

SC-Database

Software version = 5.81 Data version = 4.62

Experiment list contains 232 experiments for
(no ligands specified)

5 metals : Ru(IV), Ru(V), Ru(VI), Ru++, Ru+++

(no references specified)

(no experimental details specified)

e- HL Electron (442)
Electron;

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

Ru(IV) oth none 25°C 0.0 U K=53.3(790 mV)
K: RuO2(s)+4H+4e=Ru(s)+2H2O. From thermodynamic data

Ru(IV) EMF NaClO4 25°C 9.0M U I K=102(1510 mV)
Medium:HClO4. K(Ru(VIII)O4+4e=Ru(IV)). I=6 M: K=97(1430 mV), I=1:K=95(1400mV)

Ru(IV) EMF none 25°C 0.0 U M K=16.2(960 mV)
Medium: HCl to I=0 corr. K: R(IV)Cl(OH)2+e)=16.2(960 mV); K(Ru(IV)Br(OH)2+e)
=13.9(820 mV). K(Ru(III)Cl2+e)=1.42(84 mV)

Ru(IV) EMF KCl 25°C 0.50M U I K(Ru+e=Ru(III))=15.35(908 mV)
Medium: HCl. In 2 M: K=14.51(858 mV)

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

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

Ru(IV) kin alc/w 25°C 100% U M K(H3Ru4(CO)12+H)=11.7
K(HRu4(CO)13+H)=11.1

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

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

Ru(IV) sp NaClO4 rt 4.0M U K(Ru(OH)2L3+L)=0.36
Medium: HClO4

Ru(IV) sp NaClO4 90°C 4.0M U 1972SBb (5640) 7

K(Ru(OH)2+3L)=6.0

K(Ru(OH)2+4L)=6.2

Medium: HClO4

Ru(IV) sp NaClO4 rt 4.0M U 1971NVa (5641) 8

K(Ru(OH)2+2L)=1.4

K(Ru(OH)2+4L)=2.16

K=-0.23

Medium: HClO4. K: Ru(OH)2L4+H+L=Ru(OH)L5+ H2O

Ru(IV) ISE NaClO4 rt 1.0M U K1=3.27 B2=5.97 1971PSe (5642) 9

K3=2.57

K4=2.44

K5=2.38

Medium: HClO4

Ru(IV) oth NaClO4 6°C 0.46M U I M 197000a (5643) 10

K1(Ru(OH)2+L)=0.91

K2(Ru(OH)2+2L)=1.12

K3(Ru(OH)2+3L)=0.82

Medium: HClO4. I=0.92 M: K1=0.90; K2=1.05; K3=0.89

Method: electrical migration or transference number

Ru(IV) ix NaClO4 ? 1.0M U 1959PLb (5644) 11

K(Ru(OH)2+2L)=3.80

K(Ru(OH)2L2+2L)=-0.63

H2 L Hydrogen (6864)

Dihydrogen;

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

Ru(IV) cal non-aq ? 100% U HM 1993BSb (7519) 12

Medium: Cyclohexane. DH(RuA2+L=RuLA2)=-95.0 kJ mol-1.

A:1,2-Bis(dimethylphosphino)ethane.

Ru(IV) cal non-aq ??? 100% U HM 1993BSb (7520) 13

Medium: Cyclohexane. DH(RuA2B+L=RuLA2+B)=84.9 kJ mol-1.

A:1,2-Bis(dimethylphosphino)ethane. B:CO.

Ru(IV) cal non-aq ??? 100% U HM 1993BSb (7521) 14

Medium: Cyclohexane. DH(RuA2B+L=RuLA2+B)=-16.3 kJ mol-1.

A:1,2-Bis(dimethylphosphino)ethane. B:N2.

NO3- HL Nitrate CAS 7697-37-2 (288)

Nitrate;

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

Ru(IV) EMF oth/un 75°C dil U 1974SBe (9909) 15

$$K(\text{Ru}(\text{NO})(\text{NH}_3)_4+\text{L})=0.48$$

Spectrophotometry and conductivity also used

OH- HL Hydroxide (57)
Hydroxide;

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

Ru(IV) kin oth/un 25°C 0.50M U 1992Lca (12067) 16
*K(Ru(IV)A(OH)(H2O))=-1.32
*K(Ru(III)A(H2O)2)=-0.98

A=6,7,8,9,10,,11,17,18-Octahydro-6,10-dimethyl-5H-dibenzo[e,n][1,4,8,12]-
dioxadiazacyclopentadecine.

Ru(IV) sol NaCl 25°C 0.10M U 1983VKc (12068) 17
K[Ru(OH)2+2OH=Ru(OH)4]= 18.4

Ru(IV) sol oth/un 25°C 0.50M U 1974BNa (12069) 18
Ks(Ru4(OH)16)=-43.3
Medium: CH3SO3Na. Ks: Ru4(OH)16(s)=Ru4(OH)12++++ + 4OH

Ru(IV) sol oth/un 25°C var U 1968BNd (12070) 19
Kso=-49

Ru(IV) sol none 20°C 0.0 U 1961BKa (12071) 20
K(Ru(OH)4=Ru(OH)2+2OH)=-27.3

Ru(IV) sol oth/un 25°C 0.10M U 1961GCa (12072) 21
K(RuO2(s)+2H=RuO)=0.77

Ru(IV) gl oth/un ?25 ? U M 1961ZSa (12073) 22
*K1(RuNO(NO3)3(H2O)2)=-3.08
*K2=-9.00
*K1(RuNO(NO3)2(H2O)3)=-2.40
*K2=-4.14

*K3=-9.67. Values also for other complexes

Ru(IV) sol oth/un ?25 var U 1958STb (12074) 23
Kso(Ru(OH)4)=-43.7

Ru(IV) sol oth/un ? dil U 1957SKb (12075) 24
Kso(Ru(OH)4)=-34

S04-- H2L Sulfate CAS 7664-93-9 (15)
Sulfate;

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

Ru(IV) ix NaCl04 35°C 2.0M U TI 1967VLb (16524) 25
K(RuO+L)=1.37

K=1.07(20 C), 1.16(25 C). At I=1: K=1.25(20 C), 1.31(25 C), 1.58(35 C).
 I=0.5:K=1.37(20 C),1.47(25 C),1.69(35 C). DH=32 kJ mol⁻¹, DS=67 J K⁻¹ mol⁻¹

 Ru(IV) ix NaClO4 ? 4.0M U I 1965VLa (16525) 26
 K(RuO+HL=H+RuOL)=0.82

*K1=1.10(I=2)

C3H4N2 L Imidazole CAS 288-32-4 (90)
 1,3-Diazole, imidazole; C3H4N2

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

 Ru(IV) sp non-aq 21°C 100% U M 1983LKa (23922) 27
 K(Ru(CO)A+L)=4.96

Medium: C2H4Cl2. A=tetraphenylporphin

C4H4N2 L Pyrazine CAS 290-37-9 (620)
 1,4-Diazine, Pyrazine;

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

 Ru(IV) sp oth/un 25°C 0.10M U M 1989SFa (28794) 28
 Keff(RuA+L)=1.65
 Keff(RuB+L)=1.64

A=(NH3)4P(OCH2CH3)2(OH), Keff at pH 6.8; also for pH 2.7, 3.1, 4.5 and 5.4

B=(NH3)4P(OH)3, Keff at pH 6.9; also for pH 2.6. Medium: NaCF3COO

C6H6O HL Phenol CAS 108-95-2 (457)
 Hydroxybenzene, phenol; C6H5.OH

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

 Ru(IV) sp oth/un 25°C 0.10M U 1994CSa (43543) 29
 K(RuA5NHCOL+H=RuA5NHCOHL)=8.0

Medium: KCF3SO3. A=NH3

C10H8N2 L 2,2'-Bipyridyl CAS 366-18-7 (25)
 2,2'-Bipyridine; (C5H4N)2

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

 Ru(IV) sp NaCl 23°C 0.10M C T 1996ZWa (69638) 30
 K(RuL2HA=RuL2A)=0.82

Ru(II). HA=3-carboxyl-2,2'-bipyridine.

 Ru(IV) sp oth/un 25°C 0.10M U 1987ACa (69639) 31
 *K(RuL2(H2O)2)=-8.9

Medium: phosphate buffer. Data is for cis isomer. *K=-9.3 for trans.

C12H8N2 L Phenanthroline CAS 66-71-7 (144)

1,10-Phenanthroline;

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Metal      Mtd Medium Temp Conc Cal Flags Lg K values      Reference ExptNo
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Ru(IV)     sp  oth/un 25°C 0.10M U                               1987ACa (80510) 32
                                         *K(RuL2(H2O)2)=-10.1
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C12H8N2O4      H2L                               CAS 6813-38-3 (5904)
4,4'-Dicarboxy-2,2'-bipyridine;
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Metal      Mtd Medium Temp Conc Cal Flags Lg K values      Reference ExptNo
-----
Ru(IV)     sp  oth/un 25°C  ?  U  M                               1989NKa (80550) 33
                                         K(Ru(HL)2L+H)=1.70
                                         K(RuL2HL+H)=2.20
                                         K(Ru(bpy)LHL+H)=1.80
                                         K(Ru(bpy)L2+H)=2.50
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C12H8N2O4      H2L                               CAS 1802-30-8 (5905)
5,5'-Dicarboxy-2,2'-bipyridine;
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Metal      Mtd Medium Temp Conc Cal Flags Lg K values      Reference ExptNo
-----
Ru(IV)     sp  oth/un 25°C  ?  U                               1989NKa (80553) 34
                                         K(Ru(HL)2L+H)=2.80
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C18H15P          L                               CAS 603-35-0 (621)
Triphenylphosphine; (C6H5)3P
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Metal      Mtd Medium Temp Conc Cal Flags Lg K values      Reference ExptNo
-----
Ru(IV)     sp  non-aq 25°C 100% U T                               1988DFa (97148) 35
                                         K(RuA+L)=3.78
                                         K(RuAL+L)=1.99
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H2A=N,N'-ethylenebis(salicylidineimine). Medium: benzene. Also data at 15, 21 and 30 C.

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C19H13N5          L                               (6734)
2,6-Bis(benzimidazol-2-yl)pyridine;
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Metal      Mtd Medium Temp Conc Cal Flags Lg K values      Reference ExptNo
-----
Ru(IV)     gl  mixed 25°C 50% U                               1993XHa (99063) 36
                                         *K(RuL2) < 0
                                         *K(RuH-1L2) < 0
                                         *K(RuH-2L2) < 2
                                         *K(RuH-3L2)=-3.1
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Medium: 50% v/v acetonitrile/H2O.

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C14H32N4          L    4-Mecyclam-14    CAS 41203-22-9 (935)
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Ru(VI) dis oth/un 20°C dil U 1954MAb (12078) 45

Kd=1.77

*K1=-11.17

Ru(VII). Kd: K(RuO4=RuO4(in CCl4))=1.77; *K1: K(RuO4+H2O=H+HRuO5)

At I=0 corr. K(RuO4+H2O=HRuO5+OH)=-14.24

C6H6O8S2 H4L Tiron CAS 149-45-1 (104)

4,5-Dihydroxybenzene-1,3-disulfonic acid; (HO)2.C6H2(SO3H)2

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

Ru(VI) sp NaNO3 25°C 1.50M U 1968PLa (44485) 46

K(?)=14.66

Metal ion: RuO4--. pH 0.28-0.68

C8H10N2O3S L (4581)

Methanesulfonylbenzamidoxime; CH3.SO2.C6H4.C(:N.OH).NH2

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

Ru(VI) dis oth/un ? ? U 1972KUa (60750) 47

K(RuO4+2HL=RuO4(2HL)) = 9.35

C9H12N2O3S L CAS 33967-87-2 (4684)

Ethanesulfonylbenzamidoxime; CH3.CH2.SO2.NH.C(:N.OH).C6H5

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

Ru(VI) dis oth/un ? ? U 1972KUa (66609) 48

K(RuO4+2HL)=9.47

C13H12N2O3S HL CAS 20037-46-1 (5013)

Benzenesulfonylbenzamidoxime;

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

Ru(VI) dis oth/un ? ? U 1972KUa (85350) 49

K(RuO4+2HL)=10.42

Ru(VI) sp oth/un ? 1.0M U K1=5.48 B2=10.49 1971KUa (85351) 50

Medium: HCl. In 4 M HCl, K1(?)=5.77. Definition of K values uncertain

Br- HL Bromide CAS 10035-10-6 (19)

Bromide;

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

Ru++ sp NaClO4 25°C 0.10M U 1973CGb (2296) 51

K(Ru(NH3)5+L)=0.04

Medium: HClO4

CN- HL Cyanide CAS 74-90-8 (230)
Cyanide;

Metal	Mtd	Medium	Temp	Conc	Cal	Flags	Lg	K values	Reference	ExptNo
Ru++	con	oth/un	25°C	0.0	U				1970FKb (2760)	52
								K(K+Ru(CN)6)=2.48		

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

Metal	Mtd	Medium	Temp	Conc	Cal	Flags	Lg	K values	Reference	ExptNo
Ru++	sp	non-aq	25°C	100%	U T				1974JMa (5645)	53
								K(Ru(PPh3)3+L)=4.14		

Medium: dimethylacetanilide

Ru++	sp	oth/un	25°C	0.10M	U				1973CGb (5646)	54
								K(Ru(NH3)5+L)=0.15		

Ru++	kin	oth/un	24°C	0.10M	U			K1=1	1972DMa (5647)	55
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Medium: Li-p-toluenesulfonate

Ru++	vlt	oth/un	25°C	0.30M	U			K1=0.00	1971KEa (5648)	56
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Medium: HBF4

Ru++	vlt	oth/un		var	U				1966BMc (5649)	57
								B6=-13		

ClO4- HL Perchlorate CAS 7001-90-3 (287)
Perchlorate;

Metal	Mtd	Medium	Temp	Conc	Cal	Flags	Lg	K values	Reference	ExptNo
Ru++	sol	oth/un	25°C	?	U				1974TAb (6374)	58
								K(Ru(phen)3+L)=3.36		
								K(Ru(phen)3L+L)=0.83		

Medium: Na2SO4. K1=2.38, K2=1.73(dis, CHCl3); K1=5.43, K2=2.49(dis, acetophenone)

I- HL Iodide CAS 10034-85-2 (20)
Iodide;

Metal	Mtd	Medium	Temp	Conc	Cal	Flags	Lg	K values	Reference	ExptNo
Ru++	dis	oth/un	25°C	0.25M	U				1974TAb (8360)	59
								K(Ru(phen)3+L)=2.58		
								K(Ru(phen)3L+L)=0.99		

Medium: Na2SO4

 IO4- HL Periodate CAS 13444-71-8 (6063)
 Periodate;

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

 Ru++ dis oth/un 25°C 0.25M U 1974TAb (8613) 60
 K(Ru(phen)3+L)=3.46
 K(Ru(phen)3L+L)=1.63

Medium: Na2SO4

 NH3 L Ammonia CAS 7664-41-7 (414)
 Ammonia

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

 Ru++ cal oth/un 25°C 0.10M U H 1972WAa (9211) 61
 Medium: 0.1M NH3. DH6=-5.0 kJ mol-1

 NO L Nitric oxide CAS 10102-43-9 (850)
 Nitric oxide;

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

 Ru++ sp oth/un 25°C 0.20M C 2002WSa (9308) 62
 K(Ru(edta)H2O+NO)=ca.>5.8

Medium: 0.20 M acetate buffer, pH 5.0. Additional method: electrochemical determination of NO.

 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

 Ru++ cal oth/un ? 0.01M U HM 1972WAa (10025) 63
 DH(Ru(NH3)5OH2+Ru(NH3)5N2=(Ru(NH3)5)2N2+H2O)=-28.0 kJ mol-1

 Ru++ sp oth/un 25°C 0.30M U M 1971EGa (10026) 64
 K'=3.62
 Medium:(K,H)SO4. K': cis-Ru(NH3)4(H2O)2+0s(NH3)5N2. K'=3.61 by kinetics

 Ru++ kin NaCl 25°C 0.10M U T HM 1970ATa (10027) 65
 K'=4.56 (4.52 by analysis)
 K'(Ru(NH3)5)H2+N2(aq)=Ru(NH3)5N2+H2O). K'=4.69(20.1 C), 4.36(35 C).
 By analysis: K'=4.41(30 C), 4.08(45 C). DH=-42 kJ mol-1

 Ru++ oth oth/un 30°C 0.10M U T M 1970ATa (10028) 66
 Medium:(Na,H)Cl,Method:chemical analysis,Ligand:dinitrogen,Metal:Ru(NH3)++
 B[Ru(NH3)5OH2+N2(aq)=Ru(NH3)5N2+H2O]=4.41,Additional Temp.:B=4.32,4.08(35,45

Ru++ oth NaCl 25°C 0.10M U T HM 1970ATa (10029) 67

K'=3.86

Method:chemical analysis. K':Ru(NH3)5OH2+Ru(NH3)5N2=(Ru(NH3)5)2N2+H2O.

K'=3.74(30 C), 3.62(35 C), 3.36(45 C). DH=-46.9 kJ mol-1

Ru++ cal oth/un 25°C var U HM 1970ATa (10030) 68

DH(2Ru(NH3)OH2+N2(aq)=(Ru(NH3)5)2N2+2H2O)=-92.0 kJ mol-1

Ru++ kin KCl 20°C 0.02M U T M 1969ATa (10031) 69

K(Ru(NH3)5+N2O)=0.70

Medium: HCl, N2O in solution. At 6.8 C, K=0.85

Ru++ kin KCl 25°C ? U M 1969ATa (10032) 70

K(Ru(NH3)5(H2O)+N2)=4.7

Medium: HCl. Ru(NH3)5OH2+N2(aq)=Ru(NH3)5N2+H2O)

OH- HL Hydroxide (57)

Hydroxide;

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

Ru++ gl NaCl 25°C 0.10M U 1974ITa (12079) 71

*K'=-2.15

K(Ru(NH3)4(SO3)(H2O)+H)=5.05

*K': Ru(NH3)4SO2H2O=Ru(NH3)4SO2(OH) + H

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

Thiocyanate;

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

Ru++ dis oth/un 25°C 0.25M U M 1974TAb (15246) 72

K(Ru(phen)2+L)=2.80

K(Ru(phen)2L+L)=1.02

SO4-- H2L Sulfate CAS 7664-93-9 (15)

Sulfate;

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

Ru++ oth none 25°C 0.0 C 1975YYa (16526) 73

K(Ru(phen)3+SO4)=1.60

Method: vapour pressure osmometry.

Ru++ ix NaCl04 28°C 2.0M U IH K1=1.30 1967VLb (16527) 74

K1=1.70(I=1), 1.88(I=0.5), 2.02(I=0.25), 2.72(I=0). DH(K1)=0,DS=52 J K-1 m-1

Ru++ ix NaCl04 20°C 2.0M U K1=1.35 1966VLb (16528) 75

C3H4N2 L Imidazole CAS 288-32-4 (90)

3-Pyridine-carboxylic acid; C5H4N.COOH

Metal	Mtd	Medium	Temp	Conc	Cal	Flags	Lg	K values	Reference	ExptNo
Ru++	gl	mixed	25°C	50%	C				1999PMb (42686)	83
								K(trans-RuL4Cl2+H)=4.61 K(trans-RuHL4Cl2+H)=4.42 K(trans-RuH2L4Cl2+H)=3.49 K(trans-RuH3L4Cl2+H)=2.72		

Medium: 50% v/v acetone/H2O, 0.10 M KCl.

C6H5NO2 HL Isonicotinic ac CAS 55-22-1 (1639)
4-Pyridine-carboxylic acid; C5H4N.COOH

Metal	Mtd	Medium	Temp	Conc	Cal	Flags	Lg	K values	Reference	ExptNo
Ru++	gl	mixed	25°C	50%	C				1999PMb (42699)	84
								K(trans-RuL4Cl2+H)=4.80 K(trans-RuHL4Cl2+H)=4.31 K(trans-RuH2L4Cl2+H)=3.73 K(trans-RuH3L4Cl2+H)=2.80		

Medium: 50% v/v acetone/H2O, 0.10 M KCl.

C6H5N5 L (1699)
3-(Pyrazin-2-yl)-1,2,4-triazole; C4H3N2.C2H2N3

Metal	Mtd	Medium	Temp	Conc	Cal	Flags	Lg	K values	Reference	ExptNo
Ru++	sp	oth/un	?	0.04M	M				1991HHa (43000)	85
								K(Ru(bpy)2L+H=Ru(bpy)2HL)=3.7		

Result given is for the N(2) isomer. For the N(4) isomer, K=5.3

With 3-methyl-5-(pyrazin-2-yl)-1,2,4-triazole: K=4.2

C6H6N2O L Isonicotinamide CAS 1453-82-3 (1949)
Isonicotinamide, Pyridine-4-carboxylic acid amide; C5H4N.CO.NH2

Metal	Mtd	Medium	Temp	Conc	Cal	Flags	Lg	K values	Reference	ExptNo
Ru++	kin	oth/un	25°C	0.10M	U				1996LNa (43259)	86
								K(Ru(NH3)4(PBu3)+L)=1.98		

Medium: 0.1 M (CF3COONa/NaHCO3), pH 8.5.

C6H9N3O2 HL Histidine CAS 71-00-1 (1)
2-Amino-3-(4'-imidazolyl)propanoic acid; H2N.CH(CH2.C3H3N2)COOH

Metal	Mtd	Medium	Temp	Conc	Cal	Flags	Lg	K values	Reference	ExptNo
Ru++	kin	oth/un	25°C	0.10M	U	M			1978BSc (47609)	87
								K(Ru(NH3)4SO3+L)=3.04		

Medium: 0.1M Tris-HCl-buffer, pH 8.1

 C7H9N5O HL CAS 42484-34-4 (2185)
 1,9-Dimethylguanaine;

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

 Ru++ kin oth/un 25°C 0.10M U M 1978BSc (56514) 88
 K(Ru(NH3)4SO3+L)=2.88

Medium: 0.1M Tris-HCl-buffer, pH 8.63

 C10H8N2 L 2,2'-Bipyridyl CAS 366-18-7 (25)
 2,2'-Bipyridine; (C5H4N)2

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

 Ru++ sp NaCl 25°C 0.10M C M 2001RRa (69640) 89
 *K(RuLA(H2O))=-11.1

A=N,N-bis(2-pyridyl)ethylamine.

 C11H15N5O5 HL CAS 2140-65-0 (2184)
 1-Methylguanosine;

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

 Ru++ kin oth/un 25°C 0.10M U M 1978BSc (79075) 90
 K(Ru(NH3)4SO3+L)=2.88

Medium: 0.1M Tris-HCl-buffer, pH 8.63

 C12H8N2 L Phenanthroline CAS 66-71-7 (144)
 1,10-Phenanthroline;

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

 Ru++ gl NaCl 25°C 0.10M C H 2000KEa (80511) 91
 Kout(RuL3+L)=1.68

By calorimetry: DH(Kout)=-1.30 kJ mol⁻¹, DS=24 J K⁻¹ mol⁻¹.

 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

 Ru++ gl alc/w 25°C 20% U 1998ZNa (80551) 92
 K(RuL2A+2H)=3.5

K(Ru(HL)2A+2H)=1.8

Medium: 20% (v/v) EtOH/H2O, 0.1 M NaNO3. A: diethyldithiocarbonate.

 C15H12N3O3P H2L CAS 303111-36-2 (7707)
 2,2':6',2"-Terpyridine-4-phosphonic acid;

Metal	Mtd	Medium	Temp	Conc	Cal	Flags	Lg	K values	Reference	ExptNo
Ru++	sp	KNO3	25°C	0.50M	U				2000NZa (91445)	93
K(RuL(Me2bpy)(NCS))=6.0										

C18H15P		L						CAS 603-35-0	(621)	
Triphenylphosphine; (C6H5)3P										

Metal	Mtd	Medium	Temp	Conc	Cal	Flags	Lg	K values	Reference	ExptNo
Ru++	sp	non-aq	RT	100%	C				2002SMa (97149)	94
K(Ru(CO)A+L)=4.08										
Medium: CH2Cl2. A is 5,15-bis(3',5'-di-tert-butyl)phenyl-2,8,12,18-tetra-ethyl-3,7,13,17-tetramethylporphyrin. Data for phenylphosphine acetylenes.										

C20H24O6		L						DiBz-18-Crown-6	CAS 14187-32-7	(604)
2,3:11,12-Dibenzo-1,4,7,10,13,16-hexaoxacyclooctadeca-2,11-diene										

Metal	Mtd	Medium	Temp	Conc	Cal	Flags	Lg	K values	Reference	ExptNo
Ru++	sp	non-aq	25°C	100%	U	M			1993TDa (100235)	95
K(Ru2(bpy)(NH3)10+L)=1.36										
Medium: nitromethane, 0.02 M Bu4NPF6										

C20H36O6		L						DiCy-18-crown-6	CAS 16069-36-6	(1653)
2,3:11,12-Dicyclohexyl-1,4,7,10,13,16-hexaoxacyclooctadecane;										

Metal	Mtd	Medium	Temp	Conc	Cal	Flags	Lg	K values	Reference	ExptNo
Ru++	sp	non-aq	25°C	100%	U	M			1993TDa (100707)	96
K(Ru2(bpy)(NH3)10+L)=2.40										
Medium: nitromethane, 0.02 M Bu4NPF6										

C24H16N6		L						CAS 135774-29-7	(6575)	
5,5'-Bis-2,2'(2-pyridyl)bibenzimidazole;										

Metal	Mtd	Medium	Temp	Conc	Cal	Flags	Lg	K values	Reference	ExptNo
Ru++	sp	non-aq	20°C	100%	U	M			1991HAa (102861)	97
K(Ru2(bpy)4L+H)=8.1										
K(Ru2(bpy)4HL+H)=5.8										
K(Ru2(phen)4L+H)=7.7										
K(Ru2(phen)4HL+H)=5.9										
Medium: MeCN										

C24H44O8		L						Dicy-24-crown-8	CAS 17455-23-1	(2401)
2,3,14,15-Dicyclohexyl-1,4,7,10,13,16,19,22-octaoxacyclotetracosane;										

Metal	Mtd	Medium	Temp	Conc	Cal	Flags	Lg	K values	Reference	ExptNo
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Ru++ sp non-aq 25°C 100% U M 1993TDa (103438) 98
K(Ru2(bpy)(NH3)10+L)=2.56

Medium: nitromethane, 0.02 M Bu4NPF6

C28H40O10 L DiBz-30-crown10 CAS 104946-67-0 (1776)
2,3:17,18-Dibenzo-1,4,7,10,13,16,19,22,25,28-decaoxacyclotriaconta-2,17-diene;

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

Ru++ sp non-aq 25°C 100% U M 1993TDa (104907) 99
K(Ru2(bpy)(NH3)10+L)=3.22

Medium: nitromethane, 0.02 M Bu4NPF6

C36H60O30 L a-Cyclodextrin CAS 10016-20-3 (6946)
alpha-Cyclodextrin, Cyclohexaamylose;

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

Ru++ oth oth/un 30°C 0.05M C 2001AUa (106471) 100
K(Ru(NH3)5A+L)=2.40
K(Ru(NH3)5B+L)=1.11
K(Ru(NH3)5C+L)=1.99

Medium: 0.05 M phosphate buffer, pH 6.8. Method: capillary electrophoresis
A:4,4'-bipyridine. B:1,2-bis(4-pyridyl)ethane. C:1,3-bis(4-pyridyl)propane

C42H70O35 L b-Cyclodextrin CAS 7585-39-9 (7611)
Cycloheptaamylose;

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

Ru++ oth oth/un 30°C 0.05M U 2001AUa (106992) 101
K(Ru(NH3)5A+L)=2.54
K(Ru(NH3)5B+L)=2.15
K(Ru(NH3)5C+L)=2.80

Medium: 0.05 M phosphate buffer, pH 6.8. Method: capillary electrophoresis
A:4,4'-bipyridine. B:1,2-bis(4-pyridyl)ethane. C:1,3-bis(4-pyridyl)propane

C48H80O40 L g-Cyclodextrin CAS 17465-86-0 (7612)
Cyclooctaamylose;

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

Ru++ oth oth/un 30°C 0.05M U 2001AUa (107430) 102
K(Ru(NH3)5A+L)=0.76
K(Ru(NH3)5B+L)=1.46
K(Ru(NH3)5C+L)=1.58

Medium: 0.05 M phosphate buffer, pH 6.8. Method: capillary electrophoresis
A:4,4'-bipyridine. B:1,2-bis(4-pyridyl)ethane. C:1,3-bis(4-pyridyl)propane

Polymer DNA (4185)

Deoxyribonucleic acid;

Metal	Mtd	Medium	Temp	Conc	Cal	Flags	Lg	K values	Reference	ExptNo
Ru++	sp	NaCl	20°C	0.50M	C			K(Ru(cyclam)A+DNA)=4.70	2002CLa (108153)	103
Medium: 0.05 M NaCl, 0.005 M Tris buffer; pH 7.2 A is 9,10-phenanthroquinonediimine.										
Ru++	nmr	oth/un	RT	0.0	C			Keff((RuA2)2B+L)=4.0	2001FKa (108154)	104
Method: 1H nmr. Medium: 10% D2O/H2O. A=4,4'-dimethyl-2,2'-bipyridine. B=2,2'-bipyrimidine.										

e-			HL		Electron			(442)		
Electron;										
Metal	Mtd	Medium	Temp	Conc	Cal	Flags	Lg	K values	Reference	ExptNo
Ru+++	kin	oth/un	25°C	1.00M	U			K=1.12(66mV)	1973LLa (898)	105
Medium: CF3SO3Li. K: Ru(NH3)6+++ + e=Ru(NH3)6++										
Ru+++	kin	oth/un	25°C	1.00M	U			K=1.42(84mV)	1973LLa (899)	106
Medium: CF3SO3Li. K: Ru(NH3)5(H2O)+++ + e=Ru(NH3)5(H2O)++										
Ru+++	vlt	oth/un	25°C	0.10M	U			K=0.86(51mV)	1972LBb (900)	107
Medium: NaBF4; K:Ru(NH3)6+++ + e=Ru(NH3)6++. Method: current-voltage studies										
Ru+++	vlt	oth/un	25°C	0.20M	U			K=1.12(66mV)	1972LBb (901)	108
Medium: CF3COONa. K: Ru(NH3)5(H2O)+++ + e=Ru(NH3)5(H2O)++										
Ru+++	vlt	oth/un	25°C	0.20M	U	I M		K=-7.10(-420mV,X=OH-)	1972LBb (902)	109
Medium:0.2-1 M NaOH. K: Ru(NH3)5X++ + e=Ru(NH3)5X+. Data also for other X:s in 0.2 NaClO4: K=-0.71(-42mV,X=Cl-); -0.57(-34mV, X=Br-). Current/voltage										
Ru+++	oth	none	25°C	0.0	U			K(Ru+e=Ru(II))=4.2 (250mV)	1968GHa (903)	110
Method: Estimated data										
Ru+++	EMF	none	25°C	0.0	M			K'=2.7, 160 mV K(Ru(en)3+e)=3.6, 210 mV K(Ru(NH3)6+e)=1.7, 100mV	1968MTb (904)	111
K': Ru(NH3)5(H2O)+++ + e = Ru(NH3)5(H2O)++										

Ru+++ oth oth/un 25°C 1.0M U 1967BLa (905) 112
K(Ru+e=Ru(II))=3.0, 180 mV

Medium: H2SO4

Ru+++ EMF none 25°C 0.0 M H 1966BMc (906) 113
K(Ru+e=Ru(II))=4.204, 248.7 mV

DH=42.2 kJ mol⁻¹, DS=221 J K⁻¹ mol⁻¹

Ru+++ vlt oth/un 25°C var U 1966BMc (907) 114
K(RuCl2+e)=-0.2, -10 mV
K(RuCl3+e)=-1.7, -100 mV

Ru+++ EMF none 25°C 0.0 U 1965ETa (908) 115
K(Ru(NH3)6+e)=4.1, 240 mV
K(Ru(NH3)5+e)=3.4, 200 mV

By analysis: K(Ru(NH3)6+e=Ru(II)(NH3)6)=3.62, 214 mV

Ru+++ vlt oth/un 25°C dil U 1965MBc (909) 116
K(Ru+e=Ru++)=3.7, 220 mV

Medium: dil. CH3C6H4HSO3

Ru+++ EMF oth/un 25°C ? U 1962AVa (910) 117
K(Ru(IV)+e=Ru)=8.30(490 mV)
K(2Ru(IV)+e=Ru(IV)Ru)=9.5(560)
K(RuRu(IV)+e=2Ru)=7.1(420 mV)

Medium:pH 1.15. By polarography, 0.1 M NaClO4: K(Ru+e=Ru(II))=-1.9(-110 mV)

Ru+++ vlt oth/un 27°C var U 1951FDa (911) 118
K=14.5(860 mV)

K: Ru(CN)6+e=Ru(IV)(CN)6

Br- HL Bromide CAS 10035-10-6 (19)
Bromide;

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

Ru+++ nmr non-aq RT 100% U 1996BDa (2297) 119
K(RuA+L)=1.30

Medium: CD3SO. M is Ru++. A is 4,4'-bis[(phenyl)aminocarbonyl]-2,2'-bipyridine. Also data for tert-butylaminocarbonyl and substd hydroxyphenyl derivs.

Ru+++ sp none 25°C 0.0 U 1975WEa (2298) 120
Kout(Ru(NH3)6+L)=1.05

Ru+++ sp oth/un 75°C dil U 1974SBe (2299) 121
K(RuNO(NH3)4+L)=1.23

Ru+++ EMF oth/un 25°C 0.17M U 1973CGb (2300) 122
K(Ru(NH3)5+L)=1.72

Medium: p-toluene sulfonic acid. Method:current-voltage studies

Ru+++ kin oth/un 55°C 0.25M U TI 1971BKa (2301) 123

K(Ru(NH3)5+L)=1.63

Medium: sodium p-toluene sulfonate. In 0.1 M: K=0.91(45 C), 0.97(55 C).

By spec: K1=0.92(45 C), 0.94(55 C)

Ru+++ sp oth/un 25°C var U 1965ETa (2302) 124

K(Ru(NH3)5+L)=1.4

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

Carbon monoxide;

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

Ru+++ sp KCl 25°C 0.10M U T M 1989KHa (2822) 125

K(RuHA+L)=2.4

K(RuA+L)=4.9

K(RuHAH2O+RuAL=Ru2A2LOH)=3.7

H4A=EDTA

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

Chloride;

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

Ru+++ nmr non-aq RT 100% U 1996BDa (5650) 126

K(RuA+L)=1.60

Medium: CD3SO. M is Ru++. A is 4,4'-bis[(phenyl)aminocarbonyl]-2,2'-bipyridine. Also data for tert-butylaminocarbonyl and substd hydroxyphenyl derivs.

Ru+++ vlt KCl 25°C 0.1M U 1986THa (5651) 127

K(RuCl(H2O)5+Cl)=4.05

K((RuCl2(H2O)4+Cl)=0.86

K(RuCl3(H2O)3+Cl)=0.33

Ru+++ sp oth/un 60°C 0.10M U M 1977PIa (5652) 128

K(RuCl(NH3)4+Cl)=2.58

K(RuCl(en)2+Cl)=2.55

K(RuCl(Cyclam)+Cl) > 6

Ru+++ sp none 25°C 0.0 U M 1975WEa (5653) 129

Kout(Ru(NH3)6+L)=1.20

Ru+++ sp oth/un 75°C dil U 1974SBe (5654) 130

K(RuNO(NH3)4+L)=2.23

Ru+++ EMF oth/un 25°C 0.17M U 1973CGb (5655) 131

K(Ru(NH3)5+L)=1.98

Medium: p-toluenesulfonic acid. Method:current-voltage studies

Ru+++ ix NaClO4 55°C 0.50M U 1972Mca (5656) 132
K(RuNOCl3+Cl)=0.60
By spec. K=0.61. By kinetics, 50 C: K(RuNOClOH+H)=5.34

Ru+++ kin oth/un 55°C 0.25M U T 1971BKa (5657) 133
K(Ru(NH3)6+L)=1.94
Medium: Na-p-toluenesulfate. By kinetics K=1.09(36 C), 1.16(45 c); by spec.
K=1.13(36 C), 1.20(45 C)

Ru+++ sp oth/un 25°C 0.30M U K1=2.17 1971KEa (5658) 134
Medium: HBF4

Ru+++ ISE NaClO4 rt 1.0M U I K1=3.42 B2=6.22 1971PSe (5659) 135
K3=2.51
K4=2.41
K5=2.15
Medium: HClO4. In 40% EtOH/H2O, 1 M HClO4: K1=3.57, K2=3.14, K3=2.92,
K4=2.64, K5=2.31

Ru+++ oth NaClO4 6°C 0.21M U I K2=1.36 197000a (5660) 136
K3=0.49
K4=-0.15
Medium:HClO4. K2=1.30,K3=0.45,K4=-0.22(I=0.46). Method:paper electrophoresis

Ru+++ sp NaClO4 25°C 0.11M U 1965ETa (5661) 137
K(Ru(NH3)5+L)=1.85
Withdraws earlier value (1962)

Ru+++ oth oth/un 90°C 0.10M U T 1964BBd (5662) 138
K(Ru(NH3)5+L)=2.37
Method:chemical analysis. K=2.18(35 C), 2.21(45 C), 2.27(64 C), 2.32(80 C)

Ru+++ gl oth/un 5°C dil U 1964Mcb (5663) 139
K(Ru(NO)L4OH+H)=6.02
K(Ru(NO)L3(H2O)OH+H)=4.95, 7.5

Ru+++ sp oth/un 25°C 0.10M U M 1962ETb (5664) 140
K(Ru(NH3)5+L)=1.63

Ru+++ sp KCl 25°C 0.10M U K2=1.4 1961CFa (5665) 141
K3=0.4

Ru+++ sp oth/un 25°C 3.0M U 1960FIa (5666) 142
K4=-0.08
B6=-4

Medium: CF3CO2H

I- HL Iodide CAS 10034-85-2 (20)
Iodide;

K5=-0.96

Metal: RuNO+++ . Method:Cation exchange. Medium:HL. Similar values in 1-12 M

Ru+++ dis oth/un 20°C 3.0M U K1=-0.3 B2=-1.3 1957FLa (9912) 152
K3=-0.7

Metal: RuNO+++ . Medium:HL

OH- HL Hydroxide (57)
Hydroxide;

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

Ru+++ gl NaClO4 25°C 0.10M U 1993CBa (12080) 153
*K((NH3)5Ru(EDTA)Ru(H2O))=-5.1

By kinetics, *K=-4.6

Ru+++ gl KCl 22°C 0.50M M 1993FKa (12081) 154
*K(Ru(terp)(bpy)HA)=-4.3

A=4,4'-bipyridyl.

Ru+++ EMF oth/un ? 0.40M U 1974BTb (12082) 155
Ks=-15.6

Medium: MeSO3Na. Ks: Ru(OH)3(s)=Ru(OH)2+OH

Ru+++ sol oth/un ? var U 1968BNd (12083) 156
Kso=-38

Ru+++ gl oth/un 25°C dil U 1964BBd (12084) 157
*K1(Ru(NH3)5(H2O))=-4.2

Ru+++ sol oth/un ? var U 1958STb (12085) 158
Kso(Ru(OH)3)=-34.2

Ru+++ sol oth/un ? dil U 1957SKb (12086) 159
Kso(Ru(OH)3)=-36

Ru+++ con none 0°C 0.0 U 1956JWa (12087) 160
*K1(RuNO(NO3)3(H2O)2)=-1.85

PW11039----- H7L (2467)

alpha-Heteromonophospho-polytungstate;

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

Ru+++ nmr NaCl 0°C 1.0M U 1992RPa (13405) 161
K(RuL(OH)+H)=5.1

Method:NMR.

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

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

Ru+++ sp oth/un 75°C dil U 1974SBe (15247) 162
K(RuNO(NH3)4+L)=2.6

Ru+++ sp NaClO4 70°C 1.0M U T K1=1.78 1952YVa (15248) 163

SO4-- H2L Sulfate CAS 7664-93-9 (15)
Sulfate;

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

Ru+++ vlt NaClO4 25°C 2.0M U K1=2.04 B2=3.57 1968LKb (16529) 164

CH4N2S L Thiourea CAS 62-56-6 (51)
Thiocarbamide, Thiourea; (H2N)2CS

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

Ru+++ sp alc/w ? 40% U M 1971PSd (17854) 165
K(Ru(H2O)+L+4Cl)=18.92
K(Ru(H2O)+2L+3Cl)=22.72
K(Ru(H2O)+3L+2Cl)=26.26

Ru+++ sp NaClO4 25°C 3.0M U 1952YVb (17855) 166
K(Ru+L=RuH-1L+H)=1.21
K(RuH-1L+2L=RuH-3L+2H)=0.72

CH5N3S L CAS 79-19-6 (372)
Thiosemicarbazide; H2N.CS.NH.NH2

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

Ru+++ sp NaClO4 25°C 1.0M U 1952YVd (18082) 167
K(Ru+HL=RuL+H)=0.75

C2H2O4 H2L Oxalic acid CAS 144-62-7 (24)
Ethanedioic acid; (COOH)2

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

Ru+++ gl oth/un ? ? U K1=5 1969BBb (19050) 168
B3=12.3

C2H4N2S2 L Rubenic acid CAS 79-40-3 (2782)
Dithiooxamide; H2N.CS.CS.NH2

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

Ru+++ sp mixed 25°C 50% U K1=13.38 B2=38.14 1952YVc (19454) 169
Medium: 50% ethanoic acid, 1.0 M HClO4

Ru+++ sp oth/un 25°C 1.0M U 1952YVc (19455) 170
K(Ru+HL=RuL+H)=2.97
K(RuL+2HL=RuL2+2H)=3.92

C2H6OS L DMSO CAS 67-68-5 (329)
Dimethylsulfoxide; (CH3)2.SO

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

Ru+++ sp non-aq 21°C 100% U M 1983LKa (22122) 171
K(Ru(CO)A+L)=4.53

Medium: C2H4Cl2. A=tetraphenylporphin

C2H8N2 L Ethylenediamine CAS 107-15-7 (23)
1,2-Diaminoethane; H2N.CH2.CH2.NH2

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

Ru+++ sp NaClO4 25°C 0.10M U 1997BBb (23228) 172
K(RuL3=RuH-1L3+H)<-15

Ru+++ kin NaCl 25°C 1.00M U M 1989TGa (23229) 173
K(Ru(CN)5+HL)=3.88
K(Ru(CN)5+L)=4.15
K(Ru(CN)5)L+H)=9.7

C3H4N2 L Imidazole CAS 288-32-4 (90)
1,3-Diazole, imidazole; C3H4N2

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

Ru+++ kin oth/un 25°C 0.10M U M 1978BSc (23925) 174
K(Ru(NH3)4SO3+L)=3.63

Medium: 0.1M Tris-HCl-buffer, pH 8.6

C4H3N3O4 H3L Violuric acid CAS 26351-19-9 (1208)
2,4,5,6-(1H,3H)Pyrimidinetetrone-5-oxime, 5-isonitrosobarbituric acid;

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

Ru+++ sp NaCl 25°C 0.50M U M 1976SBa (28750) 175
K(Ru(HL)(H2L)(NO)Cl+H)=2.3
K(Ru(HL)2(NO)Cl+H)=3.5
K(Ru(HL)L(NO)Cl+H)=8.9
K(RuL2(NO)Cl+H)=10.2

Ru in the form: Ru(H2L)3(NO). Data also for Ru(H2L)3(NO) deprotonation.

Ru+++ sp oth/un 25°C 0.10M C 1975BRb (28751) 176
 $K(\text{Ru}(\text{OH})_2(\text{H}_2\text{O})_4+\text{H}_2\text{L})=6.34$
 $K(\text{Ru}(\text{OH})_2(\text{H}_2\text{O})_2\text{H}_2\text{L}+\text{H}_2\text{L})=12.85$
 $K(\text{Ru}(\text{OH})_2(\text{H}_2\text{L})_2+\text{H}_2\text{L})=6.38$

Medium Na2SO4.

C4H4N2 L Pyrazine CAS 290-37-9 (620)
 1,4-Diazine, Pyrazine;

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

Ru+++ kin oth/un 25°C 0.10M U M 1978BSc (28798) 177
 $K(\text{Ru}(\text{NH}_3)_4\text{SO}_3+\text{L})=0.08$

Medium: 0.1 M NaHCO3, pH 8.35

C4H5N3O HL Cytosine CAS 71-30-7 (1096)
 2-Oxy-6-aminopyrimidine;

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

Ru+++ kin KCl 25°C 0.20M U 1995CBb (29416) 178
 $K(\text{Ru}(\text{edta})(\text{H}_2\text{O})+\text{L})=1.88$

By spectrophotometry, K=1.86

C4H7N04 H2L IDA CAS 142-73-4 (118)
 Iminodiethanoic acid; HN(CH2.COOH)2

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

Ru+++ gl KCl 25°C 0.10M C 1988THa (32350) 179
 $K(\text{Ru}(\text{OH})\text{L}+\text{Ru})=2.09$

Also data for oxygen complexation: Ru4L4(OH)2O2

C5H5N L Pyridine CAS 110-86-1 (31)
 Pyridine, Azine;

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

Ru+++ sp non-aq 21°C 100% U M 1983LKa (36677) 180
 $K(\text{Ru}(\text{CO})\text{A}+\text{L})=4.63$

Medium: C2H4Cl2. A-tetraphenylporphin

C5H5N5 L Adenine CAS 73-24-5 (237)
 6-Aminopurine; H2N.C5H3N4

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

Ru+++ kin KCl 25°C 0.20M U 1995CBb (36979) 181
 $K(\text{Ru}(\text{edta})(\text{H}_2\text{O})+\text{L})=2.23$

C5H15N3 L CAS 15995-42-3 (153)
1,1,1-Tris(aminomethyl)ethane; (H2N.CH2)3C.CH3

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

Ru+++ sp NaClO4 25°C 0.10M U 1997BBb (41974) 182
K(RuL2=RuH-1L2+H)=-10.3
K(RuH-1L2=RuH-2L2+H)=<-15

C6H6N2O L Isonicotinamide CAS 1453-82-3 (1949)
Isonicotinamide, Pyridine-4-carboxylic acid amide; C5H4N.CO.NH2

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

Ru+++ vlt oth/un 25°C 0.10M U M 1978BSc (43260) 183
K(Ru(NH3)4SO3+L)=0.93

Medium: 0.1M NaHCO3, pH 8.35. Method: Cyclic voltammetry

Ru+++ kin oth/un 25°C 0.10M U M 1978BSc (43261) 184
K(Ru(NH3)4SO3+L)=3.6

Medium: 0.1M NaHCO3, pH 8.35

C6H8N2 L CAS 108-50-9 (2531)
2,6-Dimethylpyrazine, 2,6-Dimethyl-1,4-diazine; C4H2N2(CH3)2

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

Ru+++ sp oth/un 25°C 0.00 U T M 1985TSa (45288) 185
K(Ru(NH3)5L+H)=3.55

C6H8N2O3 H2L CAS 769-42-6 (6014)
1,3-Dimethylbarbituric acid, 1,3-Dimethyl-2,4,6(1H,3H,5H)-pyrimidinetrione;

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

Ru+++ sp KNO3 25°C 0.50M C M 1975SBd (45395) 186
K(RuL3(NO)+2OH=RuL3(NO2))=17.0

With the species (RuNO(NO2)4OH)2-

(RuL3(NO2)) determined in medium KCl, 0.2M at the same temperature.

C6H8O6 H2L Ascorbic acid CAS 50-81-7 (285)
Ascorbic acid (Vitamin C);

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

Ru+++ kin KNO3 30°C 0.10M C M 1989KSb (45654) 187
K(RuA+HL)=3.48
K(RuAHL+O2)=3.18
K(RuAHL+B)=2.99
K(RuAHLB+O2=RuALB(O2)+H)=0.95

H4A=EDTA, B=Cyclohexanol, C=Cyclohexene, D=Cyclohexane. $K(\text{MAHL}+\text{C}=\text{MAHLC})=1.50$
 $K(\text{MAHLC}+\text{O}_2=\text{MALC}(\text{O}_2)+\text{H})=1.14$, $K(\text{MAHL}(\text{O}_2)+\text{D}=\text{MAL}(\text{O}_2)\text{D}+\text{H})=0.83$

C6H9N3O2 HL Histidine CAS 71-00-1 (1)
 2-Amino-3-(4'-imidazolyl)propanoic acid; $\text{H}_2\text{N}.\text{CH}(\text{CH}_2.\text{C}_3\text{H}_3\text{N}_2)\text{COOH}$

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

Ru+++ vlt oth/un 25°C 0.10M U M 1978BSc (47610) 188
 $K(\text{Ru}(\text{NH}_3)_4\text{SO}_3+\text{L})=2.63$

Medium: 0.1M Tris-HCl-buffer, pH 8.1. Method: cyclic voltammetry

C7H6N2S HL CAS 583-39-1 (2043)
 2-Mercaptobenzimidazole;

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

Ru+++ sp alc/w ? 40% U M 1970PSb (53531) 189
 $K(\text{Ru}+4\text{Cl}+\text{H}_2\text{L})=19.2$
 $K(\text{Ru}+3\text{Cl}+2\text{H}_2\text{L})=23.4$
 $K(\text{Ru}+2\text{Cl}+3\text{H}_2\text{L})=27.3$

Medium: 40% EtOH, 4 M HCl

C7H6N4 L (6375)
 3-(Pyridin-2'-yl)-1,2,4-triazole;

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

Ru+++ sp oth/un 25°C u U 1990BVa (53538) 190
 $K(\text{Ru}(\text{bpy})_2\text{HL}=\text{Ru}(\text{bpy})_2\text{L}+\text{H})=-5.9$

In Britton-Robinson buffer.

C7H8N2S HL Phenylthiourea CAS 103-85-5 (625)
 1-Phenyl-2-thiourea; $\text{C}_6\text{H}_5.\text{NH}.\text{CS}.\text{NH}_2$

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

Ru+++ sp alc/w ? 40% U M 1971PSd (55947) 191
 $K(\text{Ru}(\text{H}_2\text{O})+\text{L}+4\text{Cl})=18.28$
 $K(\text{Ru}(\text{H}_2\text{O})+2\text{L}+3\text{Cl})=21.62$
 $K(\text{Ru}(\text{H}_2\text{O})+3\text{L}+2\text{Cl})=24.74$

Medium: 40% EtOH

C7H8N4O2 H2L Theophylline CAS 58-55-9 (1749)
 1,3-Dimethylxanthine, 2,6-Dihydroxy-1,3-dimethylpurine;

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

Ru+++ gl NaCl04 25°C 1.00M U M $K_1=1.16$ 1975CTa (56012) 192

C7H9N3S L CAS 5351-69-9 (3161)
4-Phenylthiosemicarbazide;C6H5.NH.NH.CS.NH2

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

Ru+++ sp alc/w 25°C 50% U 1952YVd (56504) 193
K(Ru+L=RuH-1L+H)=1.65

Medium: 50% EtOH, 1 M H/NaClO4

C7H9N5O HL CAS 42484-34-4 (2185)
1,9-Dimethylguanidine;

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

Ru+++ kin oth/un 25°C 0.10M U M 1978BSc (56515) 194
K(Ru(NH3)4SO3+L)=2.60

Medium: 0.1M Tris-HCl-buffer, pH 8.63. Method: Cyclic voltammetry

C8H10N4O2 H2L Caffeine CAS 58-08-2 (1750)
1,3,7-Trimethylxanthine;

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

Ru+++ gl NaClO4 25°C 1.00M U M K1=1.19 1975CTa (60800) 195

C9H5N02Br2 HL CAS 16846-41-1 (4666)
5,7-Dibromo-8-hydroxyquinoline N-oxide;

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

Ru+++ sp mixed ? 60% U K1=12.91 B2=18.20 1970GMa (63583) 196

Medium: 60% dioxan, 0.1 M NaCl

C9H5N02Cl2 HL CAS 21168-33-2 (4665)
5,7-Dichloro-8-hydroxyquinoline N-oxide;

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

Ru+++ sp mixed ? 60% U K1=12.54 B2=17.86 1970GMa (63593) 197

Medium: 60% acetone, 0.1 M NaCl

C9H5N3O6 HL CAS 21168-36-3 (4609)
5,7-Dinitro-8-hydroxyquinoline-N-oxide;

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

Ru+++ sp mixed ? 60% U K1=8.95 B2=12.14 1970GMa (63636) 198

Medium: 60% acetone, 0.1 M NaCl

C9H13N3O5 L Cytidine CAS 65-46-3 (2152)

Cytidine, Cytosine-1-beta-D-ribofuranoside;

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

Ru+++ kin KCl 25°C 0.20M U 1995CBb (67079) 199
K(Ru(edta)(H2O)+L)=1.66

By spectrophotometry, K=1.60

C10H7NO2 HL CAS 131-91-9 (2668)

1-Nitroso-2-naphthol, alpha-Nitroso-beta-naphthol;

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

Ru+++ dis oth/un 20°C 0.10M U 1969K0b (68588) 200
K(RuCl+L)=11.1
K(RuCl2+L)=10.4
K(RuCl+2L)=19.9
K(RuCl3+L=RuCl2L+Cl)=10.0

Medium: HCl. K(RuCl+HL=RuClL+H)=3.5, K(RuCl2+HL=RuCl2L+H)=2.7

K(RuCl3+HL=RuCl2L+Cl+H)=2.3, K(RuClL+HL=RuClL2+H)=1.2

Ru+++ dis oth/un 20°C 0.10M U 1969K0b (68589) 201
K(Ru(NO)+L)=9.9
K(Ru(NO)NO3+L)=10.7
K(Ru(NO)+2L)=19.1
K(Ru(NO)NO3+2L)=19.9

Medium: HNO3. K(Ru(NO)+HL=Ru(NO)L+H)=2.3, K(Ru(NO)NO3+HL=Ru(NO)LNO3+H)=3.0

K(Ru(NO)LNO3+HL=Ru(NO)L2NO3+H)=1.6, K(Ru(NO)L+HL=Ru(NO)L2+H)=1.6

Ru+++ sp alc/w ? 30% U M 1964K0a (68590) 202
K(Ru(NO)+L)=11.8
K(Ru(NO)+2L)=21.2

Medium: 30% EtOH, 0.2 M

Ru+++ sp alc/w ? 30% U K1=10.2 1963K0a (68591) 203
B3=24.2

Medium: 30% EtOH, 0.2 M citrate buffer

C10H7NO2 HL CAS 132-53-6 (2524)

2-Nitroso-1-naphthol;

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

Ru+++ dis oth/un 20°C 0.10M U 1969K0b (68657) 204
K(RuCl+L)=10.8
K(RuCl2+L)=10.1
K(RuCl+2L)=19.3
K(RuCl3+L=RuCl2L+Cl)=9.7

Medium: HCl. K(RuCl+HL=RuClL+H)=3.6, K(RuCl2+HL=RuCl2L+H)=2.8

K(RuCl3+HL=RuCl2L+Cl+H)=2.4, K(RuClL+HL=RuClL2+H)=2.4

Ru+++ dis oth/un 20°C 0.10M U 1969K0b (68658) 205

K(Ru(NO)+L)=9.7
K(Ru(NO)NO3+L)=10.5
K(Ru(NO)+2L)=18.7
K(Ru(NO)NO3+2L)=19.4

Medium: HNO3. K((Ru(NO)+HL=Ru(NO)L+H)=2.5, K(Ru(NO)NO3+HL=Ru(NO)LNO3+H)=3.2
K(Ru(NO)L+HL=Ru(NO)L2+H)=1.8, K(Ru(NO)LNO3+HL=Ru(NO)L2NO3+H)=1.8

Ru+++ sp alc/w ? 30% U M 1964K0a (68659) 206

K(Ru(NO)+L)=11.8
K(Ru(NO)+2L)=20.5

Medium: 20% EtOH, 0.2 M

Ru+++ sp alc/w ? 30% U K1=10.0 1963K0a (68660) 207

B3=24.0

Medium: 30% EtOH, 0.2 M citrate buffer

C10H7N08S2 H3L Nitroso-R acid CAS 525-05-3 (1811)
1-Nitroso-2-hydroxynaphthalene-3,6-disulfonic acid;

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

Ru+++ sp oth/un 25°C 0.30M U 1965MSa (69028) 208

K(?)=9.7

Acetate buffer

C10H8N2 L 2,2'-Bipyridyl CAS 366-18-7 (25)
2,2'-Bipyridine; (C5H4N)2

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

Ru+++ sp NaCl 25°C 0.10M C M 2001RRa (69641) 209

*K(RuLA(H2O))=-1.2

A=N,N-bis(2-pyridyl)ethylamine.

Ru+++ sp oth/un 25°C ? U M 1988CMc (69642) 210

K(RuL2H2O(OH)+H)=1.8
K(RuL2(OH)2+H)=4.9
K(RuL2(OH)+A)=-0.4

A=MeCN. Data are for cis isomer, trans isomer also reported.

K(RuL2(H2O)OH+MeCN=RuL2(H2O)MeCN+OH)=-0.4

C10H13N5O4 L Adenosine CAS 58-61-7 (2154)
Adenosine, Adenine-9-beta-D-ribofuranoside;

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

Ru+++ kin KCl 25°C 0.20M U 1995CBb (71949) 211

K(Ru(edta)(H2O)+L)=2.18

By spectrophotometry, K=2.23

C10H16N2O8 H4L EDTA CAS 60-00-4 (120)
1,2-Diaminoethane-N,N,N',N'-tetraethanoic acid, Sequestric acid;

Metal	Mtd	Medium	Temp	Conc	Cal	Flags	Lg	K values	Reference	ExptNo
Ru+++	gl	KCl	30°C	0.10M	U	H			1991KMb (74126)	212
								K(RuL+H)=2.53 K(RuH-1L+H)=8.01 K(RuH-2L+H)=11.00		
DH(RuL+H)=-55.7 kJ mol ⁻¹ ; DS=-134.0 J K ⁻¹ mol ⁻¹ ; DH(RuH-1L+H)=-48.6, DS=-8.4										

Ru+++	sp	KCl	25°C	0.10M	C			K1=22.49 K(RuL+H)=3.00 * K(Ru(OH)2L+H)=7.15 * K(Ru(OH)L+H)=5.45 *	1988THa (74127)	213
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* data measured with glass electrode

Ru+++	gl	KCl	25°C	0.10M	C			K(RuL+H)=2.36 K(Ru(OH)2L+H)=11.07 K(Ru(OH)L+H)=7.86	1986KHb (74128)	214
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Ru+++	gl	KCl	30°C	0.10M	U			K1=13.8 *K(RuL)=5.67	1982TRa (74129)	215
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Ru+++	gl	KCl	35°C	0.1M	U			K'=29.84	1982TRc (74130)	216
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K'=2Ru+2L+2+H2O=(Ru(IV)L)2(OH)(O2)+H

C10H18N2O7 H3L HEDTA CAS 150-39-0 (392)
N-(Hydroxyethyl)diaminoethane-N,N',N'-triethanoic acid;

Metal	Mtd	Medium	Temp	Conc	Cal	Flags	Lg	K values	Reference	ExptNo
Ru+++	sp	KCl	25°C	0.10M	C			K1=19.68 K(RuL+H)=2.48 * K(Ru(OH)2L+H)=6.69 * K(Ru(OH)L+H)=4.81 *	1988THa (75486)	217

* data measured with glass electrode

Ru+++	gl	KCl	35°C	0.1M	U			K'=22.13	1982TRc (75487)	218
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K'=2Ru+2L+2+H2O=(Ru(IV)L)2(OH)(O2)+H

C11H15N5O5 HL CAS 2140-65-0 (2184)
1-Methylguanosine;

Metal	Mtd	Medium	Temp	Conc	Cal	Flags	Lg	K values	Reference	ExptNo
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Ru+++ kin oth/un 25°C 0.10M U M 1978BSc (79076) 219
K(Ru(NH3)4SO3+L)=2.18
Medium: 0.1M Tris-HCl-buffer, pH 8.63. Method: cyclic voltammetry.

C11H18N2O8 H4L PDTA CAS 4408-81-5 (1655)
1,2-Diaminopropane-N,N,N',N'-tetraethanoic acid;

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

Ru+++ gl KCl 30°C 0.10M U H 1991KMb (79331) 220
K(RuL+H)=2.30
K(RuH-1L+H)=8.17
DH(RuL+H)=-58.6 kJ mol⁻¹; DS=-151 J K⁻¹ mol⁻¹; DH(RuH-1L+H)=-41.9, DS=12.6

C12H7NO2 HL CAS 33489-49-5 (4905)
Acenaphthenequinonemonoxime;

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

Ru+++ sp oth/un ? 1.0M U B2=8.28 1971SSa (80116) 221
Medium: Na acetate

C12H8N2 L Phenanthroline CAS 66-71-7 (144)
1,10-Phenanthroline;

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

Ru+++ sp oth/un 25°C ? U M 1988CMc (80512) 222
K(RuL2H2O(OH)+H)=1.8
K(RuL2(OH)2+H)=5.0
Data are for cis isomer, trans isomer also reported.

C13H12N2S L diPh-thiourea CAS 102-08-9 (1075)
1,3-Diphenyl-2-thiourea; C6H5.NH.CS.NH.C6H5

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

Ru+++ sp alc/w ? 40% U M 1971PSd (85389) 223
B(RuLC14)=18.70
B(RuL2C13)=22.42
B(RuL3C12)=25.92
Medium: 40% v/v ethanol.

C14H22N2O8 H4L CDTA CAS 482-54-2 (200)
trans-1,2-Diaminocyclohexane-N,N,N',N'-tetraethanoic acid;

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

Ru+++ sp KCl 25°C 0.10M C K1=26.00 1988THa (88767) 224

K(RuL+H)=4.41 *
 K(Ru(OH)2L+H)=8.14 *
 K(Ru(OH)L+H)=6.46 *

* data measured with glass electrode

C14H23N3O10 H5L DTPA CAS 67-43-6 (238)
 Diethylenetriamine-pentaethanoic acid; HOOC.CH2.N(CH2.CH2.N(CH2.COOH)2)2

Metal	Mtd	Medium	Temp	Conc	Cal	Flags	Lg	K values	Reference	ExptNo
Ru+++	gl	KCl	25°C	0.10M	C			K1=27.23 K(RuL+H)=4.26 K(Ru(OH)2L+H)=7.70 K(RuL+Ru)=19.30 K(Ru(OH)L+H)=9.49	1988THa (89375)	225

K(Ru2(OH)2L+H)=7.18
 K(Ru2(OH)L+H)=4.93

C15H16N2S L CAS 137-97-3 (5122)
 2,2'-Ditolylthiourea; CH3.C6H4.NH.CS.NH.C6H4.CH3

Metal	Mtd	Medium	Temp	Conc	Cal	Flags	Lg	K values	Reference	ExptNo
Ru+++	sp	alc/w	?	40%	U			B(RuLC14)=18.64 B(RuL2C13)=22.09 B(RuL3C12)=25.27	1971PSd (91931)	226

Medium: 40% v/v EtOH

C15H16N2S L CAS 621-01-2 (5123)
 4,4'-Ditolylthiourea; CH3.C6H4.NH.CS.NH.C6H4.CH3

Metal	Mtd	Medium	Temp	Conc	Cal	Flags	Lg	K values	Reference	ExptNo
Ru+++	sp	alc/w	?	40%	U			B(RuLC14)=18.43 B(RuL2C13)=21.55 B(RuL3C12)=24.34	1971PSd (91932)	227

C19H13N5 L (6734)
 2,6-Bis(benzimidazol-2-yl)pyridine;

Metal	Mtd	Medium	Temp	Conc	Cal	Flags	Lg	K values	Reference	ExptNo
Ru+++	gl	mixed	25°C	50%	U			*K(RuL2)=-6.1 *K(RuH-1L2)=-7.8 *K(RuH-2L2)=-9.1 *K(RuH-3L2)=-10.7	1993XHa (99064)	228

Medium: 50% v/v acetonitrile/H2O.

 C20H24O6 L DiBz-18-Crown-6 CAS 14187-32-7 (604)
 2,3:11,12-Dibenzo-1,4,7,10,13,16-hexaoxacyclooctadeca-2,11-diene

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

 Ru+++ sp non-aq 25°C 100% U M 1993TDa (100236) 229
 K(Ru2(bpy)(NH3)10+L)=3.20

Medium: nitromethane, 0.02 M Bu4NPF6

 C24H44O8 L Dicy-24-crown-8 CAS 17455-23-1 (2401)
 2,3,14,15-Dicyclohexyl-1,4,7,10,13,16,19,22-octaoxacyclotetracosane;

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

 Ru+++ sp non-aq 25°C 100% U M 1993TDa (103439) 230
 K(Ru2(bpy)(NH3)10+L)=8.28

Medium: nitromethane, 0.02 M Bu4NPF6

 C28H40O10 L DiBz-30-crown10 CAS 104946-67-0 (1776)
 2,3:17,18-Dibenzo-1,4,7,10,13,16,19,22,25,28-decaoxacyclotriaconta-2,17-diene;

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

 Ru+++ sp non-aq 25°C 100% U M 1993TDa (104908) 231
 K(Ru2(bpy)(NH3)10+L)=6.70

Medium: nitromethane, 0.02 M Bu4NPF6

 Polymer DNA (4185)
 Deoxyribonucleic acid;

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

 Ru+++ vlt NaCl 25°C 0.01M C M 2000AIa (108155) 232
 K(Ru(NH3)6+L)=5.63

Method: differential pulse voltammetry.

Medium: 0.01 M NaCl, 0.01 M Tris, pH 7.

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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

EVALUATION Flags are :-

T or IUP=T signifies EVALUATION RATING = Tentative by IUPAC

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