

SC-Database

Software version = 5.81 Data version = 4.62

Experiment list contains 271 experiments for

(no ligands specified)

Metal : Zr++++

(no references specified)

(no experimental details specified)

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e- HL Electron (442)  
Electron;

Metal	Mtd	Medium	Temp	Conc	Cal	Flags	Lg	K values	Reference	ExptNo
Zr++++	oth	none	25°C	0.0	U				1952LAB	(1037) 1

K=-96.0(-1430 mV)

K: ZrO2(s)+4H+4e=Zr(s)+2H2O. From thermodynamic data

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CO3-- H2L Carbonate CAS 465-79-6 (268)  
Carbonate;

Metal	Mtd	Medium	Temp	Conc	Cal	Flags	Lg	K values	Reference	ExptNo
Zr++++	dis	oth/un	20°C	1.00M	U	I			1987JBb	(3454) 2

B4=39.95

When I=2.5 M: B4=39.59

Zr++++	gl	KCl	25°C	1.00M	U				1982KcC	(3455) 3
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K(Zr(OH)2L+L)=11.2

Zr++++	gl	oth/un	20°C	1.0M	U				1980MCg	(3456) 4
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K4=10.9

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

Metal	Mtd	Medium	Temp	Conc	Cal	Flags	Lg	K values	Reference	ExptNo
Zr++++	cal	non-aq	25°C	100%	U	HM			1993DSb	(5964) 5

Medium: Toluene. DH(Zr(H-1A)2B2(s)+2HL=Zr(H-1L)2A2+2HB)=-373.5 kJ mol-1.

A:Cyclopentadiene. B:CH3. Also for B=C4Ph4: DH=-300.5 kJ mol-1.

Zr++++	cal	non-aq	25°C	100%	U	HM			1993DSb	(5965) 6
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Medium: Toluene. DH([Zr(H-1A)2L]2O(s)+2HL=2ZrL2(H-1A)2+H2O)=-82.4 kJ mol-1.

A:Cyclopentadiene. In isopropylether, DH=-37.5 kJ mol-1.

Zr++++	dis	NaClO4	25°C	4.00M	U	M			1976TSa	(5966) 7
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K(ZrOH+Cl)=-0.52

Zr++++	sp	NaClO4	?	3.50M	U				1972TSa	(5967) 8
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K1=-0.5

Medium: HClO4

Zr++++ dis NaClO4 20°C 2.0M U K1=0.08 B2=-0.54 1970PHb (5968) 9  
B3=-1.0

Medium: HClO4

Zr++++ ix NaClO4 ? 4.0M U I K1=0.04 B2=-0.68 1962MRc (5969) 10  
B3=-1.30

Medium: HClO4. In 2 M HClO4: K1=-0.02, B2=-0.92, B3=-1.15, B4=-1.10

Zr++++ dis NaClO4 20°C 6.54M U K1=0.92 B2=1.32 1957S0b (5970) 11  
K3=0.19  
K4=-0.33

Zr++++ dis NaClO4 25°C 2.0M U K1=0.30 1949CMc (5971) 12  
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ClO4- HL Perchlorate CAS 7001-90-3 (287)  
Perchlorate;

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

Zr++++ con oth/un ? dil U 1961MPb (6394) 13  
K(ZrOL+L)=2.73?

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

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

Zr++++ cal NaClO4 25°C 4.0M U H 1990AHa (7363) 14  
DH(Zr+HF=ZrF+H)=17.5 kJ mol<sup>-1</sup>; DH(ZrF+HF=ZrF2+H)=16.8;  
DH(ZrF2+HF=ZrF3+H)=11.2; DH(ZrF3+HF=ZrF4+H)=22

Zr++++ ISE NaNO3 25°C 0.10M U H 1987SMd (7364) 15  
K(ZrA+L)=3.04  
DH=-12.6 kJ mol<sup>-1</sup>, DS=16.4 J K<sup>-1</sup> mol<sup>-1</sup>. H3A=HEDTA

Zr++++ cal none 25°C 0 U IH 1976VKb (7365) 16  
DH(Zr+3L)=-25.1 kJ/mol  
DH(Zr+4L)=25.5 kJ/mol  
DH(Zr+5L)=7.5 kJ/mol  
DH(Zr+6L)=23.4 kJ/mol

Zr++++ ISE NaClO4 25°C 4.0M U 1973NOa (7366) 17  
\*K1=5.97  
\*K2=4.4

Medium: (H,Na)ClO4. \*Kn: ZrF(n-1)+HL=ZrFn+H

Zr++++ ix oth/un ? ? U 1972PAb (7367) 18  
K6=3.84

-----  
Zr++++ ix NaClO4 25°C 1.0M U I 1969KKe (7368) 19

\*K1=5.32

\*B2=9.11

Medium: HClO4; \*K1=5.81(I=2); \*B2=9.38(I=2). In HNO3, I=1: \*K1=5.41,\*B2=9.65  
I=2: \*K1=5.79, \*B2=9.53. \*Bn: Zr+nHL=ZrLn+nH

-----  
Zr++++ dis NaClO4 20°C 4.0M U 1969NOa (7369) 20

\*K1=5.88

\*K2=4.36

\*K3=3.00

\*K4=2.3

Medium: HClO4. \*Kn: ZrF(n-1)+HF=ZrFn+F

-----  
Zr++++ EMF NaClO4 20°C 4.0M U 1967NOa (7370) 21

K(ZrF+HF=ZrF2+H)=4.42

K(ZrF2+HF=ZrF3+H)=3.00

K(ZrF3+HF=ZrF4+H)=2.28

K(ZrF4+HF=ZrF5+H)=1.53

Medium:HClO4. K(ZrF5+HF=ZrF6+H)=0.3

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Zr++++ EMF oth/un ? 0.50M U 1967PMa (7371) 22

K6=3.6

Medium: HCl

-----  
Zr++++ EMF NaClO4 25°C 1.0M U 1966BFb (7372) 23

K4=2.8

K5=1.9

K6=1.35

Method:quinhydrone electrode

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Zr++++ ix NaClO4 20°C 4.00M U 1963AKc (7373) 24

K(Zr+HF=ZrF+H)=5.96

K(ZrF+HF=ZrF2+H)=4.54

Method: cation exchange. Medium:HClO4

-----  
Zr++++ con NaClO4 25°C 0.50M U 1962BUB (7374) 25

K(ZrF2+HF=ZrF3+H)=2.7

K(ZrF3+HF=ZrF4+H)=1.83

K(ZrF4+HF=ZrF5+H)=1.51

K(ZrF5+HF=ZrF6+H)=0.86

-----  
Zr++++ dis none 25°C 0.0 U K1=9.80 1955PAa (7375) 26

-----  
Zr++++ dis NaClO4 25°C 2.00M U 1949CMc (7376) 27

K(Zr+HF=ZrF+H)=5.80

K(ZrF+HF=ZrF2+H)=4.32

K(ZrF2+HF=ZrF3+H)=2.83

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MoO4-- H2L Molybdate (443)

Molybdate;

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Metal Mtd Medium Temp Conc Cal Flags Lg K values Reference ExptNo  
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Zr++++ kin oth/un 25°C var U K1=9.11 1963YRa (8764) 28  
K(Zr+H2L=ZrL+2H)=4.18

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

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Metal Mtd Medium Temp Conc Cal Flags Lg K values Reference ExptNo  
-----  
Zr++++ dis NaClO4 20°C 2.0M U K1=-0.05 B2=-0.46 1970PHb (10015) 29  
Medium: HClO4

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Zr++++ ix NaClO4 ? 4.0M U I K1=-0.06 B2=-0.85 1962MRc (10016) 30  
Medium: HClO4. In 2 M HClO4: K1=-0.04, B2=-0.34

-----  
Zr++++ dis NaClO4 25°C 2.50M U 1962NPc (10017) 31  
K(ZrO+2L)=1.91  
K(ZrO+4L)=1.63  
Medium: HClO4. Kd(ZrO+2H+4L+2T(CCl4)=ZrL4T2(CCl4))=2.37; T=(BuO)2BuPO

-----  
Zr++++ dis oth/un 23°C 0.0 U M 1961UHb (10018) 32  
K(Zr+4L+2TBP(CCl4)=ZrL4(TBP)2(CCl4))=-1.8

-----  
Zr++++ ix NaClO4 ? 2.0M U B2=0.22 1958PSb (10019) 33

-----  
Zr++++ dis NaClO4 20°C 4.0M U K1=0.34 B2=0.11 1957SOB (10020) 34  
K3=-0.37  
K4=-0.56  
B5=-1.5  
B6=-1.7

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Zr++++ dis NaClO4 25°C 2.0M U K1=0.3 1949CMc (10021) 35  
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OH- HL Hydroxide (57)  
Hydroxide;

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Metal Mtd Medium Temp Conc Cal Flags Lg K values Reference ExptNo  
-----  
Zr++++ gl NaClO4 25°C 1.0M C T H 2004EKa (12532) 36

\*K1=-0.87  
\*B(2)=-2.9  
\*B3=-4.9  
\*B4=-6.7  
Additional method extraction of 95Zr with acac into toluene. \*B(2,6)=-2.42  
\*B(4,8)=5.23. Data for 15 and 35 C. DH(\*K1)=63, DH(\*B4)=250, DH(\*B2,6)=150

-----  
Zr++++ sol NaClO4 25°C 1.0M C 2004EKa (12533) 37

Ks4=-7.3  
\*Kso=-0.70  
Ks(Zr(OH)4=ZrO3+H2O+2H)=-33.26  
K(Zr+3H2O=ZrO3+6H)=-32.56

Ks4: Zr(OH)4(s)=Zr(OH)4(aq).

-----  
Zr++++ gl KNO3 25°C 0.20M U I 1998VDa (12534) 38

\*B3=-2.02  
\*B4=-6.09  
\*B(2,7)=-5.26

At I=0.50 M: \*B3=-2.18, \*B4=-6.7, \*B(2,7)=-5.39.

At I=2.0 M: \*B3=-1.77, \*B4=-6.9, \*B(2,7)=-4.35.

-----  
Zr++++ dis oth/un 25°C 0.00 U K1=12.0 1975CCa (12535) 39

\*B2=-3.5

-----  
Zr++++ dis NaClO4 20°C 4.00M U T 1973NOa (12536) 40

\*K1=0.3

Medium: HClO4; \*K1=-0.55(25 C) determined with fluoride-ion selective electrode

-----  
Zr++++ sp NaClO4 ? 3.50M U 1972TSa (12537) 41

\*B(3Zr+2H2O=Zr3O2+4H)=ca.6  
K(3ZrOH+H2O=(ZrO)3OH+4H)=ca.6

-----  
Zr++++ sp NaClO4 25°C 0.10M U I K1=14.1 B2=27.8 1969NMb (12538) 42

B3=41.4  
B4=54.6

K1=14.1, B2=27.9, B3=41.5, B4=54.7(I=0.3); K1=14.2, B2=28.0, B3=41.6, B4=54.8(I=0.5); K1=14.3, B2=28.2, B3=41.9, B4=55.2(I=1)

-----  
Zr++++ dis none 25°C 0.0 M 1967STe (12539) 43

\*K3=1.13  
\*K4=1.13  
\*K1=0.68  
\*K2=0.90

-----  
Zr++++ oth NaClO4 20°C 1.00M U T 1966BBa (12540) 44

\*Kso(Zr(OH)4(s)+4H)=3.8  
K(Zr(OH)4(s)=Zr(OH)4)=-4.36

\*Kso=4.6(20 C), 5.05(40 C); K(Zr(OH)4(s)=Zr(OH)4)=-3.9(20 - 40 C)

-----  
Zr++++ oth oth/un 20°C var U 1966BBE (12541) 45

K(Zr(OH)4(s)=Zr(OH)4)=-4.6

Medium: sea water. Method: Tyndall scattering

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Zr++++ oth oth/un 25°C ? U 1966BBE (12542) 46

K(Zr(OH)4(s)=Zr(OH)4)=-4.6

Medium: 50% sea water  
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Zr++++	oth	oth/un	?	2.0M	U	K1=11.77	1966LIa (12543)	47
Method:Literature evaluated data								
Zr++++	dis	none	25°C	0.0	M	K1=14.58 B2=29.38 B3=43.72 B4=57.85	1966SIId (12544)	48
Zr++++	sol	none	19°C	0.0	U	Kso(Zr(OH)4)=-53.96 ?	1961KBc (12545)	49
Zr++++	dis	NaCl04	25°C	1.0M	U	K1=14.32 K3=13.65 K4=13.36	1961PMb (12546)	50
Zr++++	sol	NaCl	?	2.0M	U	*B2=0.3	1961PPb (12547)	51
Zr++++	sol	oth/un	?	1.0M	U	K(Zr(OH)4(s)+OH=Zr(OH)5)=-3.6	1960SPa (12548)	52
Medium: NaOH								
Zr++++	sol	oth/un	?	var	U	Kso(Zr(OH)4)=-52	1958STb (12549)	53
Zr++++	dis	NaCl04	25°C	2.0M	U	*K1=-0.22 *K2=-0.62 *K3=-1.05 *K4=-1.17	1957S0b (12550)	54
Zr++++	sol	oth/un	?	var	U	Kso(Zr(OH)4)=-52	1957SRc (12551)	55
Zr++++	sp	oth/un	25°C	2.0M	U	*B(3,4)=5.38 *B(4,8)=8.30?	1956ZCa (12552)	56
Zr++++	sp	NaCl04	25°C	2.0M	U	*B(3,4)=5.40 *B(4,8)=8.18?	1956ZCa (12553)	57
Zr++++	dis	NaCl04	25°C	4.0M	U	*B(3,5)=6.60 *B(4,8)=9.15	1953ZIa (12554)	58
Zr++++	gl	oth/un	25°C	var	U	Ks(Zr(OH)4=Zr(OH)2+2OH)=-25.5	1950LGa (12555)	59
Zr++++	gl	oth/un	25°C	dil	U	Kso(Zr(OH)4)=-48.2	19380Ka (12556)	60

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

Metal	Mtd	Medium	Temp	Conc	Cal	Flags	Lg	K values	Reference	ExptNo
Zr++++	sp	oth/un	25°C	2.00M	U				1985THc (12760)	61
								*B(2,4)=-19.38		
Zr++++	sp	oth/un	25°C	var	U				1973KPF (12761)	62
								K(ZrO+H2L)=3.2 to 4.8		
Zr++++	sp	oth/un	20°C	1.0M	U				1970SKe (12762)	63
								K(ZrO+H2L)=3.10 (?)		
Zr++++	sp	oth/un	?	dil	U				1961BUb (12763)	64
								K(2ZrO+H2L)=5.6		

\*\*\*\*\*  
 P04--- H3L Phosphate CAS 7664-38-2 (176)  
 Phosphate;

Metal	Mtd	Medium	Temp	Conc	Cal	Flags	Lg	K values	Reference	ExptNo
Zr++++	sp	NaClO4	20°C	1.00M	U				1972DSg (13390)	65
								K(Zr+3HL)=1.59		
Zr++++	oth	oth/un	?	?	U				1945BUa (13391)	66
								Ks(ZrO(H2L)2=ZrO+2H2L)=-17.64		

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

Metal	Mtd	Medium	Temp	Conc	Cal	Flags	Lg	K values	Reference	ExptNo
Zr++++	dis	NaClO4	25°C	3.50M	U	M			1976TSa (15344)	67
								K(ZrOH+SCN)=0.95		
Zr++++	sp	NaClO4	?	3.50M	U			K1=1.06	1972TSa (15345)	68
Zr++++	dis	NaClO4	?	3.0M	U			K1=1.08 B2=2.33	1971LFb (15346)	69
								B4=2.31		
Zr++++	sp	non-aq	20°C	100%	U	I		K1=2.17 B2=3.17	1970GLa (15347)	70
								B3=6.04		
								B4=7.79		
								B5=9.43		
								B6=10.96		
								B7=12.33, B8=13.72; Medium: N,N-dimethylformamide; In acetonitrile, B6=18.6		
Zr++++	sp	NaClO4	?	?	U	I		K1=3.8 B2=7.3	1966GSI (15348)	71

B3=10.8  
 B4=14.0  
 B5=15.1  
 B6=21.0

B7=22.9, B8=25.6; constants for 0.8 M H+. Data also for 0.1 M H+: K1=2.0,  
 B2=3.4, B3=4.7, B4=5.8, B5=6.9, B6=7.9, B7=8.9, B8=9.9

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 Zr++++ sp oth/un 20°C var U 1963SCf (15349) 72  
 K(ZrO(OH)+L)=1.15

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

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

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 Zr++++ kin NaClO4 25°C 0.02M U 1979ABb (16683) 73  
 K(Zr(OH)3+HSO4=Zr(OH)2SO4+H2O)=4.96

-----  
 Zr++++ dis NaClO4 25°C 4.00M U K1=1.60 B2=2.72 1976TSa (16684) 74

-----  
 Zr++++ dis NaClO4 20°C 2.0M U 1970PHb (16685) 75  
 K(Zr+HL=ZrL+H)=2.6  
 K(Zr+2HL=ZrL2+2H)=4.5  
 K(Zr+3HL=ZrL3+3H)=5.5

Medium: 2 M HClO4

-----  
 Zr++++ dis NaClO4 20°C 4.0M U 1969NOa (16686) 76  
 \*K1=2.8  
 \*K2=0.9  
 \*K3=0.3

Medium: HClO4

-----  
 Zr++++ ix NaClO4 ? 2.30M U 1964RMd (16687) 77  
 \*K1=2.67  
 \*B2=3.54  
 \*B3=6.59

Medium: HClO4

-----  
 Zr++++ ix NaClO4 20°C 4.0M U 1963AKc (16688) 78  
 \*K1=2.85  
 \*K2=1.85

-----  
 Zr++++ ix NaClO4 ? 2.30M U 1962REb (16689) 79  
 \*K1=2.56  
 \*B2=3.34  
 \*B3=5.61

-----  
 Zr++++ sol oth/un 20°C var U 1959SAb (16690) 80  
 K(2ZrO+L)=8.73  
 -----



Zr++++ dis NaClO4 25°C 2.0M U K1=3.79 B2=6.64 1953WDa (16691) 81

Zr++++ dis NaClO4 25°C 2.0M U K1=3.74 B2=6.54 1949CMc (16692) 82  
K3=1.1

Medium: HClO4. \*K1=2.66, \*K2=1.72, \*K3=0.0

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CH2O2 HL Formic acid CAS 64-18-6 (37)  
Methanoic acid; H.COOH

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

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Zr++++ EMF oth/un 25°C 0.01M U 1969KPb (17662) 83  
K(Zr(OH3)+L)=3.36

Medium: 0.01 ZrOCl2

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CH6O6P2 H4L Medronic acid CAS 1984-15-2 (2384)  
Methanediphosphonic acid; CH2(PO3H2)2

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

-----  
Zr++++ gl KCl 25°C 0.10M U 1967KLa (18300) 84  
K(ZrO+L)=13.13  
K(ZrO+2L)=19.45  
K(ZrO+HL)=9.01  
K(ZrO+2HL)=12.18

\*\*\*\*\*

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

-----  
Zr++++ dis NaClO4 25°C 4.00M U M 1976TSa (19162) 85  
K(ZrOH+H2L=ZrL+H)=4.30

-----  
Zr++++ oth oth/un ? ? U 1968K0a (19163) 86  
K(?)=6.33

Method: metal indicator

-----  
Zr++++ sp KCl 19°C 1.0M U K1=10.26 1966KSc (19164) 87  
Medium: HCl. 18-20 C

-----  
Zr++++ ix KNO3 20°C 1.0M U I K1=11.1 B2=31.40 1964CKa (19165) 88  
Medium: HNO3. I=5: K1=11.3

-----  
Zr++++ sp oth/un ? ? U K1=9.80 B2=17.14 1964PCa (19166) 89  
K3=3.72  
K4=0.29

-----  
Zr++++ ix NaClO4 ? 2.0M U I 1962MRb (19167) 90  
K(Zr+H2L=ZrL+2H)=5.50

$K(\text{Zr}+2\text{H}_2\text{L}=\text{ZrL}_2+4\text{H})=9.7$

Medium:  $\text{HClO}_4$ ,  $I=4.0$ ,  $K(\text{Zr}+\text{H}_2\text{L}=\text{ZrL}+2\text{H})=5.60$

-----  
Zr++++ gl oth/un 25°C ? U 1961GAa (19168) 91

$K_3(?)=4.0$

\*\*\*\*\*  
C2H4O2 HL Acetic acid CAS 64-19-7 (36)  
Ethanoic acid;  $\text{CH}_3.\text{COOH}$

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

-----  
Zr++++ kin none 25°C 0.00 U 1973VPa (20239) 92

$K(\text{Zr}(\text{OH})_2+\text{L})=6.18$

-----  
Zr++++ EMF oth/un 25°C 0.01M U 1969KPb (20240) 93

$K(\text{Zr}(\text{OH})_3+\text{L})=3.35$

$K(\text{Zr}(\text{OH})_3\text{L}+\text{L})=1.83$

Medium:  $\text{ZrOCl}_2$

\*\*\*\*\*  
C2H4O3 HL Glycolic acid CAS 79-14-1 (33)  
2-Hydroxyethanoic acid;  $\text{HO}.\text{CH}_2.\text{COOH}$

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

-----  
Zr++++ kin none 25°C 0.00 U 1973KPg (20667) 94

$K(\text{Zr}(\text{OH})_2+\text{L})=7.7$

-----  
Zr++++ sp KCl ? 1.00M U 1970KKd (20668) 95

$K(\text{Zr}(\text{OH})_2+\text{L})=6.48$

$K(\text{Zr}(\text{OH})_3+\text{L})=6.57$

\*\*\*\*\*  
C2H8O7P2 H4L HEDPA CAS 2809-21-4 (436)  
1-Hydroxyethane-1,1-diphosphonic acid;  $\text{CH}_3.\text{C}(\text{OH})(\text{PO}_3\text{H}_2)_2$

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

-----  
Zr++++ gl KCl 25°C 0.10M U 1967KLa (23407) 96

$K(\text{ZrO}+\text{L})=15.18$

$K(2\text{ZrO}+\text{H}-1\text{L})=26.04$

$K(2\text{ZrO}+\text{L})=20.40$

$K(\text{ZrO}+2\text{H}-1\text{L})=21.92$

$K(\text{ZrO}+2\text{L})=18.63$

\*\*\*\*\*  
C2H8O7P2 H5L CAS 76267-75-9 (4226)  
2-Hydroxyethylidenediphosphonic acid;  $\text{HO}.\text{CH}_2.\text{CH}(\text{PO}_3\text{H}_2)_2$

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

-----  
Zr++++ sp oth/un 25°C 2.0M U 1999VKa (23411) 97

$K(\text{Zr}+\text{H}_3\text{L}=\text{ZrH}_3\text{L})=7.82$

In 2.0 M HClO4, T=room

\*\*\*\*\*

C3H2O5                    H2L    Mesoxalic acid        (3544)  
Oxopropanedioic acid; HOOC.CO.COOH            (Ketomalonic acid)

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

Zr++++      ix NaClO4    ?    2.0M U            K1=4            1960REa (23490) 98

\*\*\*\*\*

C3H4O4                    H2L    Malonic acid        CAS 141-82-2 (79)  
Propanedioic acid; CH2(COOH)2

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

Zr++++      kin oth/un 25°C var U            1961YRa (24602) 99  
K(Zr(OH)3+H2L=Zr(OH)3L+2H)=1.46

\*\*\*\*\*

C3H6O2                    HL     Propionic acid    CAS 79-09-4 (35)  
Propanoic acid; CH3.CH2.COOH

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

Zr++++      kin oth/un 25°C 0.05M U    M            1977VPa (25079) 100  
B(Zr+2OH+L)=36.40

-----  
Zr++++      EMF oth/un 25°C 0.01M U    M            1969KPb (25080) 101  
K(Zr(OH)3+L)=3.77

Medium: ZrOCl2

\*\*\*\*\*

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  
-----

Zr++++      ix NaClO4    ?    2.0M U            1964RMd (25582) 102  
K(Zr+HL=ZrL+H)=2.28  
K(Zr+2HL=ZrL2+2H)=2.5

-----  
Zr++++      ix oth/un    ?    2.0M U            1960REa (25583) 103  
K(Zr+HL=ZrL+H)=1.98

\*\*\*\*\*

C3H7NO2S                    H2L    Cysteine            CAS 52-90-4 (96)  
2-Amino-3-mercaptopropanoic acid; H2N.CH(CH2.SH)COOH

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

Zr++++      gl NaNO3    15°C 0.10M U T            K1=14.40            1984IDa (26854) 104  
At 30 C, K1=13.15.

\*\*\*\*\*

C3H8O                    L     isoPropanol        CAS 67-63-0 (2024)

2-Propanol; CH<sub>3</sub>.CH(OH).CH<sub>3</sub>

```
-----
Metal      Mtd Medium Temp Conc Cal Flags Lg K values      Reference ExptNo
-----
Zr++++    cal non-aq 25°C 100% U  HM                      1993DSb (27647) 105
Medium: Toluene or iso-propyl ether. DH(Zr(H-1A)2BH(s)+L=Zr(H-1A)2B(H-1L)+
H2)=-69.5 kJ mol-1. A:Cyclopentadiene. B:Cl. Also data for L= MeOH, EtOH etc
*****
C3H12NO9P3      H6L      NTPA                      CAS 6419-19-8 (2920)
Nitrilotris(methylenephosphonic acid); N(CH2P03H2)3
-----
```

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-----
Metal      Mtd Medium Temp Conc Cal Flags Lg K values      Reference ExptNo
-----
Zr++++    sp  oth/un 25°C  2.0M U                      1999VKa (28601) 106
                                         K(Zr+H3L=ZrH3L)=13.04
-----
```

In 2.0 M HClO<sub>4</sub>, T=room

```
*****
C4H6O4      H2L      Succinic acid  CAS 110-15-6 (112)
1,4-Butanedioic acid; HOOC.CH2.CH2.COOH
-----
```

```
-----
Metal      Mtd Medium Temp Conc Cal Flags Lg K values      Reference ExptNo
-----
Zr++++    kin oth/un 25°C  var  U                      1961YRa (30078) 107
                                         K(Zr(OH)3+H2L)=1.46
-----
```

```
*****
C4H6O4S      H3L      Thiomalic acid  CAS 70-49-5 (109)
2-Mercaptosuccinic acid, 2-Sulfanyl-1,4-butanedioic acid; HOOC.CH(SH).CH2.COOH
-----
```

```
-----
Metal      Mtd Medium Temp Conc Cal Flags Lg K values      Reference ExptNo
-----
Zr++++    gl  oth/un  ?  .005M U                      1965SNa (30380) 108
                                         K(ZrO+L)=9.6
-----
```

```
*****
C4H6O5      H2L      Malic acid      CAS 617-48-1 (393)
2-Hydroxybutane-1,4-dioic acid, Hydroxy-succinic acid; HOOC.CH2.CH(OH).COOH
-----
```

```
-----
Metal      Mtd Medium Temp Conc Cal Flags Lg K values      Reference ExptNo
-----
Zr++++    ix  NaClO4  ?  2.0M U                      1964RMd (30768) 109
                                         K(Zr+H2L=ZrHL+H)=2.24
-----
```

```
-----
Zr++++    ix  NaClO4  ?  2.0M U                      1960REa (30769) 110
                                         K(Zr+H2L=ZrHL+H)=1.94
-----
```

Medium: HClO<sub>4</sub>

```
*****
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
-----
```

Zr++++ sp KCl 25°C 1.00M U 1978KKf (31405) 111  
K(Zr(OH)+HL)=8.76

Zr++++ EMF oth/un 25°C dil U T 1973KKf (31406) 112  
K(Zr(OH)3+L)=6.07  
K(20 C)=6.15; K(30 C)=5.92; K(35 C)=5.84

Zr++++ ix oth/un ? ? U 1973ZGb (31407) 113  
K(Zr(OH)2+H2L)=9.80

Zr++++ EMF oth/un 25°C ? U 1970KKb (31408) 114  
K(Zr(OH)3+L)=6.09  
K(Zr(OH)3L+L)=3.06

Zr++++ oth oth/un ? ? U 1968K0a (31409) 115  
K(?)=5.31

Method: metal indicator

Zr++++ sp KCl 19°C 1.0M U 1966KSe (31410) 116  
K(Zr+HL)=6.86

Medium: HCl. 18-20 C

Zr++++ ix NaClO4 ? 2.0M U 1964RMd (31411) 117  
K(Zr+H2L=ZrHL+H)=2.49

Zr++++ kin oth/un 25°C var U 1961YRa (31412) 118  
K(Zr(OH)3+H2L)=5.51  
K(Zr(OH)L+H2L=ZrL2+H)=0.95

Zr++++ ix NaClO4 ? 1.0M U I 1960REa (31413) 119  
K(Zr+H2L=ZrHL+H)=3.15

Medium: HClO4

Zr++++ dis NaClO4 ? 2.0M U 1959REa (31414) 120  
K(Zr+H2L=ZrHL+H)=2.19

Medium: HClO4

\*\*\*\*\*

C4H6O6 H2L meso-Tartaric CAS 147-73-9 (91)  
meso-2,3-Dihydroxybutanedioic acid; HOOC.CH(OH).CH(OH).COOH

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

Zr++++ sp KCl 25°C 1.00M U 1978KKf (31433) 121  
K(Zr(OH)+HL)=9.40

\*\*\*\*\*

C4H7NO4 H2L Aspartic acid CAS 56-84-8 (21)  
Aminobutanedioic acid; H2N.CH(CH2.COOH).COOH

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

Zr++++ gl NaClO4 25°C 0.10M U K1=9.70 B2=16.55 1972SSg (31985) 122  
K3=3.50

\*\*\*\*\*  
C4H7NO4 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  
-----

Zr++++ ix oth/un ? 2.0M U 1964PVc (32409) 123  
K(?)=3.45

\*\*\*\*\*  
C4H8N2O3 HL Asparagine CAS 70-47-3 (17)  
2-Aminobutanedioic acid 4-amide; H2N.CH(CH2.CO.NH2).COOH

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

Zr++++ gl KNO3 25°C 0.10M U T K1=8.50 B2=16.05 1986SSe (32751) 124  
Data for 25-45 C and 0-1.0 M KNO3. DH and DS values reported.

-----  
Zr++++ gl NaClO4 25°C 0.10M U K1=8.80 B2=15.05 1973TSe (32752) 125

\*\*\*\*\*  
C4H8O2 HL CAS 107-92-6 (1118)  
n-Butanoic acid; CH3.CH2.CH2.COOH

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

Zr++++ EMF oth/un 25°C 0.01M U 1969KPb (33357) 126  
K(Zr(OH)3+L)=3.78

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

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

Zr++++ oth none 25°C 0.0 U HM 1958ERb (36692) 127  
DG(ZrCl4(s)+2L(g)=ZrCl4L2(S))=-32.8 kJ mol<sup>-1</sup>, DH=-71,DS=-134. Also for ZrBr4

\*\*\*\*\*  
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  
-----

Zr++++ dis NaClO4 25°C 1.0M C T H K1=11.5 B2=21.60 2004EKa (38148) 128  
B3=30.6  
B4=37.3

Extraction of <sup>95</sup>Zr with acac into toluene. Data for 15 and 35 C.  
DH(K1)=-40 kJ mol<sup>-1</sup>, DH(B2)=230, DH(B3)=130, DH(B4)=140.

-----  
Zr++++ sp KCl 19°C 1.0M U K1=11.25 1966KSc (38149) 129  
Medium: HCl

\*\*\*\*\*

C5H8O7 H2L CAS 40120-71-6 (3022)  
2,3,4-Trihydroxypentanedioic acid, Trihydroxyglutaric acid; HOOC.(CH(OH))3.COOH

-----  
Metal Mtd Medium Temp Conc Cal Flags Lg K values Reference ExptNo  
-----  
Zr++++ sp KCl 25°C 1.00M U 1978KKf (38447) 130  
K(Zr(OH)+HL)=9.72

-----  
Zr++++ ix NaCl ? 2.25M U 1973ZGb (38448) 131  
K(Zr(OH)2+L)=11.37

-----  
Zr++++ EMF oth/un 25°C ? U 1970KKb (38449) 132  
K(Zr(OH)3+L)=6.86

-----  
Zr++++ ix NaClO4 ? 2.0M U 1964Rmd (38450) 133  
K(Zr+H2L=ZrHL+H)=3.41  
K(Zr+2H2L=Zr(HL)2+2H)=5.40

Medium: HClO4

-----  
Zr++++ ix NaClO4 ? 2.0M U 1960REa (38451) 134  
K(Zr+H2L=ZrHL+H)=3.09  
K(Zr+2H2L=Zr(HL)2+2H)=4.14

Medium: HClO4

\*\*\*\*\*

C5H9N04 H2L Glutamic acid CAS 56-86-0 (22)  
2-Aminopentanedioic acid; H2N.CH(CH2.CH2.COOH)COOH

-----  
Metal Mtd Medium Temp Conc Cal Flags Lg K values Reference ExptNo  
-----  
Zr++++ gl NaClO4 25°C 0.10M U K1=9.60 B2=16.00 1972SSg (39150) 135  
K3=3.32

\*\*\*\*\*

C5H10N2O3 HL Glutamine CAS 56-85-9 (18)  
2-Aminopentanedioic acid 5-amide; H2N.CH(CH2.CH2.CO.NH2)COOH

-----  
Metal Mtd Medium Temp Conc Cal Flags Lg K values Reference ExptNo  
-----  
Zr++++ gl NaClO4 25°C 0.10M U K1=8.75 B2=14.85 1973TSe (39850) 136

\*\*\*\*\*

C5H10O2 HL n-Valeric acid CAS 109-52-4 (3027)  
Pentanoic acid; CH3(CH2)3.COOH

-----  
Metal Mtd Medium Temp Conc Cal Flags Lg K values Reference ExptNo  
-----  
Zr++++ EMF oth/un 25°C 0.01M U M 1969KPb (40205) 137  
K(Zr(OH)3+L)=3.94

Medium: 0.01 ZrOCl2

\*\*\*\*\*

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
-----
Zr++++    sp  NaClO4 25°C  2.0M U                               1951TVa (42062) 138
                                         K(Zr+H2L=ZrL+2H)=5.76
                                         K(ZrL+H2L=ZrL2+2H)=3.78
*****
```

C6H5NO2 HL Nicotinic acid CAS 59-67-6 (419)  
 3-Pyridine-carboxylic acid; C5H4N.COOH

```
-----
Metal      Mtd Medium Temp Conc Cal Flags Lg K values      Reference ExptNo
-----
Zr++++    gl  KNO3   25°C  0.10M U          K1=10.18 B2=19.28 1988ZMa (42693) 139
Metal is ZrO++.
```

C6H5N3O4 L Dinitroaniline CAS 618-87-1 (1938)  
 3,5-Dinitroaminobenzene; H2N.C6H3(NO2)2

```
-----
Metal      Mtd Medium Temp Conc Cal Flags Lg K values      Reference ExptNo
-----
Zr++++    sp  diox/w 25°C 100% U                               1975BSb (42990) 140
                                         K(ZrBr4+2L)=4.15
*****
```

C6H6N2O2 L o-Nitroaniline CAS 88-74-4 (463)  
 2-Nitroaminobenzene; H2N.C6H4.NO2

```
-----
Metal      Mtd Medium Temp Conc Cal Flags Lg K values      Reference ExptNo
-----
Zr++++    sp  diox/w 25°C 100% U                               1975BSb (43362) 141
                                         K(ZrBr4+2L)=4.78
*****
```

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

```
-----
Metal      Mtd Medium Temp Conc Cal Flags Lg K values      Reference ExptNo
-----
Zr++++    cal non-aq 25°C 100% U HM                               1993DSb (43551) 142
Medium:Toluene or iso-propyl ether. DH(Zr(H-1A)2BH(s)+HL=ZrL(H-1A)2B+H2)=
-80.6 kJ mol-1. A:Cyclopentadiene. B:Cl.
*****
```

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
-----
Zr++++    ix  NaClO4 ?  1.0M U          K1=22.63          1967EKb (43872) 143
Medium: HClO4
*****
```

C6H6O3 H3L Pyrogallol CAS 87-66-1 (696)



1,2,3-Trihydroxybenzene; C6H3(OH)3

Metal	Mtd	Medium	Temp	Conc	Cal	Flags	Lg K values	Reference	ExptNo
Zr++++	sp	KCl	19°C	0.10M	U	I		1966PRc (44003)	144
K(Zr(OH)3+H3L=Zr(OH)2HL+H)=4.17(I=0), 4.06(I=0.1)									
*****									
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
Zr++++	ix	oth/un	?	1.0M	U	I	K1=24.15	1967EKb (44526)	145
K(Zr+H2L=ZrL+2H)=3.89									
Medium: HClO4. K=3.95(I=0.5), 3.00(I=2.0)									

Zr++++	gl	oth/un	25°C	0.10M	U	M		1964IMa (44527)	146
K(ZrY+H2L=ZrYHL+H)=-12									
K(Zr2Y2L2+2H=2ZrYHL)=3.70									
H4Y=EDTA									

*****									
C6H7O3As		H2L		Phenylarsonic			CAS 98-05-5	(3690)	
Benzeneearsonic acid, phenylarsonic acid; C6H5AsO3H2									

Metal	Mtd	Medium	Temp	Conc	Cal	Flags	Lg K values	Reference	ExptNo
Zr++++	sol	KNO3	?	2.0M	U		B2=30.6	1967KPb (45180)	147
Medium: HNO3									

Zr++++	sol	oth/un	18°C	0.10M	U		K1=11.5	1960MIa (45181)	148
*****									
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
Zr++++	sp	oth/un	?	?	U			1966SAb (45668)	149
K(Zr+HL)=9.5									
*****									
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
Zr++++	sp	oth/un	?	?	U			1968K0a (46323)	150
K(?)=6.14									

Zr++++	sp	KCl	19°C	1.0M	U			1966KSc (46324)	151
K(Zr+HL)=10.78									
Medium: HCl									

-----  
Zr++++ ix NaClO4 ? 2.0M U 1964RMd (46325) 152  
K(Zr+H3L=ZrH2L+H)=3.41  
-----

Zr++++ ix NaClO4 ? 2.0M U I 1960REa (46326) 153  
K(Zr+H3L=ZrH2L+H)=3.12

Medium: HClO4. K=3.87(I=1.0)

\*\*\*\*\*

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  
-----

Zr++++ sp oth/un ? 1.0M C K1=19.31 1999VKb (47123) 154

Medium: 1.0 M HClO4; room temperature  
-----

Zr++++ cal oth/un 25°C 0.0 U TIH 1981VBa (47124) 155  
DH(K1)=35.1 kJ mol-1  
-----

Zr++++ ix NaClO4 20°C 2.00M U K1=18.6 1970PHb (47125) 156  
-----

Zr++++ ix NaClO4 ? 0.23M U I T K1=20.81 1966EMd (47126) 157

Medium: HClO4. K1=19.51(I=1.0)  
-----

Zr++++ sp KCl 19°C 1.0M U K1=18.93 1966KSc (47127) 158

Medium: HCl  
-----

Zr++++ sp NaClO4 ? 2.00M U B2=7.8 1966LPa (47128) 159  
-----

Zr++++ ix NaClO4 ? 2.0M U I 1964EMc (47129) 160

K(Zr+H3L=ZrL+3H)=4.08

Medium: HClO4. K=5.35(I=1)  
-----

Zr++++ sp oth/un 25°C 0.10M U T K1=20.8 1964IMa (47130) 161  
-----

Zr++++ ix oth/un ? 2.0M U 1964PVb (47131) 162

K(?)=6.58

\*\*\*\*\*

C6H10O8 H2L Mucic acid CAS 526-99-8 (3650)

2,3,4,5-Tetrahydroxyhexanedioic acid, Galactaric acid; HOOC.(CHOH)4.COOH  
-----

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

Zr++++ sp KCl 25°C 1.00M U 1978KKf (48442) 163

K(Zr(OH)+HL)=9.49  
-----

Zr++++ EMF oth/un 25°C ? U 1970KKb (48443) 164

K(Zr(OH)3+L)=6.55  
-----

\*\*\*\*\*

C6H10O8 H2L Saccharic acid CAS 87-73-0 (1191)

D-2,3,4,5-Tetrahydroxy-1,6-hexanedioic acid, Glucaric acid; HOOC.(CHOH)4.COOH

-----  
Metal Mtd Medium Temp Conc Cal Flags Lg K values Reference ExptNo  
-----  
Zr++++ ix NaClO4 20°C 2.0M U 1963RCa (48493) 165  
K(Zr+H2L=ZrL+2H)=2.43

Medium: HClO4

\*\*\*\*\*  
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  
-----  
Zr++++ gl KNO3 25°C 0.10M U 1959CGa (48820) 166  
K(ZrO(OH)L+H)=5.3

\*\*\*\*\*  
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  
-----  
Zr++++ ix NaCl ? 2.00M U 1971ZGa (49772) 167  
K(Zr(OH)2+L)=6.60  
K(Zr(OH)2L+L)=5.95

-----  
Zr++++ sp NaClO4 25°C 0.20M U 1970CMd (49773) 168  
Keff(ZrO2+2L)=2.25 pH 3

-----  
Zr++++ ix NaClO4 20°C 2.0M U 1963RCa (49774) 169  
K(Zr+HL=ZrL+H)=1.73

Medium: HClO4

\*\*\*\*\*  
C6H13NO4 HL Bicine CAS 150-25-4 (2124)  
N,N-Bis(2-hydroxyethyl)glycine; (HO.CH2.CH2)2N.CH2.COOH

-----  
Metal Mtd Medium Temp Conc Cal Flags Lg K values Reference ExptNo  
-----  
Zr++++ gl KNO3 25°C 0.10M U 1959CGa (50422) 170  
K(ZrO(OH)L+H)=3.9  
K(ZrO(OH)2L+H)=8.5

\*\*\*\*\*  
C7H6O3 H2L Salicylic acid CAS 69-72-7 (14)  
2-Hydroxybenzoic acid, Salicylic acid; HO.C6H4.COOH

-----  
Metal Mtd Medium Temp Conc Cal Flags Lg K values Reference ExptNo  
-----  
Zr++++ sp KCl ? 0.10M U 1970KKd (54345) 171  
K(Zr(OH)3+HL)=6.38  
K(Zr(OH)2+HL)=6.05

Zr++++ kin oth/un 25°C ? U 1969KMF (54346) 172  
K(Zr(OH)3+HL)=6.1

\*\*\*\*\*  
C7H6O4 H3L Resorcylic acid CAS 89-86-1 (876)  
2,4-Dihydroxybenzoic acid, b-Resorcylic acid; C6H3(OH)2.COOH

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

Zr++++ gl KNO3 30°C 0.10M U M T 1978SDa (54554) 173  
K(ZrO+HL)=16.55

\*\*\*\*\*  
C7H6O6S H3L CAS 5965-83-3 (399)  
5-Sulfosalicylic acid, 2-Hydroxy-5-sulfobenzoic; HO3S.C6H3(OH).COOH

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

Zr++++ sp KCl ? 1.0M U 1970KKd (55084) 174  
K(Zr(OH)2+HL)=6.15  
K(Zr(OH)3+HL)=6.24

-----  
Zr++++ kin oth/un 25°C ? U 1969KMF (55085) 175  
K(Zr(OH)3+HL)=6.0

-----  
Zr++++ sp KCl 19°C 1.0M U 1966KSc (55086) 176  
K(?)=4.79

\*\*\*\*\*  
C7H7NO2 H2L Salicylaldehyde oxime; HO.C6H4.CH:N.OH  
2-Hydroxybenzaldehyde oxime; HO.C6H4.CH:N.OH

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

Zr++++ gl KCl 25°C 0.10M U I K1=12.43 1968MDe (55315) 177  
K1=17.9(I=0),17.35(I=0.01),16.45(I=0.025),15.13(I=0.05),13.90(I=0.075)

\*\*\*\*\*  
C7H7NO2 HL CAS 495-18-1 (184)  
Benzohydroxamic acid; C6H5.CO.NH.OH

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

Zr++++ gl diox/w 37°C 30% C M B2=10.58 1983MAd (55527) 178  
B(Zr(bpy)L)=12.60

-----  
Zr++++ dis NaClO4 25°C 1.0M U K1=12.43 B2=24.08 1965BGa (55528) 179  
Medium: HClO4

\*\*\*\*\*  
C7H8N2O2 L CAS 89-62-3 (466)  
2-Nitro-4-methylaminobenzene; CH3.C6H3(NO2).NH2

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

Zr++++ sp diox/w 25°C 100% U 1975BSb (55889) 180  
K(ZrBr4+2L)=5.58

\*\*\*\*\*

C7H11N06P2 H4L CAS 4712-06-5 (4470)

Amino(phenyl)methylenediphosphonic acid;

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

Zr++++ gl KCl 25°C 0.10M U K1=17.08 B2=21.66 1969DMd (56945) 181  
K(ZrO+HL)=11.61  
K(2ZrO+L)=23.18  
K(ZrO+H+2L)=16.69

\*\*\*\*\*

C8H502F3S HL TTA CAS 326-91-0 (165)

4,4,4-Trifluoro-1-(2-thienyl)butane-1,3-dione; F3C.CO.CH2.CO.C4H3S

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

Zr++++ dis oth/un 25°C 1.0M U K1=10.98 B2=21.88 1967M0c (58699) 182  
K3=10.36  
K4=9.93

-----  
Zr++++ sp NaClO4 25°C 4.0M U 1951Mca (58700) 183

K(Zr+HL=ZrL+H)=3.03

\*\*\*\*\*

C8H502F3Se HL CAS 713-15-5 (3842)

4,4,4-Trifluoro-1-(2'-selenoyl)-butane-1,3-dione; F3C.CO.CH2.CO.C4H3Se

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

Zr++++ dis oth/un 25°C 1.0M U K1=11.35 B2=22.10 1963MPc (58705) 184  
K3=10.15  
K4=9.55

\*\*\*\*\*

C8H703Br HL CAS 1878-91-7 (3819)

2-(4'-Bromophenyl)-2-hydroxyethanoic acid, p-bromomandelic acid;

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

Zr++++ sp KCl ? 1.0M U 1970KKd (59245) 185  
K(Zr(OH)2+L)=6.27  
K(Zr(OH)3+L)=6.21

-----  
Zr++++ dis NaClO4 25°C 1.0M U K1=7.15 B2=13.43 1961AHa (59246) 186  
K3=6.65  
K4=5.52

Medium: HClO4

\*\*\*\*\*

C8H802 HL Phenylacetic CAS 103-82-2 (1361)

Phenylethanoic acid; C6H5.CH2.COOH

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

Zr++++ kin oth/un 25°C 0.10M U I 1973KPg (59574) 187  
K(Zr(OH)2+2L)=6.2

K(Zr(OH)2+2L)(I=0)=6.6, (I=0.01)=6.2

\*\*\*\*\*

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  
-----

Zr++++ sp KCl ? 1.0M U 1970KKd (59891) 188  
K(Zr(OH)2+L)=6.65  
K(Zr(OH)3+L)=6.71

-----  
Zr++++ sp KCl 19°C 1.0M U K1=5.64 1966KSc (59892) 189  
Medium: HCl

\*\*\*\*\*

C9H6N04IS 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  
-----

Zr++++ gl KNO3 25°C 0.10M C K1=11.68 B2=17.60 1985ZHa (63840) 190  
Metal ion is ZrO++.

\*\*\*\*\*

C9H6N2O5S H2L CAS 5263-74-1 (2738)  
7-Nitroso-8-hydroxyquinoline-5-sulfonic acid;

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

Zr++++ gl alc/w 27°C 50% C H K1=6.41 B2=11.69 1986EAa (63879) 191  
\*\*\*\*\*

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  
-----

Zr++++ sp alc/w 25°C 50% U 1967NPb (64740) 192  
K(ZrO+HL)=13

Medium: 50% MeOH, 0.1 M NaClO4

\*\*\*\*\*

C10H6O3 HL CAS 83-72-7 (3294)  
2-Hydroxy-1,4-naphthoquinone;

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

Zr++++ sp alc/w 20°C 40% C K1=7.96 B2=15.30 1997SEd (68465) 193  
K(Zr+H2L=ZrL+2H)=-1.07

K(ZrL+H2L=ZrL2+2H)=-1.55  
 K(Zr+20H+L)=32.55  
 K(Zr+20H+2L)=32.44

Medium: 40% v/v 0.10 M NaClO4. K(Zr(OH)2L+2H)=3.4, K(Zr(OH)2L2+2H)=5.6.

\*\*\*\*\*

C10H6O8Cl2S2 H4L CAS 6155-33-5 (4761)  
 2,7-Dichlorochromotropic acid;

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

Zr++++ sp oth/un ? ? U 1973DMb (68538) 194  
 K(Zr(OH)2+2HL)=12.55

\*\*\*\*\*

C10H6O9S2 H3L CAS 58425-39-1 (2004)  
 8-Hydroxy-1,2-naphthoquinone-3,6-disulfonic acid;

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

Zr++++ sp NaClO4 20°C 0.10M U 1975MDa (68541) 195  
 B(Zr(OH)2L2)=17.7

\*\*\*\*\*

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  
 -----

Zr++++ sp alc/w 32°C 50% U K1=3.6 1954JMa (68601) 196  
 Medium: 50% EtOH, 0.1 M NaNO3

\*\*\*\*\*

C10H7NO2 HL CAS 132-53-6 (2524)  
 2-Nitroso-1-naphthol;

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

Zr++++ sp alc/w 25°C 50% U I K1=3.7 1952JMa (68667) 197  
 In 50% dioxan B4=11.7

\*\*\*\*\*

C10H7NO2 HL Quinaldic acid CAS 93-10-7 (2209)  
 Quinoline-2-carboxylic acid;

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

Zr++++ gl KNO3 25°C 0.10M U K1=11.25 B2=19.60 1988ZMa (68726) 198  
 K3=7.15

Metal is ZrO++.

\*\*\*\*\*

C10H7NO8S2 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

-----  
Zr++++ sp KCl 25°C 0.30M U 1976GMd (69041) 199  
K1eff=5.1 at pH 1.5

\*\*\*\*\*  
C10H7O2F3 HL CAS 326-06-7 (196)  
3-Benzoyl-1,1,1-trifluoroacetone; CF3.CO.CH2.CO.C6H5  
-----

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

Zr++++ dis oth/un 25°C 1.0M U K1=10.85 B2=21.20 19710Ma (69166) 200  
K3=9.85  
K4=9.35

\*\*\*\*\*  
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  
-----

Zr++++ gl diox/w 37°C 30% C M B2=6.98 1983MAd (69665) 201  
B(Zr(bha)L)=12.60

bha: benzohydroxamic acid  
-----

Zr++++ sp oth/un 20°C 0.10M U 1969SHF (69666) 202  
K(Zr(OH)2+L)=9.66

\*\*\*\*\*  
C10H8O8S2 H4L Chromotropic ac CAS 148-25-4 (1875)  
1,8-Dihydroxynaphthalene-3,6-disulfonic acid;  
-----

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

Zr++++ sp KCl 20°C 0.10M U 1963SMa (69985) 203  
K(Zr(OH)2+HL=ZrOHL)=18.68

\*\*\*\*\*  
C10H10O2 HL Benzoylacetone CAS 93-91-4 (197)  
1-Phenylbutane-1,3-dione; C6H5.CO.CH2.CO.CH3  
-----

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

Zr++++ dis oth/un 25°C 1.0M U K1=12.71 B2=24.57 1961PMa (70791) 204  
K3=11.34  
K4=11.08

\*\*\*\*\*  
C10H12O2 HL CAS 1946-74-3 (202)  
3-Isopropyltropolone;  
-----

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

Zr++++ sp alc/w 25°C 50% U 1961HSa (71617) 205  
B4=20.46

Medium: 50% EtOH, 0.01 M





-----  
 Zr++++ gl NaClO4 25°C 0.10M U K1=19.40 1956MJa (74354) 219  
 \*\*\*\*\*  
 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  
 -----

Zr++++ ISE KNO3 25°C 0.10M C M 1996YHa (75549) 220  
 K(ZrH-1L+H)=1.18  
 K(ZrL+F)=5.37  
 K(ZrLF+F)=4.11  
 K(ZrH-1L+F)=3.50

Method: Fluoride ISE. K(ZrH-1LF+F)=2.4.

\*\*\*\*\*  
 C11H9N3O2 H2L PAR CAS 1141-59-9 (636)  
 4-(2'-Pyridylazo)-1,3-dihydroxybenzene; C5H4N.N:N.C6H3(OH)2  
 -----

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

Zr++++ vlt alc/w 25°C 50% U 1975TBa (77608) 221  
 K(Zr(OH)3+HL)=16.7

Medium: 50% EtOH/H2O  
 -----

Zr++++ sp oth/un 20°C 0.10M U 1968SHb (77609) 222  
 K(Zr(OH)3+HL)=16.44

\*\*\*\*\*  
 C11H12O9 H3L CAS 69065-58-3 (2714)  
 1,2,4-Trihydroxy-3,4,5-trimethoxycarbonylcyclopentadiene;  
 -----

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

Zr++++ sp NaCl 20°C 0.10M U 1979BLa (78429) 223  
 K[Zr(OH)3+HL=Zr(OH)3HL]=11.68  
 K[Zr(OH)+HL=Zr(OH)HL]=12.45  
 K[Zr(OH)2+HL=Zr(OH)2HL]=12.75

\*\*\*\*\*  
 C11H18N2O8 H4L CAS 4408-81-5 (923)  
 1,3-Diaminopropane-N,N,N',N'-tetraethanoic acid; ((HOOCH2)2N.CH2.)2.CH2  
 -----

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

Zr++++ dis NaClO4 ? 1.0M U K1=28.33 1968EMa (79481) 224  
 K(Zr+2HL)=33.02

\*\*\*\*\*  
 C11H18N2O9 H4L HDPTA CAS 3148-72-9 (431)  
 1,3-Diamino-2-hydroxypropane-N,N,N',N'-tetraethanoic acid;  
 -----

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

Zr++++ oth KCl 20°C 0.10M U K1=23.58 1967TIb (79582) 225  
Method: chromatography. Medium: HCl

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

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

Zr++++ sp oth/un 20°C 0.10M U 1968SHa (80533) 226  
K(Zr(OH)2+2L)=10.07

\*\*\*\*\*  
C12H10N2O2 H2L CAS 2050-14-8 (3378)  
2,2'-Dihydroxyazobenzene; HO.C6H4.N:N.C6H4.OH

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

Zr++++ sp alc/w 32°C 50% U 1954JMa (80703) 227  
K(ZrOL+2H=ZrO+H2L)=5.0

Medium: 50% EtOH 0.03 M NaClO4  
\*\*\*\*\*

C12H20N2O8 H4L CAS 40623-42-5 (1101)  
1,2-Diaminoethane-N,N'-di(2-pentane-1,5-dioic acid); (CH2NHCH(COOH)CH2CH2COOH)2

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

Zr++++ gl KNO3 30°C 0.10M U 1971TSf (82113) 228  
K(ZrO+L)=11.80

\*\*\*\*\*  
C12H20N2O8S H4L TEDTA CAS 923-74-0 (3394)  
2,2'-Thiobis(ethyliminodiethanoic acid); S(CH2.CH2.N(CH2.COOH)2)2

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

Zr++++ dis oth/un 20°C 0.10M U K1=23.17 1967TIb (82481) 229  
\*\*\*\*\*

C12H20N2O9 H4L EEDTA CAS 923-73-9 (2112)  
Oxa-bis(ethyleneimino)diethanoic acid; ((HOOC.CH2)2N.CH2.CH2)2O

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

Zr++++ dis oth/un 20°C 0.10M U K1=24.72 1967TIb (82576) 230  
\*\*\*\*\*

C13H10N2O2 HL CAS 27147-03-1 (6307)  
2-Hydroxy-5-(phenylazo)benzaldehyde; C6H5.N:N.C6H3(CHO)(OH)

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

Zr++++ gl KNO3 30°C 1.0M U 1976JDa (84848) 231  
K(ZrO+L)=6.70  
K(ZrO+2L)=12.70



-----  
 Zr++++ ix oth/un ? 2.10M U K2=4.36 1964PVb (88828) 239  
 \*\*\*\*\*  
 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
Zr++++	EMF	NaClO4	20°C	1.0M	U		K1=36.9 K(ZrL+OH)=8.1	1967BAc (89449)	240

-----  
 Zr++++ dis oth/un 20°C 0.39M U K1=33.96 1967TIb (89450) 241  
 -----

Zr++++ ix NaClO4 ? 1.0M U I K1=35.40 1966EMd (89451) 242  
 Medium: HClO4. K1=35.81(I=0.23 M)  
 -----

Zr++++ sp NaClO4 ? 100% U 1966LPa (89452) 243  
 K(Zr+H5L=ZrL+5H)=4.43  
 -----

Zr++++ ix oth/un ? 2.0M U I 1964EMd (89453) 244  
 K(Zr+H5L=ZrL+5H)=3.63  
 Medium: HClO4. K=5.67(I=1)  
 -----

Zr++++ ix oth/un ? 2.10M U K2=4.89 1964PVb (89454) 245  
 \*\*\*\*\*  
 C15H10O3 HL CAS 577-85-5 (3443)  
 3-Hydroxyflavone;  
 -----

Metal	Mtd	Medium	Temp	Conc	Cal	Flags	Lg K values	Reference	ExptNo
Zr++++	sp	alc/w	20°C	20%	C	M		2002TTc (90978)	246

Method: fluorescence spectrophotometric titration. Medium: 20% v/v EtOH/H2O. K(Zr(H2O)2edta+L=Zr(edta)L+H)=5.43.  
 -----

Zr++++ sp oth/un ? 0.10M U K1=5.7 B2=8.00 1955HHa (90979) 247  
 \*\*\*\*\*  
 C15H10O6 H4L Kaempferol CAS 520-18-3 (5099)  
 3,5,7-Trihydroxy-2-(4'-hydroxyphenyl)-1-benzopyran-4-one;  
 -----

Metal	Mtd	Medium	Temp	Conc	Cal	Flags	Lg K values	Reference	ExptNo
Zr++++	sp	alc/w	?	40%	U			1968GTa (90994)	248

K(ZrO+H4L=ZrO(H3L)+H)=4.6  
 Medium: 40% EtOH  
 -----

C15H10O7 H5L Melanoxetin CAS 27696-41-9 (4054)  
 3,3',4',7,8-Pentahydroxyflavone;  
 -----

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

Zr++++ sp alc/w 20°C 50% U 1965KGa (91008) 249  
K(ZrO+H5L=ZrO(H4L)+H)=5.56

Medium: 50% EtOH, 1 M HCl

\*\*\*\*\*  
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  
-----

Zr++++ vlt alc/w 25°C 50% U 1975TBa (91247) 250  
K(Zr(OH)3+HL)=14.3

Medium: 50% EtOH/H2O

\*\*\*\*\*  
C16H11N3O10S2 H4L (5174)  
2-Hydroxy-1-(2'-hydroxy-4'-nitro)phenylazo-3,6-disulfonaphthalene;

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

Zr++++ sp oth/un 25°C ? U 1971RCd (92883) 251  
K(?)=7.07

\*\*\*\*\*  
C16H13N2O10AsS2 H5L Thorin I CAS 3688-92-4 (2609)  
1-((2-Arsonophenyl)azo)-2-hydroxy-3,6-naphthalylldisulfonic acid;

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

Zr++++ sp KCl 25°C 0.10M U 1976GMd (93221) 252  
K1eff=5.2 at pH 2.0

\*\*\*\*\*  
C17H14N2O2 L CAS 4551-69-3 (698)  
4-Benzoyl-3-methyl-1-phenyl-2-pyrazolin-5-one;

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

Zr++++ dis oth/un 25°C 1.0M U K1=10.14 B2=20.22 19710Ma (95910) 253  
K3=10.02  
K4=9.96

\*\*\*\*\*  
C17H14N2O5S H3L Calmagite CAS 3147-14-6 (2875)  
1-(1-Hydroxy-4-methyl-2-phenylazo)-2-naphthol-4-sulfonic acid;

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

Zr++++ sp KCl 25°C 0.10M U K1=49.0 1976GMd (95933) 254

\*\*\*\*\*  
C18H14N2O2 HL CAS 15017-21-7 (6859)  
2-Hydroxynaphthalidene benzoyl hydrazone; C6H5.CO.NH.N:CH.C10H6.OH

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

Zr++++ gl diox/w 20°C 75% U T HM K1=8.65 B2=16.48 1994Mca (96913) 255  
 B3=21.75  
 K(Zr(edta)+L)=4.31  
 K(Zr(Hedta)+L)=3.92  
 K(Zr(нта)+L)=3.68

Medium: 75% v/v dioxane/H2O, 0.10 M NaClO4. Data for 30 and 40 C.  
 DH and DS values.

\*\*\*\*\*

C18H30N4O12 H6L TTHA CAS 869-52-3 (694)  
 Triethylenetetraaminehexaethanoic acid;((HOOС.CH2)2N.CH2.CH2.N(CH2.COOH).CH2)2

Metal	Mtd	Medium	Temp	Conc	Cal	Flags	Lg	K values	Reference	ExptNo
Zr++++	ISE	KNO3	25°C	0.10M	C	M			1996YHa (98109)	256
								K(ZrL+H)=2.77 K(ZrHL+F)=5.48 K(ZrL+F)=2.9		

Method: Fluoride ISE.

Zr++++ ix NaClO4 ? 0.50M U I K1=19.74 1966EMc (98110) 257  
 K(Zr(OH)+H6L=ZrH2L+3H)=4.76

Medium: HClO4. K1=9.74(I=1); K(Zr+H6L=ZrH2L+4H)=4.08(I=1), 2.9(I=2)

\*\*\*\*\*

C19H14O7S H4L Pyrocatechol Vi CAS 369596-29-2 (709)

Pyrocatechol Violet,  
 3-[3,4-Dihydroxyphenyl-3-hydroxy-4-oxo-2,5-cyclohexadien-1-ylidenemethyl-b.;

Metal	Mtd	Medium	Temp	Conc	Cal	Flags	Lg	K values	Reference	ExptNo
Zr++++	sp	non-aq	25°C	100%	U				1968DSb (99119)	258
								B12(?)=11.04		

Medium: 1-butanol. Ligand: Pyrocatechol sulfophthalein

\*\*\*\*\*

C20H14N2O5S H3L Solochrome 6B CAS 3564-14-5 (3507)

1-(1-Hydroxy-2-naphthylazo)-2-naphthol-4-sulfonic acid, Mordant Black3, Eriochrome blue-black B;

Metal	Mtd	Medium	Temp	Conc	Cal	Flags	Lg	K values	Reference	ExptNo
Zr++++	sp	KCl	25°C	0.10M	U			K1=46.2	1976GMd (99671)	259

\*\*\*\*\*

C22H18N4O14As2S2 H8L Arsenazo III CAS 1668-00-4 (1148)

2,7-Bis(2'-arsonophenylazo)chromotropic acid;

Metal	Mtd	Medium	Temp	Conc	Cal	Flags	Lg	K values	Reference	ExptNo
Zr++++	sp	NaClO4	20°C	3.0M	U				1964BUd (101667)	260
								B(Zr2H18L2)=87.2		

Medium: 3-6 M HClO4

\*\*\*\*\*

C22H37N5O14                    H7L                    CAS 3234-59-1 (2425)  
 Tetraethylenepentamineheptaethanoic acid;

Metal	Mtd	Medium	Temp	Conc	Cal	Flags	Lg	K values	Reference	ExptNo
Zr++++	ix	NaClO4	?	0.50M	U	I			1966EMc (102350)	261

$K(\text{Zr}(\text{OH})+\text{H7L}=\text{ZrH4L}+2\text{H})=6.08$

Medium: HClO4.  $K(\text{Zr}+\text{H7L}=\text{ZrH4L}+3\text{H})=5.45(\text{I}=1)$ ,  $4.51(\text{I}=2)$

C23H24N4O2                    L                    Trichachnine                    CAS 1251-85-0 (2606)  
 4,4'-Diantipyrilmethane,  
 4,4'-phenylmethylene-bis-(1,2-dihydro-1,5-dimethyl-2-phenylpyrazol-3-one

Metal	Mtd	Medium	Temp	Conc	Cal	Flags	Lg	K values	Reference	ExptNo
Zr++++	sp	oth/un	25°C	0.10M	U			K1=8.71	1979SPe (102682)	262
Zr++++	sp	oth/un	25°C	1.00M	U			B2=12.58	1979SPe (102683)	263
Zr++++	sp	KCl	?	0.10M	U			B4=16.92	1972SCb (102684)	264

Zr++++	sp	KCl	?	1.0M	U	I		B2=11.8	1963BSb (102685)	265
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Medium: HCl.  $B2=11.5(\text{I}=0.1)$

C26H25NO9S                    H4L                    Semi-Xylenol O                    (426)  
 3-(N,N-Di(carboxymethyl)aminomethyl)-2-cresolsulfonephthalein;

Metal	Mtd	Medium	Temp	Conc	Cal	Flags	Lg	K values	Reference	ExptNo
Zr++++	gl	KNO3	25°C	0.10M	C				1993YHa (103951)	266

$K(\text{ZrL}+\text{F})=7.4$   
 $K(2\text{ZrL}+2\text{OH}=\text{Zr}_2(\text{OH})_4(\text{HL})_2)=29.0$

Zr++++	gl	KNO3	25°C	1.00M	U			K2=26.25	1978SYb (103952)	267
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$B(\text{ZrHL})=27.56$

C31H32N2O13S                    H6L                    Xylenol orange                    CAS 63721-85-5 (432)  
 5,5'-Bis-N,N-bis(carboxymethyl)aminomethyl-4'-hydroxy-3,3'-dimethylfuchstone-2''-sulfonic acid;

Metal	Mtd	Medium	Temp	Conc	Cal	Flags	Lg	K values	Reference	ExptNo
Zr++++	sp	NaClO4	20°C	0.48M	C				1984MSe (105514)	268

$K1\text{eff}=4.58$   
 $B\text{eff}(\text{Zr}_2\text{L})=11.59$

Medium: 0.48 M HClO4.

Zr++++	gl	KNO3	25°C	1.00M	U				1978SYb (105515)	269
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$B(\text{ZrH3L})=37.80$



B(ZrH4L)=38.68

B(Zr2L)=43.47

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Zr++++ sp NaNO3 20?°C 0.20M U 1963BGa (105516) 270  
B(Zr2L2)=31.0  
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Zr++++ sp NaClO4 ? 0.80M U 1959CHa (105517) 271  
K(?)=7.60

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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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