

SC-Database

Software version = 5.81 Data version = 4.62

Experiment list contains 153 experiments for
(no ligands specified)

Metal : Ge(IV)

(no references specified)

(no experimental details specified)

e- HL Electron (442)
Electron;

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Metal      Mtd Medium Temp Conc Cal Flags Lg K values      Reference ExptNo
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Ge(IV)     kin oth/un 25?°C 1.00M U                1965REa   (513)   1
                                         K(Ge(IV) + 2e = Ge++)=0
                                         K(Ge(IV)+4e=Ge(s))=8.38, 124mV
Medium: H2SO4
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Ge(IV)     EMF none 25°C 0.0 U                1959Lba   (514)   2
                                         K=-4.0(brown GeO, -118 mV)
                                         K=-9.2(yellow GeO, -273 mV)
                                         K(Ge(II)+2e=Ge(s))=7.81(231mV)
K: GeO2(s,hex)+2H+2e=GeO(s)+H2O. K(H2GeO3+4H+4e=Ge(s)+3H2O)=0.7(11 mV)
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Br- HL Bromide CAS 10035-10-6 (19)
Bromide;

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Metal      Mtd Medium Temp Conc Cal Flags Lg K values      Reference ExptNo
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Ge(IV)     dis oth/un 25°C ? C                199150a   (1943)  3
                                         K(GeMe(OH)+H+L=GeMeL)=-2.57
                                         K(GeMe(OH)2+2H+2L=GeMeL2)=-4.3
                                         K(GeMe(OH)3+3H+3L=GeMeL3)=-4.7
                                         K(GeMe2(OH)+H+L=GeMe2L)=-1.59
K(GeMe2(OH)2+2H+2L=GeMe2L2)=-3.49
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Cl- HL Chloride CAS 7647-01-0 (50)
Chloride;

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Metal      Mtd Medium Temp Conc Cal Flags Lg K values      Reference ExptNo
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Ge(IV)     dis oth/un 25°C ? C                199150a   (4931)  4
                                         K(Ge(OH)+H+L=GeL(H2O))=-3.02
                                         K(Ge(OH)2+2H+2L=GeL2)=-3.84
                                         K(Ge(OH)3+3H+3L=GeL3)=-4.82
                                         K(Ge(OH)4+4H+4L=GeL4)=-5.09
K(MeGe(OH)+H+L=MeGeL)=-2.31; K(MeGe(OH)2+2H+2L=MeGe(OH)2)=-2.95; K(MeGe(OH)3
+3H+3L=MeGeL3)=-3.81; K(Me2Ge(OH)+H+L=Me2GeL)=-0.71; K(Me2Ge(OH)2+2H+2L)=-2.2
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Ge(IV) sp oth/un ? var U 1961ADb (4932) 5
 K5K6=-5.06

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

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

 Ge(IV) ISE NaCl04 25°C 3.00M U I 1990CIc (6930) 6

*B(2,-1)=2.9
 *B(4,0)=7.18
 *B(4,1)=6.65
 *B(6,1)=9.94

*B(6,2)=9.59. *B(p,q): Ge(OH)4 + pHF = Ge(OH)xFp + qH + 4-x H2O. Data also
 in 3.0 M LiCl04

 Ge(IV) dis oth/un 20°C ? U K1=1.68 B2=3.03 1979NVa (6931) 7
 B3=4.18
 B4=5.17
 B5=6.07
 B6=7.24

 Ge(IV) ix oth/un ? ? U K6=3.21 1972PAb (6932) 8

 Ge(IV) ix KCl ? 0.50M U K6=3.86 1968PMF (6933) 9

 Ge(IV) ISE oth/un 25°C var U T K=-30.9 1965RKa (6934) 10
 K(GeF6+2H2O=4H+6F+GeO2)=-25.8

K: K2GeF6(s)+2H2O=2K+4H+6F+GeO2(s,hex)

 Ge(IV) oth NaCl 50°C 0.40M U T H K(GeF5H2O+HF=GeF6+H3O)=0.34 1964RKb (6935) 11
 Method:chemical analysis. K=0.66(0 C),0.62(10 C),0.58(20 C),0.50(30 C),
 0.42(40 C). At 25 C: DH(K)=10.8 kJ mol-1, DS=-26.3 J K-1 mol-1

 Ge(IV) oth oth/un 25°C dil U T K(GeF4H2O0H+HF+F=GeF6)=5.3 1964RKc (6936) 12
 Method: chemical analysis, quinhydrone electrode. At 0 C:K=5.9

 Ge(IV) EMF NaCl04 25°C 0.50M U K(Ge(OH)4+4HF)=7.30 1963BPb (6937) 13
 K(Ge(OH)4+5HF)=8.94

MoO4-- H2L Molybdate (443)
 Molybdate;

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

 Ge(IV) sp oth/un ? ? U 1960KRb (8735) 14
 $K(H_4GeO_4+4H_2O=H_4GeO_4+4H_2O)? =12.86$ (pH 2.40)

 OH- HL Hydroxide (57)
 Hydroxide;

Metal	Mtd	Medium	Temp	Conc	Cal	Flags	Lg	K values	Reference	ExptNo
Ge(IV)	gl	NaCl04	25°C	0.10M	C				2000KAa (11543)	15
									$K(Ge(OH)_4=GeO(OH)_3+H)=-9.16$	

 Ge(IV) gl oth/un 25°C 0.0 C T 1998PSb (11544) 16
 $K(GeO_2(s)+2H_2O=Ge(OH)_4)=-5.02$
 $K(GeO(OH)_3+H=Ge(OH)_4)=9.32$

Method: solubility of GeO2(tetr) in dil KOH, 21-90 C. Also solubility data for GeO2 at pH 1.5-10 at 25-350 C.

 Ge(IV) sol NaCl 25°C 0.10M C 1998PSc (11545) 17
 $Ks(GeO_2+2H_2O=Ge(OH)_4)=-1.38$

Method: solubility of GeO2(hex) in NaCl.

 Ge(IV) sol none RT 0.0 C 1990DEa (11546) 18
 $Ks(Ge(OH)_4+2H)=-19.26$
 $K(4Ge(OH)_4(s)+GeO_2(OH)_2)=13.15$

K: $4Ge(OH)_4(s)+GeO_2(OH)_2=Ge_5O_{11}+9H_2O$

 Ge(IV) sp KNO3 25°C 0.10M U I K1=14.18 B2=27.98 1968NFa (11547) 19
 B3=41.52
 B4=54.81

K1=13.73, B2=29.28, B3=43.47, B4=56.98(I=1). Also when I=0.3, 0.5

 Ge(IV) dis oth/un 25°C U K1=14.78 B2=29.18 1966ANa (11548) 20
 B3=43.32
 B4=56.85

Medium: LiCl

 Ge(IV) sol oth/un 25°C var U 1964GZa (11549) 21
 $*Ks(Ge(OH)_2(s)+H=GeOH)=-1.26$
 $K(GeOH+H=Ge(II))=-1.7 ?$

Ge as Ge++ ?

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

Metal	Mtd	Medium	Temp	Conc	Cal	Flags	Lg	K values	Reference	ExptNo
Ge(IV)	gl	KCl	25°C	0.10M	U				1960ARb (12665)	22
									$K(GeO(OH)_3+2H_2L)=1.68$	

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

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

Ge(IV) sp oth/un 70°C ? U 1974N0a (16226) 23
K(GeO2+HL)=-0.15

Medium: H2SO4

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

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

Ge(IV) EMF alc/w 20°C 100% U 1964GUa (17882) 24
K(Ge(H-1L)3+H-1L)=13.65
K(Ge(H-1L)4+H=Ge(H-1L)3)=2.95

Method: H electrode. Medium: MeOH, 1.0 M Me4NCl

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

Ge(IV) ix oth/un 25°C ? U 1964KSd (18914) 25
K3=3.5

C2H4O3 HL Glycolic acid CAS 79-14-1 (33)
2-Hydroxyethanoic acid; HO.CH2.COOH

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

Ge(IV) gl KNO3 25°C 0.10M U 1975BPf (20552) 26
K(Ge(OH)2+2L)=0.25

C2H6OS HL CAS 60-24-2 (841)
2-Mercaptoethanol; HS.CH2.CH2.OH

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

Ge(IV) gl KCl 25°C 0.10M U 1963ATa (22065) 27
K(H2GeO3+2HL=GeOH(H1L)2+H)=-4.22

C2H6O2 L Ethyleneglycol CAS 107-21-1 (924)
1,2-Dihydroxyethane (Ethane-1,2-diol); HO.CH2.CH2.OH

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

Ge(IV) EMF KCl 25°C 0.10M U 1959ANa (22147) 28
K(HGeO3+L)=0.17

K(HGeO3+2L)=-0.37

Method: quinhydrone electrode

C2H8O7P2 H4L HEDPA CAS 2809-21-4 (436)

1-Hydroxyethane-1,1-diphosphonic acid; CH3.C(OH)(PO3H2)2

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

Ge(IV) sp NaNO3 20°C 0.10M U 1983SBb (23376) 29

K(Ge(OH)2+H3L)=2.52

C3H6O5S2 HL Xanthic acid CAS 151-01-9 (590)

(Ethoxy)dithiomethanoic acid; CH3.CH2O.CSSH

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

Ge(IV) sp KNO3 20°C 0.10M U I 1982SGc (24873) 30

K(Ge(OH)2+2L)=8.81

C3H6O3 HL L-Lactic acid CAS 79-33-4 (82)

L-2-Hydroxypropanoic acid; CH3.CH(OH).COOH

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

Ge(IV) gl KNO3 25°C 0.10M U 1975BPf (25454) 31

K(Ge(OH)2+2L)=0.46

Ge(IV) con NaCl 18°C 1.0M U 1957VAa (25455) 32

K(H2GeO3+2HL)=0.6(?)

Ge(IV) gl oth/un 18°C 0.0 U 1957VAa (25456) 33

K(H2GeO3+2HL)=1.9(?)

C3H8O2 L Propyleneglycol CAS 57-55-6 (2025)

Propan-1,2-diol; CH3.CH(OH).CH2(OH)

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

Ge(IV) EMF KCl 25°C 0.10M U 1959ANa (27677) 34

K(HGeO3+L)=0.28

K(HGeO3+2L)=0.06

Method: quinhydrone electrode.

C3H8O3 L Glycerol CAS 56-81-5 (2707)

Propane-1,2,3-triol; HO.CH2.CH(OH).CH2.OH

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

Ge(IV) gl KCl 25°C 0.10M U I 1957ANa (27735) 35

K(HGeO3+L)=1.21

$$K(\text{HGeO}_3+2\text{L})=1.94$$

$$K(\text{HGeO}_3+2\text{L})=1.105-1.700\sqrt{I}$$

C3H12N09P3 H6L NTPA CAS 6419-19-8 (2920)

Nitrilotris(methylenephosphonic acid); $\text{N}(\text{CH}_2\text{PO}_3\text{H}_2)_3$

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

Ge(IV) sp KNO3 20°C 0.10M U 1984SBa (28570) 36

$$K(\text{Ge}+\text{H}_2\text{L})=13.64$$

C4H6O5 H2L Malic acid CAS 617-48-1 (393)

2-Hydroxybutane-1,4-dioic acid, Hydroxy-succinic acid; $\text{HOOC.CH}_2.\text{CH}(\text{OH}).\text{COOH}$

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

Ge(IV) con NaCl 18°C 1.0M U 1957VAa (30639) 37

$$K(\text{H}_2\text{GeO}_3+2\text{H}_2\text{L})=0.68$$

Ge(IV) gl oth/un 18°C 0.0 U 1957VAa (30640) 38

$$K(\text{H}_2\text{GeO}_3+2\text{H}_2\text{L})=2.92$$

C4H6O6 H2L L-Tartaric acid CAS 87-69-4 (92)

L-Tartaric acid, L-2,3-Dihydroxybutanedioic acid; $\text{HOOC.CH}(\text{OH}).\text{CH}(\text{OH}).\text{COOH}$

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

Ge(IV) sp NaNO3 25°C 0.10M U 1973BPa (31266) 39

$$K(\text{Ge}(\text{OH})_2+\text{H}_2\text{L})=4.13$$

Ge(IV) gl NaCl 18°C 1.0M U 1957VAa (31267) 40

$$K(\text{H}_2\text{GeO}_3+\text{HL})=5.2$$

C4H10O2 L Butanediol CAS 26171-83-5 (3574)

Butanediol (1,2-/1,3-/1,4- etc not stated)

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

Ge(IV) EMF KCl 25°C 0.10M U 1959ANa (34667) 41

$$K(\text{HGeO}_3+\text{L})=0.64$$

$$K(\text{HGeO}_3+2\text{L})=0.04$$

Method: quinhydrone electrode.

C4H10O3 L CAS 623-39-2 (3577)

3-Methoxypropan-1,2-diol; $\text{CH}_2(\text{OH}).\text{CH}(\text{OH}).\text{CH}_2.\text{OCH}_3$

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

Ge(IV) oth KCl 25°C 0.10M U 1959ANa (34707) 42

$$K(\text{HGeO}_3+\text{L}=\text{GeO}_2\text{H}-2\text{L})=0.84$$



Method: quinhydrone electrode

C4H11NO8P2 H5L CAS 2439-99-8 (2129)
 N-Carboxymethyl-N,N-bis(methylenephosphonic acid); $\text{HOOC}.\text{CH}_2.\text{N}(\text{CH}_2.\text{PO}_3\text{H}_2)_2$

Metal	Mtd	Medium	Temp	Conc	Cal	Flags	Lg	K values	Reference	ExptNo
Ge(IV)	sp	KNO3	20°C	0.10M	U				1988SBb (35109)	43
									$K(\text{Ge}+\text{HL})=17.1$	

Phosphate buffer pH=6

Ge(IV)	sp	KNO3	20°C	0.10M	U				1986SBb (35110)	44
									$K(\text{Ge}(\text{OH})_2+\text{H}_2\text{L})=4.18$	

C5H4O3 HL Pyromeconic aci CAS 496-63-9 (3600)
 3-Hydroxy-4H-pyran-4-one;

Metal	Mtd	Medium	Temp	Conc	Cal	Flags	Lg	K values	Reference	ExptNo
Ge(IV)	sp	NaCl	25°C	0.50M	U				1967CBb (36272)	45
									$K(\text{Ge}(\text{OH})_4+2\text{HL}=\text{Ge}(\text{OH})_2\text{L}_2)=2.86$	

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

Metal	Mtd	Medium	Temp	Conc	Cal	Flags	Lg	K values	Reference	ExptNo
Ge(IV)	cal	non-aq	25°C	100%	U	H			1967MOB (36638)	46
Medium: n-hexane. $\text{DH}(\text{GeF}_4(\text{l})+2\text{L}(\text{l})=\text{GeF}_4\text{L}_2(\text{c}))=-202.3$ kJ mol ⁻¹ , $\text{DH}(\text{GeF}_4(\text{g})+2\text{L}(\text{l})=\text{GeF}_4\text{L}_2(\text{c}))=-224$; $\text{DH}(\text{GeCl}_4(\text{g})+2\text{L}(\text{l})=\text{GeCl}_4\text{L}_2(\text{c}))=-207$. Plus others										

C5H10N07P H4L PMIDA CAS 5994-61-6 (2433)
 N-(Phosphonomethyl)iminodiethanoic acid; $\text{H}_2\text{O}_3\text{P}.\text{CH}_2.\text{N}(\text{CH}_2.\text{COOH})_2$

Metal	Mtd	Medium	Temp	Conc	Cal	Flags	Lg	K values	Reference	ExptNo
Ge(IV)	sp	KNO3	20°C	0.10M	U				1988SBb (39676)	47
									$K(\text{Ge}(\text{OH})+\text{HL})=10.4$	

Phosphate buffer pH 6

Ge(IV)	sp	KNO3	20°C	0.10M	U				1986SBb (39677)	48
									$K(\text{Ge}(\text{OH})_2+\text{HL})=6.48$	

C5H10O5S2 HL CAS 110-50-9 (591)
 (Butoxy)dithiomethanoic acid; $\text{CH}_3.\text{CH}_2.\text{CH}_2.\text{CH}_2.\text{CSSH}$

Metal	Mtd	Medium	Temp	Conc	Cal	Flags	Lg	K values	Reference	ExptNo
Ge(IV)	sp	KNO3	20°C	0.10M	U	I			1982SGc (40158)	49

K(Ge(OH)2+2L)=8.82

C5H10O4 L Deoxy-Ribose CAS 533-67-5 (7470)
2-Deoxy-D-ribose, 2-Deoxy-D-erythro-pentose;

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

Ge(IV) gl KCl 25°C 0.10M U 1979HUa (40327) 50
K(H2GeO3+L)=3.44

C5H10O5 L D-Arabinose CAS 10323-20-3 (3606)
D-Arabinose;

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

Ge(IV) gl KCl 25°C 0.10M U 1959ATa (40335) 51
K(HGeO3+2L=HGeO(H-2L)2)=3.52

C5H10O5 L D-Xylose CAS 58-86-6 (3607)
D-Xylose;

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

Ge(IV) gl KCl 25°C 0.10M U 1959ATa (40362) 52
K(HGeO3+2L=HGeO(H-2L)2)=3.38

C5H10O5 L L-Arabinose CAS 5328-37-0 (1616)
L-Arabinose

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

Ge(IV) gl KCl 25°C 0.10M U 1959ATa (40370) 53
K(HGeO3+2L=HGeO(H-2L)2)=3.63

C6H03Cl3 HL CAS 69173-78-0 (3668)
Trichlorohydroxy-1,4-benzoquinone;

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

Ge(IV) sp NaCl 25°C 0.50M U 1966BBb (42031) 54
K(Ge(OH)4+2HL) < 1.4

C6H2N2O8 H2L Nitroanilic aci CAS 479-22-1 (3669)
3,6-Dinitro-2,5-dihydroxy-1,4-benzoquinone;

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

Ge(IV) sp NaCl04 25°C 3.0M U 1967BBa (42034) 55
K(Ge(OH)4+2HL=Ge(OH)2L2)=4.9

Medium: LiCl04

C6H2O4Cl2 H2L Chloranilic acid CAS 87-88-7 (1281)
3,6-Dichloro-2,5-dihydroxy-1,4-benzoquinone;

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

Ge(IV) gl NaCl 25°C 0.50M U 1964BBb (42051) 56
K(Ge(OH)4+2HL)=6.57

Ge(IV) sp KCl 25°C 0.50M U 1964BBb (42052) 57
K(Ge(OH)2L2+H)=0.8

Medium: HCl

Ge(IV) sp oth/un 25°C 2.50M U 1962NFa (42053) 58
K(Ge(OH)4+HL)=7.64
K(Ge(OH)3L+HL)=6.30
K(Ge(OH)2L2+HL)=5.65

C6H4N2O6 H2L CAS 7659-29-2 (2694)
1,2-Dihydroxy-3,5-dinitrobenzene; (HO)2.C6H2(NO2)2

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

Ge(IV) sp NaClO4 25°C 0.10M U 1970NLd (42266) 59
B3=47.85

C6H4O4 H2L CAS 615-94-1 (1280)
2,5-Dihydroxy-1,4-benzoquinone;

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

Ge(IV) sp KCl 25°C 0.50M U 1967BBa (42305) 60
K(Ge(OH)4+2HL=Ge(OH)2L2)=8.09
K(Ge(OH)2L2+H=Ge(OH)2HL2)=1.8

Ge(IV) sp NaCl 25°C 0.50M U 1966BBb (42306) 61
K(Ge(OH)4+2HL=Ge(OH)2L2)=9.1

C6H4O5 H2L Comenic acid CAS 499-78-5 (2544)
3-Hydroxypyran-4-one-6-carboxylic acid;

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

Ge(IV) sp NaCl 25°C 0.50M U 1967CBb (42319) 62
K(Ge(OH)4+2HL=Ge(OH)2L2)=2.25

C6H4O10S2 H4L Euthiochronic a (3670)
3,6-Disulfo-2,5-dihydroxy-1,4-benzoquinone;

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

Ge(IV) sp NaCl 25°C 0.50M U 1967BBa (42333) 63
K(Ge(OH)4+2HL=Ge(OH)2L2)=6.35

C6H5N04 H2L 3-Nitrocatechol CAS 6665-98-1 (2685)
1,2-Dihydroxy-3-nitrobenzene; O2N.C6H3(OH)2

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

Ge(IV) sp NaCl04 25°C 0.10M U 1970NLc (42861) 64
B3=59.59

C6H5N04 H2L 4-Nitrocatechol CAS 3316-09-4 (890)
1,2-Dihydroxy-4-nitrobenzene; O2N.C6H3(OH)2

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

Ge(IV) sp KCl 25°C 0.10M U 1967PBd (42928) 65
K(Ge(OH)4+3H2L=GeL3+2H)=3.90

C6H5O2Cl H2L 4-Cl-Catechol CAS 2138-22-9 (1656)
1,2-Dihydroxy-4-chlorobenzene; Cl.C6H3(OH)2

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

Ge(IV) sp NaCl 25°C 0.10M U 1967PBd (43082) 66
K(Ge(OH)4+3H2L=GeL3+2H)=0.65

C6H5O4Cl HL Chlorokojic aci (3086)
3-Chloro-5-hydroxy-2-hydroxymethyl-4-pyrone;

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

Ge(IV) sp NaCl 25°C 0.50M U 1967CBb (43133) 67
K(Ge(OH)4+2HL=Ge(OH)2L2)=2.33

C6H5O4I HL Iodokojic acid CAS 40838-33-3 (3681)
3-Iodo-5-hydroxy-2-hydroxymethyl-4-pyrone;

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

Ge(IV) sp NaCl 25°C 0.50M U 1967CBb (43143) 68
K(Ge(OH)4+2HL=Ge(OH)2L2)=2.49

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

Ge(IV) gl NaCl 25°C 0.10M M 1998PSc (43768) 69

$K(\text{Ge}(\text{OH})_4+3\text{H}_2\text{L}=\text{GeL}_3+2\text{H}+4\text{H}_2\text{O})=-1.39$

Method: solubility of $\text{GeO}_2(\text{hex})$ in 0.1 m $\text{NaCl}/0.01-0.05$ m H_2L .

Ge(IV) gl oth/un 25°C 0.0 U 1963ANc (43769) 70
 $K(\text{HGeO}_3+3\text{H}_2\text{L}=\text{HGeL}_3)=8.67$

Ge(IV) gl KCl 25°C 0.10M U 1959AMa (43770) 71
 $K(\text{H}_2\text{GeO}_3+3\text{H}_2\text{L}=\text{GeL}_3+2\text{H})=-0.77$

C6H6O3 H3L Pyrogallol CAS 87-66-1 (696)
1,2,3-Trihydroxybenzene; $\text{C}_6\text{H}_3(\text{OH})_3$

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

Ge(IV) gl oth/un 25°C 0.0 U 1963ANc (43961) 72
 $K(\text{HGeO}_3+3\text{H}_3\text{L}=\text{HGe}(\text{HL})_2)=9.05$

Ge(IV) gl KCl 25°C 0.10M U 1959AMa (43962) 73
 $K(\text{H}_2\text{GeO}_3+3\text{H}_3\text{L}=\text{Ge}(\text{HL})_3+2\text{H})=-0.22$

C6H6O3 HL Maltol CAS 118-71-8 (2442)
3-Hydroxy-2-methyl-4H-pyran-4-one;

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

Ge(IV) gl KNO_3 20°C 0.10M C 1979MBf (44088) 74
 $K(\text{GeO}_2+2\text{HL}=\text{Ge}(\text{OH})_2\text{L}_2)=4.2$
 $K(\text{GeO}_2+3\text{HL}+\text{H}=\text{GeL}_3+2\text{H}_2\text{O})=8.3$

Ge(IV) sp NaCl 25°C 0.50M U 1966BBb (44089) 75
 $K(\text{Ge}(\text{OH})_4+2\text{HL}=\text{Ge}(\text{OH})_2\text{L}_2)=3.90$
 $K(\text{Ge}(\text{OH})_4+3\text{HL}+\text{H}=\text{GeL}_3)=8.05$

C6H6O3 HL Allomaltol CAS 644-46-2 (2688)
5-Hydroxy-2-methyl-4H-pyran-4-one;

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

Ge(IV) sp NaCl 25°C 0.50M U 1967CBb (44127) 76
 $K(\text{Ge}(\text{OH})_4+2\text{HL}=\text{Ge}(\text{OH})_2\text{L}_2)=3.43$

C6H6O4 HL Kojic acid CAS 501-30-4 (1800)
5-Hydroxy-2-(hydroxymethyl)-4H-pyran-4-one;

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

Ge(IV) gl KNO_3 20°C 0.10M C 1979MBf (44219) 77
 $K(\text{GeO}_2+2\text{HL}=\text{Ge}(\text{OH})_2\text{L}_2)=3.2$
 $K(\text{GeO}_2+3\text{HL}+\text{H}=\text{GeL}_3+2\text{H}_2\text{O})=6.0$

Ge(IV) sp NaCl 25°C 0.50M U 1967CBb (44220) 78
K(Ge(OH)4+2HL=Ge(OH)2L2)=2.81

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

Ge(IV) sp NaCl 25°C 1.00M U I 1967PBd (44453) 79
K(Ge(OH)4+2H2L=GeL2)=3.89
K'(Ge(OH)4+3H2L=GeL3+2H)=3.70
K=2.30(I=0.11), 3.10(I=0.26), 3.50(I=0.50)

Ge(IV) gl KCl 25°C var U 1966ATc (44454) 80
K(Ge(OH)4+3H2L=GeL3+2H)=-2.307+27.49SQRTI/(1+2.851SQRTI)-0.370I

Ge(IV) gl KCl 25°C 0.10M U 1959AMa (44455) 81
K(Ge(OH)4+3H2L=GeL3+2H)=-2.74

C6H8O7 H3L Citric acid CAS 77-92-9 (95)
2-Hydroxypropane-1,2,3-tricarboxylic acid; HOOCCH2.CH(OH)(COOH).CH2COOH

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

Ge(IV) gl NaCl 25°C 0.10M M 1998PSc (46126) 82
K(Ge(OH)4+2H3L=Ge(OH)2(H2L)2+2H2O)=6.2, K(Ge(OH)4+H2L=Ge(OH)3HL+H2O)=
2.4. Method: solubility of GeO2(hex) in 0.1 m NaCl/0.02 m H3L.

Ge(IV) sp NaNO3 25°C 0.10M U 1973BPa (46127) 83
K(Ge(OH)2+H3L)=2.01 pH 1-2

C6H9NO6 H3L NTA CAS 139-13-9 (191)
Nitrilotriethanoic acid; N(CH2.COOH)3

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

Ge(IV) sp KNO3 20°C 0.10M U 1988SBb (46843) 84
K(Ge(OH)2+HL)=4.06

Phosphate buffer pH=6

Ge(IV) sp KNO3 20°C 0.10M U 1986SBb (46844) 85
K(Ge(OH)2+HL)=3.82

Ge(IV) gl KNO3 20°C 0.10M U 1981MMe (46845) 86
K(GeO2+H2L=Ge(OH)2L)=4.42

C6H10O7 HL Glucuronic acid CAS 6556-12-3 (599)
D-Glucuronic acid;

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

Ge(IV) gl KCl 25°C 0.10M M K1=1.70 1986HPb (48420) 87

C6H11NO5 H2L HIMDA CAS 93-62-9 (192)
N-(2-Hydroxyethyl)iminodiethanoic acid; HO.CH2.CH2.N(CH2.COOH)2

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

Ge(IV) sp KNO3 20°C 0.10M U 1988SBb (48739) 88
K(Ge(OH)2+L)=8.42

Phosphate buffer pH=6

C6H12O52 HL CAS 123-97-7 (6144)
Pentoxydithiomethanoic acid; C5H11.0.C(S)SH

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

Ge(IV) sp KNO3 20°C 0.10M U I 1982SGc (49411) 89
K(Ge(OH)2+2L)=8.72

C6H12O5 L L-Rhamnose CAS 634-74-2 (3659)
6-Deoxy-L-mannose;

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

Ge(IV) gl KCl 25°C 0.10M U 1959ATa (49507) 90
K(HGeO3+2L=HGeO(H-2L)2)=3.24

C6H12O6 L D-Fructose CAS 57-48-7 (1561)
D-Fructose

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

Ge(IV) gl NaCl 25°C 0.10M M 1998PSc (49548) 91
K(GeO(OH)3+2L=Ge(OH)(H-2L)2+3H2O)=5.48.
2.4. Method: solubility of GeO2(hex) in 0.1 m NaCl/0.02 m L.

Ge(IV) gl KCl 25°C var U I 1963NFA (49549) 92
K(HGeO3+2L)=4.273+1.155SQRTI

Ge(IV) gl KCl 25°C 0.10M U 1958ANa (49550) 93
K(HGeO3+2L=HGeO(H-2L)2)=5.48

C6H12O6 L D-Galactose CAS 59-23-4 (1559)
D-Galactose

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

Ge(IV) gl KCl 25°C var U I 1963NFA (49565) 94
K(HGeO3+2L)=2.117+1.297SQRTI

Ge(IV) gl KCl 25°C 0.10M U 1958ANa (49566) 95
K(HGeO3+2L=HGeO(H-2L)2)=3.29

C6H12O6 L D-Glucose CAS 492-62-6 (1560)
D-Glucose

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

Ge(IV) gl KNO3 20°C 0.10M M 1980MBc (49589) 96
K(GeO2+2H2L=Ge(OH)L2+H)=-6.33
K'(Ge(OH)L2+H2L=GeL3+H)=-10.6

For L=D-dulcitol, K=-3.88, K'=-10.0; L=D-adonitol, K=-5.43, K'=-10.6.

Ge(IV) gl KCl 25°C var U I 1963NFa (49590) 97
K(HGeO3+2L)=1.451+1.178SQRTI

Ge(IV) gl KCl 25°C 0.10M U 1958ANa (49591) 98
K(HGeO3+2L=HGeO(H-2L)2)=3.46

C6H12O6 L D-Mannose CAS 3458-28-4 (1562)
D-Mannose

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

Ge(IV) gl KCl 25°C 0.10M U 1958ANa (49606) 99
K(HGeO3+2L=HGeO(H-2L)2)=4.13

C6H12O6 L Sorbose CAS 87-79-6 (930)
L(-)-Sorbose;

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

Ge(IV) gl KCl 25°C 0.10M U 1959ATa (49614) 100
K(HGeO3+2L=HGeO(H-2L)2)=5.35

C6H12O6 L Inositol CAS 87-89-8 (2285)
myo-Inositol, meso-Inositol;

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

Ge(IV) gl KCl 25°C 0.10M U 1967FAa (49638) 101
K(HGeO3+2L=HGeO(H-2L)2)=2.140

C6H12O7 HL Gluconic acid CAS 526-95-4 (904)
D-Gluconic acid, 2,3,4,5,6-Pentahydroxyhexanoic acid; HO.CH2(CHOH)4.COOH

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

Ge(IV) gl KCl 25°C 0.10M M K1=2.06 1986HPb (49721) 102

 C6H13NO6 HL CAS 84518-56-9 (4387)
 2-Amino-2-deoxy-D-gluconic acid;

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

 Ge(IV) gl NaClO4 25°C 0.10M U M 2000KAa (50532) 103
 B(GeO(OH)H-1L)=3.01
 B(Ge(OH)2(H-1L)2)=6.63
 B(GeO(OH)H-2L)=-6.23
 B(Ge(OH)(H-1L)2)=14.35

Metal is Ge(OH)4. Also data for ternary species Ge(OH)4ML, M = Zn, Cd, Pb.

C6H14O6 L D-Dulcitol CAS 608-66-2 (3663)
 D-Galactitol;

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

 Ge(IV) gl KCl 25°C 0.10M U 1959ARa (51061) 104
 K(HGeO3+2L=HGeO(H-2L)2)=4.71

 C6H14O6 L D-Mannitol CAS 69-65-8 (3664)
 D-Mannitol;

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

 Ge(IV) gl KNO3 20°C 0.10M C 1979MBf (51081) 105
 K(GeO2+3H2L=GeL3+2H+2H2O)=-13.7; K(GeO2+2H2L=Ge(OH)L2+H+H2O)=-4.0;
 K(Ge(OH)L2+H2O=GeL3+H+H2O)=-9.7

 Ge(IV) gl NaCl 25°C 0.50M U 1973PAb (51082) 106
 K(Ge(OH)4+L+H2O=GeH-1(OH)4L+H)=-6.43, K(Ge(OH)4+2L+H2O=GeH-1(OH)4L2+H)=-3.95
 K(2Ge(OH)4+2L+2H2O=(Ge(OH)4)2H-2L2+2H)=-10.68

 Ge(IV) gl KCl 25°C var U 1963NFa (51083) 107
 K(HGeO3+2L)=3.394+1.055SQRTI

 Ge(IV) gl KCl 25°C 0.10M U 1959ARa (51084) 108
 K(HGeO3+2L=HGeO(H-2L)2)=4.53

 C6H14O6 L Glucitol CAS 50-70-4 (2878)
 D-Sorbitol;

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

 Ge(IV) gl KNO3 20°C 0.10M C 1979MBf (51103) 109
 K(GeO2+3H2L=GeL3+2H+2H2O)=-12.3; K(GeO2+2H2L=Ge(OH)L2+H+H2O)=-3.7;
 K(Ge(OH)L2+H2O=GeL3+H+H2O)=-8.6

 Ge(IV) gl KCl 25°C 0.10M U 1959ARa (51104) 110

K(HGeO3+2L=HGeO(H-2L)2)=5.09

C6H15NO3 Triethanolamine CAS 102-71-6 (447)
Tris-(2-hydroxyethyl)amine; L

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

Ge(IV) gl KNO3 20°C 0.10M U 1981MMe (51292) 111
K(GeO2+H3L=Ge(OH)L+H2O)=5.26

C7H4O7 H3L Meconic acid CAS 497-59-6 (3723)
3-Hydroxy-4-pyrone-2,6-dicarboxylic acid;

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

Ge(IV) sp NaCl 25°C 0.50M U 1967CBb (52565) 112
K(Ge(OH)4+2HL) < 1

C7H6O2 HL Tropolone CAS 533-75-5 (3129)
2-Hydroxycyclohepta-2,4,6-trien-1-one;

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

Ge(IV) sp NaCl 25°C 0.50M U 1966BBb (53675) 113
K(Ge(OH)4+2HL)=8.03
K(Ge(OH)4+3HL+H)=13.3

C7H6O3 H2L CAS 139-85-5 (881)
3,4-Dihydroxybenzaldehyde, protocatechuic aldehyde; C6H3(OH)2.CHO

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

Ge(IV) gl KCl 25°C 0.10M U 1968A0a (54355) 114
K(HGeO3+3H2L)=2.78

C8H6O4 H2L CAS 6272-27-1 (4474)
2,3-Dihydro-6,7-dihydroxy-3-oxobenzofuran;

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

Ge(IV) sp oth/un 25°C ? U M 1967NPa (58815) 115
K(Ge(OH)2+2H2L=Ge(OH)2L2+4H)=11.4

C8H8O3 HL Mandelic Acid CAS 611-72-3 (80)
2-Phenyl-2-hydroxyethanoic acid; C6H5.CH(OH).COOH

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

Ge(IV) EMF KCl 25°C 0.10M U 1962CLb (59836) 116
K(GeL3+H)=3.83

K(GeHL3+H)=2.53

Ge(IV) con NaCl 18°C 1.0M U 1957VAa (59837) 117
K(H2GeO3+2HL)=2.0

Ge(IV) gl oth/un 18°C 0.0 U 1957VAa (59838) 118
K(H2GeO3+2HL)=2.92

C9H5NOCl2 HL CAS 773-76-2 (3278)
5,7-Dichloro-8-hydroxyquinoline;

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

Ge(IV) sp NaCl 25°C 0.50M U 1967Tmd (63543) 119
K(Ge(OH)4+2HL=Ge(OH)2L2)=6.7

C9H6NO4IS H2L Ferron CAS 547-91-1 (275)
7-Iodo-8-hydroxyquinoline-5-sulfonic acid; (HO)(HO3S)C9H4NI

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

Ge(IV) sp NaCl 25°C 0.50M U 1967Tmd (63805) 120
K(Ge(OH)4+2HL=Ge(OH)2L2)=6.78

C9H7N L CAS 119-65-3 (487)
Isoquinoline;

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

Ge(IV) cal non-aq 25°C 100% U H 1967MOb (64026) 121
Medium: n-hexane. Many data; DH(GeF4(l)+2L(l)=GeF4L2(c))=-149.2 kJ mol-1
DH(GeF4(g)+2L(l)=GeF4L2(c))=-170.9, DH(GeCl4(l)+2L(l)=GeCl4L2(c))=-93.2

C9H7NO HL Oxine CAS 148-24-3 (504)
8-Hydroxyquinoline (8-quinolinol);

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

Ge(IV) sp NaCl 25°C 0.50M U 1967Tmd (64279) 122
K(Ge(OH)4+2HL=Ge(OH)2L2)=6.61

C9H7NO4S H2L Sulfoxine CAS 84-88-8 (448)
8-Hydroxyquinoline-5-sulfonic acid;

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

Ge(IV) sp NaCl 25°C 0.50M U 1967Tmd (64549) 123
K(Ge(OH)4+2HL=Ge(OH)2L2)=6.55

C9H28N3O15P5 10L DTPPH CAS 15827-60-8 (2921)

Ge(IV) gl KCl 25°C 0.10M M K1=2.32 B2=3.25 1986HPb (82866) 138

C12H22O11 L alpha-Lactose CAS 5989-81-1 (2486)
4-D-Beta-D-Galactopyranosyl-alpha-D-glucose;

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

Ge(IV) gl KCl 25°C 0.10M M K1=1.97 1986HPb (82875) 139

C12H22O11 L Maltose CAS 6363-53-7 (2705)
4-O-alpha-D-Glucopyranosyl-D-glucose, Maltobiose;

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

Ge(IV) gl KCl 25°C 0.10M M K1=1.48 1986HPb (82880) 140

C12H22O11 L Cellobiose CAS 528-50-7 (2697)
4-O-beta-D-Glucopyranosyl-D-glucose;

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

Ge(IV) gl KCl 25°C 0.10M M K1=1.58 1986HPb (82886) 141

C12H22O11 L Melibiose CAS 66009-10-7 (2699)
6-O-D-Galactopyranose-D-glucose;

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

Ge(IV) gl KCl 25°C 0.10M M K1=2.32 B2=3.24 1986HPb (82890) 142

C12H22O11 L Gentiobiose CAS 554-91-6 (2698)
6-O-D-Glucopyranosyl-D-glucose, Amygdalose;

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

Ge(IV) gl KCl 25°C 0.10M M K1=1.27 1986HPb (82893) 143

C12H22O11 L Trehalose CAS 6138-23-4 (2700)
D-Glucopyranosyl-D-glucopyranoside;

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

Ge(IV) gl KCl 25°C 0.10M M K1=1.12 1986HPb (82900) 144

C12H22O11 L Sucrose CAS 57-50-1 (2523)
beta-D-Fructofuranosyl-alpha-D-glucopyranoside; Saccharose;

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

Ge(IV) gl KCl 25°C 0.10M M K1=1.00 1986HPb (82910) 145

 C12H24O11 L Maltitol CAS 585-88-6 (2709)
 4-O-alpha-D-Glucopyranosyl-D-glucitol;

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

Ge(IV) gl KCl 25°C 0.10M M K1=3.22 1988HLA (83683) 146

 C12H24O11 L Lactitol CAS 535-94-4 (2710)
 4-O-beta-D-Galactopyranosyl-D-glucitol;

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

Ge(IV) gl KCl 25°C 0.10M M K1=3.08 1988HLA (83686) 147

 C14H8O7S H3L DASA CAS 83-61-4 (950)
 1,2-Dihydroxyanthraquinone-3-sulfonic acid, Alizarin Red S;

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

Ge(IV) sp oth/un 25°C 0.10M U 1972NFb (86732) 148
 B3=52.80

Medium: acetate

 C15H11N3O HL PAN CAS 85-85-8 (572)
 1-(2-Pyridylazo)-2-naphthol; C5H4N.N:N.C10H6.OH

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

Ge(IV) sp oth/un 27°C ? U M 1974ZSa (91219) 149
 Keff(GeCl4+L)=3.3

 C18H12O6 H2L (4124)
 2,5-Dihydroxy-3,6-diphenoxy-1,4-benzoquinone;

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

Ge(IV) sp NaCl 25°C 0.50M U 1967BBa (96886) 150
 K(Ge(OH)4+2HL=Ge(OH)2L2)=8.8

 C19H12O9Br2S H6L Bromo Pyrog.Red CAS 16574-43-9 (706)
 5',5''-Dibromopyrogallolsulfonephthalein;

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

Ge(IV) sp NaNO3 ? 0.10M U 1969NMa (99011) 151
 K(Ge(OH)3+3H2L)=12.9

 C22H20O13 H5L Carminic acid CAS 1260-17-9 (714)

Carminic acid;

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

Ge(IV) sp oth/un 25°C ? U 1970BRa (101702) 152
K(Ge(OH)₄+H₅L)=4.58

Medium: conc H₂SO₄

C₂₈H₁₅N₀₄ L CAS 82-22-4 (3522)
1,1'-Iminodianthraquinone; (1,1'-dianthrimide)

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

Ge(IV) sp mixed ? 93% U 1968LNa (104653) 153
K(HGeO₂+HL)=2.35(?)

Medium: 93.2% H₂SO₄

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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

END