

SC-Database

Software version = 5.81 Data version = 4.62

Experiment list contains 35 experiments for
(no ligands specified)

Metal : Os

(no references specified)

(no experimental details specified)

e- HL Electron (442)
Electron;

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

Os kin oth/un ? 1.00M U H 1968BHc (762) 1

K=0.89.

Medium: 1 M KOH. K: OsO6---- + OsO4-- = 2Os(VII)

Os EMF none 25°C 0.0 M 1966BDb (763) 2

K=14.96, 884.7 mV

K'=8.18, 483.6 mV

K: Os(bpy)3+++ + e = Os(bpy)3++. K': Os(bpY)2(py)Cl++ + e = Os(bpy)2(py)Cl+
17 similar reactions

Os EMF none 25°C 0.0 U 1956CAa (764) 3

K=65.3(964 mV)

K: OsO4(aq)+4H+4e=OsO2(H2O)x(s)+2H2O

Os oth none 25°C 0.0 U 1952LAB (765) 4

K=10(0.3 V)

K(HOs(VIII)O5+2e=Os(VI)O4+OH); from thermodynamic data. Estimated values:
K(OsO4+8H+8e=Os(s)+4H2O)=114(850 mV), K(Os(IV)Cl6+e)=14(850 mV)

Os EMF oth/un 25°C 2.11M U I 1950Mca (766) 5

K=5.90(349 mV)

Medium: M HBr; K: Os(IV)Br6+e=Os(V)Br6. In I=4 M: K=5.24(310 mV), I=3.25 M:
K=5.43(321 mV), I=2.12: K=5.90(349 mV)

Os EMF oth/un 20°C 0.10M U I 1946DHa (767) 6

K=7.67(446 mV)

Medium: HCl; K: Os(IV)+e=Os(III). For I=5 M HCl: K=5.28(307 mV); 3.5 M: K=
5.80(337 mV); 2 M: 6.66(387 mV). Also in HBr: 1 M: K=6.63(392 mV)

CO L Carbon monoxide CAS 630-08-0 (551)
Carbon monoxide;

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

Os kin non-aq 25°C 100% U T HM 1993PSb (2816) 7

K(Os3L10H2+L)=2.77

Medium: Decalin. T. 25-90 C. K=2.63(30C); 2.51(35); 2.41(40); 1.96(60); 1.87(70); 1.64(80); 1.49(90). At 25-40C, DH=-42.3 kJ mol⁻¹; at 50-90 C, DH=-39.8

Os gl non-aq 25°C 100% U HM 1993PSb (2817) 8
B(Os3L10H2+2L)=ca. 7.70

Medium:Decalin. DH=-79.9 kJ mol⁻¹; DS=-113.0.

Os kin alc/w 25°C 100% U 1983WPa (2818) 9
K(H3Os4(CO)12+H)=12.0
K(HOs3(CO)12+H)=14.7
K(HOs(CO)4+H)=15.2

N2 L Nitrogen CAS 7727-37-9 (5686)
Dinitrogen, also Nitrous oxide; N2O

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

Os sp oth/un 25°C 0.30M U M 1971EGa (10024) 10
K'=3.62

Medium:(K,H)SO4. K': cis-Ru(NH3)4(H2O)2+Os(NH3)5N2. K'=3.61 by kinetics

N2H4 L Hydrazine CAS 302-01-2 (2117)
Hydrazine; H2N.NH2

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

Os kin oth/un 25°C var U K1=6.76 1972RKc (10085) 11
Metal: OsO4 (?) Medium: HCl

OH- HL Hydroxide (57)
Hydroxide;

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

Os gl KCl 25°C 1.2M C 1998ARa (11828) 12
*K(OsO(H2O)(CN)4)=3
*K(OsO(OH)(CN)4)=>-1

Medium: KCl/KNO3

Os sp oth/un 25°C var C 1983GZa (11829) 13
*K(H2OsO2(OH)4)=-8.5
*K(HOsO2(OH)2)=-10.4

Metal is Os(VI).

Os sp oth/un 25°C var C 1983GZa (11830) 14
*K(OsO4)=-12.2

Metal is Os(VIII).

Os sp NaClO4 10°C 4.00M U M 1982BMa (11831) 15
K(Os(VI)Cl4(OH)2+H)=0.8

K(Os(VI)Cl4(H2O)OH+H)=0.3

Os kin oth/un 20°C 0.10M C 1978LDa (11832) 16
K(OsO4+OH=HOsO5)=2.48

Metal is Os(VIII). Medium: 0.10 M NaHCO3/Na2CO3.

Os kin oth/un 35°C 1.0M U 1977MGa (11833) 17
K(OsO3L3+L)=1.50

Os dis oth/un 24°C U 1972LEb (11834) 18
*K1(OsO4+H2O=OsO4OH+H)=-12.5

medium:KOH at various concentrations

Os gl oth/un 20°C 0.25M U 1967BNa (11835) 19
*K1=-7.24

Os as OsO2(OH)4. Medium: 0.25 M Na2SO4. In 'dilute' soln: *K1=-7.2,
*K2=12.2, *K3=-13.95, *K4=K(OsO5OH=OsO56+H)=-14.17

Os gl oth/un 25°C dil U 1966WSa (11836) 20
*K1(Os(en)3)=-5.10

Metal: Os+++

Os dis none 25°C 0.0 U I 1963GOb (11837) 21
Kd(M(aq)=M(CCl4))=1.09

M is OsO4(H2O)n; data also for 1 M-NaClO4 (Kd=1.16); no ev polynuclear
complex for <10**⁻³ M-Os in CCl4

Os gl oth/un ? var U 1955DHa (11838) 22
*K1(Os(en)3) > 0
*K2=-5.8

Os dis NaClO4 25°C 1.0M U 1953SSb (11839) 23
*K1(OsO4(H2O)n)=-12.0
*K2=-14.85?

By spectrophotometry *K1=-12.0, *K2=-14.52

Os dis non-aq 25°C 100% U 1938AYa (11840) 24
Kd=1.89(x units)
K=0.80 in CCl4

In CCl4; metal is OsO4(H2O)n; Kd: K(OsO4(aq)=OsO4(CCl4));ev (OsO4)n in CCl4,
K(4OsO4=(OsO4)4?); method:also partial pressure of CCl4

Os dis oth/un 25°C dil U 1928YWa (11841) 25
*K1(OsO4(H2O)n)=-12.10
Kd=1.09

metal is OsO4(H2O)n; Kd(OsO4(aq)=OsO4(CCl4))

P04--- H3L Phosphate CAS 7664-38-2 (176)

Phosphate;

Metal	Mtd	Medium	Temp	Conc	Cal	Flags	Lg	K values	Reference	ExptNo
Os	kin	oth/un	25°C	var	U				1973KRb (13282)	26
K(OsO4+L)=2.4 (?)										

C2H5NO2		HL		Glycine				CAS 56-40-6	(85)	
2-Aminoethanoic acid; H2N.CH2.COOH										

Metal	Mtd	Medium	Temp	Conc	Cal	Flags	Lg	K values	Reference	ExptNo
Os	kin	NaCl	25°C	1.00M	U T H			K1=1.30	1984MKa (21655)	27
Data at 25-40C. DH = 8 kJ mol-1. Os = OsO4(OH)2										

C3H7NO2		HL		Alanine				CAS 56-41-7	(86)	
2-Aminopropanoic acid; H2N.CH(CH3).COOH										

Metal	Mtd	Medium	Temp	Conc	Cal	Flags	Lg	K values	Reference	ExptNo
Os	kin	NaCl	25°C	1.00M	U T H			K1=0.93	1984MKa (26229)	28
Data at 25-40C. DH = 17 kJ mol-1. Os = OsO4(OH)2										

C5H11NS2		HL						CAS 147-84-2	(2126)	
Diethyldithiocarbamic acid; (CH3.CH2)2N.CSSH										

Metal	Mtd	Medium	Temp	Conc	Cal	Flags	Lg	K values	Reference	ExptNo
Os	sp	non-aq	30°C	100%	U				1993PBa (41358)	29
K(trans-OsL2A2=cis-OsL2A2)=0.78 (for Os(II)) and -3.87 (for Os(III)).										

C9H7N3O2S		H2L		TAR				CAS 2246-46-0	(707)	
4-(2'-Thiazolylazo)-resorcinol; C3H2NS.N:N.C6H3(OH)2										

Metal	Mtd	Medium	Temp	Conc	Cal	Flags	Lg	K values	Reference	ExptNo
Os	sp	oth/un	?	0.10M	U				1969IBc (64718)	30
K(?)=8.59										
Metal:Os(IV). For Os(VIII), K(?)=6.49										

C10H11N7S2		L						CAS 60435-22-5	(2819)	
Phthalimide-dithiosemicarbazone;										

Metal	Mtd	Medium	Temp	Conc	Cal	Flags	Lg	K values	Reference	ExptNo
Os	sp	none	25°C	0.0	U				1976GPc (71099)	31
Keff=4.18										
Os(VIII) at pH 4										

C12H8N2O4		H2L						CAS 6813-38-3	(5904)	
4,4'-Dicarboxy-2,2'-bipyridine;										

Metal	Mtd	Medium	Temp	Conc	Cal	Flags	Lg	K values	Reference	ExptNo
Os	sp	none	25°C	0.0	U				1990KNb (80549)	32
									K(OsH ₂ L ₃ =OsL ₃ +2H)=-1.70	

C14H10N4		L							CAS 25005-96-3	(5906)
2,3-Bis(2-pyridyl)pyrazine;										

Metal	Mtd	Medium	Temp	Conc	Cal	Flags	Lg	K values	Reference	ExptNo
Os	sp	none	25°C	0.0	U				1990KNb (86913)	33
									K(OsHL ₃ =OsL ₃ +H)=4.60	

C15H11N3O		HL		PAN					CAS 85-85-8	(572)
1-(2-Pyridylazo)-2-naphthol; C ₅ H ₄ N ₂ O										

Metal	Mtd	Medium	Temp	Conc	Cal	Flags	Lg	K values	Reference	ExptNo
Os	sp	mixed	?	50%	U			K1=9.34	1969BIc (91235)	34
									Os(IV). Medium: 50% DMF, 0.1 M NaClO ₄ . With Os(VIII), K1(?)=8.62	

C15H12N2O3S		HL							(4070)	
2-(3'-Benzoylthioureido)benzoic acid;										

Metal	Mtd	Medium	Temp	Conc	Cal	Flags	Lg	K values	Reference	ExptNo
Os	sp	alc/w	30°C	96%	U				1966MBa (91440)	35
									K(?)=4.38	
Metal: Os(VIII). Medium: 95% EtOH										

REFERENCES

- 1998ARa A Abou-Hamdan, A Roodt, A Merbach; Inorg.Chem., 37, 1278 (1998)
- 1993PBa A Pramanik, N Bag, A Chakravorty; J.Chem.Soc., Dalton Trans., 237 (1993)
- 1993PSb A Poe, C Sampson et al; J.Am.Chem.Soc., 115, 3174 (1993)
- 1990KNb K Kalyanasundaram, K Nazeeruddin; Inorg.Chim.Acta, 171, 213 (1990)
- 1984Mka R Mehrotra, R Kapoor, S Vajpai; J.Chem.Soc., Dalton Trans., 999 (1984)
- 1983Gza Z Galbacs, A Zsednai, L Csanyi; Transition Met.Chem., 8, 328 (1983)
- 1983Wpa H Walker, R Pearson et al; J.Am.Chem.Soc., 105, 1179 (1983)
- 1982Bma C Bremard, B Mouchel; Inorg.Chem., 21, 1810 (1982)
- 1978Lda J Leipoldt, C Dennis, A van Wyk; Inorg.Chim.Acta, 31, 187 (1978)
- 1977Mga D Mohan, Y Gupta; J.Chem.Soc., Dalton Trans., 1085 (1977)
- 1976Gpc M Guzman, D Perez-Bendito et al; Anal.Chim.Acta, 83, 259 (1976)
- 1973Krb G Konishevskaya, V Romanov, K Yatsimirskii; Zh.Neorg.Khim., 18, 462(E:243) (1973)
- 1972LEb D Lee; J.Inorg.Nucl.Chem., 34, 375 (1972)
- 1972Rkc V Romanov, G Kinishevskaya et al; Zh.Neorg.Khim., 17, 3300(E:1734) (1972)
- 1971Ega C Elson, J Gulens, J Page; Can.J.Chem., 49, 207 (1971)
- 1969BIc A Busev, V Ivanov, L Bogdanovich; Vestnik Moskov Univ., 24, 3, 86 (1969)
- 1969IBC V Ivanov, A Busev, L Popova et al; Zh.Anal.Khim., 24, 7, 1064 (1969)

1968BHc J Beaufils, M Hellin, F Coussemant; Compt. Rend., 266C, 496 (1968)
1967BNa J Bavay, G Nowogrocki, G Tridot; Bull. Soc. Chim. Fr., 2026 (1967)
1966BDb D Buckingham, F Dwyer, A Sargeson; Inorg. Chem., 5, 1243 (1966)
1966MBa A Majumdar, S Bhowal; Anal. Chim. Acta, 35, 479 (1966)
1966WSa G Watt, J Summers, E Potrafke, E Birnbaum; Inorg. Chem., 5, 857 (1966)
1963GOB G Goldstein; Inorg. Chem., 2, 425 (1963)
1956CAa G Cartledge; J. Phys. Chem., 60, 1468 (1956)
1955DHa F Dwyer, J Hogarth; J. Am. Chem. Soc., 77, 6152 (1955)
1953SSb R Sauerbrunn, E Sandell; J. Am. Chem. Soc., 75, 4170 (1953)
1952LAB W Latimer; "Oxidation Potentials", Prentice Hall, NY (1952)
1950Mca R Mertes, W Crowell, R Brinton; J. Am. Chem. Soc., 72, 4218 (1950)
1946DHa F Dwyer, J Humpoletz, R Nyholm; J. Proc. Roy. Soc., NSW, 80, 242 (1946)
1938AYa L Anderson, D Yost; J. Am. Chem. Soc., 60, 1822 (1938)
1928Ywa D Yost, R White; J. Am. Chem. Soc., 50, 81 (1928)

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