

PHỤ LỤC

BẢNG 1

Sinh nhiệt tiêu chuẩn của một số hợp chất

Chất	Trạng thái	ΔH^0_s (kcal/mol)
H ₂ O	k	-57,800
H ₂ O	l	-68,320
CO	k	-26,420
CO ₂	k	-94,050
SO ₂	k	-70,96
SO ₃	k	-94,45
SO ₃	l	-110,52
NO	k	+21,600
NO ₂	k	+8,090
NH ₃	k	-11,040
HCl	k	-22,060
HI	k	+6,200
H ₂ S	k	-4.820
CH ₄	k	-17,890
C ₂ H ₆	k	-20,240
C ₂ H ₄	k	+12,500
C ₂ H ₂	k	+54,190
nC ₆ H ₄	l	-39,96
C ₆ H ₆	k	+19,89
C ₆ H ₆	l	+11,720
CH ₃ OH	l	-57,02
C ₂ H ₅ OH	l	-66,35
CH ₃ COOH	l	-115,7
NaOH	r	-102,00
NaF	r	-136,5
NaCl	r	-98,23
NaBr	r	-86,45

Chất	Trạng thái	ΔH^0_s (kcal/mol)
Na ₂ SO ₄	r	-330.500
KCl	r	-104.180
KOH	r	-102.000
NaI	r	-69.3
MgO	r	-143.84
Mg(OH) ₂	r	-221.00
MgCl ₂	r	-153.4
MgCO ₃	r	-266
MgSO ₄	r	-305.5
CaO	r	-151.9
Ca(OH) ₂	r	-235.8
CaCO ₃	r	-288.45
canxit		
CaF ₂	r	-290.3
CaCl ₂	r	-190.0
Al ₂ O ₃	r	-399.09
Al ₂ (SO ₄) ₃	r	-820.98
FeO	r	-64.30
Fe ₂ O ₃	r	-196.50
FeS	r	-22.80
FeSO ₄	r	-220,5
CuO	r	-37.1
CuSO ₄	r	-184.0
MnO	r	-92.1
MnSO ₄	r	-254,2
AgNO ₃	r	-29,400
BaCO ₃	r	-290,703
BaSO ₄	r	-352,103
Fe ₂ O ₃	r	-77,486
ZnO	r	-82,036

BẢNG 2

Nhiệt đốt cháy tiêu chuẩn của một số hợp chất hữu cơ

Chất	Công thức	Trạng thái	ΔH^0_c (kcal/mol)
Metan	CH_4	k	-212.800
Eptan	C_2H_6	k	-372.820
Protan	C_3H_8	k	-530.600
n-Butan	C_4H_{10}	k	-678.980
n-Pentan	C_5H_{12}	k	-845.16
Etylen	C_2H_4	k	-337.230
Axetylen	C_2H_2	k	-310.620
Benzen	C_6H_6	k	-787.200
	C_6H_6	l	-780.980
Toluen	C_7H_8	l	-934.500
Naptalen	C_{10}H_8	r	-1228.18
Saccaroz	$\text{C}_{12}\text{H}_{22}\text{O}_{11}$	r	-1348.900
Metanol	CH_3OH	l	-173.670
Etanol	$\text{C}_2\text{H}_5\text{OH}$	l	-326.700
Axit axetic	CH_3COOH	l	-208.340
Axit benzonc	$\text{C}_6\text{H}_5\text{COOH}$	r	-771.200

BẢNG 3

Entropy tiêu chuẩn của một số chất

Chất	Trạng thái	S^0 (Cal/mol độ)
H	k	27.391
H_2	k	31.208
C	k	37.759
C_2	k	47.636
N	k	36.613
N_2	k	45.769
O	k	38.476
O_2	k	49.003
O_3	k	57.079

Chất	Trạng thái	S^0 (Cal/mol độ)
F	k	37.917
F_2	k	48.439
S	k	56.917
Cl	k	39.457
Cl_2	k	53.288
Br	k	41.805
Br_2	k	58.641
I	k	43.184
I_2	K	62.280

BẢNG 4

Entropy tiêu chuẩn của một số chất

Đơn chất rắn

Chất	Trạng thái	S° (Cal/mol độ)
C _{graphit}	r	1.372
C _{kim cương}	r	0.568
Na _{tt}	r	12.239
S _{thoi}	r	7.600
S _{đơn tà}	r	7.832

Chất	Trạng thái	S° (Cal/mol độ)
Ca _{tt}	r	9.900
Fe _{tt}	r	6.520
Cu _{tt}	r	7.923
Zn _{tt}	r	9.950
Ag _{tt}	r	10.170

Hợp chất vô cơ khí

Chất	Trạng thái	S° (Cal/mol độ)
H ₂ O	k	45.104
H ₂ O ₂	k	55.593
NH ₃	k	45.970
HCl	k	44.646
HI	k	49.351
CO	k	47.219
CO ₂	k	51.059

Chất	Trạng thái	S° (Cal/mol độ)
NO	k	50.347
NO ₂	k	57.349
N ₂ O	k	52.519
SO ₂	k	59.300
SO ₃	k	61.367
ClO	k	54.140
ClO ₂	k	61.386

Hợp chất vô cơ lỏng - rắn

Chất	Trạng thái	S° (Cal/mol độ)
H ₂ O	L	16.709
H ₂ O ₂	L	26.915
SO ₃	L	27.199

Chất	Trạng thái	S° (Cal/mol độ)
CaO _{tt}	r	9.500
Ca(OH) _{2tt}	r	19.931
CaCO _{3,canxit}	r	22.204
BaCO ₃	r	26.793
BaSO _{4tt}	r	31.597
Fe ₂ O _{3,hematit}	r	20.889
CuO _{tt}	r	10.189

			ZnO _{tt}	r	10.430
			AgCl _{tt}	r	22.922

Hợp chất hữu cơ khí

Chất	Trạng thái	S° (Cal/mol độ)
CH ₄ (metan)	k	44.998
C ₂ H ₆ (etan)	k	54.760
C ₂ H ₄ (etilen)	k	52.390
C ₂ H ₂ (axetilen)	k	47.990
C ₃ H ₈ (propan)	k	47.421
C ₃ H ₆ (propylen)	k	63.719
C ₄ H ₁₀ (isobutan)	k	70.600
C ₄ H ₈ (1-buten)	k	73.573
C ₄ H ₈ (cis-2-buten)	k	71.869
C ₄ H ₈ (trans-2-buten)	k	70.698
C ₆ H ₆ (benzen)	k	64.400

Hợp chất hữu cơ lỏng

Chất	Trạng thái	S° (Cal/mol độ)
CH ₃ OH (metanol)	l	30.306
C ₂ H ₅ oh (etanol)	l	38.408
CH ₃ COOH (axit axetic)	l	38.193
C ₆ H ₆ (benzen)	l	64.400

BẢNG 5

Thế đẳng áp tạo thành tiêu chuẩn $\Delta G^{\circ}_{298,tt}$ (kcal/mol)

Chất	Trạng thái	ΔG°_{tt} (kcal/mol)	Chất	Trạng thái	ΔG°_{tt} (kcal/mol)
H	k	48.51	F	k	14.806
H ₂	k	0	F ₂	k	0
C	k	160.442	S	k	56.946
C ₂	k	185.449	Cl	k	25.262
N	k	108.886	Cl ₂	k	0
N ₂	k	0	Br	k	19.701
O	k	55.389	Br ₂	k	0.751
O ₂	k	0	I	k	16.789
O ₃	k	39.006	I ₂	k	4.627
H ₂ O	k	-54.634	NO	k	20.686
H ₂ O ₂	k	-25.239	NO ₂	k	12.259
NH ₃	k	-3.939	N ₂ O	k	24.900
HCl	k	-22.777	SO	k	-4.693
HI	k	0.411	SO ₂	k	-71.748
CO	k	-32.780	SO ₃	k	-88.689
CO ₂	k	-94.254	ClO	k	23.449
			ClO ₂	k	28.800
H ₂ O	L	-56.687			
H ₂ O ₂	L	-28.781			
SO ₃	L	-89.340			
CaO _{tt}	r	-44.371	Fe ₂ O ₃	r	-177.39
Ca(OH) _{2tt}	r	-214.76	Hematit	r	
CaCO ₃	r	-269.80	CuO _{tt}	r	-31.00
Canxit	r		ZnO _{tt}	r	-76.08
BaCO ₃	r	-271.89	AgCl _{tt}	r	-26.244
BaSO _{4tt}	r	-325.57			

BẢNG 6

Thế đẳng áp tạo thành tiêu chuẩn của một số hợp chất hữu cơ

Chất	Trạng thái	ΔG°_{tt} (kcal/mol)
CH ₄ (metan)	k	-12.146
C ₂ H ₆ (etan)	k	-7.636
C ₂ H ₄ (etilen)	k	16.355
C ₂ H ₂ (axetilen)	k	50.184
C ₃ H ₈ (propan)	k	-5.832
C ₃ H ₆ (propylen)	k	14.847
C ₄ H ₁₀ (n-butan)	k	-3.958
C ₄ H ₁₀ (isobutan)	k	-4.962
C ₄ H ₈ (1-buten)	k	16.788
C ₄ H ₈ (cis-2-buten)	k	15.655
C ₄ H ₈ (trans-2-buten)	k	15.153
C ₆ H ₆ (benzen)	k	30.987
CH ₃ OH (Metanol)	l	-39.759
C ₂ H ₅ OH (Etanol)	l	-41.800
CH ₃ COOH (Axit axetic)	l	-93.212
C ₅ H ₅ COOH (Axit benzonitric)	l	29.737

BẢNG 7

Hằng số điện li của một số axit và bazơ trong dung dịch nước ở 25°C

Chất điện ly	Phương trình điện ly	Ka và Kb
HNO ₂	$\text{HNO}_2 \rightleftharpoons \text{H}^+ + \text{HSeO}_4$	$K_1 = 5,1 \cdot 10^{-4}$
C ₆ H ₅ COOH	$\text{C}_6\text{H}_5\text{COOH} \rightleftharpoons \text{C}_6\text{H}_5\text{COO}^- + \text{H}^+$	$K_1 = 2,0 \cdot 10^{-5}$
H ₃ BO ₃	$\text{H}_3\text{BO}_3 \rightleftharpoons \text{H}^+ + \text{H}_2\text{BO}_3^-$	$K_1 = 5,8 \cdot 10^{-10}$
H ₂ B ₄ O ₇	$\text{H}_2\text{B}_4\text{O}_7 \rightleftharpoons \text{H}^+ + \text{HB}_4\text{O}_7^-$	$K_1 = 1,8 \cdot 10^{-4}$
	$\text{HB}_4\text{O}_7^- \rightleftharpoons \text{H}^+ + \text{B}_4\text{O}_7^{2-}$	$K_2 = 1,5 \cdot 10^{-5}$
H ₂ GeO ₃	$\text{H}_2\text{GeO}_3 \rightleftharpoons \text{H}^+ + \text{GeO}_3^-$	$K_1 = 5,0 \cdot 10^{-10}$
	$\text{HGeO}_3 \rightleftharpoons \text{H}^+ + \text{GeO}_3^{2-}$	$K_2 = 2,0 \cdot 10^{-13}$
HIO ₃	$\text{HIO}_3 \rightleftharpoons \text{H}^+ + \text{IO}_3^-$	$K_1 = 1,6 \cdot 10^{-1}$
HCOOH	$\text{HCOOH} \rightleftharpoons \text{H}^+ + \text{HCOO}^-$	$K_1 = 1,7 \cdot 10^{-4}$

H ₃ AsO ₄	H ₃ AsO ₄	$\rightleftharpoons \text{H}^+ + \text{H}_2\text{AsO}_4^-$	$K_1 = 6,0 \cdot 10^{-3}$
	H ₂ AsO ₄ ⁻	$\rightleftharpoons \text{H}^+ + \text{HAsO}_4^{2-}$	$K_2 = 1,1 \cdot 10^{-7}$
	HAsO ₄ ⁻	$\rightleftharpoons \text{H}^+ + \text{AsO}_4^{3-}$	$K_3 = 4,0 \cdot 10^{-12}$
H ₂ O ₂	H ₂ O ₂	$\rightleftharpoons \text{H}^+ + \text{HO}_2^-$	$K_1 = 2,0 \cdot 10^{-12}$
HF	HF	$\rightleftharpoons \text{H}^+ + \text{F}^-$	$K_1 = 6,8 \cdot 10^{-4}$
CH ₃ COOH	CH ₃ COOH	$\rightleftharpoons \text{CH}_3\text{COO}^- + \text{H}^+$	$K_1 = 1,8 \cdot 10^{-5}$
CH ₃ CH ₂ COOH	CH ₃ CH ₂ COOH	$\rightleftharpoons \text{CH}_3\text{CH}_2\text{COO}^- + \text{H}^+$	$K_1 = 2,0 \cdot 10^{-5}$
HCNS	HCNS	$\rightleftharpoons \text{H}^+ + \text{CNS}^-$	$K_1 = 1,4 \cdot 10^{-1}$
H ₂ SeO ₃	H ₂ SeO ₃	$\rightleftharpoons \text{H}^+ + \text{HSeO}_3^-$	$K_1 = 2,4 \cdot 10^{-3}$
	HSeO ₃ ⁻	$\rightleftharpoons \text{H}^+ + \text{SeO}_3^{2-}$	$K_2 = 4,8 \cdot 10^{-9}$
H ₂ SeO ₄	H ₂ SeO ₄	$\rightleftharpoons \text{H}^+ + \text{HSeO}_4^-$	
	HSeO ₄ ⁻	$\rightleftharpoons \text{H}^+ + \text{SeO}_4^{2-}$	$K_2 = 8,9 \cdot 10^{-3}$
H ₂ SO ₄	H ₂ SO ₄	$\rightleftharpoons \text{H}^+ + \text{HSO}_4^-$	Điện ly hoàn toàn
	HSO ₄ ⁻	$\rightleftharpoons \text{H}^+ + \text{SO}_4^{2-}$	$K_2 = 1,2 \cdot 10^{-2}$
H ₂ SO ₃	H ₂ SO ₃	$\rightleftharpoons \text{H}^+ + \text{HSO}_3^-$	$K_1 = 1,3 \cdot 10^{-2}$
	HSO ₃ ⁻	$\rightleftharpoons \text{H}^+ + \text{SO}_3^{2-}$	$K_2 = 6,3 \cdot 10^{-8}$
H ₂ S	H ₂ S	$\rightleftharpoons \text{H}^+ + \text{HS}^-$	$K_1 = 8,9 \cdot 10^{-8}$
	HS ⁻	$\rightleftharpoons \text{H}^+ + \text{S}^{2-}$	$K_2 = 1,3 \cdot 10^{-13}$
H ₂ TeO ₃	H ₂ TeO ₃	$\rightleftharpoons \text{H}^+ + \text{HTeO}_3^-$	$K_1 = 3,2 \cdot 10^{-3}$
	HTeO ₃ ⁻	$\rightleftharpoons \text{H}^+ + \text{TeO}_3^{3-}$	$K_2 = 2,0 \cdot 10^{-8}$
H ₂ TeO ₄	H ₂ TeO ₄	$\rightleftharpoons \text{H}^+ + \text{HTeO}_4^-$	$K_1 = 2,5 \cdot 10^{-9}$
	HTeO ₄ ⁻	$\rightleftharpoons \text{H}^+ + \text{TeO}_4^{2-}$	$K_2 = 4,1 \cdot 10^{-11}$
H ₂ S ₂ O ₃	H ₂ S ₂ O ₃	$\rightleftharpoons \text{H}^+ + \text{HS}_2\text{O}_3^-$	$K_1 = 2,5 \cdot 10^{-1}$
	HS ₂ O ₃ ⁻	$\rightleftharpoons \text{H}^+ + \text{S}_2\text{O}_3^{2-}$	$K_2 = 1,9 \cdot 10^{-2}$
H ₂ CO ₃	H ₂ CO ₃	$\rightleftharpoons \text{H}^+ + \text{HCO}_3^-$	$K_1 = 4,5 \cdot 10^{-7}$
	HCO ₃ ⁻	$\rightleftharpoons \text{H}^+ + \text{CO}_3^{2-}$	$K_2 = 4,7 \cdot 10^{-11}$
C ₆ H ₅ OH	C ₆ H ₅ OH	$\rightleftharpoons \text{C}_6\text{H}_5\text{O}^- + \text{H}^+$	$K_1 = 1,3 \cdot 10^{-10}$
H ₃ PO ₃	H ₃ PO ₃	$\rightleftharpoons \text{H}^+ + \text{H}_2\text{PO}_3^-$	$K_1 = 1,6 \cdot 10^{-2}$

	$\text{H}_2\text{PO}_3^{2-}$	$\rightleftharpoons \text{H}^+ + \text{HPO}_3^{2-}$	$K_2 = 2.0 \cdot 10^{-7}$
H_3PO_4	H_3PO_4	$\rightleftharpoons \text{H}^+ + \text{H}_2\text{PO}_4^-$	$K_1 = 7.6 \cdot 10^{-3}$
	H_2PO_3^-	$\rightleftharpoons \text{H}^+ + \text{HPO}_4^{2-}$	$K_2 = 6.2 \cdot 10^{-8}$
	HPO_4^{2-}	$\rightleftharpoons \text{H}^+ + \text{PO}_4^{3-}$	$K_3 = 4.4 \cdot 10^{-13}$
$\text{H}_4\text{P}_2\text{O}_7$	$\text{H}_4\text{P}_2\text{O}_7$	$\rightleftharpoons \text{H}^+ + \text{H}_3\text{P}_2\text{O}_7^-$	$K_1 = 3.0 \cdot 10^{-2}$
	$\text{H}_3\text{P}_2\text{O}_7^{2-}$	$\rightleftharpoons \text{H}^+ + \text{H}_2\text{P}_2\text{O}_7^{2-}$	$K_2 = 4.4 \cdot 10^{-3}$
	$\text{H}_2\text{P}_2\text{O}_7^{2-}$	$\rightleftharpoons \text{H}^+ + \text{HP}_2\text{O}_7^{3-}$	$K_3 = 2.5 \cdot 10^{-7}$
	$\text{HP}_2\text{O}_7^{3-}$	$\rightleftharpoons \text{H}^+ + \text{P}_2\text{O}_7^{4-}$	$K_4 = 5.6 \cdot 10^{-10}$
HClO	HClO	$\rightleftharpoons \text{H}^+ + \text{ClO}^-$	$K_1 = 3.0 \cdot 10^{-8}$
HClO_2	HClO_2	$\rightleftharpoons \text{H}^+ + \text{ClO}_2^-$	$K_1 = 1.1 \cdot 10^{-2}$
H_2CrO_4	H_2CrO_4	$\rightleftharpoons \text{H}^+ + \text{CrO}_4^-$	$K_1 = 1.8 \cdot 10^{-1}$
	HCrO_4^-	$\rightleftharpoons \text{H}^+ + \text{CrO}_4^{2-}$	$K_2 = 3.2 \cdot 10^{-7}$
	2HCrO_4^-	$\rightleftharpoons \text{Cr}_2\text{O}_7^{2-} + \text{H}_2\text{O}$	$3.0 \cdot 10^{-2}$
$\text{H}_2\text{C}_2\text{O}_4$	$\text{H}_2\text{C}_2\text{O}_4$	$\rightleftharpoons \text{H}^+ + \text{HC}_2\text{O}_4^-$	$K_1 = 5.6 \cdot 10^{-2}$
	HC_2O_4^-	$\rightleftharpoons \text{H}^+ + \text{C}_2\text{O}_4^{2-}$	$K_2 = 5.1 \cdot 10^{-5}$
NH_4OH	NH_4OH	$\rightleftharpoons \text{NH}_4^+ + \text{OH}^-$	$K_1 = 1.8 \cdot 10^{-5}$
$\text{C}_6\text{H}_5\text{NH}_2$	$\text{C}_6\text{H}_5\text{NH}_2$	$\rightleftharpoons \text{C}_6\text{H}_5\text{NH}_3 + \text{OH}^-$	$K_1 = 4.2 \cdot 10^{-10}$
CH_3NH_2	CH_3NH_2	$\rightleftharpoons \text{CH}_3\text{NH}_3 + \text{OH}^-$	$K_1 = 4.8 \cdot 10^{-4}$
$\text{C}_2\text{H}_5\text{NH}_2$	$\text{C}_2\text{H}_5\text{NH}_2 + \text{H}_2\text{O}$	$\rightleftharpoons \text{C}_2\text{H}_5\text{NH}_3^+ + \text{OH}^-$	$K_1 = 4.7 \cdot 10^{-4}$

BẢNG 7

Tích số tan trong nước của một số chất ở 25⁰C

Chất điện li	Phương trình điện li	K _a và K _b
AgCl	$\text{AgCl} \rightleftharpoons \text{Ag}^+ + \text{Cl}^-$	$1,1 \cdot 10^{-11}$
AgBr	$\text{AgBr} \rightleftharpoons \text{Ag}^+ + \text{Br}^-$	$6,3 \cdot 10^{-13}$
AgI	$\text{AgI} \rightleftharpoons \text{Ag}^+ + \text{I}^-$	$1,5 \cdot 10^{-16}$
AgCN	$\text{AgCN} \rightleftharpoons \text{Ag}^+ + \text{CN}^-$	$7 \cdot 10^{-15}$
AgIO ₃	$\text{AgIO} \rightleftharpoons \text{Ag}^+ + \text{IO}_3^-$	$3,2 \cdot 10^{-8}$
Ag ₂ S	$\text{Ag}_2\text{S} \rightleftharpoons 2\text{Ag}^+ + \text{S}_2^{2-}$	$5,7 \cdot 10^{-51}$
Al(OH) ₃	$\text{Al(OH)}_3 \rightleftharpoons \text{Al}^{3+} + 3\text{OH}^-$	$1,9 \cdot 10^{-33}$
Al(OH) ₃	$\text{Al(OH)}_3 \rightleftharpoons \text{H}^+ + (\text{AlO}_2 \cdot \text{H}_2\text{O})^-$	$1,1 \cdot 10^{-15}$
As ₂ S ₃	$\text{As}_2\text{S}_3 \rightleftharpoons 2\text{As}^{3+} + 3\text{S}^{2-}$	$4 \cdot 10^{-29}$ (ở 18 ⁰ C)
BaCO ₃	$\text{BaCO}_3 \rightleftharpoons \text{Ba}^{2+} + \text{CO}_3^{2-}$	$7 \cdot 10^{-9}$
BaCO ₄	$\text{BaCO}_4 \rightleftharpoons \text{Ba}^{2+} + \text{CrO}_4^{2-}$	$2,3 \cdot 10^{-10}$
BaSO ₄	$\text{BaSO}_4 \rightleftharpoons \text{Ba}^{2+} + \text{SO}_4^{2-}$	$1,08 \cdot 10^{-10}$
Be(OH) ₂	$\text{Be(OH)}_2 \rightleftharpoons \text{Be}^{2+} + 2\text{OH}^-$	$2,7 \cdot 10^{-10}$
H ₂ BeO ₂	$\text{H}_2\text{BeO}_2 \rightleftharpoons \text{H}^+ + \text{BeO}_2^{2-}$	$2 \cdot 10^{-30}$
Bi(OH) ₃	$\text{Bi(OH)}_3 \rightleftharpoons \text{Bi}^{3+} + 3\text{OH}^-$	$1,3 \cdot 10^{-31}$ (ở 18 ⁰ C)
BiOCl	$\text{BiOCl} \rightleftharpoons \text{Cl}^- + \text{BiO}^+$	$7 \cdot 10^{-9}$
Bi ₂ S ₃	$\text{Bi}_2\text{S}_3 \rightleftharpoons 2\text{Bi}^{3+} + 3\text{S}^{2-}$	$1,6 \cdot 10^{-72}$ (ở 18 ⁰ C)
CaCO ₃	$\text{CaCO}_3 \rightleftharpoons \text{Ca}^{2+} + \text{CO}_3^{2-}$	$4,8 \cdot 10^{-9}$
Ca(OH) ₂	$\text{Ca(OH)}_2 \rightleftharpoons \text{Ca}^{2+} + 2\text{HO}^-$	$3,1 \cdot 10^{-5}$
CaSO ₄	$\text{CaSO}_4 \rightleftharpoons \text{Ca}^{2+} + \text{SO}_4^{2-}$	$6,26 \cdot 10^{-5}$

$\text{CaSO}_4 \cdot 2\text{H}_2\text{O}$	$\text{CaSO}_4 \cdot 2\text{H}_2\text{O} \rightleftharpoons \text{Ca}^{2+} + \text{SO}_4^{2-} + 2\text{H}_2\text{O}$	$1,3 \cdot 10^{-4}$
$\text{Ca}_3(\text{PO}_4)_2$	$\text{Ca}_3(\text{PO}_4)_2 \rightleftharpoons 3\text{Ca}^{2+} + 2\text{PO}_4^{3-}$	$1 \cdot 10^{-4}$
$\text{Cd}(\text{OH})_2$	$\text{Cd}(\text{OH})_2 \rightleftharpoons \text{Cd}^{2+} + 2\text{OH}^-$	$2,4 \cdot 10^{-13}$ (ϑ 18°C)
$\text{Co}(\text{OH})_2$	$\text{Co}(\text{OH})_2 \rightleftharpoons \text{Co}^{2+} + 2\text{OH}^-$	$1,6 \cdot 10^{-18}$ (ϑ 18°C)
$\text{Co}(\text{OH})_3$	$\text{Co}(\text{OH})_3 \rightleftharpoons \text{Co}^{3+} + 3\text{OH}^-$	$2,5 \cdot 10^{-43}$
CoS	$\text{CoS} \rightleftharpoons \text{Co}^{2+} + \text{S}^{2-}$	$3,1 \cdot 10^{-23}$
$\text{Cr}(\text{OH})_3$	$\text{Cr}(\text{OH})_3 \rightleftharpoons \text{Cr}^{3+} + 3\text{OH}^-$	$6,7 \cdot 10^{-31}$
$\text{Cr}(\text{OH})_3$	$\text{Cr}(\text{OH})_3 \rightleftharpoons \text{CrO}_2^- + \text{H}^+ + \text{H}_2\text{O}$	$9 \cdot 10^{-17}$
CuCO_3	$\text{CuCO}_3 \rightleftharpoons \text{Cu}^{2+} + \text{CO}_3^{2-}$	$5,6 \cdot 10^{-10}$
$\text{Cu}(\text{OH})_2$	$\text{Cu}(\text{OH})_2 \rightleftharpoons \text{Cu}^{2+} + 2\text{OH}^-$	$5,6 \cdot 10^{-20}$
Cu_2Cl_2	$\text{CuCl}_2 \rightleftharpoons \text{Cu}_2^{2+} + 2\text{Cl}^-$	$1,8 \cdot 10^{-7}$
Cu_2I_2	$\text{Cu}_2\text{I}_2 \rightleftharpoons \text{Cu}_2^{2+} + 2\text{I}^-$	$1,1 \cdot 10^{-12}$
Cu_2S	$\text{Cu}_2\text{S} \rightleftharpoons \text{Cu}_2^{2+} + \text{S}^{2-}$	$2 \cdot 10^{-47}$ (ϑ 18°C)
CuS	$\text{CuS} \rightleftharpoons \text{Cu}^{2+} + \text{S}^{2-}$	$4 \cdot 10^{-38}$
FeCO_3	$\text{FeCO}_3 \rightleftharpoons \text{Fe}^{2+} + \text{CO}_3^{2-}$	$2,11 \cdot 10^{-11}$
$\text{Fe}(\text{OH})_2$	$\text{Fe}(\text{OH})_2 \rightleftharpoons \text{Fe}^{2+} + 2\text{OH}^-$	$4,8 \cdot 10^{-16}$ (ϑ 18°C)
$\text{Fe}(\text{OH})_3$	$\text{Fe}(\text{OH})_3 \rightleftharpoons \text{Fe}^{3+} + 3\text{OH}^-$	$3,8 \cdot 10^{-38}$ (ϑ 18°C)
FeS	$\text{FeS} \rightleftharpoons \text{Fe}^{2+} + \text{S}^{2-}$	$3,7 \cdot 10^{-19}$
Hg_2Cl_2	$\text{Hg}_2\text{Cl}_2 \rightleftharpoons \text{Hg}_2^{2+} + 2\text{Cl}^-$	$1,1 \cdot 10^{-18}$
Hg_2I_2	$\text{Hg}_2\text{I}_2 \rightleftharpoons \text{Hg}_2^{2+} + 2\text{I}^-$	$3,7 \cdot 10^{-29}$
Hg_2O	$\text{Hg}_2\text{O} + \text{H}_2\text{O} \rightleftharpoons \text{Hg}_2^{2+} + 2\text{OH}^-$	$1,6 \cdot 10^{-23}$

HgO	$\text{HgO} + \text{H}_2\text{O} \rightleftharpoons \text{Hg}^{2+} + 2\text{OH}^-$	$1,7 \cdot 10^{-26}$
Hg ₂ S	$\text{Hg}_2\text{S} \rightleftharpoons \text{Hg}_2^{2+} + \text{S}^{2-}$	$1,0 \cdot 10^{-47}$ (ở 18°C)
HgS	$\text{HgS} \rightleftharpoons \text{Hg}^{2+} + \text{S}^{2-}$	$4,0 \cdot 10^{-53}$ (ở 18°C)
KClO ₄	$\text{KClO}_4 \rightleftharpoons \text{K}^+ + \text{ClO}_4^-$	$1,07 \cdot 10^{-2}$
Li ₂ CO ₃	$\text{Li}_2\text{CO}_3 \rightleftharpoons 2\text{Li}^+ + \text{CO}_3^{2-}$	$1,66 \cdot 10^{-3}$
MgCO ₃ ·3H ₂ O	$\text{MgCO}_3 \cdot 3\text{H}_2\text{O} \rightleftharpoons \text{Mg}^{2+} + \text{CO}_3^{2-} + 3\text{H}_2\text{O}$	$1,0 \cdot 10^{-5}$
MgS	$\text{MgS} \rightleftharpoons \text{Mg}^{2+} + \text{S}^{2-}$	$2,0 \cdot 10^{-15}$
Mg(OH) ₂	$\text{Mg(OH)}_2 \rightleftharpoons \text{Mg}^{2+} + 2\text{OH}^-$	$5,5 \cdot 10^{-12}$
MnCO ₂	$\text{MnCO}_2 \rightleftharpoons \text{Mn}^{2+} + \text{CO}_3^{2-}$	$5,05 \cdot 10^{-10}$
Mn(OH) ₂	$\text{Mn(OH)}_2 \rightleftharpoons \text{Mn}^{2+} + \text{CO}_3^{2-}$	$4 \cdot 10^{-14}$ (ở 18°C)
MnS	$\text{MnS} \rightleftharpoons \text{Mn}^{2+} + \text{S}^{2-}$	$5,6 \cdot 10^{-16}$ (ở 18°C)
Ni(OH) ₂	$\text{Ni(OH)}_2 \rightleftharpoons \text{Ni}^{2+} + 2\text{OH}^-$	$1,6 \cdot 10^{-14}$
NiS	$\text{NiS} \rightleftharpoons \text{Ni}^{2+} + \text{S}^{2-}$	$3 \cdot 10^{-21}$ (ở 18°C)
PbCO ₃	$\text{PbCO}_3 \rightleftharpoons \text{Pb}^{2+} + \text{CO}_3^{2-}$	$1,5 \cdot 10^{-13}$
PbCl ₂	$\text{PbCl}_2 \rightleftharpoons \text{Pb}^{2+} + 2\text{Cl}^-$	$1,7 \cdot 10^{-5}$
PbBr ₂	$\text{PbBr}_2 \rightleftharpoons \text{Pb}^{2+} + 2\text{Br}^-$	$6,3 \cdot 10^{-5}$
PbI ₂	$\text{PbI}_2 \rightleftharpoons \text{Pb}^{2+} + 2\text{I}^-$	$8,7 \cdot 10^{-9}$
PbCrO ₄	$\text{PbCrO}_4 \rightleftharpoons \text{Pb}^{2+} + \text{CrO}_4^{2-}$	$1,77 \cdot 10^{-14}$
PbO	$\text{PbO} + \text{H}_2\text{O} \rightleftharpoons \text{Pb}^{2+} + 2\text{OH}^-$	$5,5 \cdot 10^{-16}$
PbS	$\text{PbS} \rightleftharpoons \text{Pb}^{2+} + \text{S}^{2-}$	$1,1 \cdot 10^{-29}$
PbSO ₄	$\text{PbSO}_4 \rightleftharpoons \text{Pb}^{2+} + \text{SO}_4^{2-}$	$1,8 \cdot 10^{-8}$

Pt(OH) ₂	Pt(OH) ₂	\rightleftharpoons	Pt ²⁺ + 2OH ⁻	10 ⁻²⁵
Sb(OH) ₃	Sb(OH) ₃	\rightleftharpoons	Sb ³⁺ + 3OH ⁻	4,0.10 ⁻⁴²
Sb ₂ S ₃	Sb ₂ S ₃	\rightleftharpoons	2Sb ³⁺ + 3S ²⁻	1.10 ⁻³⁰
H ₂ SiO ₃	H ₂ SiO ₃	\rightleftharpoons	HSiO ₃ ⁺ + H ⁻	1.10 ⁻³⁰
Sn(OH) ₂	Sn(OH) ₂	\rightleftharpoons	Sn ⁴⁺ + 4OH ⁻	5.10 ⁻²⁶
Sn(OH) ₄	Sn(OH) ₄	\rightleftharpoons	Sn ⁴⁺ + 4OH ⁻	1..10 ⁻⁵⁶
SnS	SnS	\rightleftharpoons	Sn ²⁺ + S ²⁻	1.10 ⁻²⁸
SrCO ₃	SrCO ₃	\rightleftharpoons	Sr ²⁺ + CO ₃ ²⁻	9,42.10 ⁻¹⁰
SrSO ₄	SrSO ₄	\rightleftharpoons	Sr ²⁺ + SO ₄ ²⁻	2,8.10 ⁻⁷
TeO(OH) ₂	TeO(OH) ₂	\rightleftharpoons	TeO ²⁺ + 2OH ⁻	1.10 ⁻¹¹
Te(OH) ₄	Te(OH) ₄	\rightleftharpoons	Te ⁴⁺ + 4OH ⁻	7.10 - 53 (ở 18 ⁰ C)
TiO(OH)	TiO(OH) ₂	\rightleftharpoons	TiO ²⁺ + 2OH ⁻	1.10 ⁻³⁰
ZnCO ₃	ZnCO ₃	\rightleftharpoons	Zn ²⁺ + CO ₃ ²⁻	6.10 ⁻¹¹
Zn(OH) ₂	Zn(OH) ₂	\rightleftharpoons	Zn ²⁺ + 2OH ⁻	4.10 ⁻¹⁶
ZnS	ZnS	\rightleftharpoons	Zn ²⁺ + S ²⁻	6,9.10 ⁻²⁶

BẢNG 8

Thế điện cực chuẩn (ở 25 °C)

Điện cực	Phản ứng điện cực	ε ⁰ (Vôn)
Li ⁺ /Li	Li ⁺ + e \rightleftharpoons Li	-3,04
Hb ⁺ /Rb	Rb ⁺ + e \rightleftharpoons Rb	-2,92
Cs ⁺ /Cs	Cs ⁺ + e \rightleftharpoons Cs	-2,92
K ⁺ /K	K ⁺ + e \rightleftharpoons K	-2,92

Ra ²⁺ /Ra	Ra ²⁺ + 2e	\rightleftharpoons	Ra	-2,92
Ba ²⁺ /Ba	Ba ²⁺ + 2e	\rightleftharpoons	Ba	-2,90
Ca ²⁺ /Ca	Ca ²⁺ + 2e	\rightleftharpoons	Ca	-2,87
Na ⁺ /Na	Na ⁺ + e	\rightleftharpoons	Na	-2,713
La ³⁺ /La	La ³⁺ + 3e	\rightleftharpoons	La	-2,52
Mg ²⁺ /Mg	Mg ²⁺ + 2e	\rightleftharpoons	Mg	-2,38
Be ²⁺ /Be	Be ²⁺ + 2e	\rightleftharpoons	Be	-1,85
HfO ₂ , H ⁺ /Hf	HfO ₂ + 4H ⁺ + 4e	\rightleftharpoons	Hf + 2H ₂ O	-1,7
Al ³⁺ /Al	Al ³⁺ + 3e	\rightleftharpoons	Al	-1,66
Ti ²⁺ /Ti	Ti ²⁺ + 2e	\rightleftharpoons	Ti	-1,63
Zr ⁴⁺ /Zr	Zr ⁴⁺ + 4e	\rightleftharpoons	Zr	-1,53
V ²⁺ /V	V ²⁺ + 2e	\rightleftharpoons	V	-1,18
Mn ²⁺ /Mn	Mn ²⁺ + 2e	\rightleftharpoons	Mn	-1,18
WO ₄ ²⁻ /W	WO ₄ ²⁻ + 6e + 4H ₂ O	\rightleftharpoons	W + 8OH ⁻	-1,05
Se ²⁻ /Se	Se ³⁺ + 2e	\rightleftharpoons	Se ²⁻	-0,92
Zn ²⁺ /Zn	Zn ²⁺ + 2e	\rightleftharpoons	Zn	-0,763
Cr ³⁺ /Cr	Cr ³⁺ + 3e	\rightleftharpoons	Cr	-0,74
SbO ₂ ⁻ /Sb	SbO ₂ ⁻ + 3e + 2H ₂ O	\rightleftharpoons	Sb + 4OH ⁻	-0,67
Ga ³⁺ /Ga	Ga ³⁺ + 3e	\rightleftharpoons	Ga	-0,53
S ²⁻ ?S	S + 2e	\rightleftharpoons	S ²⁻	-0,51
Fe ²⁺ /Fe	Fe ²⁺ + 2e	\rightleftharpoons	Fe	-0,44
Cr ³⁺ /Cr ²⁺ / Pt	Cr ³⁺ + e	\rightleftharpoons	Cr ²⁺	-0,410
Cd ²⁺ /Cd	Cd ²⁺ + 2e	\rightleftharpoons	Cd	-0,402

Ti ³⁺ , Ti ²⁺ /Pt	Ti ³⁺ + e	\rightleftharpoons Ti ²⁺	-0,37
Tl ⁺ /Tl	Tl ⁺ + e	\rightleftharpoons Tl	- 0,335
Co ²⁺ /Co	Co ²⁺ + 2e	\rightleftharpoons Co	- 0,27
Ni ²⁺ /Ni	Ni ²⁺ + 2e	\rightleftharpoons Ni	- 0,24
Mo ³⁺ /Mo	Mo ²⁺ + 3e	\rightleftharpoons Mo	- 0,2
Sn ⁴⁺ /Sn	Sn ²⁺ + 2e	\rightleftharpoons Sn	- 0,136
Pb ²⁺ /Pb	Pb ²⁺ + 2e	\rightleftharpoons Pb	- 0,126
Ti ⁴⁺ , Ti ³⁺ /Pt	Ti ⁴⁺ + e	\rightleftharpoons Ti ³⁺	- 0,04
H ⁺ , H ₂ /Pt	2H ⁺ + 2e	\rightleftharpoons H ₂	± 0,000
Ge ²⁺ /Ge	Ge ²⁺ + 2e	\rightleftharpoons Ge	+ 0,01
Cu ²⁺ , Cu ⁺ /Pt	Cu ²⁺ + e	\rightleftharpoons Cu ⁺	+ 0,153
Sn ⁴⁺ , Sn ²⁺ /Pt	Sn ⁴⁺ + 2e	\rightleftharpoons Sn ²⁺	+ 0,154
Cu ²⁺ /Cu	Cu ²⁺ + 2e	\rightleftharpoons Cu	+ 0,337
Fe(CN) ₆ ³⁻ , Fe(CN) ₆ ⁴⁻ /Pt	Fe(CN) ₆ ³⁻ + e	\rightleftharpoons Fe(CN) ₆ ⁴⁻	+ 0,36
OH ⁻ /O ₂ , Pt	O ₂ + 2H ₂ O + 4e	\rightleftharpoons 4OH ⁻	+ 0,401
Cu ⁺ , Cu	Cu ⁺ + e	\rightleftharpoons Cu	+ 0,52
2I ⁻ /I ₂	I ₂ + 2e	\rightleftharpoons 2I ⁻	+ 0,536
Te ⁴⁺ /Te	Te ⁴⁺ + 4e	\rightleftharpoons Te	+ 0,56
MnO ₄ ⁻ , MnO ₄ ²⁻ /Pt	MnO ₄ ⁻ + e	\rightleftharpoons MnO ₄ ²⁻	+ 0,561
Rh ²⁺ /Rh	Rh ²⁺ + e	\rightleftharpoons Rh	+ 0,6
Fe ³⁺ ,	Fe ³⁺ + e	\rightleftharpoons Fe ²⁺	+ 0,771

Fe ³⁺ /Pt				
Hg ₂ ²⁺ /Hg	Hg ₂ ²⁺ + 2e	\rightleftharpoons	2Hg	+ 0,798
Ag ⁺ /Ag	Ag ⁺ + e	\rightleftharpoons	Ag	+ 0,799
Hg ²⁺ /Hg	Hg ²⁺ + e	\rightleftharpoons	Hg	+ 0,854
Hg ²⁺ , Hg ⁺ /Pt	Hg ²⁺ + e	\rightleftharpoons	Hg ⁺	+ 0,91
Pd ² /Pd	Pd ² + 2e	\rightleftharpoons	Pd	+0,987
2Br ⁻ /Br ₂ , Pt	Br ₂ + 2e	\rightleftharpoons	2Br ⁻	+1,066
Pt ²⁺ /Pt	Pt ²⁺ + 2e	\rightleftharpoons	Pt	+1,2
Mn ²⁺ , H ⁺ /MnO ₂ , Pt	MnO ₂ + 4H ⁺ + 2e	\rightleftharpoons	Mn ²⁺ + 2H ₂ O	+ 1,236
Cr ₂ O ₇ ²⁻ , Cr ³⁺ /Pt	Cr ₂ O ₇ ²⁻ + 14H ⁺ + 6e	\rightleftharpoons	2Cr ³⁺ + 7H ₂ O	+ 1,33
Ti ³⁺ , Ti ⁺ /Pt	Ti ³⁺ + 2e	\rightleftharpoons	Ti ⁺	+ 1,247
Cl ⁻ /Cl ₂ , Pt	Cl ₂ + 2e	\rightleftharpoons	2Cl ⁻	+ 1,359
Pb ²⁺ /Pb O ₂	PbO ₂ + 4H ⁺ + 2e	\rightleftharpoons	Pb ²⁺ + 2H ₂ O	+ 1,455
Au ³⁺ /Au	Au ³⁺ + 3e	\rightleftharpoons	Au	+1,50
MnO ₄ ⁻ , H ⁺ /Mn ²⁺ ,Pt	MnO ₄ ⁻ + 8H ⁺ + 5e	\rightleftharpoons	MnO ₂ + 2H ₂ O	+1,51
MnO ₄ ⁻ , H ⁺ , MnO ₂	MnO ₄ ⁻ + 4H ⁺	\rightleftharpoons	MnO ₂ + 2H ₂ O	+1,695