

SC-Database

Software version = 5.81 Data version = 4.62

Experiment list contains 52 experiments for
(no ligands specified)

Metal : Ta

(no references specified)

(no experimental details specified)

e- HL Electron (442)
Electron;

Metal Mtd Medium Temp Conc Cal Flags Lg K values Reference ExptNo

Ta sp NaClO4 25°C 0.10M U 1971CKa (948) 1
K(Ta6Cl12 + e)=14.0 (830mV)
Medium:HClO4. K=8.3(0.49V,(+++)). For Br complex, values are 15.0(0.89V) and
10.0(0.59V) (Esce=0.242V). Method:spectroscopy and current-voltage studies

Ta kin NaClO4 15°C 0.10M U 1966EMb (949) 2
K=-1.74
Medium 0.1M HClO4. By spectrophotometry, 22 C: K'=-1.80

Ta oth none 25°C 0.0 U 1952LAb (950) 3
K=-68.6(-810 mV)
K: 0.5Ta2O5(s)+5H+5e=Ta(s)+2.5H2O. From thermodynamic data

Cl- HL Chloride CAS 7647-01-0 (50)
Chloride;

Metal Mtd Medium Temp Conc Cal Flags Lg K values Reference ExptNo

Ta ISE oth/un 175°C ? C 1992BMa (5760) 4
K6=3.89
Medium: NaCl-AlCl3 melt.

Ta nmr oth/un -90°C var U M 1971BIb (5761) 5
K'=0.52(cis)
K'=1.15(trans)
K''=2.39(cis)
K''=-1.35(trans)
K': 5TaF2L4=TaF6+4TaFL5. K'': 5TaF3L3=2TaF6+3TaFL5. K(5TaF4L2=3TaF6+2TaFL5)=
-1.29(cis); -0.96(trans). Data also for other complexes and Br analogues

Ta gl alc/w 25°C 100% U M 1965GSd (5762) 6
K'=-3.55
K''=-7.83
Medium: MeOH. K':TaCl5+MeOH=TaOMeCl4+H+Cl, K'':TaCl5+2MeOH=Ta(OMe)2Cl3+2H+2Cl

Ta oth non-aq 300°C 100% U T 1959COa (5763) 7

K6=3.2 , x units
 K(TaCl5(g)+Cl(melt))=1.8

Method: by partial pressure of TaCl5. Medium: liquid NaFeCl4.
 K(TaCl5(g)+Cl(in melt)=TaCl6(in melt))=0.5(400 C) atm and x units

F- HL Fluoride CAS 7644-39-3 (201)
 Fluoride;

 Metal Mtd Medium Temp Conc Cal Flags Lg K values Reference ExptNo

Ta ISE non-aq ? 100% C 1978GRa (7209) 8
 K6=8.88
 K(TaF5+TaF6=Ta2F11)=1.50

Medium: liquid anhydrous HF

 Ta sp oth/un ? ? U 1973LCa (7210) 9
 K(TaH2O2+F)=2.39
 B(TaH2O2+2F)=2.35
 B(TaH2O2+3F)=1.93
 B(TaH2O2+4F)=1.83

 Ta ISE NaClO4 25°C 2.0M U K1=6.37 B2=11.85 1972BAb (7211) 10
 B3=16.03
 B4=19.63
 B5=23.29
 B7=30.21

Metal: Ta(V)

 Ta ix NaClO4 25°C 1.0M U 1969VAa (7212) 11
 K4=5.90
 K4K5=10.80

Metal: Ta(V). Method: quinhydrone electrode also

 Ta ix NaClO4 25°C 3.0M U 1969VAa (7213) 12
 K4.K5.K6.K7=18.9
 K4.K5.K6.K7.K8.K9=25.2

Medium: HClO4. Metal: Ta(V). Medium: quinhydrone electrode also used

 Ta EMF NaClO4 25°C 1.0M U 1966BFb (7214) 13
 K6=3.75
 K7=3.10
 K8=0.66

Method: quinhydrone electrode

 Ta dis NaClO4 25°C 3.0M U 1965VWa (7215) 14
 K4=5.86
 K4K5=10.77
 B6/B3=15.67
 B7/B3=20.15

Ta ix oth/un 25°C 1.00M U 1962VF a (7216) 15

K5=4.8
K6=3.6
K7=3.3
K8=3.0

K9=3.6. Method: anion exchange and quinhydrone electrode.

O2-- H2L Peroxide CAS 7772-84-1 (2813)
Peroxide; -0.0-

Metal Mtd Medium Temp Conc Cal Flags Lg K values Reference ExptNo

Ta sp oth/un 20°C 78% U TIH 1973VZ a (12699) 16
K(TaOS04+H2L)=2.73

Medium:78.4% H2S04. K=2.80(15 C), 2.62(35 C), 2.55(55 C)
DH=-17 kJ mol-1 (TaO(S04) assumed) also 63.5, 88.7, 94.5%

Ta sp oth/un 0°C 90% U 1969CK a (12700) 17
K(TaOS04+H2L)=3

Medium:H2S04

Ta sp oth/un 0°C 10% U I 1969VZ a (12701) 18
K(TaOS04+H2L)=1.48

Medium: 10% H2S04 K=1.48(20%), 2.20(30%), 2.59(50%), 2.80(70%), 3.38(80%),
3.59(100%)

Ta sp non-aq ? 100% U 1968VZ a (12702) 19
K(Ta(V)+H2L)=3.43

Medium: H2S04

Ta vlt oth/un 25°C 0.34M U 1964BR b (12703) 20
B(HTaO3+H2L)=2.0

Medium: H2S04

SCN- HL Thiocyanate CAS 463-56-9 (106)
Thiocyanate;

Metal Mtd Medium Temp Conc Cal Flags Lg K values Reference ExptNo

Ta sp alc/w ? 100% U I K1=3.12 B2=5.48 1964GS a (15264) 21
B3=7.77

Medium:MeOH. In BuOH: K1=3.68, B2=7.05, B3=11.42. In Me2NCHO: K1=3.15,
B2=5.92, B3=8.55, B4=11.06, B5=13.52, B6=15.96

CH4O L Methyl alcohol CAS 67-56-1 (597)
Methanol; CH3.OH

Metal Mtd Medium Temp Conc Cal Flags Lg K values Reference ExptNo

Ta EMF alc/w 20°C 100% U M 1965GB a (17902) 22

C2H6NOC12P L CAS 667-43-0 (910)
Dichloro(dimethylamine)phosphine oxide; (CH3)2N.P(O)Cl2

Metal Mtd Medium Temp Conc Cal Flags Lg K values Reference ExptNo

Ta nmr non-aq -60°C 100% U M 1974GMa (21901) 29
K(TaBr5A+L=TaBr5L+A)=1.48

Medium: CH2Cl2, A=acetonitrile

C2H6O L CAS 115-10-6 (4214)
Dimethyl ether; CH3.O.CH3

Metal Mtd Medium Temp Conc Cal Flags Lg K values Reference ExptNo

Ta nmr non-aq -40°C 100% U M 1972MBb (22021) 30
K(TaCl5A+L=TaCl5L+A)=1.25

Medium: CHCl3l. A=diethyl ether. K=0.04, A=dioxan. Metal ion: Ta(V)

C2H6S L CAS 75-18-3 (151)
Dimethyl sulfide; CH3.S.CH3

Metal Mtd Medium Temp Conc Cal Flags Lg K values Reference ExptNo

Ta nmr non-aq -60°C 100% U M 1974GMa (22195) 31
K(TaCl5A+L=TaCl5L+A)=0.72

Medium: CH2Cl2, A=pivalocyanide

Ta nmr non-aq -60°C 100% U M 1974GMa (22196) 32
K(TaBr5A+L=TaBr5L+A)=0.24

Medium: CH2Cl2, A=pivalocyanide

Ta nmr non-aq -40°C 100% U M 1972MBb (22197) 33
K(TaCl5A+L=TaCl5L+A)=0.26

Medium: CHCl3. A=t-butyl nitrile. K=0.40, A=acetonitrile, K=1.98, A=diethyl ether. K=0.72, A=diethyl sulfide. K=0.72, A=dimethyl sulfide.

Ta nmr non-aq -60°C 100% U M 1972MBb (22198) 34
K(TaBr5A+L=TaBr5L+A)=0.24

Medium: CH2Cl2. A=pivalonitrile.

C2H6Se L DiMeSelenide CAS 81369-92-3 (911)
Dimethylselenide; CH3.Se.CH3

Metal Mtd Medium Temp Conc Cal Flags Lg K values Reference ExptNo

Ta nmr non-aq -60°C 100% U M 1974GMa (22207) 35
K(TaCl5A+L=TaCl5L+A)=0.06
K(TaBr5A+L=TaBr5L+A)=0.43
K(TaBr5B+L=TaBr5L+B)=0.67

Medium: CH2Cl2, A=dimethylthioether, B=t-butylcyanide

 C2H6Te L DiMeTelluride CAS 593-80-6 (912)
 Dimethyltelluride; CH3.Te.CH3

 Metal Mtd Medium Temp Conc Cal Flags Lg K values Reference ExptNo

 Ta nmr non-aq -60°C 100% U M 1974GMA (22209) 36
 K(TaCl5A+L=TaCl5L+A)=0.25
 K(TaCl5B+L=TaCl5L+B)=0.31
 K(TaBr5A+L=TaBr5L+A)=0.95

Medium: CH2Cl2, A=selenobismethane, B=thiobismethane

 C4H6O6 H2L L-Tartaric acid CAS 87-69-4 (92)
 L-Tartaric acid, L-2,3-Dihydroxybutanedioic acid; HOOC.CH(OH).CH(OH).COOH

 Metal Mtd Medium Temp Conc Cal Flags Lg K values Reference ExptNo

 Ta dis oth/un 22°C 3.00M U M 1972SSj (31366) 37
 K(Ta(OH)4+L)=0.72
 K(Ta(OH)4+H-1L)=8.83
 K(Ta(OH)4+H-2L)=15.3

 C4H8OS L 1,4-Thioxane CAS 15980-15-1 (4266)
 1,4-Oxathiane; cyclo(-O.CH2.CH2.S.CH2.CH2-)

 Metal Mtd Medium Temp Conc Cal Flags Lg K values Reference ExptNo

 Ta nmr non-aq -60°C 100% U M 1972MBb (33191) 38
 K(TaCl5L+A=TaCl5A+L)=0.70

Medium: CHCl3. A=t-butyl nitrile

 C4H8S L CAS 110-01-0 (150)
 Tetrahydrothiophene; cyclo(-CH2.CH2.S.CH2.CH2-)

 Metal Mtd Medium Temp Conc Cal Flags Lg K values Reference ExptNo

 Ta nmr non-aq -60°C 100% U 1972MBb (33742) 39
 K(TaCl5A+L=TaCl5L+A)=0.63

A=t-butyl mercaptan. Medium: CHCl3

 C4H8S2 L 1,4-Dithiane CAS 505-29-3 (4255)
 1,4-Dithiane; cyclo-(S.CH2.CH2.S.CH2.CH2-)

 Metal Mtd Medium Temp Conc Cal Flags Lg K values Reference ExptNo

 Ta nmr non-aq -60°C 100% U 1972MBb (33744) 40
 K(TaCl5A+L=TaCl5L+A)=0.85

A=t-butyl nitrile. Medium: CHCl3

 C4H10S L CAS 352-93-2 (4259)

Diethyl sulfide; C2H5.S.C2H5

Metal Mtd Medium Temp Conc Cal Flags Lg K values Reference ExptNo

Ta nmr non-aq -60°C 100% U M 1974GMa (34722) 41
K(TaBr5A+L=TaBr5L+A)=-0.61

A=t-butyl nitrile. Medium: CH2Cl2

Ta nmr non-aq -40°C 100% U M 1972MBb (34723) 42
K(TaCl15A+L=TaCl15L+A)=0.00

A=dimethyl ether. Medium: CHCl3.

C5H8O2 HL Acetylacetone CAS 123-54-6 (164)
Pentane-2,4-dione; CH3.CO.CH2.CO.CH3

Metal Mtd Medium Temp Conc Cal Flags Lg K values Reference ExptNo

Ta EMF non-aq 20°C 100% U M 1971GSa (38090) 43
K(TaA5+HL=TaA4L+HA)=4.36
K(TaA3L+A)=12.95
K(TaA4L+2A=TaA6+L)=7.10

Medium: MeOH. HA=MeOH

C5H9N L t-Butylnitrile CAS 7188-38-7 (913)
t-Butylcyanide;(CH3)3C.CN

Metal Mtd Medium Temp Conc Cal Flags Lg K values Reference ExptNo

Ta nmr non-aq -60°C 100% U M 1974GMa (38456) 44
K(TaBr5A+L=TaBr5L+A)=0.11
K(TaBr5B+L=TaBr5L+B)=0.39
K(TaBr5C+L=TaBr5L+C)=1.72

Medium: CH2Cl2, A=acetonitrile, B=thiobismethane, C=dimethylether

Ta nmr non-aq -40°C 100% U M 1972MBb (38457) 45
K(TaCl15A+L=TaCl15L+A)=0.47

Medium: CHCl3. A=dimethyl ether. When A=cyanomethane, K=0.15,

A=1,4-dioxan (-60 C), K=0.51

C6H6O2 H2L Catechol CAS 120-80-9 (534)
1,2-Dihydroxybenzene, pyrocatechol; HO.C6H4.OH

Metal Mtd Medium Temp Conc Cal Flags Lg K values Reference ExptNo

Ta EMF alc/w 20°C 100% U M 1971GSa (43837) 46
K(TaA3L+A)=9.04
K(TaA3L+TaA4L=Ta2A7L2)=2.50
K(TaA3L+H2L+A=TaA2L2+2HA)=14.2
K(TaA2L2+H2L+A=TaAL3+2HA)=7.85

Medium: MeOH, 1.0 M Me4NCl. HA=CH3OH

1978GRa R Gut, J Rueede; J.Coord.Chem.,8,47 (1978)
 1974GMA R Good, A Merbach; Helv.Chim.Acta,57,1192 (1974)
 1973LCa G Latysh, A Chernyak, T Serebrennikova; Zh.Neorg.Khim.,18,1014(E:533)
 (1973)
 1973VZa V Vasilev, G Zaitseva; Zh.Neorg.Khim.,18,139(E:70) (1973)
 1972BAB E Baumann; J.Inorg.Nucl.Chem.,34,687 (1972)
 1972MBb A Merbach, J Bunzli; Helv.Chim.Acta,55,580 (1972)
 1972SSj G Shabanova, N Skorik; Zh.Obshch.Khim.,42,204 (1972)
 1971BIb Y Buslaev, E Ilin, M Krutkina; Dokl.Akad.Nauk SSSR,200,1345(E:850) (1971)
 1971CKa N Cook, T Kuwana, J Espenson; Inorg.Chem.,10,1081 (1971)
 1971GSa R Gut, E Schmid, J Serrallach; Helv.Chim.Acta,54,593;609 (1971)
 1970ZPa E Zhurennikov, D Pobezhimoskaya; Radiokhim.,12,1,105 (1970)
 1969CKa A Chernyak, V Khomutnikov, A Batsuev et al; Zh.Neorg.Khim.,14,1251(E:655)
 (1969)
 1969VAa L Varga; Anal.Chem.,41,323 (1969)
 1969VSb G Volkova, V Sochevanov; Zh.Neorg.Khim.,14,5,1245 (1969)
 1969VZa V Vasilev, G Zaitseva; Zh.Neorg.Khim.,14,198(E:102) (1969)
 1968ADa B Agarwala, A Dey; Chim.Anal.(Paris),50,233 (1968)
 1968VZa V Vasilev, G Zaitseva; Zh.Neorg.Khim.,13,84 (1968)
 1967ADa B Agarwala, A Dey; Curr.Sci.,36,544 (1967)
 1966BFb M Bukhsh, J Flegenheimer, F Hall et al; J.Inorg.Nucl.Chem.,28,421 (1966)
 1966EMb J Espenson, R McCarley; J.Am.Chem.Soc.,88,1063 (1966)
 1966SAb K Stoliarov, I Amantova; Vestnik Leningr.Univ.,4,141;155;10,133 (1966)
 1965BLd A Babko, V Lukachina, B Nabivanets; Zh.Neorg.Khim.,10,467 (865) (1965)
 1965GBa R Gut, H Buser, E Schmid; Helv.Chim.Acta,48,878 (1965)
 1965GSd A Golub, A Sych; Zh.Neorg.Khim.,10,889 (1965)
 1965VWa L Varga, W Wakley, L Nicolson et al; Anal.Chem.,37,1003 (1965)
 1964BRb L Budarin, T Rummyantseva, T Sherina; Izv.VUZ.Khim.,7,715 (1964)
 1964GSa A Golub, A Sych; Izv.Akad.Nauk Latv.SSR,387 (1964)
 1964GUa R Gut; Helv.Chim.Acta,47,2262 (1964)
 1962VFa L Varga, H Freund; J.Phys.Chem.,66,21 (1962)
 1959COa C Cook; J.Am.Chem.Soc.,81,535 (1959)
 1952LAB W Latimer; "Oxidation Potentials", Prentice Hall, NY (1952)

EXPLANATORY NOTES

DATA Flags are :-

T Data at other TEMPERATURES
 I Data with various BACKGROUNDS
 H Data for THERMOCHEMICAL quantities
 M Data for TERNARY Complexes

 END