SC-Database
Software version = 5.81 Data version = 4.62
Experiment list contains 41 experiments for
 (no ligands specified)
 Metal : Si++++
 (no references specified)
 (no experimental details specified)

****
e- HL Electron (442)
Electron;

Metal | Mtd | Medium | Temp | Conc | Cal | Flags | Lg K values | Reference | ExptNo
---
Si++++ | oth | none | 25°C | 0.0 | U | | K=-57.9(-860 mV) | 1952LAb (934) | 1
K: SiO2(s)+4H+4e=Si(s)+2H2O. From thermodynamic data. K(SiF6+4e=Si(s)+6F)=
-84(1200 mV). K(Si(s)+4H=4e=SiH4(g))=6.9(102 mV)
****
F- HL Fluoride CAS 7644-39-3 (201)
Fluoride;

Metal | Mtd | Medium | Temp | Conc | Cal | Flags | Lg K values | Reference | ExptNo
---
Si++++ | ISE | NaClO4 | 25°C | 3.00M | C | M | B(0,1)=2.40
B(-1,1)=1.66
B(0,4)=9.35
B(1,6)=13.88 | 1988CIa (7156) | 2
B(2,6)=13.23. Medium: LiClO4. B(p,q)=Si(OH)4+qHF=Si(OH)4Fq+pH

Si++++ | ISE | KCl | 25°C | 1.00M | U | T | K(K2SiF6)=17.0 | 1986CIa (7157) | 3
K: Si(OH)4 + 6HF + 2K = K2SiF6(s) + 2H + 4H2O

Si++++ | ISE | NaCl | 25°C | 0.40M | U | | K(Si(OH)4+4H+6F=SiF6+4aq)=29.5 | 1984GGb (7158) | 4

Si++++ | ISE | NaCl | 25°C | 0.20M | U | I | K(Si(OH)4+6F+4H=SiF6+4aq)=29.4 | 1984GOa (7159) | 5

Si++++ | ISE | NaNO3 | 25°C | 1.00M | U | | K(Si(OH)4+HF=Si(OH)3F)=2.23
K(Si(OH)4+6HF=SiF6)=12.3 | 1982CLa (7160) | 6

Si++++ | ISE | NaCl | 25°C | 1.0M | C | T | K=29.98 | 1980BSa (7161) | 7
Quinhydrone+Felecrode. Reaction: Si(OH)4 + 4H + 6F = SiF6 + 4H2O
At 0 C: K=31.60; 60 C: K=28.23

```
Si++++     gl  oth/un 25°C 0.20M U                        1979MMc  (7162)   8
                                        B(SiF6)=16.90
-------------------------------------------------------------------------------
Si++++     ISE NaClO4 25°C 0.10M C                        1978RBd  (7163)   9
K(H4SiO4+6F+4H=SiF6+4H2O)=30.18
Method: F ion selective electrode. Medium: 0.10 M NaClO4 or NaCl or NaNO3.
-------------------------------------------------------------------------------
Si++++     gl  none   25°C  0.0  U                        1978SKb  (7164)  10
                                        K(HSiF6=H+SiF6)=1.83
                                        K(H2SiF6=HSiF6+H)=0.13
-------------------------------------------------------------------------------
Si++++     kin NaClO4 25°C 0.40M U T                      1974PLb  (7165)  11
                                        K(SiF5+HF=SiF6+H)=1.89
Medium: LiClO4. K=2.10(0 C)
-------------------------------------------------------------------------------
Si++++     ix  oth/un   ?     ?  U                        1972PAb  (7166)  12
                                        K6=3.00
-------------------------------------------------------------------------------
Si++++     nmr oth/un 25°C  var  U T H                    1971BZd  (7167)  13
                                        K5(SiF4+HF=SiF5+H)=2.40
                                        K6(SiF5+HF=SiF6+H)=1.60
DH(K5)=-6.3 kJ mol-1, DH(K6)=-32.6. K5=2.46, K6=1.92(10 C); K5=2.35,
K6=1.33(40 C); K5=2.30, K6=1.10(54 C)
-------------------------------------------------------------------------------
Si++++     ix  NaClO4   ?  0.20M U  I M                  1971KKe  (7168)  14
                                        K(UO2+HSiF6=UO2SiF6+H)=1.45
Medium: HClO4. K=1.49(I=0.5), 1.45(I=1), 1.40(I=2)
-------------------------------------------------------------------------------
Si++++     ix  NaClO4   ?   1.0M U  I M                  1971KKe  (7169)  15
                                        K(NpO2+HSiF6=NpO2SiF6+H)=1.97
Medium: HClO4. K=1.77(I=2). K(PuO2+HSiF6=PuO2SiF6+H)=2.40(I=1); 2.21(I=2)
-------------------------------------------------------------------------------
Si++++     nmr none   25°C  0.0  U    M                  1970HCa  (7170)  16
                                        K(Fe(II)+SiF6)=-0.09
                                        K(Co(II)+SiF6)=-0.12
                                        K(Ni(II)+SiF6)=-0.22
                                        K(Cu(II)+SiF6)=-0.59
-------------------------------------------------------------------------------
Si++++     sp  oth/un   ?   var  U                        1969KLd  (7171)  17
                                        K(SiF4(H2O)OH+H)=5-5.6
-------------------------------------------------------------------------------
Si++++     sol NaClO4   ?   4.0M U                        1968KLa  (7172)  18
                                        Ks(2SiO2(s)+4SiF6+8H)=-7.15
                                        Ks(SiO2(s)+5SiF6+4H)=-1.05
-------------------------------------------------------------------------------
Si++++     ix  KCl      ?  0.50M U                        1968PMf  (7173)  19
                                        K6=3.96
-------------------------------------------------------------------------------
Si++++     kin none   11°C  0.0  U                        1946RYb  (7174)  20
                                        K5K6=6.19
```

K(Si(OH)4+4HF=SiF4+4H2O)=7.98. K(Si(OH)4+6HF=SiF6+2H+4H2O)=26.27

Si++++	kin	none	20°C	0.0	U			1926RHa	(7175) 21
						K5.K6=6.0			

****

MoO4-- H2L Molybdate (443)

Molybdate;

Metal	Mtd	Medium	Temp	Conc	Cal	Flags	Lg K values	Reference	ExptNo
Si++++	vlt	oth/un	?	?	U			1959GHa	(8754) 22
							K=10.82		

pH 2.5. K: Si(OH)4+2H6Mo6O21=6H2O+H4SiMo12O40

Si++++	sp	oth/un	rt	?	U			1959KRc	(8755) 23

K(SiO2(aq)+4H2Mo2O7=H4SiMo8O28(alpha or beta)+2H2O)=11.8 ? (pH 2-4)

K(SiO2(aq)+4H2Mo3O10=H4SiMo12O40(gamma)+2H2O)=13.7 ? (pH 1.5)

Si++++	gl	none	30°C	0.0	U			1959TEa	(8756) 24
							K(H14SiMo12O46+H)=2.17		
							K(H13SiMo12O46+H)=2.58 ?		

****

OH- HL Hydroxide (57)

Hydroxide;

Metal	Mtd	Medium	Temp	Conc	Cal	Flags	Lg K values	Reference	ExptNo
Si++++	sol	NaCl	25°C	0.10M	C			1998PSc (12123)	25
							Ks(SiO2+2H2O=Si(OH)4)=-2.74		

Method: solubility of SiO2(am) in NaCl.

****

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

Sulfate;

Metal	Mtd	Medium	Temp	Conc	Cal	Flags	Lg K values	Reference	ExptNo
Si++++	sol	none	25°C	0.0	C			1982MCc (16536)	26
							K(Si(OH)4+SO4)=-0.544		

Method: solubility of SiO2(am) in Na2SO4 media. Data for 0-35 C.

At 200 C, K=-0.412

****

VO4--- H3L CAS 15457-75-7 (1586)

Vanadate; VO2(OH)3-- or polymers

Metal	Mtd	Medium	Temp	Conc	Cal	Flags	Lg K values	Reference	ExptNo
Si++++	nmr	NaCl	25°C	0.60M	U	I		1996HHa (17390)	27
							K(H3SiO4+H+HVO4=H3VSiO7)=12.66		
							K(H3SiO4+HVO4=H2VSiO7)=1.12		
							*K(H3VSiO7)=-11.54		

In 3 M NaCl: K(H3SiO4+H+HVO4=H3VSiO7+H2O)=12.83, K(H3SiO4+HVO4=H2VSiO7)=1.20 *K(H3VSiO7)=-11.63. 51V and 17O NMR used. All values approximate.

****

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

Metal	Mtd	Medium	Temp	Conc	Cal	Flags	Lg K values	Reference	ExptNo
Si++++	EMF	alc/w	20°C	100%	U		1971GSa (17900)		28
							K(Si+4L=Si(H-1L)4+4H) > 1		

Medium: MeOH, 1 M Li tosylate

****

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

Metal	Mtd	Medium	Temp	Conc	Cal	Flags	Lg K values	Reference	ExptNo
Si++++	cal	non-aq	25°C	100%	U	HM		1967MOb (36678)	29

Medium: n-hexane. DH(SiF4(l)+2L(l)=SiF4L2(c))=-121.2 kJ mol-1, DH(SiF4(g)+2L(l)=SiF4L2(c))=-138.4, DH(SiCl4(l)+2L(l)=SiCl4L2(c))=-216.1 plus others

****

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
Si++++	gl	NaCl	25°C	0.10M	M			1998PSc (43820)	30

K(Si(OH)4+2H2L=SiL3+2H+4H2O)=-12.0
Method: solubility of SiO2(am) in 0.1 m NaCl/0.1 m H2L.

Si++++	gl	NaCl	25°C	0.60M	C			1991ONa (43821)	31
							B(-2,1,3)=-10.44		

B(p,q,r); pH+qSi(OH)4+rH2L=Hp(Si(OH)4)q(H2L)r

Si++++	nmr	oth/un	25°C	0.20M	U			1990EPa (43822)	32
							K=-12.42		

K: Si(OH)4+3H2L=SiL3+4H2O+2H. Medium: Various buffers. With 1,2-dihydroxy-4,5-dichlorobenzene, K=-8.49; -4-nitrobenzene, K=-7.74; -3,4-dinitro-, -4.37

Si++++	EMF	R4N.X	20°C	1.00M	U	M		1971GSa (43823)	33
							K(SiA4+3H2L+2A=SiL3+6HA)=18.1		

Medium: MeOH, 1.0 Me4NCl. HA=MeOH

****

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
Si++++	gl	NaCl	25°C	0.60M	C			1992FOa (43978)	34
							B(-2,1,3)=-10.02		

B(p,q,r) pH+q(Si(OH)4)+r(H3L)=Hp(Si(OH)4)q(H3L)r
****
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
---
Si++++ gl NaCl 25°C 0.60M C 1985SIa (53690) 35
B(H4SiO4+3HL+H=SiL3+4H2O)=7.08
K(2H4SiO4=(H4SiO4)2)=1.2
Additional method: 29Si-NMR
****
C7H6O4 H3L Protocatechuic CAS 99-50-3 (875)
3,4-Dihydroxybenzoic acid; C6H3(OH)2.COOH

Metal Mtd Medium Temp Conc Cal Flags Lg K values Reference ExptNo
---
Si++++ gl NaCl 25°C 0.60M C 1992FOa (54697) 36
B(-5,1,3)=-21.95
B(p,q,r); pH+r(Si(OH)4)+q(H3L)=Hp(Si(OH)4)q(H3L)r
****
C7H6O5 H4L Gallic acid CAS 149-91-7 (446)
3,4,5-Trihydroxybenzoic acid; C6H2(OH)3.COOH

Metal Mtd Medium Temp Conc Cal Flags Lg K values Reference ExptNo
---
Si++++ gl NaCl 25°C 0.60M C 1992FOa (54763) 37
B(-5,1,3)=-21.26
B(p,q,r); pH+q(Si(OH)4)+r(H4L)=Hp(Si(OH)4)q(H4L)r
****
C8H11NO2 H2L Dopamine CAS 579-59-9 (251)
2-(3',4'-Dihydroxyphenyl)ethylamine; (HO)2.C6H3.CH2.CH2.NH2

Metal Mtd Medium Temp Conc Cal Flags Lg K values Reference ExptNo
---
Si++++ gl NaCl 25°C 0.60M U 1993SSa (61085) 38
B(-2,1,3)=9.70
B(-3,1,3)=19.33
B(p,q,r): pH+qSi(OH)4+rH3L=Hp(Si(OH)4)q(H3L)r
****
C9H7N L CAS 119-65-3 (487)
Isoquinoline;

Metal Mtd Medium Temp Conc Cal Flags Lg K values Reference ExptNo
---
Si++++ cal non-aq 25°C 100% U H 1967MOb (64027) 39
Medium: n-hexane. Many data; DH(SiF4(l)+2L(l)=SiF4L2(c))=-116.2 kJ mol-1
DH(SiF4(g)+2L(l)=SiF4L2(c))=-133.3, DH(SiCl4(l)+2L(l)=SiCl4L2(c))=-72.7
****
C9H11NO4 H3L DOPA CAS 59-92-7 (5)

2-Amino-3-(3,4-dihydroxyphenyl)propanoic acid;H2NCH(CH2C6H3(OH)2)COOH

Metal	Mtd	Medium	Temp	Conc	Cal	Flags	Lg K values	Reference	ExptNo
Si++++	gl	NaCl	25°C	0.60M	U		B(-2,1,3)=-10.08 B(-3,1,3)=-19.35	1993SSa (66402)	40

B(p,q,r): pH+qSi(OH)4+rH3L=Hp(Si(OH)4)q(H3L)r

****

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

Metal	Mtd	Medium	Temp	Conc	Cal	Flags	Lg K values	Reference	ExptNo
Si++++	gl	NaCl	25°C	0.10M	C	H	Kout(SiL3+L)=1.50 K(SiL3=Si(OH)L2+L+H)=-8.05	2000KEa (80513)	41

By calorimetry: DH(SiL3+L)=-16 kJ mol-1, DS=-20 J K-1 mol-1.
DH(SiL3=Si(OH)L2+L+H)=-15, DS=100.

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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 Experiments recorded for Dr. M. Filella, University of Geneva
from SC-Database on Sunday, 25 September, 2022 at 12:03:35