$	11,8	0,35	
$\text{RuO}_2(\text{s}) + 4\text{H}^+ + 4\text{e}^- \rightleftharpoons \text{Ru(s)} + 2\text{H}_2\text{O}$	53,3	0,79	
$\text{Ru}^{3+} + \text{e}^- \rightleftharpoons \text{Ru}^{2+}$	4,2	0,25	
$1/2\text{Rh}_2\text{O}_3(\text{s}) + 3\text{H}^+ + 3\text{e}^- \rightleftharpoons \text{Rh(s)} + 3/2\text{H}_2\text{O}$	44,0	0,87	
$\text{Rh}^{3+} + 3\text{e}^- \rightleftharpoons \text{Rh(s)}$	38,44	0,758	
$\text{PdO}_2(\text{s}) + \text{H}_2\text{O} + 2\text{e}^- \rightleftharpoons \text{PdO(s)} + 2\text{OH}^-$	25	0,73	
$\text{PdCl}_4^{2-} + 2\text{e}^- \rightleftharpoons \text{Pd(s)} + 4\text{Cl}^-$	19,9	0,59	
$\text{Pd}^{2+} + 2\text{e}^- \rightleftharpoons \text{Pd(s)}$	31,1	0,92	
$\text{HOsO}_5^- + 2\text{e}^- \rightleftharpoons \text{OsO}_4^{2-} + \text{OH}^-$	10	0,3	
$\text{OsO}_4(\text{aq}) + 4\text{H}^+ + 4\text{e}^- \rightleftharpoons \text{OsO}_2(\text{s}) + 2\text{H}_2\text{O}$	65,3	0,964	
$\text{OsO}_4(\text{s}) + 8\text{H}^+ + 8\text{e}^- \rightleftharpoons \text{Os(s)} + 4\text{H}_2\text{O}$	114	0,85	
$\text{OsO}_4^{2-} + 2\text{H}_2\text{O} + 2\text{e}^- \rightleftharpoons \text{OsO}_2(\text{s}) + 4\text{OH}^-$	3	0,1	
$\text{IrO}_2(\text{s}) + 4\text{H}^+ + 4\text{e}^- \rightleftharpoons \text{Ir(s)} + 2\text{H}_2\text{O}$	62,6	0,93	
$\text{IrCl}_6^{2-} + \text{e}^- \rightleftharpoons \text{IrCl}_6^{3-}$	14,65	0,8665	
$\text{IrCl}_6^{3-} + 3\text{e}^- \rightleftharpoons \text{Ir(s)} + 6\text{Cl}^-$	43,6	0,86	
$\text{PtO}_2(\text{s}) + 2\text{H}^+ + 2\text{e}^- \rightleftharpoons \text{Pt(OH)}_2(\text{s})$	21?	0,62	
$\text{Pt(OH)}_6^{2-} + 2\text{e}^- \rightleftharpoons \text{Pt(OH)}_2(\text{s}) + 4\text{OH}^-$	7	0,2	
$\text{Pt(OH)}_2(\text{s}) + 2\text{H}^+ + 2\text{e}^- \rightleftharpoons \text{Pt(s)} + 2\text{H}_2\text{O}$	33	0,98	
$\text{PtCl}_6^{2-} + 2\text{e}^- \rightleftharpoons \text{PtCl}_4^{2-} + 2\text{Cl}^-$	25,3	0,75	
$\text{PtCl}_4^{2-} + 2\text{e}^- \rightleftharpoons \text{Pt(s)} + 4\text{Cl}^-$	25,4	0,75	
<u>1B</u> $\text{Cu}^{2+} + 2\text{e}^- \rightleftharpoons \text{Cu(s)}$	11,44	0,3384	
$\text{Cu}^+ + \text{e}^- \rightleftharpoons \text{Cu(s)}$	8,76	0,5182	
$1/2\text{Ag}_2\text{O}_3(\text{s}) + \text{H}^+ + \text{e}^- \rightleftharpoons \text{AgO(s)} + 1/2\text{H}_2\text{O}$	29	1,7	
$\text{AgO(s)} + \text{H}^+ + \text{e}^- \rightleftharpoons 1/2\text{Ag}_2\text{O(s)} + 1/2\text{H}_2\text{O}$	23,8	1,41	
$\text{Ag}^{2+} + \text{e}^- \rightleftharpoons \text{Ag}^+$	33,82	2,00	4 M HClO ₄
$\text{Ag}^+ + \text{e}^- \rightleftharpoons \text{Ag(s)}$	13,514	0,7994	
$1/2\text{Ag}_2\text{O(s)} + \text{H}^+ + \text{e}^- \rightleftharpoons \text{Ag(s)} + 1/2\text{H}_2\text{O}$	19,83	1,173	
$\text{AgCl(s)} + \text{e}^- \rightleftharpoons \text{Ag(s)} + \text{Cl}^-$	3,759	0,22236	
$1/2\text{Au}_2\text{O}_3(\text{s}) + 3\text{H}^+ + 3\text{e}^- \rightleftharpoons \text{Au(s)} + 3/2\text{H}_2\text{O}$	69,1	1,362	
$\text{AuCl}_4^- + 2\text{e}^- \rightleftharpoons \text{AuCl}_2^- + 2\text{Cl}^-$	31,31	0,926	
$\text{AuCl}_2^- + \text{e}^- \rightleftharpoons \text{Au(s)} + 2\text{Cl}^-$	19,51	1,154	
$\text{Au(CN)}_2^- + \text{e}^- \rightleftharpoons \text{Au(s)} + 2\text{CN}^-$	-10,6	-0,611	

	Reaktion	lg K _r	e ⁰ (V)	Anm
<u>2B</u>	$\text{Zn}^{2+} + 2\text{e}^- \rightleftharpoons \text{Zn(s)}$	-25,79	-0,7628	
	$\text{Cd}^{2+} + 2\text{e}^- \rightleftharpoons \text{Cd(s)}$	-13,61	-0,4025	
	$2\text{Hg}^{2+} + 2\text{e}^- \rightleftharpoons \text{Hg}_2^{2+}$	30,68	0,9075	
	$\text{Hg}_2^{2+} + 2\text{e}^- \rightleftharpoons 2\text{Hg(l)}$	26,79	0,7925	
	$\text{Hg(l)} \rightleftharpoons \text{Hg(aq)}$	-6,54	-	
	$\text{HgO(s)} + 2\text{H}^+ + 2\text{e}^- \rightleftharpoons \text{Hg(l)} + \text{H}_2\text{O}$	31,31	0,9261	
	$\text{Hg}_2\text{Cl}_2\text{(s)} + 2\text{e}^- \rightleftharpoons 2\text{Hg(l)} + 2\text{Cl}^-$	9,067	0,26818	
<u>3(B)</u>	$\text{B(OH)}_3 + 3\text{H}^+ + 3\text{e}^- \rightleftharpoons \text{B(s)} + 3\text{H}_2\text{O}$	-44,1	-0,87	
	$\text{Al}^{3+} + 3\text{e}^- \rightleftharpoons \text{Al(s)}$	-84,3	-1,66	
	$\text{Ga(OH)}_4^- + 3\text{e}^- \rightleftharpoons \text{Ga(s)} + 4\text{OH}^-$	-65,4	-1,29	
	$\text{Ga}^{3+} + 3\text{e}^- \rightleftharpoons \text{Ga(s)}$	-28,4	-0,560	
	$\text{Ga}^{3+} + 2\text{e}^- \rightleftharpoons \text{Ga}^+$	$\leq -13,5$	$\leq -0,40$	
	$\text{In}^{3+} + 2\text{e}^- \rightleftharpoons \text{In}^+$	-13,7	-0,4042	
	$\text{In}^{3+} + 3\text{e}^- \rightleftharpoons \text{In(s)}$	-17,15	-0,3382	
	$\text{Tl}^{3+} + 2\text{e}^- \rightleftharpoons \text{Tl}^+$	42,6	1,26	
	$\frac{1}{2} \text{Tl}_2\text{O}_3\text{(s)} + 3/2\text{H}_2\text{O} + 2\text{e}^- \rightleftharpoons \text{Tl}^+ + 3\text{OH}^-$	0,7	0,02	
	$\text{Tl}^+ + \text{e}^- \rightleftharpoons \text{Tl(s)}$	-5,680	-0,3360	
<u>4(B)</u>	$2\text{CO}_2\text{(g)} + 2\text{H}^+ + 2\text{e}^- \rightleftharpoons \text{H}_2\text{C}_2\text{O}_4$	-15,9	-0,49	
	$\text{CO}_2\text{(g)} + 2\text{H}^+ + 2\text{e}^- \rightleftharpoons \text{HCOOH}$	-6,71	-0,196	
	$\text{CO}_2\text{(g)} + 2\text{H}^+ + 2\text{e}^- \rightleftharpoons \text{CO(g)} + \text{H}_2\text{O}$	-3,5	-0,116	
	$\text{SiO}_2\text{(s)} + 4\text{H}^+ + 4\text{e}^- \rightleftharpoons \text{Si(s)} + 2\text{H}_2\text{O}$	-57,9	-0,86	
	$\text{Si(s)} + 4\text{H}^+ + 4\text{e}^- \rightleftharpoons \text{SiH}_4\text{(g)}$	6,9	0,102	
	$\text{GeO}_2\text{(s, hex)} + 2\text{H}^+ + 2\text{e}^- \rightleftharpoons \text{GeO(s)} + \text{H}_2\text{O}$	-4,0	-0,118	brun GeO
		-9,2	-0,273	gul GeO
	$\text{GeO}_2\text{(s)} + 4\text{H}^+ + 2\text{e}^- \rightleftharpoons \text{Ge}^{2+} + 2\text{H}_2\text{O}$	-11,4	-0,338	GeO ₂ tetra
		-8,4	-0,249	GeO ₂ hex
	$\text{Ge}^{2+} + 2\text{e}^- \rightleftharpoons \text{Ge(s)}$	7,81	0,231	
	$\text{Sn(IV)} + 2\text{e}^- \rightleftharpoons \text{Sn(II)}$	4,48	0,1325	2 M HCl
	$\text{Sn}^{2+} + 2\text{e}^- \rightleftharpoons \text{Sn(s)}$	-4,76	-0,1406	
	$\text{PbO}_2\text{(s)} + 4\text{H}^+ + 2\text{e}^- \rightleftharpoons \text{Pb}^{2+} + 2\text{H}_2\text{O}$	49,19	1,455	
	$\text{PbO}_2\text{(s)} + 4\text{H}^+ + \text{SO}_4^{2-} + 2\text{e}^- \rightleftharpoons \text{PbSO}_4\text{(s)} + 2\text{H}_2\text{O}$	57,167	1,69095	
	$\text{Pb(IV)} + 2\text{e}^- \rightleftharpoons \text{Pb}^{2+}$	57	1,69	1 M HNO ₃
	$\text{Pb}^{2+} + 2\text{e}^- \rightleftharpoons \text{Pb(s)}$	-4,23	-0,1251	
<u>5(B)</u>	$\text{NO}_3^- + 2\text{H}^+ + \text{e}^- \rightleftharpoons 1/2\text{N}_2\text{O}_4\text{(g)} + \text{H}_2\text{O}$	13,6	0,80	
	$\text{NO}_3^- + 3\text{H}^+ + 2\text{e}^- \rightleftharpoons \text{HNO}_2 + \text{H}_2\text{O}$	31,6	0,94	
	$\text{NO}_3^- + 4\text{H}^+ + 3\text{e}^- \rightleftharpoons \text{NO(g)} + 2\text{H}_2\text{O}$	48,5	0,96	
	$2\text{NO(g)} + 2\text{H}^+ + 2\text{e}^- \rightleftharpoons \text{H}_2\text{N}_2\text{O}_2$	24,1	0,71	
	$2\text{NO(g)} + 2\text{H}^+ + 2\text{e}^- \rightleftharpoons \text{N}_2\text{O(g)} + \text{H}_2\text{O}$	53,8	1,59	
	$\text{N}_2\text{O(g)} + 2\text{H}^+ + 2\text{e}^- \rightleftharpoons \text{N}_2\text{(g)} + \text{H}_2\text{O}$	59,7	1,77	
	$3/2\text{N}_2\text{(g)} + \text{H}^+ + \text{e}^- \rightleftharpoons \text{HN}_3$	-52,3	-3,1	
	$\text{N}_2\text{(g)} + 2\text{H}_2\text{O} + 4\text{H}^+ + 2\text{e}^- \rightleftharpoons 2\text{NH}_3\text{OH}^+$	-63,3	-1,87	

Reaktion	$\lg K_r$	$e^0(V)$	Anm
$N_2(g) + 5H^+ + 4e^- \rightleftharpoons N_2H_5^+$	-15,4	-0,23	
$N_2H_5^+ + 3H^+ + 2e^- \rightleftharpoons 2NH_4^+$	43,2	1,275	
$H_3PO_4 + 2H^+ + 2e^- \rightleftharpoons H_2PHO_3 + H_2O$	-9,32	-0,276	
$H_2PHO_3 + 2H^+ + 2e^- \rightleftharpoons HPH_2O_2 + H_2O$	-16,9	-0,50	
$H_2PHO_3 + H^+ + e^- \rightleftharpoons 1/4P_4(s) + 2H_2O$	-8,6	-0,51	
$1/4P_4(s) + 3H^+ + 3e^- \rightleftharpoons PH_3(g)$	3,2	0,06	
$H_3AsO_4 + 2H^+ + 2e^- \rightleftharpoons H_3AsO_3 + H_2O$	18,9	0,559	
$1/2As_2O_3(s) + 3H^+ + 3e^- \rightleftharpoons As(s) + 3/2H_2O$	11,87	0,234	
$H_3AsO_3 + 3H^+ + 3e^- \rightleftharpoons As(s) + 3H_2O$	12,55	0,2475	
$As(s) + 3H^+ + 3e^- \rightleftharpoons AsH_3(g)$	-30,8	-0,60	
$1/2Sb_2O_3(s) + 3H^+ + 3e^- \rightleftharpoons Sb(s) + 3/2H_2O$	7,63	0,1504	
$SbO^+ + 2H^+ + 3e^- \rightleftharpoons Sb(s) + H_2O$	10,35	0,2040	
$Sb(s) + 3H^+ + 3e^- \rightleftharpoons SbH_3(g)$	-25,9	-0,51	
$1/2Bi_2O_3(s) + 3/2H_2O + 3e^- \rightleftharpoons Bi(s) + 3OH^-$	-23,2	-0,46	
$BiClO(s) + 2H^+ + 3e^- \rightleftharpoons Bi(s) + H_2O + Cl^-$	8,11	0,1599	
<u>6(B)</u> $O_3(g) + 2H^+ + 2e^- \rightleftharpoons O_2(g) + H_2O$	70,2	2,07	
$O_2(g) + 2H^+ + 2e^- \rightleftharpoons H_2O_2$	23,5	0,695	
$1/2O_2(g) + 2H^+ + 2e^- \rightleftharpoons H_2O$	41,55	1,229	
$H_2O_2 + 2H^+ + 2e^- \rightleftharpoons 2H_2O$	60,0	1,77	
$S_2O_8^{2-} + 2e^- \rightleftharpoons 2SO_4^{2-}$	67,9	2,01	
$SO_4^{2-} + 4H^+ + 2e^- \rightleftharpoons H_2SO_3 + H_2O$	5,8	0,17	
$S_2O_6^{2-} + 4H^+ + 2e^- \rightleftharpoons 2H_2SO_3$	19,2	0,57	
$2SO_3^{2-} + 2H_2O + 2e^- \rightleftharpoons S_2O_4^{2-} + 4OH^-$	-38,0	-1,12	
$2H_2SO_3 + 2H^+ + 4e^- \rightleftharpoons S_2O_3^{2-} + 3H_2O$	27,0	0,40	
$H_2SO_3 + 4H^+ + 4e^- \rightleftharpoons S(s) + 3H_2O$	30,4	0,45	
$S_4O_6^{2-} + 2e^- \rightleftharpoons 2S_2O_3^{2-}$	5,71	0,169	
$S(s) + 2H^+ + 2e^- \rightleftharpoons H_2S(g)$	5,78	0,171	
$SeO_4^{2-} + 4H^+ + 2e^- \rightleftharpoons H_2SeO_3 + H_2O$	38,9	1,15	
$H_2SeO_3 + 4H^+ + 4e^- \rightleftharpoons Se(s) + 3H_2O$	50,3	0,744	
$Se(s) + 2H^+ + 2e^- \rightleftharpoons H_2Se(g)$	-12,5	-0,37	
$Te(OH)_6(s) + 2H^+ + 2e^- \rightleftharpoons TeO_2(s) + 4H_2O$	34,6	1,02	
$TeO_2(s) + 4H^+ + 4e^- \rightleftharpoons Te(s) + 2H_2O$	35,76	0,5286	
$Te(s) + 2H^+ + 2e^- \rightleftharpoons H_2Te(g)$	-24,3	-0,72	
$PoCl_6^{2-} + 2e^- \rightleftharpoons PoCl_4^{2-} + 2Cl^-$	24,1	0,712	
$PoCl_4^{2-} + 2e^- \rightleftharpoons Po(s) + 4Cl^-$	17,2	0,510	

	Reaktion	lg K _r	e ⁰ (V)	Anm
<u>7(B)</u>	$F_2O(g) + 2H^+ + 4e^- \rightleftharpoons H_2O + 2F^-$	146	2,1	
	$1/2F_2(g) + e^- \rightleftharpoons F^-$	48,4	2,87	
	$ClO_4^- + 2H^+ + 2e^- \rightleftharpoons ClO_3^- + H_2O$	41,6	1,23	
	$ClO_3^- + 2H^+ + e^- \rightleftharpoons ClO_2(g) + H_2O$	19,5	1,15	
	$ClO_3^- + 3H^+ + 2e^- \rightleftharpoons HClO_2 + H_2O$	37,3	41,0 1,10	
	$ClO_3^- + 6H^+ + 5e^- \rightleftharpoons 1/2Cl_2(g) + 3H_2O$	124,2	1,47	
	$HClO + H^+ + e^- \rightleftharpoons 1/2Cl_2(g) + H_2O$	27,5	1,63	
	$1/2Cl_2(g) + e^- \rightleftharpoons Cl^-$	22,962	1,35840	
	$BrO_4^- + 2H^+ + 2e^- \rightleftharpoons BrO_3^- + H_2O$	59,6	1,763	
	$BrO_3^- + 6H^+ + 5e^- \rightleftharpoons 1/2Br_2(l) + 3H_2O$	128,3	1,52	
	$BrO^- + H_2O + 2e^- \rightleftharpoons Br^- + 2OH^-$	25,7	0,76	
	$1/2Br_2(l) + e^- \rightleftharpoons Br^-$	18,01	1,0652	
	$1/2Br_2 + e^- \rightleftharpoons Br^-$	18,381	1,0873	
	$H_5IO_6 + H^+ + 2e^- \rightleftharpoons IO_3^- + 3H_2O$	54	1,6	
	$IO_3^- + 6H^+ + 5e^- \rightleftharpoons 1/2I_2(s) + 3H_2O$	101,0	1,195	
	$HIO + H^+ + e^- \rightleftharpoons 1/2I_2(s) + H_2O$	24,3	1,45	
	$1/2I_2(s) + e^- \rightleftharpoons I^-$	9,06	0,5356	
	$I_3^- + 2e^- \rightleftharpoons 3I^-$	18,13	0,536	
	$ICl(s) + e^- \rightleftharpoons 1/2I_2(s) + Cl^-$	20,6	1,22	

2. Hydroxid

	Reaktion	lg K
<u>1(A)</u>	$H^+ + OH^- \rightleftharpoons H_2O$	14,00
	$D^+ + OD^- \rightleftharpoons D_2O$	14,81
<u>2(A)</u>	$3Be^{2+} + 3H_2O \rightleftharpoons Be_3(OH)_3^{3+} + 3H^+$	-8,7
	$Be(OH)_2(s, \beta) \rightleftharpoons Be^{2+} + 2OH^-$	-21,5
	$Be(OH)_2(s, \beta) + OH^- \rightleftharpoons Be(OH)_3^-$	-2,9
	$Be(OH)_2(s, \beta) + 2OH^- \rightleftharpoons Be(OH)_4^{2-}$	-3,1
	$Mg^{2+} + OH^- \rightleftharpoons MgOH^+$	2,6
	$Mg(OH)_2(s) \rightleftharpoons Mg^{2+} + 2OH^-$	-10,9
	$Ca^{2+} + OH^- \rightleftharpoons CaOH^+$	1,3
	$Ca(OH)_2(s) \rightleftharpoons Ca^{2+} + 2OH^-$	-5,03
	$Sr^{2+} + OH^- \rightleftharpoons SrOH^+$	0,8
	$Ba^{2+} + OH^- \rightleftharpoons BaOH^+$	0,6

	Reaktion	lg K
<u>3A</u>	$\text{Sc}^{3+} + \text{H}_2\text{O} \rightleftharpoons \text{ScOH}^{2+} + \text{H}^+$	-4,2
	$2\text{Sc}^{3+} + 2\text{H}_2\text{O} \rightleftharpoons \text{Sc}_2(\text{OH})_2^{4+} + 2\text{H}^+$	-5,4
	$\text{Sc}(\text{OH})_3(\text{s}) \rightleftharpoons \text{Sc}^{3+} + 3\text{OH}^-$	-29,7
	$\text{Y}^{3+} + \text{H}_2\text{O} \rightleftharpoons \text{YOH}^{2+} + \text{H}^+$	-7,7
	$2\text{Y}^{3+} + 2\text{H}_2\text{O} \rightleftharpoons \text{Y}_2(\text{OH})_2^{4+} + 2\text{H}^+$	-14,3
	$\text{Y}(\text{OH})_3(\text{s}) \rightleftharpoons \text{Y}^{3+} + 3\text{OH}^-$	-24,5
(4f)	$\text{La}^{3+} + \text{H}_2\text{O} \rightleftharpoons \text{LaOH}^{2+} + \text{H}^+$	-8,7
	$\text{La}(\text{OH})_3(\text{s}) \rightleftharpoons \text{La}^{3+} + 3\text{OH}^-$	-21,5
	$\text{Lu}^{3+} + \text{H}_2\text{O} \rightleftharpoons \text{LuOH}^{2+} + \text{H}^+$	-7,3
	$\text{Lu}(\text{OH})_3(\text{s}) \rightleftharpoons \text{Lu}^{3+} + 3\text{OH}^-$	-27
<u>4A</u>	$\text{Ti}^{3+} + \text{H}_2\text{O} \rightleftharpoons \text{TiOH}^{2+} + \text{H}^+$	-1,3
	$\text{TiO}_2(\text{s}) + \text{H}_2\text{O} \rightleftharpoons \text{TiO}^{2+} + 2\text{OH}^-$	-29
	$2\text{Th}^{4+} + 2\text{H}_2\text{O} \rightleftharpoons \text{Th}_2(\text{OH})_2^{6+} + 2\text{H}^+$	-4
<u>5A</u>	$\text{V}(\text{OH})_2(\text{s}) \rightleftharpoons \text{V}^{2+} + 2\text{OH}^-$	-15,4
	$\text{V}^{3+} + \text{H}_2\text{O} \rightleftharpoons \text{VOH}^{2+} + \text{H}^+$	-1,7
	$\text{V}(\text{OH})_3(\text{s}) \rightleftharpoons \text{V}^{3+} + 3\text{OH}^-$	-34,4
	$\text{VO}^{2+} + \text{H}_2\text{O} \rightleftharpoons \text{VOOH}^+ + \text{H}^+$	-5,67
	$2\text{VO}^{2+} + 2\text{H}_2\text{O} \rightleftharpoons (\text{VO})_2(\text{OH})_2^{2+} + 2\text{H}^+$	-6,67
<u>6A</u>	$\text{Cr}^{3+} + \text{H}_2\text{O} \rightleftharpoons \text{CrOH}^{2+} + \text{H}^+$	-3,6
	$\text{CrOH}^{2+} + \text{H}_2\text{O} \rightleftharpoons \text{Cr}(\text{OH})_2^+ + \text{H}^+$	-5,3
	$2\text{Cr}^{3+} + 2\text{H}_2\text{O} \rightleftharpoons \text{Cr}_2(\text{OH})_2^{4+} + 2\text{H}^+$	-4
	$\text{Cr}(\text{OH})_3(\text{s}) \rightleftharpoons \text{Cr}^{3+} + 3\text{OH}^-$	-30
	$\text{Cr}(\text{OH})_3(\text{s}) + \text{OH}^- \rightleftharpoons \text{Cr}(\text{OH})_4^-$	-0,4
	$2\text{UO}_2^{2+} + 2\text{H}_2\text{O} \rightleftharpoons (\text{UO}_2)_2(\text{OH})_2^{2+} + 2\text{H}^+$	-5,7
	$3\text{UO}_2^{2+} + 5\text{H}_2\text{O} \rightleftharpoons (\text{UO}_2)_3(\text{OH})_5^+ + 5\text{H}^+$	-15,4
	$\text{UO}_2(\text{OH})_2(\text{s}) \rightleftharpoons \text{UO}_2^{2+} + 2\text{OH}^-$	-22,4
<u>7A</u>	$\text{Mn}(\text{OH})_2(\text{s}) \rightleftharpoons \text{Mn}^{2+} + 2\text{OH}^-$	-12,8
<u>8</u>	$\text{Fe}^{2+} + \text{H}_2\text{O} \rightleftharpoons \text{FeOH}^+ + \text{H}^+$	-9,5
	$\text{Fe}(\text{OH})_2(\text{s}) \rightleftharpoons \text{Fe}^{2+} + 2\text{OH}^-$	-15,1
	$\text{Fe}(\text{OH})_2(\text{s}) + \text{OH}^- \rightleftharpoons \text{Fe}(\text{OH})_3^-$	-5,1
	$\text{Fe}^{3+} + \text{H}_2\text{O} \rightleftharpoons \text{FeOH}^{2+} + \text{H}^+$	-2,4
	$2\text{Fe}^{3+} + 2\text{H}_2\text{O} \rightleftharpoons \text{Fe}_2(\text{OH})_2^{4+} + 2\text{H}^+$	-2,90
	$\alpha\text{-FeOOH}(\text{s}) + 3\text{H}^+ \rightleftharpoons \text{Fe}^{3+} + 2\text{H}_2\text{O}$	0,4
	$\text{Co}(\text{OH})_2(\text{s}) \rightleftharpoons \text{Co}^{2+} + 2\text{OH}^-$	-14,5
	$\text{CoOOH}(\text{s}) + 3\text{H}^+ \rightleftharpoons \text{Co}^{3+} + 2\text{H}_2\text{O}$	-3
	$\text{Ni}(\text{OH})_2(\text{s}) \rightleftharpoons \text{Ni}^{2+} + 2\text{OH}^-$	-17,2

	Reaktion	lg K
<u>1B</u>	$1/2\text{Cu}_2\text{O}(\text{s}) + 1/2\text{H}_2\text{O} \rightleftharpoons \text{Cu}^+ + \text{OH}^-$	-14,7
	$2\text{Cu}^{2+} + 2\text{H}_2\text{O} \rightleftharpoons \text{Cu}_2(\text{OH})_2^{2+} + 2\text{H}^+$	-10,6
	$\text{Cu}(\text{OH})_2(\text{s}) \rightleftharpoons \text{Cu}^{2+} + 2\text{OH}^-$	-18,8
	$\text{CuO}(\text{s}) + \text{H}_2\text{O} \rightleftharpoons \text{Cu}^{2+} + 2\text{OH}^-$	-20,5
	$\text{Cu}(\text{OH})_2(\text{s}) + \text{OH}^- \rightleftharpoons \text{Cu}(\text{OH})_3^-$	-3,6
	$\text{Cu}(\text{OH})_2(\text{s}) + 2\text{OH}^- \rightleftharpoons \text{Cu}(\text{OH})_4^{2-}$	-2,7
	$1/2\text{Ag}_2\text{O}(\text{s}) + 1/2\text{H}_2\text{O} \rightleftharpoons \text{Ag}^+ + \text{OH}^-$	-7,71
	$\text{Ag}^+ + \text{OH}^- \rightleftharpoons \text{AgOH}$	2,0
	$\text{Ag}^+ + 2\text{OH}^- \rightleftharpoons \text{Ag}(\text{OH})_2^-$	3,99
	$1/2\text{Au}_2\text{O}_3(\text{s}) + 3/2\text{H}_2\text{O} + \text{OH}^- \rightleftharpoons \text{Au}(\text{OH})_4^-$	-3,3
<u>2B</u>	$2\text{Zn}^{2+} + \text{H}_2\text{O} \rightleftharpoons \text{Zn}_2\text{OH}^{3+} + \text{H}^+$	-9,0
	$\epsilon\text{-Zn}(\text{OH})_2(\text{s}) \rightleftharpoons \text{Zn}^{2+} + 2\text{OH}^-$	-16,47
	$\text{ZnO}(\text{s}) + \text{H}_2\text{O} \rightleftharpoons \text{Zn}^{2+} + 2\text{OH}^-$	-16,87
	$\epsilon\text{-Zn}(\text{OH})_2(\text{s}) + \text{OH}^- \rightleftharpoons \text{Zn}(\text{OH})_3^-$	-2,5
	$\epsilon\text{-Zn}(\text{OH})_2(\text{s}) + 2\text{OH}^- \rightleftharpoons \text{Zn}(\text{OH})_4^{2-}$	-1,4
	$\text{Cd}^{2+} + \text{H}_2\text{O} \rightleftharpoons \text{CdOH}^+ + \text{H}^+$	-10,5
	$4\text{Cd}^{2+} + 4\text{H}_2\text{O} \rightleftharpoons \text{Cd}_4(\text{OH})_4^{4+} + 4\text{H}^+$	-32,5
	$\text{Cd}(\text{OH})_2(\text{s}) \rightleftharpoons \text{Cd}^{2+} + 2\text{OH}^-$	-14,4
	$\text{Hg}^{2+} + \text{H}_2\text{O} \rightleftharpoons \text{HgOH}^+ + \text{H}^+$	-3,2
	$\text{HgOH}^+ + \text{H}_2\text{O} \rightleftharpoons \text{Hg}(\text{OH})_2 + \text{H}^+$	-2,6
<u>3(B)</u>	$2\text{Hg}^{2+} + 2\text{H}_2\text{O} \rightleftharpoons \text{Hg}_2(\text{OH})_2^{2+} + 2\text{H}^+$	-4,7
	$\text{HgO}(\text{s}) + \text{H}_2\text{O} + \text{OH}^- \rightleftharpoons \text{Hg}(\text{OH})_3^-$	-4,5
	$\text{Al}(\text{OH})_3(\text{s}) + 3\text{H}^+ \rightleftharpoons \text{Al}^{3+} + 3\text{H}_2\text{O}$	8,5
	$\text{Al}^{3+} + \text{H}_2\text{O} \rightleftharpoons \text{AlOH}^{2+} + \text{H}^+$	-5
	$2\text{Al}^{3+} + 2\text{H}_2\text{O} \rightleftharpoons \text{Al}_2(\text{OH})_2^{4+} + 2\text{H}^+$	-7
	$\text{Al}(\text{OH})_3(\text{s}) + \text{OH}^- \rightleftharpoons \text{Al}(\text{OH})_4^-$	-0,6
	$\text{GaOOH}(\text{s}) + 3\text{H}^+ \rightleftharpoons \text{Ga}^{3+} + 2\text{H}_2\text{O}$	3
	$\text{GaOOH}(\text{s}) + \text{H}_2\text{O} + \text{OH}^- \rightleftharpoons \text{Ga}(\text{OH})_4^-$	0,3
	$\text{In}^{3+} + \text{H}_2\text{O} \rightleftharpoons \text{InOH}^{2+} + \text{H}^+$	-3,7
	$\text{InOH}^{2+} + \text{H}_2\text{O} \rightleftharpoons \text{In}(\text{OH})_2^+ + \text{H}^+$	-3,7
	$2\text{In}^{3+} + 2\text{H}_2\text{O} \rightleftharpoons \text{In}_2(\text{OH})_2^{4+} + 2\text{H}^+$	-5,2
	$\text{In}(\text{OH})_3(\text{s}) + 3\text{H}^+ \rightleftharpoons \text{In}^{3+} + 3\text{H}_2\text{O}$	5,1
	$\text{In}(\text{OH})_3(\text{s}) + \text{OH}^- \rightleftharpoons \text{In}(\text{OH})_4^-$	-3,0
	$\text{Tl}^+ + \text{OH}^- \rightleftharpoons \text{TlOH}$	0,8
	$1/2\text{Tl}_2\text{O}_3(\text{s}) + 3\text{H}^+ \rightleftharpoons \text{Tl}^{3+} + 3/2\text{H}_2\text{O}$	-3

	Reaktion	lg K
	$Tl^{3+} + H_2O \rightleftharpoons TlOH^{2+} + H^+$	-0,4
	$TlOH^{2+} + H_2O \rightleftharpoons Tl(OH)_2^+ + H^+$	-1,1
<u>4(B)</u>	$GeO(s, brun) + H_2O \rightleftharpoons Ge(OH)_2$	-3,7
	$GeO(s, brun) + 2H^+ \rightleftharpoons Ge^{2+} + H_2O$	-6
	$SnO(s) + 2H^+ \rightleftharpoons Sn^{2+} + H_2O$	1,8
	$Sn^{2+} + H_2O \rightleftharpoons SnOH^+ + H^+$	-3,6
	$3Sn^{2+} + 4H_2O \rightleftharpoons Sn_3(OH)_4^{2+} + 4H^+$	-6,1
	$SnO(s) + H_2O + OH^- \rightleftharpoons Sn(OH)_3^-$	-0,8
	$PbO(s, r\ddot{o}d) + 2H^+ \rightleftharpoons Pb^{2+} + H_2O$	12,7
	$PbO(s, gul) + 2H^+ \rightleftharpoons Pb^{2+} + H_2O$	12,9
	$Pb^{2+} + H_2O \rightleftharpoons PbOH^+ + H^+$	-7,5
	$4Pb^{2+} + 4H_2O \rightleftharpoons Pb_4(OH)_4^{4+} + 4H^+$	-20
	$PbO(s, r\ddot{o}d) + H_2O \rightleftharpoons Pb(OH)_2$	-4,4
	$PbO(s, r\ddot{o}d) + H_2O + OH^- \rightleftharpoons Pb(OH)_3^-$	-1,4
<u>5(B)</u>	$1/2Sb_2O_3(s) + H^+ \rightleftharpoons SbO^+ + 1/2H_2O$	-3,1
	$1/2Sb_2O_3(s) + 3/2H_2O + OH^- \rightleftharpoons Sb(OH)_4^-$	-2
	$1/2Bi_2O_3(s, \alpha) + 3H^+ \rightleftharpoons Bi^{3+} + 3/2H_2O$	11
	$6Bi^{3+} + 8H_2O \rightleftharpoons Bi_6O_4(OH)_4^{6+} + 12H^+$	1

3. Vanadat, niobat

	Reaktion	lg K
<u>1(A)</u>	$10VO_2^+ + 8H_2O \rightleftharpoons H_2V_{10}O_{28}^{4-} + 14H^+$	-10
	$H_2V_{10}O_{28}^{4-} \rightleftharpoons HV_{10}O_{28}^{3-} + H^+$	-4,5
	$H^+ + VO_4^{3-} \rightleftharpoons HVO_4^{2-}$	14
	$H^+ + HVO_4^{2-} \rightleftharpoons VO_3^{2-} + H_2O$	8,7
	$H^+ + VO_3^{2-} \rightleftharpoons HVO_3^-$	4,0
	$H^+ + HVO_3^- \rightleftharpoons VO_3^{2-} + H_2O$	3,3
	$3VO_3^{2-} \rightleftharpoons V_3O_9^{3-}$	6,6
	$H_2Nb_6O_{19}^{7-} \rightleftharpoons HNb_6O_{19}^{7-} + H^+$	-11
	$HNb_6O_{19}^{7-} \rightleftharpoons Nb_6O_{19}^{6-} + H^+$	-14

4. Kromat

	Reaktion	lg K
<u>1 (A)</u>	$H^+ + CrO_4^{2-} \rightleftharpoons HCrO_4^-$	6,50
	$2HCrO_4^- \rightleftharpoons Cr_2O_7^{2-} + H_2O$	1,55
<u>2 (A)</u>	$SrCrO_4(s) \rightleftharpoons Sr^{2+} + CrO_4^{2-}$	-4,6
	$BaCrO_4(s) \rightleftharpoons Ba^{2+} + CrO_4^{2-}$	-9,7
<u>1B</u>	$Ag_2CrO_4(s) \rightleftharpoons 2Ag^+ + CrO_4^{2-}$	-11,6
<u>2B</u>	$Hg_2CrO_4(s) \rightleftharpoons Hg_2^{2+} + CrO_4^{2-}$	-8,7
<u>3 (B)</u>	$Tl_2CrO_4(s) \rightleftharpoons 2Tl^+ + CrO_4^{2-}$	-12,0
<u>4 (B)</u>	$PbCrO_4(s) \rightleftharpoons Pb^{2+} + CrO_4^{2-}$	-12,5

5. Molybdat

	Reaktion	lg K
<u>1 (A)</u>	$H^+ + MoO_4^{2-} \rightleftharpoons HMoO_4^-$	4,6
	$H^+ + HMoO_4^- \rightleftharpoons H_2MoO_4$	4,0
	$8H^+ + 7MoO_4^{2-} \rightleftharpoons Mo_7O_{24}^{6-} + 4H_2O$	58
	$H^+ + Mo_7O_{24}^{6-} \rightleftharpoons HMo_7O_{24}^{5-}$	6
	$H^+ + HMo_7O_{24}^{5-} \rightleftharpoons H_2Mo_7O_{24}^{4-}$	5
<u>1B</u>	$Ag_2MoO_4(s) \rightleftharpoons 2Ag^+ + MoO_4^{2-}$	-11,55

6. Volfram

	Reaktion	lg K
<u>1 (A)</u>	$7H^+ + 6WO_4^{2-} \rightleftharpoons HW_6O_{21}^{5-} + 3H_2O$	62
	även andra långsamma reaktioner	

7. Cyanoferrat

	Reaktion	lg K
<u>1 (A)</u>	$H^+ + Fe(CN)_6^{4-} \rightleftharpoons HFe(CN)_6^{3-}$	4,3
	$H^+ + HFe(CN)_6^{3-} \rightleftharpoons H_2Fe(CN)_6^{2-}$	2,3

8. Borat

	Reaktion	lg K
<u>1 (A)</u>	$B(OH)_3 + H_2O \rightleftharpoons B(OH)_4^- + H^+$	-9,24
	$3B(OH)_3 \rightleftharpoons B_3O_3(OH)_4^- + H^+ + 2H_2O$	-7,2
	$4B(OH)_3 \rightleftharpoons B_4O_5(OH)_4^{2-} + 2H^+ + 3H_2O$	-15,7
	$5B(OH)_3 \rightleftharpoons B_5O_6(OH)_4^- + H^+ + 5H_2O$	-7,0

9. Cyanid

	Reaktion	lg K
<u>1 (A)</u>	$H^+ + CN^- \rightleftharpoons HCN$	9,2
<u>8</u>	$Fe^{2+} + 6 CN^- \rightleftharpoons Fe(CN)_6^{4-}$	36
	$Fe^{3+} + 6 CN^- \rightleftharpoons Fe(CN)_6^{3-}$	44
	$Co^{2+} + 6 CN^- \rightleftharpoons Co(CN)_6^{4-}$	18
	$Co^{3+} + 6 CN^- \rightleftharpoons Co(CN)_6^{3-}$	64
<u>1B</u>	$CuCN(s) \rightleftharpoons Cu^+ + CN^-$	-19,5
	$Cu^+ + 2 CN^- \rightleftharpoons Cu(CN)_2^-$	24
	$Cu^+ + 3 CN^- \rightleftharpoons Cu(CN)_3^{2-}$	28,6
	$Cu^+ + 4 CN^- \rightleftharpoons Cu(CN)_4^{3-}$	30,3
	$AgCN(s) \rightleftharpoons Ag^+ + CN^-$	-15,9
	$Ag^+ + 2 CN^- \rightleftharpoons Ag(CN)_2^-$	20,9
	$Ag^+ + 3 CN^- \rightleftharpoons Ag(CN)_3^{2-}$	21,8
	$Ag^+ + CN^- + OH^- \rightleftharpoons AgCNOH^-$	13,22
<u>2B</u>	$Zn^{2+} + 4 CN^- \rightleftharpoons Zn(CN)_4^{2-}$	19,62
	$Cd^{2+} + 4 CN^- \rightleftharpoons Cd(CN)_4^{2-}$	18
	$Hg^{2+} + 2 CN^- \rightleftharpoons Hg(CN)_2$	35,2
	$Hg^{2+} + 3 CN^- \rightleftharpoons Hg(CN)_3^-$	38,8
	$Hg^{2+} + 4 CN^- \rightleftharpoons Hg(CN)_4^{2-}$	41,5
<u>3(B)</u>	$Tl^{3+} + 4 CN^- \rightleftharpoons Tl(CN)_4^-$	35

10. Cyanat

	Reaktion	lg K
<u>1 (A)</u>	$H^+ + CNO^- \rightleftharpoons HCN O$	3,5

11. Thiocyanat, $SCN^- = L^-$

	Reaktion	lg K
<u>1 (A)</u>	$H^+ + L^- \rightleftharpoons HL$	-2
<u>6 (A)</u>	$Cr^{3+} + L^- \rightleftharpoons CrL^{2+}$	3,1
	$Cr^{3+} + 2 L^- \rightleftharpoons CrL_2^+$	4,8
	$Cr^{3+} + 3 L^- \rightleftharpoons CrL_3$	5,8
	$Cr^{3+} + 4 L^- \rightleftharpoons CrL_4^-$	6,1
	$Cr^{3+} + 5 L^- \rightleftharpoons CrL_5^{2-}$	5,4
	$Cr^{3+} + 6 L^- \rightleftharpoons CrL_6^{3-}$	3,8
<u>8</u>	$Fe^{3+} + L^- \rightleftharpoons FeL^{2+}$	3,0
	$Fe^{3+} + 2 L^- \rightleftharpoons FeL_2^+$	4,9
	$Fe^{3+} + 3 L^- \rightleftharpoons FeL_3$	5,1
	$Co^{2+} + L^- \rightleftharpoons CoL^+$	1,7
	$Ni^{2+} + L^- \rightleftharpoons NiL^+$	1,9

	Reaktion	lg K
<u>1B</u>	$\text{CuL(s)} \rightleftharpoons \text{Cu}^+ + \text{L}^-$	-14
	$\text{Cu}^+ + 3\text{L}^- \rightleftharpoons \text{CuL}_3^{2-}$	9,9
	$\text{Cu}^+ + 4\text{L}^- \rightleftharpoons \text{CuL}_4^{3-}$	9,7
	$\text{Cu}^{2+} + \text{L}^- \rightleftharpoons \text{CuL}^+$	2,3
	$\text{Cu}^{2+} + 2\text{L}^- \rightleftharpoons \text{CuL}_2$	3,6
	$\text{AgL(s)} \rightleftharpoons \text{Ag}^+ + \text{L}^-$	-11,97
	$\text{Ag}^+ + \text{L}^- \rightleftharpoons \text{AgL}$	4,75
	$\text{Ag}^+ + 2\text{L}^- \rightleftharpoons \text{AgL}_2^-$	8,23
	$\text{Ag}^+ + 3\text{L}^- \rightleftharpoons \text{AgL}_3^{2-}$	9,45
	$\text{Ag}^+ + 4\text{L}^- \rightleftharpoons \text{AgL}_4^{3-}$	9,67
<u>2B</u>	$\text{Zn}^{2+} + \text{L}^- \rightleftharpoons \text{ZnL}^+$	1,2
	$\text{Cd}^{2+} + \text{L}^- \rightleftharpoons \text{CdL}^+$	2,1
	$\text{Cd}^{2+} + 2\text{L}^- \rightleftharpoons \text{CdL}_2$	3,0
	$\text{Cd}^{2+} + 3\text{L}^- \rightleftharpoons \text{CdL}_3^-$	3,6
	$\text{Hg}_2\text{L}_2(\text{s}) \rightleftharpoons \text{Hg}_2^{2+} + 2\text{L}^-$	-19,5
	$\text{Hg}_2^{2+} + 2\text{L}^- \rightleftharpoons \text{Hg}_2\text{L}_2$	17,3
	$\text{Hg}^{2+} + 3\text{L}^- \rightleftharpoons \text{HgL}_3^-$	20,0
	$\text{Hg}^{2+} + 4\text{L}^- \rightleftharpoons \text{HgL}_4^{2-}$	21,7
	$\text{HgL}_2(\text{s}) \rightleftharpoons \text{HgL}_2$	-2,6
<u>3(B)</u>	$\text{Al}^{3+} + \text{L}^- \rightleftharpoons \text{AlL}^{2+}$	0,4
	$\text{In}^{3+} + \text{L}^- \rightleftharpoons \text{InL}^{2+}$	3,4
	$\text{In}^{3+} + 2\text{L}^- \rightleftharpoons \text{InL}_2^+$	5,1
	$\text{In}^{3+} + 3\text{L}^- \rightleftharpoons \text{InL}_3$	6,4
	$\text{In}^{3+} + 4\text{L}^- \rightleftharpoons \text{InL}_4^-$	6,4
	$\text{TlL(s)} \rightleftharpoons \text{Tl}^+ + \text{L}^-$	-3,8
	$\text{Tl}^+ + \text{L}^- \rightleftharpoons \text{TlL}$	0,6
<u>4(B)</u>	$\text{Pb}^{2+} + \text{L}^- \rightleftharpoons \text{PbL}^+$	1,8
	$\text{Pb}^{2+} + 2\text{L}^- \rightleftharpoons \text{PbL}_2$	2,5
<u>5(B)</u>	$\text{Bi}^{3+} + \text{L}^- \rightleftharpoons \text{BiL}^{2+}$	2,2

12. Selenocyanat

	Reaktion	lg K
<u>1B</u>	$\text{AgSeCN(s)} \rightleftharpoons \text{Ag}^+ + \text{SeCN}^-$	-14,0

13. Karbonat, $\text{CO}_3^{2-} = \text{L}^{2-}$

	Reaktion	lg K
<u>1(A)</u>	$\text{H}^+ + \text{L}^{2-} \rightleftharpoons \text{HL}^-$	10,33
	$\text{H}^+ + \text{HL}^- \rightleftharpoons \text{H}_2\text{L}$	6,35
	$\text{CO}_2(\text{g}) + \text{H}_2\text{O} \rightleftharpoons \text{H}_2\text{L}$	-1,47

	Reaktion	lg K
	$D^+ + L^{2-} \rightleftharpoons DL^-$	10,9
	$D^+ + DL^- \rightleftharpoons D_2L$	6,8
<u>2 (A)</u>	$MgL(s, \text{magnesit}) \rightleftharpoons Mg^{2+} + L^{2-}$	-7,80
	$MgL(H_2O)_3(s) \rightleftharpoons Mg^{2+} + L^{2-} + 3H_2O$	-5
	$CaL(s, \text{kalcit}) \rightleftharpoons Ca^{2+} + L^{2-}$	-8,35
	$CaL(s, \text{aragonit}) \rightleftharpoons Ca^{2+} + L^{2-}$	-8,22
	$SrL(s) \rightleftharpoons Sr^{2+} + L^{2-}$	-9,0
	$BaL(s) \rightleftharpoons Ba^{2+} + L^{2-}$	-8,3
<u>3 (A)</u>		
(5f)	$UO_2^{2+} + 2L^{2-} \rightleftharpoons UO_2L_2^{2-}$	15
	$UO_2^{2+} + 3L^{2-} \rightleftharpoons UO_2L_3^{4-}$	21
	$UO_2(OH)_2(s) + H_2L \rightleftharpoons UO_2L(s) + H_2O$	1,2
<u>7A</u>	$MnL(s) \rightleftharpoons Mn^{2+} + L^{2-}$	-9,30
<u>8</u>	$FeL(s) \rightleftharpoons Fe^{2+} + L^{2-}$	-10,68
	$CoL(s) \rightleftharpoons Co^{2+} + L^{2-}$	-12,84
	$NiL(s) \rightleftharpoons Ni^{2+} + L^{2-}$	-6,87
<u>1B</u>	$CuL(s) \rightleftharpoons Cu^{2+} + L^{2-}$	-9,6
	$Cu(OH)_2(s) + 3L^{2-} \rightleftharpoons CuL_3^{4-} + 2OH^-$	-8
	$Cu_2(OH)_2L(s) \rightleftharpoons 2Cu^{2+} + 2OH^- + L^{2-}$	-31,9
	$Ag_2L(s) \rightleftharpoons 2Ag^+ + L^{2-}$	-11,1
<u>2B</u>	$ZnL(s) \rightleftharpoons Zn^{2+} + L^{2-}$	-10,0
	$CdL(s) \rightleftharpoons Cd^{2+} + L^{2-}$	-12,00
<u>4 (B)</u>	$PbL(s) \rightleftharpoons Pb^{2+} + L^{2-}$	-13,14
	$Pb_3(OH)_2L_2(s) \rightleftharpoons 3Pb^{2+} + 2OH^- + 2L^{2-}$	-45

14. Silikat

	Reaktion	lg K
<u>1 (A)</u>	$H^+ + SiO_2(OH)_2^- \rightleftharpoons SiO(OH)_3^-$	13,2
	$H^+ + SiO(OH)_3^- \rightleftharpoons Si(OH)_4$	9,8
	$SiO_2(s, \text{gel}) + 2H_2O \rightleftharpoons Si(OH)_4$	-2,57
	$SiO_2(s, \text{kvarts}) + 2H_2O \rightleftharpoons Si(OH)_4$	-3,68

15. Germanat

	Reaktion	lg K
<u>1 (A)</u>	$H^+ + GeO_3^{2-} \rightleftharpoons HGeO_3^-$	12,9
	$H^+ + HGeO_3^- \rightleftharpoons H_2GeO_3$	9,4

16. Plumbat

	Reaktion	lg K
<u>1(A)</u>	$\text{PbO}_2(\text{s}) + 2\text{OH}^- + 2\text{H}_2\text{O} \rightleftharpoons \text{Pb}(\text{OH})_6^{2-}$	-4,5

17. Ammoniak, $\text{NH}_3 = \text{L}$

	Reaktion	lg K
<u>1(A)</u>	$\text{H}^+ + \text{L} \rightleftharpoons \text{HL}^+$	9,26
	$\text{D}^+ + \text{L} \rightleftharpoons \text{DL}^+$	9,76

<u>8</u>	$\text{Co}^{2+} + \text{L} \rightleftharpoons \text{CoL}^{2+}$	2,0
	$\text{Co}^{2+} + 2\text{L} \rightleftharpoons \text{CoL}_2^{2+}$	3,5
	$\text{Co}^{2+} + 3\text{L} \rightleftharpoons \text{CoL}_3^{2+}$	4,4
	$\text{Co}^{2+} + 4\text{L} \rightleftharpoons \text{CoL}_4^{2+}$	5,1
	$\text{Co}^{2+} + 5\text{L} \rightleftharpoons \text{CoL}_5^{2+}$	5,1
	$\text{Co}^{2+} + 6\text{L} \rightleftharpoons \text{CoL}_6^{2+}$	4,4
	$\text{Co}^{3+} + 5\text{L} \rightleftharpoons \text{CoL}_5^{3+}$	30
	$\text{Co}^{3+} + 6\text{L} \rightleftharpoons \text{CoL}_6^{3+}$	34
	$\text{Ni}^{2+} + \text{L} \rightleftharpoons \text{NiL}^{2+}$	2,8
	$\text{Ni}^{2+} + 2\text{L} \rightleftharpoons \text{NiL}_2^{2+}$	4,8
	$\text{Ni}^{2+} + 3\text{L} \rightleftharpoons \text{NiL}_3^{2+}$	6,5
	$\text{Ni}^{2+} + 4\text{L} \rightleftharpoons \text{NiL}_4^{2+}$	7,8
	$\text{Ni}^{2+} + 5\text{L} \rightleftharpoons \text{NiL}_5^{2+}$	8,4
	$\text{Ni}^{2+} + 6\text{L} \rightleftharpoons \text{NiL}_6^{2+}$	8,5

	Reaktion	lg K
<u>1B</u>	$\text{Cu}^+ + \text{L} \rightleftharpoons \text{CuL}^+$	6
	$\text{Cu}^+ + 2\text{L} \rightleftharpoons \text{CuL}_2^+$	11
	$\text{Cu}^{2+} + \text{L} \rightleftharpoons \text{CuL}^{2+}$	4,3
	$\text{Cu}^{2+} + 2\text{L} \rightleftharpoons \text{CuL}_2^{2+}$	7,9
	$\text{Cu}^{2+} + 3\text{L} \rightleftharpoons \text{CuL}_3^{2+}$	10,8
	$\text{Cu}^{2+} + 4\text{L} \rightleftharpoons \text{CuL}_4^{2+}$	13,0
	$\text{Cu}^{2+} + 5\text{L} \rightleftharpoons \text{CuL}_5^{2+}$	12,4
	$\text{Ag}^+ + \text{L} \rightleftharpoons \text{AgL}^+$	3,31
	$\text{Ag}^+ + 2\text{L} \rightleftharpoons \text{AgL}_2^+$	7,22
<u>2B</u>	$\text{Zn}^{2+} + \text{L} \rightleftharpoons \text{ZnL}^{2+}$	2,2
	$\text{Zn}^{2+} + 2\text{L} \rightleftharpoons \text{ZnL}_2^{2+}$	4,6
	$\text{Zn}^{2+} + 3\text{L} \rightleftharpoons \text{ZnL}_3^{2+}$	7,0
	$\text{Zn}^{2+} + 4\text{L} \rightleftharpoons \text{ZnL}_4^{2+}$	9,1
	$\text{Cd}^{2+} + \text{L} \rightleftharpoons \text{CdL}^{2+}$	2,6
	$\text{Cd}^{2+} + 2\text{L} \rightleftharpoons \text{CdL}_2^{2+}$	4,8
	$\text{Cd}^{2+} + 3\text{L} \rightleftharpoons \text{CdL}_3^{2+}$	6,2
	$\text{Cd}^{2+} + 4\text{L} \rightleftharpoons \text{CdL}_4^{2+}$	7,3
	$\text{Hg}^{2+} + \text{L} \rightleftharpoons \text{HgL}^{2+}$	8,8
	$\text{Hg}^{2+} + 2\text{L} \rightleftharpoons \text{HgL}_2^{2+}$	17,5
	$\text{Hg}^{2+} + 3\text{L} \rightleftharpoons \text{HgL}_3^{2+}$	18,5
	$\text{Hg}^{2+} + 4\text{L} \rightleftharpoons \text{HgL}_4^{2+}$	19,3

18. Hydrazin

	Reaktion	lg K
<u>1(A)</u>	$\text{H}^+ + \text{N}_2\text{H}_4 \rightleftharpoons \text{N}_2\text{H}_5^+$	7,96

19. Hydroxylamin

	Reaktion	lg K
<u>1(A)</u>	$\text{H}^+ + \text{NH}_2\text{OH} \rightleftharpoons \text{NH}_3\text{OH}^+$	5,98

20. Azid

	Reaktion	lg K
<u>1(A)</u>	$\text{H}^+ + \text{N}_3^- \rightleftharpoons \text{HN}_3$	4,64
	$\text{D}^+ + \text{N}_3^- \rightleftharpoons \text{DN}_3$	5,16
<u>8</u>	$\text{Fe}^{3+} + \text{N}_3^- \rightleftharpoons \text{FeN}_3^{2+}$	4,8
<u>1B</u>	$\text{CuN}_3(\text{s}) \rightleftharpoons \text{Cu}^+ + \text{N}_3^-$	-8,31
	$\text{AgN}_3(\text{s}) \rightleftharpoons \text{Ag}^+ + \text{N}_3^-$	-8,56
<u>2B</u>	$\text{Hg}_2(\text{N}_3)_2(\text{s}) \rightleftharpoons \text{Hg}_2^{2+} + 2\text{N}_3^-$	-9,15
<u>4(B)</u>	$\text{Pb}(\text{N}_3)_2(\text{s}) \rightleftharpoons \text{Pb}^{2+} + 2\text{N}_3^-$	-8,59

21. <u>Kväveoxid</u>	
	Reaktion
<u>8</u>	$\text{Fe}^{2+} + \text{NO}(\text{g}) \rightleftharpoons \text{FeNO}^{2+}$
	lg K
	-0,18
22. <u>Nitrit, $\text{NO}_2^- = \text{L}^-$</u>	
	Reaktion
	lg K
<u>1 (A)</u>	$\text{H}^+ + \text{L}^- \rightleftharpoons \text{HL}$
	3,14
<u>1B</u>	$\text{Cu}^{2+} + \text{L}^- \rightleftharpoons \text{CuL}^+$
	2,0
	$\text{Cu}^{2+} + 2\text{L}^- \rightleftharpoons \text{CuL}_2$
	3,0
	$\text{AgL}(\text{s}) \rightleftharpoons \text{Ag}^+ + \text{L}^-$
	-4,15
<u>2B</u>	$\text{Cd}^{2+} + \text{L}^- \rightleftharpoons \text{CdL}^+$
	2,5
	$\text{Cd}^{2+} + 2\text{L}^- \rightleftharpoons \text{CdL}_2$
	4,0
	$\text{Cd}^{2+} + 3\text{L}^- \rightleftharpoons \text{CdL}_3^-$
	4,8
	$\text{Hg}^{2+} + 4\text{L}^- \rightleftharpoons \text{HgL}_4^{2-}$
	11,2
<u>3(B)</u>	$\text{Tl}^+ + \text{L}^- \rightleftharpoons \text{TlL}$
	0,80
<u>4(B)</u>	$\text{Pb}^{2+} + \text{L}^- \rightleftharpoons \text{PbL}^+$
	2,5
23. <u>Nitrat</u>	
	Reaktion
	lg K
<u>1 (A)</u>	$\text{H}^+ + \text{NO}_3^- \rightleftharpoons \text{HNO}_3$
	-1,4
<u>4 (B)</u>	$\text{Pb}^{2+} + \text{NO}_3^- \rightleftharpoons \text{PbNO}_3^+$
	1,1
24. <u>Fosfinat</u>	
	Reaktion
	lg K
<u>1 (A)</u>	$\text{H}^+ + \text{PH}_2\text{O}_2^- \rightleftharpoons \text{HPH}_2\text{O}_2$
	1,3
25. <u>Fosfonat</u>	
	Reaktion
	lg K
<u>1 (A)</u>	$\text{H}^+ + \text{PHO}_3^{2-} \rightleftharpoons \text{HPO}_3^-$
	6,5
	$\text{H}^+ + \text{HPO}_3^- \rightleftharpoons \text{H}_2\text{PHO}_3$
	1,4
26. <u>Fosfat, $\text{PO}_4^{3-} = \text{L}^{3-}$</u>	
	Reaktion
	lg K
<u>1 (A)</u>	$\text{H}^+ + \text{L}^{3-} \rightleftharpoons \text{HL}^{2-}$
	12,36
	$\text{H}^+ + \text{HL}^{2-} \rightleftharpoons \text{H}_2\text{L}^-$
	7,20
	$\text{H}^+ + \text{H}_2\text{L}^- \rightleftharpoons \text{H}_3\text{L}$
	2,12
	$\text{D}^+ + \text{L}^{3-} \rightleftharpoons \text{DL}^{2-}$
	12,82
	$\text{D}^+ + \text{DL}^{2-} \rightleftharpoons \text{D}_2\text{L}^-$
	7,69
	$\text{D}^+ + \text{D}_2\text{L}^- \rightleftharpoons \text{D}_3\text{L}$
	2,42

	Reaktion	lg K
<u>2 (A)</u>	$\text{Mg}_3\text{L}_2(\text{s}) \rightleftharpoons 3\text{Mg}^{2+} + 2\text{L}^{3-}$	-23
	$\text{Ca}_3\text{L}_2(\text{s}) \rightleftharpoons 3\text{Ca}^{2+} + 2\text{L}^{3-}$	-28,9
	$\text{CaHL}(\text{s}) \rightleftharpoons \text{Ca}^{2+} + \text{HL}^{2-}$	-6,9
	$\text{Ca}_5\text{OHL}_3(\text{s}) \rightleftharpoons 5\text{Ca}^{2+} + \text{OH}^- + 3\text{L}^{3-}$	-58
	$\text{Sr}_3\text{L}_2(\text{s}) \rightleftharpoons 3\text{Sr}^{2+} + 2\text{L}^{3-}$	-27
	$\text{SrHL}(\text{s}) \rightleftharpoons \text{Sr}^{2+} + \text{HL}^{2-}$	-6,3
	$\text{Ba}_3\text{L}_2(\text{s}) \rightleftharpoons 3\text{Ba}^{2+} + 2\text{L}^{3-}$	-22
	$\text{BaHL}(\text{s}) \rightleftharpoons \text{Ba}^{2+} + \text{HL}^{2-}$	-7
<u>3A</u>	$\text{LaL}(\text{s}) \rightleftharpoons \text{La}^{3+} + \text{L}^{3-}$	-25
(4f)		
<u>1B</u>	$\text{Ag}_3\text{L}(\text{s}) \rightleftharpoons 3\text{Ag}^+ + \text{L}^{3-}$	-20
<u>4 (B)</u>	$\text{Pb}_3\text{L}_2(\text{s}) \rightleftharpoons 3\text{Pb}^{2+} + 2\text{L}^{3-}$	-44,4
	$\text{PbHL}(\text{s}) \rightleftharpoons \text{Pb}^{2+} + \text{HL}^{2-}$	-11,4
<u>5 (B)</u>	$\text{BiL}(\text{s}) \rightleftharpoons \text{Bi}^{3+} + \text{L}^{3-}$	-23

27. Difosfat, $\text{P}_2\text{O}_7^{4-} = \text{L}^{4-}$

	Reaktion	lg K
<u>1 (A)</u>	$\text{H}^+ + \text{L}^{4-} \rightleftharpoons \text{HL}^{3-}$	9,3
	$\text{H}^+ + \text{HL}^{3-} \rightleftharpoons \text{H}_2\text{L}^{2-}$	6,7
	$\text{H}^+ + \text{H}_2\text{L}^{2-} \rightleftharpoons \text{H}_3\text{L}^-$	2,1
	$\text{H}^+ + \text{H}_3\text{L}^- \rightleftharpoons \text{H}_4\text{L}$	0,9
	$\text{Li}^+ + \text{L}^{4-} \rightleftharpoons \text{LiL}^{3-}$	3,1
	$\text{Na}^+ + \text{L}^{4-} \rightleftharpoons \text{NaL}^{3-}$	2,3
	$\text{K}^+ + \text{L}^{4-} \rightleftharpoons \text{KL}^{3-}$	2,3
<u>2 (A)</u>	$\text{Mg}^{2+} + \text{L}^{4-} \rightleftharpoons \text{MgL}^{2-}$	7,2
	$\text{Ca}^{2+} + \text{L}^{4-} \rightleftharpoons \text{CaL}^{2-}$	6

28. Trimetafosfat

	Reaktion	lg K
<u>1 (A)</u>	$\text{H}^+ + \text{P}_3\text{O}_9^{3-} \rightleftharpoons \text{HP}_3\text{O}_9^{2-}$	1,7
<u>2 (A)</u>	$\text{Ca}^{2+} + \text{P}_3\text{O}_9^{3-} \rightleftharpoons \text{CaP}_3\text{O}_9^-$	3,4

29. Trifosfat, $P_3O_{10}^{5-} = L^{5-}$

	Reaktion	lg K
<u>1 (A)</u>	$H^+ + L^{5-} \rightleftharpoons HL^{4-}$	9,24
	$H^+ + HL^{4-} \rightleftharpoons H_2L^{3-}$	6,50
	$H^+ + H_2L^{3-} \rightleftharpoons H_3L^{2-}$	2,3
	$H^+ + H_3L^{2-} \rightleftharpoons H_4L^{-}$	1,8
	$H^+ + H_4L^{-} \rightleftharpoons H_5L^0$	0,5
	$Li^+ + L^{5-} \rightleftharpoons LiL^{4-}$	3,9
	$Na^+ + L^{5-} \rightleftharpoons NaL^{4-}$	2,8
	$K^+ + L^{5-} \rightleftharpoons KL^{4-}$	2,8
<u>2 (A)</u>	$Mg^{2+} + L^{5-} \rightleftharpoons MgL^{3-}$	8,6
	$Ca^{2+} + L^{5-} \rightleftharpoons CaL^{3-}$	8,1

30. Tetrametafosfat

	Reaktion	lg K
<u>1 (A)</u>	$H^+ + P_4O_{12}^{4-} \rightleftharpoons HP_4O_{12}^{3-}$	2,78
	$Na^+ + P_4O_{12}^{4-} \rightleftharpoons NaP_4O_{12}^{3-}$	2,1
<u>2 (A)</u>	$Ca^{2+} + P_4O_{12}^{4-} \rightleftharpoons CaP_4O_{12}^{2-}$	5,4

31. Amidofosfat

	Reaktion	lg K
<u>1 (A)</u>	$H^+ + H_2NPO_3^{2-} \rightleftharpoons H_2NPO_2(OH)^{-}$	8,6
	$H^+ + H_2NPO_2OH^{-} \rightleftharpoons H_2NPO(OH)_2$	3,1

32. Hypofosfat

	Reaktion	lg K
<u>1 (A)</u>	$H^+ + P_2O_6^{4-} \rightleftharpoons HP_2O_6^{3-}$	10,0
	$H^+ + HP_2O_6^{3-} \rightleftharpoons H_2P_2O_6^{2-}$	7,3
	$H^+ + H_2P_2O_6^{2-} \rightleftharpoons H_3P_2O_6^{-}$	2,8

33. Fluorofosfat

	Reaktion	lg K
<u>1 (A)</u>	$H^+ + FPO_3^{2-} \rightleftharpoons FPO_2(OH)^{-}$	5,12

34. Arsenit

	Reaktion	lg K
<u>1 (A)</u>	$\text{H}^+ + \text{H}_2\text{AsO}_3^- \rightleftharpoons \text{H}_3\text{AsO}_3$	9,29

35. Arsenat

	Reaktion	lg K
<u>1 (A)</u>	$\text{H}^+ + \text{AsO}_4^{3-} \rightleftharpoons \text{HAsO}_4^{2-}$	11,50
	$\text{H}^+ + \text{HAsO}_4^{2-} \rightleftharpoons \text{H}_2\text{AsO}_4^-$	6,94
	$\text{H}^+ + \text{H}_2\text{AsO}_4^- \rightleftharpoons \text{H}_3\text{AsO}_4$	2,19

36. Peroxid

	Reaktion	lg K
<u>1 (A)</u>	$\text{H}^+ + \text{HO}_2^- \rightleftharpoons \text{H}_2\text{O}_2$	11,65

37. Sulfid

	Reaktion	lg K
<u>1 (A)</u>	$\text{H}_2\text{S}(\text{g}) \rightleftharpoons \text{H}_2\text{S}(\text{aq})$	-0,99
	$\text{H}^+ + \text{S}^{2-} \rightleftharpoons \text{HS}^-$	13,90
	$\text{H}^+ + \text{HS}^- \rightleftharpoons \text{H}_2\text{S}$	6,99
<u>7A</u>	$\text{MnS}(\text{s, skär}) + 2\text{H}^+ \rightleftharpoons \text{Mn}^{2+} + \text{H}_2\text{S}(\text{g})$	11,4
	$\text{MnS}(\text{s, grönn}) + 2\text{H}^+ \rightleftharpoons \text{Mn}^{2+} + \text{H}_2\text{S}(\text{g})$	8,4
<u>8</u>	$\text{FeS}(\text{s}) + 2\text{H}^+ \rightleftharpoons \text{Fe}^{2+} + \text{H}_2\text{S}(\text{g})$	3,8
	$\text{CoS}(\text{s, } \alpha) + 2\text{H}^+ \rightleftharpoons \text{Co}^{2+} + \text{H}_2\text{S}(\text{g})$	0,6
	$\text{CoS}(\text{s, } \beta) + 2\text{H}^+ \rightleftharpoons \text{Co}^{2+} + \text{H}_2\text{S}(\text{g})$	-3,7
	$\text{NiS}(\text{s, } \alpha) + 2\text{H}^+ \rightleftharpoons \text{Ni}^{2+} + \text{H}_2\text{S}(\text{g})$	2,5
	$\text{NiS}(\text{s, } \beta) + 2\text{H}^+ \rightleftharpoons \text{Ni}^{2+} + \text{H}_2\text{S}(\text{g})$	-3,0
	$\text{NiS}(\text{s, } \gamma) + 2\text{H}^+ \rightleftharpoons \text{Ni}^{2+} + \text{H}_2\text{S}(\text{g})$	-4,7
<u>1B</u>	$1/2\text{Cu}_2\text{S}(\text{s}) + \text{H}^+ \rightleftharpoons \text{Cu}^+ + 1/2\text{H}_2\text{S}(\text{g})$	-13,3
	$\text{CuS}(\text{s}) + 2\text{H}^+ \rightleftharpoons \text{Cu}^{2+} + \text{H}_2\text{S}(\text{g})$	-14,2
	$1/2\text{Ag}_2\text{S}(\text{s}) + \text{H}^+ \rightleftharpoons \text{Ag}^+ + 1/2\text{H}_2\text{S}(\text{g})$	-14,1
<u>2B</u>	$\text{ZnS}(\text{s, } \alpha) + 2\text{H}^+ \rightleftharpoons \text{Zn}^{2+} + \text{H}_2\text{S}(\text{g})$	-2,8
	$\text{ZnS}(\text{s, } \beta) + 2\text{H}^+ \rightleftharpoons \text{Zn}^{2+} + \text{H}_2\text{S}(\text{g})$	-0,6
	$\text{CdS}(\text{s}) + 2\text{H}^+ \rightleftharpoons \text{Cd}^{2+} + \text{H}_2\text{S}(\text{g})$	-5,1
	$\text{HgS}(\text{s, svart}) + 2\text{H}^+ \rightleftharpoons \text{Hg}^{2+} + \text{H}_2\text{S}(\text{g})$	-30,8
	$\text{HgS}(\text{s, röd}) + 2\text{H}^+ \rightleftharpoons \text{Hg}^{2+} + \text{H}_2\text{S}(\text{g})$	-31,4

	Reaktion	lg K
<u>3(B)</u>	$1/2 \text{Ti}_2\text{S}(s) + \text{H}^+ \rightleftharpoons \text{Ti}^+ + 1/2\text{H}_2\text{S}(g)$	0,4
<u>4(B)</u>	$\text{SnS}(s) + 2\text{H}^+ \rightleftharpoons \text{Sn}^{2+} + \text{H}_2\text{S}(g)$	-4,0
	$\text{SnS}_2(s) + \text{HS}^- + \text{OH}^- \rightleftharpoons \text{SnS}_3^{2-} + \text{H}_2\text{O}$	4,1
	$\text{PbS}(s) + 2\text{H}^+ \rightleftharpoons \text{Pb}^{2+} + \text{H}_2\text{S}(g)$	-5,6
<u>5(B)</u>	$1/2\text{Bi}_2\text{S}_3(s) + 3\text{H}^+ \rightleftharpoons \text{Bi}^{3+} + 3/2\text{H}_2\text{S}(g)$	-17

38. Tiosulfat, $\text{S}_2\text{O}_3^{2-} = \text{L}^{2-}$

	Reaktion	lg K
<u>1(A)</u>	$\text{H}^+ + \text{L}^{2-} \rightleftharpoons \text{HL}^-$	1,5
<u>1B</u>	$\text{Ag}^+ + \text{L}^{2-} \rightleftharpoons \text{AgL}^-$	8,8
	$\text{Ag}^+ + 2\text{L}^{2-} \rightleftharpoons \text{AgL}_2^{3-}$	13,5
<u>2B</u>	$\text{Zn}^{2+} + \text{L}^{2-} \rightleftharpoons \text{ZnL}$	2,3
	$\text{Cd}^{2+} + \text{L}^{2-} \rightleftharpoons \text{CdL}$	3,9
	$\text{Cd}^{2+} + 2\text{L}^{2-} \rightleftharpoons \text{CdL}_2^{2-}$	6,2
	$\text{Hg}^{2+} + 2\text{L}^{2-} \rightleftharpoons \text{HgL}_2^{2-}$	29,2
	$\text{Hg}^{2+} + 3\text{L}^{2-} \rightleftharpoons \text{HgL}_3^{4-}$	30,5
<u>3(B)</u>	$\text{Ti}^+ + \text{L}^{2-} \rightleftharpoons \text{TiL}^-$	2

39. Sulfit, $\text{SO}_3^{2-} = \text{L}^{2-}$

	Reaktion	lg K
<u>1(A)</u>	$\text{SO}_2(g) + \text{H}_2\text{O} \rightleftharpoons \text{H}_2\text{L}$	0,09
	$\text{H}^+ + \text{L}^{2-} \rightleftharpoons \text{HL}^-$	7,20
	$\text{H}^+ + \text{HL}^- \rightleftharpoons \text{H}_2\text{L}$	1,8
<u>2(A)</u>	$\text{CaL}(s) \rightleftharpoons \text{Ca}^{2+} + \text{L}^{2-}$	-6,5
<u>1B</u>	$\text{Ag}^+ + \text{L}^{2-} \rightleftharpoons \text{AgL}^-$	5,60
	$\text{Ag}^+ + 2\text{L}^{2-} \rightleftharpoons \text{AgL}_2^{3-}$	8,68
	$\text{Ag}^+ + 3\text{L}^{2-} \rightleftharpoons \text{AgL}_3^{5-}$	9,00
	$\text{Ag}_2\text{L}(s) \rightleftharpoons 2\text{Ag}^+ + \text{L}^{2-}$	-13,82

40. Sulfat, $\text{SO}_4^{2-} = \text{L}^{2-}$

	Reaktion	lg K
<u>1 (A)</u>	$\text{H}^+ + \text{L}^{2-} \rightleftharpoons \text{HL}^-$	1,99
	$\text{H}^+ + \text{HL}^- \rightleftharpoons \text{H}_2\text{L}$	-8,30
<u>2 (A)</u>	$\text{Mg}^{2+} + \text{L}^{2-} \rightleftharpoons \text{MgL}$	2,25
	$\text{CaL}(\text{H}_2\text{O})_2(\text{s}) \rightleftharpoons \text{Ca}^{2+} + \text{L}^{2-} + 2\text{H}_2\text{O}$	-4,6
	$\text{SrL}(\text{s}) \rightleftharpoons \text{Sr}^{2+} + \text{L}^{2-}$	-6,5
	$\text{BaL}(\text{s}) \rightleftharpoons \text{Ba}^{2+} + \text{L}^{2-}$	-10,0
<u>3A</u>	$\text{La}^{3+} + \text{L}^{2-} \rightleftharpoons \text{LaL}^+$	3,65
(4f)	$\text{Eu}^{3+} + \text{L}^{2-} \rightleftharpoons \text{EuL}^+$	3,7
(5f)	$\text{UO}_2^{2+} + \text{L}^{2-} \rightleftharpoons \text{UO}_2\text{L}$	2,8
	$\text{UO}_2^{2+} + 2\text{L}^{2-} \rightleftharpoons \text{UO}_2\text{L}_2^{2-}$	3,5
	$\text{UO}_2^{2+} + 3\text{L}^{2-} \rightleftharpoons \text{UO}_2\text{L}_3^{4-}$	3
<u>7A</u>	$\text{Mn}^{2+} + \text{L}^{2-} \rightleftharpoons \text{MnL}$	2,3
<u>8</u>	$\text{Fe}^{3+} + \text{L}^{2-} \rightleftharpoons \text{FeL}^+$	4,0
	$\text{Fe}^{3+} + 2\text{L}^{2-} \rightleftharpoons \text{FeL}_2^-$	5,4
	$\text{Co}^{2+} + \text{L}^{2-} \rightleftharpoons \text{CoL}$	2,4
	$\text{Ni}^{2+} + \text{L}^{2-} \rightleftharpoons \text{NiL}$	2,3
<u>1B</u>	$\text{Cu}^{2+} + \text{L}^{2-} \rightleftharpoons \text{CuL}$	2,3
	$\text{Ag}_2\text{L}(\text{s}) \rightleftharpoons 2\text{Ag}^+ + \text{L}^{2-}$	-4,85
<u>2B</u>	$\text{Zn}^{2+} + \text{L}^{2-} \rightleftharpoons \text{ZnL}$	2,3
	$\text{Cd}^{2+} + \text{L}^{2-} \rightleftharpoons \text{CdL}$	2,3
	$\text{Hg}_2\text{L}(\text{s}) \rightleftharpoons \text{Hg}_2^{2+} + \text{L}^{2-}$	-6,15
<u>3 (B)</u>	$\text{Tl}^+ + \text{L}^{2-} \rightleftharpoons \text{TlL}^-$	1,4
<u>4 (B)</u>	$\text{PbL}(\text{s}) \rightleftharpoons \text{Pb}^{2+} + \text{L}^{2-}$	-7,78

41. Amidosulfat

	Reaktion	lg K
<u>1 (A)</u>	$\text{H}^+ + \text{H}_2\text{NSO}_3^- \rightleftharpoons \text{H}_2\text{NSO}_2(\text{OH})$	0,99

42. Ditionit

	Reaktion	lg K
<u>1 (A)</u>	$\text{H}^+ + \text{S}_2\text{O}_4^{2-} \rightleftharpoons \text{HS}_2\text{O}_4^-$	2,5

43. Selenid

	Reaktion	lg K
<u>1 (A)</u>	$\text{H}^+ + \text{Se}^{2-} \rightleftharpoons \text{HSe}^-$	15,0
	$\text{H}^+ + \text{HSe}^- \rightleftharpoons \text{H}_2\text{Se}$	3,8

44. Selenit

	Reaktion	lg K
<u>1 (A)</u>	$H^+ + SeO_3^{2-} \rightleftharpoons HSeO_3^-$	8,3
	$H^+ + HSeO_3^- \rightleftharpoons H_2SeO_3$	2,6

45. Selenat, $SeO_4^{2-} = L^{2-}$

	Reaktion	lg K
<u>1 (A)</u>	$H^+ + L^{2-} \rightleftharpoons HL^-$	1,7
<u>2 (A)</u>	$CaL(s) \rightleftharpoons Ca^{2+} + L^{2-}$	-3,1
	$SrL(s) \rightleftharpoons Sr^{2+} + L^{2-}$	-4,6
	$BaL(s) \rightleftharpoons Ba^{2+} + L^{2-}$	-7,5
<u>1B</u>	$Ag_2L(s) \rightleftharpoons 2Ag^+ + L^{2-}$	-8,9
<u>4 (B)</u>	$PbL(s) \rightleftharpoons Pb^{2+} + L^{2-}$	-6,8

46. Tellurat

	Reaktion	lg K
<u>1 (A)</u>	$H^+ + TeO_2(OH)_4^{2-} \rightleftharpoons TeO(OH)_5^-$	11,0
	$H^+ + TeO(OH)_5^- \rightleftharpoons Te(OH)_6$	7,7

47. Fluorid

	Reaktion	lg K
<u>1 (A)</u>	$H^+ + F^- \rightleftharpoons HF$	3,17
	$HF + F^- \rightleftharpoons HF_2^-$	0,59
<u>2 (A)</u>	$MgF_2(s) \rightleftharpoons Mg^{2+} + 2F^-$	-8,2
	$Mg^{2+} + F^- \rightleftharpoons MgF^+$	1,8
	$CaF_2(s) \rightleftharpoons Ca^{2+} + 2F^-$	-10,5
	$SrF_2(s) \rightleftharpoons Sr^{2+} + 2F^-$	-8,6
	$BaF_2(s) \rightleftharpoons Ba^{2+} + 2F^-$	-5,9
<u>3A</u>	$La^{3+} + F^- \rightleftharpoons LaF^{2+}$	3,6
<u>6A</u>	$Cr^{3+} + F^- \rightleftharpoons CrF^{2+}$	5,2
	$Cr^{3+} + 2F^- \rightleftharpoons CrF_2^+$	9
	$Cr^{3+} + 3F^- \rightleftharpoons CrF_3$	12
<u>8</u>	$Fe^{3+} + F^- \rightleftharpoons FeF^{2+}$	6,0
	$Fe^{3+} + 2F^- \rightleftharpoons FeF_2^+$	10,8
	$Fe^{3+} + 3F^- \rightleftharpoons FeF_3$	14
<u>2B</u>	$Zn^{2+} + F^- \rightleftharpoons ZnF^+$	1,3
	$Hg^{2+} + F^- \rightleftharpoons HgF^+$	1,6

	Reaktion	lg K
<u>3(B)</u>	$B(OH)_3 + 3H^+ + 4F^- \rightleftharpoons BF_4^- + 3H_2O$	20
	$Al^{3+} + F^- \rightleftharpoons AlF^{2+}$	7,0
	$Al^{3+} + 2F^- \rightleftharpoons AlF_2^+$	12,8
	$Al^{3+} + 3F^- \rightleftharpoons AlF_3$	17,0
	$Al^{3+} + 4F^- \rightleftharpoons AlF_4^-$	19,7
	$Al^{3+} + 5F^- \rightleftharpoons AlF_5^{2-}$	20,9
	$Al^{3+} + 6F^- \rightleftharpoons AlF_6^{3-}$	20,9
	$Ga^{3+} + F^- \rightleftharpoons GaF^{2+}$	5,9
	$In^{3+} + F^- \rightleftharpoons InF^{2+}$	4,7
	$In^{3+} + 2F^- \rightleftharpoons InF_2^+$	8,1
	$In^{3+} + 3F^- \rightleftharpoons InF_3$	10,3
	$In^{3+} + 4F^- \rightleftharpoons InF_4^-$	11,5
<u>4(B)</u>	$PbF_2(s) \rightleftharpoons Pb^{2+} + 2F^-$	-7,57

48. Klorid

	Reaktion	lg K
<u>1(A)</u>	$H^+ + Cl^- \rightleftharpoons HCl$	-6,1
<u>8</u>	$Fe^{3+} + Cl^- \rightleftharpoons FeCl^{2+}$	1,3
	$Fe^{3+} + 2Cl^- \rightleftharpoons FeCl_2^+$	2
	$Fe^{3+} + 3Cl^- \rightleftharpoons FeCl_3$	1
	$Pd^{2+} + Cl^- \rightleftharpoons PdCl^+$	6,1
	$Pd^{2+} + 2Cl^- \rightleftharpoons PdCl_2$	10,7
	$Pd^{2+} + 3Cl^- \rightleftharpoons PdCl_3^-$	13
	$Pd^{2+} + 4Cl^- \rightleftharpoons PdCl_4^{2-}$	16
	$Pd^{2+} + 5Cl^- \rightleftharpoons PdCl_5^{3-}$	14
	$Pd^{2+} + 6Cl^- \rightleftharpoons PdCl_6^{4-}$	12
<u>1B</u>	$CuCl(s) \rightleftharpoons Cu^+ + Cl^-$	-6,73
	$CuCl(s) + Cl^- \rightleftharpoons CuCl_2^-$	-1,18
	$CuCl(s) + 2Cl^- \rightleftharpoons CuCl_3^{2-}$	-1,7
	$Cu^{2+} + Cl^- \rightleftharpoons CuCl^+$	0,05
	$AgCl(s) \rightleftharpoons Ag^+ + Cl^-$	-9,75
	$Ag^+ + Cl^- \rightleftharpoons AgCl$	3,0
	$Ag^+ + 2Cl^- \rightleftharpoons AgCl_2^-$	5,0
	$Ag^+ + 3Cl^- \rightleftharpoons AgCl_3^{2-}$	5,0
	$Ag^+ + 4Cl^- \rightleftharpoons AgCl_4^{3-}$	5,3
<u>2B</u>	$Cd^{2+} + Cl^- \rightleftharpoons CdCl^+$	1,9
	$Cd^{2+} + 2Cl^- \rightleftharpoons CdCl_2$	2,4
	$Cd^{2+} + 3Cl^- \rightleftharpoons CdCl_3^-$	2,1
	$Hg_2Cl_2(s) \rightleftharpoons Hg_2^{2+} + 2Cl^-$	-17,9
	$Hg^{2+} + Cl^- \rightleftharpoons HgCl^+$	7,4

	Reaktion	lg K
	$\text{Hg}^{2+} + 2\text{Cl}^- \rightleftharpoons \text{HgCl}_2$	14,2
	$\text{Hg}^{2+} + 3\text{Cl}^- \rightleftharpoons \text{HgCl}_3^-$	15,1
	$\text{Hg}^{2+} + 4\text{Cl}^- \rightleftharpoons \text{HgCl}_4^{2-}$	15,8
<u>3(B)</u>	$\text{In}^{3+} + \text{Cl}^- \rightleftharpoons \text{InCl}^{2+}$	1,7
	$\text{In}^{3+} + 2\text{Cl}^- \rightleftharpoons \text{InCl}_2^+$	2,6
	$\text{TlCl(s)} \rightleftharpoons \text{Tl}^+ + \text{Cl}^-$	-3,73
	$\text{Tl}^+ + \text{Cl}^- \rightleftharpoons \text{TlCl}$	0,5
<u>4(B)</u>	$\text{Sn}^{2+} + \text{Cl}^- \rightleftharpoons \text{SnCl}^+$	1,8
	$\text{Sn}^{2+} + 2\text{Cl}^- \rightleftharpoons \text{SnCl}_2$	2,7
	$\text{Sn}^{2+} + 3\text{Cl}^- \rightleftharpoons \text{SnCl}_3^-$	2,7
	$\text{PbCl}_2(\text{s}) \rightleftharpoons \text{Pb}^{2+} + 2\text{Cl}^-$	-4,8
	$\text{Pb}^{2+} + \text{Cl}^- \rightleftharpoons \text{PbCl}^+$	1,5
	$\text{Pb}^{2+} + 2\text{Cl}^- \rightleftharpoons \text{PbCl}_2$	2
<u>7(B)</u>	$\text{Cl}_2(\text{g}) \rightleftharpoons \text{Cl}_2(\text{aq})$	-1,23
	$\text{Cl}_2 + \text{Cl}^- \rightleftharpoons \text{Cl}_3^-$	-0,7
	$\text{Br}_2 + \text{Cl}^- \rightleftharpoons \text{Br}_2\text{Cl}^-$	0,1
	$\text{I}_2 + \text{Cl}^- \rightleftharpoons \text{I}_2\text{Cl}^-$	0,4

49. Hypoklorit

	Reaktion	lg K
<u>1(A)</u>	$\text{H}^+ + \text{ClO}^- \rightleftharpoons \text{HClO}$	7,5

50. Klorit

	Reaktion	lg K
<u>1(A)</u>	$\text{H}^+ + \text{ClO}_2^- \rightleftharpoons \text{HClO}_2$	2,0

51. Bromid

	Reaktion	lg K
<u>8</u>	$\text{Fe}^{3+} + \text{Br}^- \rightleftharpoons \text{FeBr}^{2+}$	0,6
<u>1B</u>	$\text{CuBr(s)} \rightleftharpoons \text{Cu}^+ + \text{Br}^-$	-8,3
	$\text{CuBr(s)} + \text{Br}^- \rightleftharpoons \text{CuBr}_2^-$	-2,3
	$\text{AgBr(s)} \rightleftharpoons \text{Ag}^+ + \text{Br}^-$	-12,34
	$\text{Ag}^+ + \text{Br}^- \rightleftharpoons \text{AgBr}$	4,4
	$\text{Ag}^+ + 2\text{Br}^- \rightleftharpoons \text{AgBr}_2^-$	7,3
	$\text{Ag}^+ + 3\text{Br}^- \rightleftharpoons \text{AgBr}_3^{2-}$	8,0
	$\text{Ag}^+ + 4\text{Br}^- \rightleftharpoons \text{AgBr}_4^{3-}$	8,7

	Reaktion	lg K
<u>2B</u>	$\text{Cd}^{2+} + \text{Br}^- \rightleftharpoons \text{CdBr}^+$	2,2
	$\text{Cd}^{2+} + 2\text{Br}^- \rightleftharpoons \text{CdBr}_2^-$	3,0
	$\text{Cd}^{2+} + 3\text{Br}^- \rightleftharpoons \text{CdBr}_3^{2-}$	3,2
	$\text{Cd}^{2+} + 4\text{Br}^- \rightleftharpoons \text{CdBr}_4^{2-}$	3,0
	$\text{Hg}_2\text{Br}_2(\text{s}) \rightleftharpoons \text{Hg}_2^{2+} + 2\text{Br}^-$	-22,25
	$\text{Hg}^{2+} + \text{Br}^- \rightleftharpoons \text{HgBr}^+$	9,8
	$\text{Hg}^{2+} + 2\text{Br}^- \rightleftharpoons \text{HgBr}_2^-$	18,3
	$\text{Hg}^{2+} + 3\text{Br}^- \rightleftharpoons \text{HgBr}_3^{2-}$	20,3
	$\text{Hg}^{2+} + 4\text{Br}^- \rightleftharpoons \text{HgBr}_4^{2-}$	21,6
	$\text{HgBr}_2(\text{s}) \rightleftharpoons \text{HgBr}_2(\text{aq})$	-1,8
<u>3(B)</u>	$\text{TlBr}(\text{s}) \rightleftharpoons \text{Tl}^+ + \text{Br}^-$	-5,42
	$\text{Tl}^+ + \text{Br}^- \rightleftharpoons \text{TlBr}$	1,0
<u>4(B)</u>	$\text{Sn}^{2+} + \text{Br}^- \rightleftharpoons \text{SnBr}^+$	1,1
	$\text{Sn}^{2+} + 2\text{Br}^- \rightleftharpoons \text{SnBr}_2^-$	1,8
	$\text{Sn}^{2+} + 3\text{Br}^- \rightleftharpoons \text{SnBr}_3^-$	1,5
	$\text{PbBr}_2(\text{s}) \rightleftharpoons \text{Pb}^{2+} + 2\text{Br}^-$	-4,6
	$\text{PbBrOH}(\text{s}) \rightleftharpoons \text{Pb}^{2+} + \text{Br}^- + \text{OH}^-$	-14,7
	$\text{Pb}^{2+} + \text{Br}^- \rightleftharpoons \text{PbBr}^+$	1,6
	$\text{Pb}^{2+} + 2\text{Br}^- \rightleftharpoons \text{PbBr}_2$	2
<u>7(B)</u>	$\text{Br}_2 + \text{Br}^- \rightleftharpoons \text{Br}_3^-$	1,2
	$2\text{Br}_2 + \text{Br}^- \rightleftharpoons \text{Br}_5^-$	1,4
	$\text{I}_2 + \text{Br}^- \rightleftharpoons \text{I}_2\text{Br}^-$	1,1

52. Hypobromit

	Reaktion	lg K
<u>1(A)</u>	$\text{H}^+ + \text{BrO}^- \rightleftharpoons \text{HBrO}$	8,6

53. Bromat

	Reaktion	lg K
<u>1B</u>	$\text{AgBrO}_3(\text{s}) \rightleftharpoons \text{Ag}^+ + \text{BrO}_3^-$	-4,27
	$\text{Ag}^+ + \text{BrO}_3^- \rightleftharpoons \text{AgBrO}_3$	0,3

54. Jodid

	Reaktion	lg K
<u>1B</u>	$\text{CuI}(\text{s}) \rightleftharpoons \text{Cu}^+ + \text{I}^-$	-12,0
	$\text{CuI}(\text{s}) + \text{I}^- \rightleftharpoons \text{CuI}_2^-$	-3,1
	$\text{AgI}(\text{s}) \rightleftharpoons \text{Ag}^+ + \text{I}^-$	-16,08
	$\text{AgI}(\text{s}) + \text{I}^- \rightleftharpoons \text{AgI}_2^-$	-5,4
	$\text{AgI}(\text{s}) + 2\text{I}^- \rightleftharpoons \text{AgI}_3^{2-}$	-3
	$\text{AgI}(\text{s}) + 3\text{I}^- \rightleftharpoons \text{AgI}_4^{3-}$	-3
<u>2B</u>	$\text{Cd}^{2+} + \text{I}^- \rightleftharpoons \text{CdI}^+$	2,3
	$\text{Cd}^{2+} + 2\text{I}^- \rightleftharpoons \text{CdI}_2$	4
	$\text{Cd}^{2+} + 3\text{I}^- \rightleftharpoons \text{CdI}_3^-$	5
	$\text{Cd}^{2+} + 4\text{I}^- \rightleftharpoons \text{CdI}_4^{2-}$	6
	$\text{Hg}_2\text{I}_2(\text{s}) \rightleftharpoons \text{Hg}_2^{2+} + 2\text{I}^-$	-28,35
	$\text{Hg}_2^{2+} + \text{I}^- \rightleftharpoons \text{HgI}^+$	13,6
	$\text{Hg}_2^{2+} + 2\text{I}^- \rightleftharpoons \text{HgI}_2$	24,8
	$\text{Hg}_2^{2+} + 3\text{I}^- \rightleftharpoons \text{HgI}_3^-$	28,5
	$\text{Hg}_2^{2+} + 4\text{I}^- \rightleftharpoons \text{HgI}_4^{2-}$	30,5
<u>3(B)</u>	$\text{TlI}(\text{s}) \rightleftharpoons \text{Tl}^+ + \text{I}^-$	-7,2
<u>4(B)</u>	$\text{PbI}_2(\text{s}) \rightleftharpoons \text{Pb}^{2+} + 2\text{I}^-$	-8,1
	$\text{Pb}^{2+} + \text{I}^- \rightleftharpoons \text{PbI}^+$	2,0
	$\text{Pb}^{2+} + 2\text{I}^- \rightleftharpoons \text{PbI}_2$	3,2
	$\text{Pb}^{2+} + 3\text{I}^- \rightleftharpoons \text{PbI}_3^-$	3,9
	$\text{Pb}^{2+} + 4\text{I}^- \rightleftharpoons \text{PbI}_4^{2-}$	4,5
<u>7(B)</u>	$\text{I}_2 + \text{I}^- \rightleftharpoons \text{I}_3^-$	2,87
	$\text{I}_2(\text{s}) \rightleftharpoons \text{I}_2(\text{aq})$	-2,88

55. Hypoiodit

	Reaktion	lg K
<u>1(A)</u>	$\text{H}^+ + \text{IO}^- \rightleftharpoons \text{HIO}$	10,6

56. Jodat, $\text{IO}_3^- = \text{L}^-$

	Reaktion	lg K
<u>1 (A)</u>	$\text{H}^+ + \text{L}^- \rightleftharpoons \text{HL}$	0,78
	$\text{D}^+ + \text{L}^- \rightleftharpoons \text{DL}$	1,15
<u>2 (A)</u>	$\text{CaL}_2(\text{s}) \rightleftharpoons \text{Ca}^{2+} + 2\text{L}^-$	-6,15
	$\text{Ca}^{2+} + \text{L}^- \rightleftharpoons \text{CaL}^+$	0,9
	$\text{SrL}_2(\text{s}) \rightleftharpoons \text{Sr}^{2+} + 2\text{L}^-$	-6,95
	$\text{BaL}_2(\text{s}) \rightleftharpoons \text{Ba}^{2+} + 2\text{L}^-$	-8,81
<u>1 (B)</u>	$\text{CuL}_2(\text{s}) \rightleftharpoons \text{Cu}^{2+} + 2\text{L}^-$	-7,13
	$\text{AgL}(\text{s}) \rightleftharpoons \text{Ag}^+ + \text{L}^-$	-7,52
	$\text{Ag}^+ + \text{L}^- \rightleftharpoons \text{AgL}$	0,6
<u>3 (B)</u>	$\text{TlL}(\text{s}) \rightleftharpoons \text{Tl}^+ + \text{L}^-$	-5,5
<u>4 (B)</u>	$\text{PbL}_2(\text{s}) \rightleftharpoons \text{Pb}^{2+} + 2\text{L}^-$	-12,6

57. Perjodat

	Reaktion	lg K
<u>1 (A)</u>	$\text{H}^+ + \text{H}_2\text{IO}_6^{3-} \rightleftharpoons \text{H}_3\text{IO}_6^{2-}$	13,5
	$\text{H}^+ + \text{H}_3\text{IO}_6^{2-} \rightleftharpoons \text{H}_4\text{IO}_6^-(\text{IO}_4^-)$	8,3
	$\text{H}^+ + \text{IO}_4^- \rightleftharpoons \text{HIO}_4$	1,6