

## SC-Database

Software version = 5.81 Data version = 4.62

Experiment list contains 25 experiments for

(no ligands specified)

2 metals : Se(IV), Se(not IV)

(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
Se(IV)	EMF	none	25°C	0.0	U				19660Va	(931) 1
K=50.3, 744 mV										
K: H <sub>2</sub> SeO <sub>3</sub> + 4H + 4e = Se(s) + 3H <sub>2</sub> O										

Se(IV)	oth	none	25°C	0.0	U				1952LAb	(932) 2
K=38.9(1150 mV)										
K: Se(VI)O <sub>4</sub> +4H+2e=H <sub>2</sub> SeO <sub>3</sub> +H <sub>2</sub> O. From thermodynamic data. K(H <sub>2</sub> SeO <sub>3</sub> +4H+4e=Se(s)+3H <sub>2</sub> O)=50.04(740 mV) plus others										

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

Metal	Mtd	Medium	Temp	Conc	Cal	Flags	Lg	K values	Reference	ExptNo
Se(IV)	sp	non-aq	25°C	100%	U T H				1975WSa	(2308) 3
K(SeO <sub>2</sub> +Br)=1.11										
K(SeOCl <sub>2</sub> +Br)=1.49										
Medium: DMSO. DH(SeO <sub>2</sub> L)=-11.1; DS=-59. DH(SeOCl <sub>2</sub> L)=21.3 kJ mol <sup>-1</sup> ; DS=96 J K <sup>-1</sup> mol <sup>-1</sup>										

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

Metal	Mtd	Medium	Temp	Conc	Cal	Flags	Lg	K values	Reference	ExptNo
Se(IV)	sol	oth/un	0°C	dil	U T				1961HAb	(2761) 4
K(Se(s)+HL=SeCN+H)=-3.11										
Medium: not specified; at 0.3 C. Se(all)=Se(0). At 10.8 C, K=-3.33										

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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
Se(IV)	sp	non-aq	25°C	100%	U T H				1975WSa	(5699) 5
K(SeO <sub>2</sub> +Cl)=1.50										

K(SeOCl<sub>2</sub>+Cl)=1.08

Medium: DMSO. DH(SeO<sub>2</sub>L)=-4.1; DS=-42. DH(SeOCl<sub>2</sub>L)=24.3 kJ mol<sup>-1</sup>; DS=100 J K<sup>-1</sup> mol<sup>-1</sup>

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Se(IV)	EMF non-aq 25°C 100% U	1969DTa (5700)	6
		K(SeOL <sub>2</sub> =SeOL+L)=-9.7	

Medium: SeOCl<sub>2</sub>, 0.5 M (C<sub>2</sub>H<sub>5</sub>)<sub>4</sub>NC<sub>10</sub>

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

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Metal	Mtd	Medium	Temp	Conc	Cal	Flags	Lg K values	Reference	ExptNo
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Se(IV)	sp	non-aq	25°C	100%	U T H	K1=0.95	1975WSa (8373)	7
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Medium: DMSO. DH(SeO<sub>2</sub>L)= 12.2 kJ mol<sup>-1</sup>. DS=-56 J K<sup>-1</sup> mol<sup>-1</sup>

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NO <sub>3</sub> -	HL	Nitrate	CAS 7697-37-2 (288)
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Nitrate;

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Metal	Mtd	Medium	Temp	Conc	Cal	Flags	Lg K values	Reference	ExptNo
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Se(IV)	ix	oth/un	25°C	>3	U	K1=2.34	B2=3.47	19850Ka (9917)	8
						K3=0.69			
						K4=0.45			
						K5=0.28			
						K6=0.13			

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OH-	HL	Hydroxide	(57)
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Hydroxide;

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Metal	Mtd	Medium	Temp	Conc	Cal	Flags	Lg K values	Reference	ExptNo
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Se(IV)	oth	NaClO <sub>4</sub>	20°C	2.50M	U	B2=29.0	19840Ka (12121)	9
						K3=14.15		
						K4=12.30		

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CH <sub>4</sub> O	L	Methyl alcohol	CAS 67-56-1 (597)
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Methanol; CH<sub>3</sub>.OH

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Metal	Mtd	Medium	Temp	Conc	Cal	Flags	Lg K values	Reference	ExptNo
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Se(IV)	EMF	alc/w	20°C	100%	U	1971GSa (17899)	10
						K(Se+4L=Se(H-1L) <sub>4</sub> +4H) > 1	

Medium: MeOH, 1 M Me<sub>4</sub>NC<sub>1</sub>

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C <sub>5</sub> H <sub>11</sub> NS <sub>2</sub>	HL	Diethyldithiocarbamic acid; (CH <sub>3</sub> .CH <sub>2</sub> ) <sub>2</sub> N.CSSH	CAS 147-84-2 (2126)
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Metal	Mtd	Medium	Temp	Conc	Cal	Flags	Lg K values	Reference	ExptNo
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Se(IV) sp non-aq ? 100% U M 1968SRg (41370) 11  
K(Se(HA)4+4HL=SeL4+4H2A)=6.5

Medium: CCl4. H2A=dithizone

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C6H7NS HL CAS 137-07-5 (3098)  
2-Aminothiophenol (o-aminothiophenol); H2N.C6H4.SH

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Metal Mtd Medium Temp Conc Cal Flags Lg K values Reference ExptNo  
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Se(IV) sp oth/un 25°C 2.00M U 1971BSi (45089) 12  
I=2.0-2.4. K(H2SeO3+4HL=SeL2+L2+3H2O)=16.2 (L2=PhSSPh, SeL2=PhSSeSPh)

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C7H5NS2 HL CAS 149-30-3 (3752)  
2-Mercaptobenzo-1,3-thiazole;

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Metal Mtd Medium Temp Conc Cal Flags Lg K values Reference ExptNo  
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Se(IV) sp oth/un 25°C 1.80M U 1971BSi (53085) 13  
Range of ionic strength 1.7-2.0. K(H2SeO3+4RSH=RSSeSR+RSSR+3H2O)=13.3

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C7H6O2S H2L Thiosalicylic CAS 147-93-3 (236)  
2-Mercaptobenzoic acid; HS.C6H4.COOH

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Metal Mtd Medium Temp Conc Cal Flags Lg K values Reference ExptNo  
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Se(IV) sp oth/un 25°C 2.0M U 1971BSi (53916) 14  
Range of ionic strength 2.0-2.8. K(H2SeO3+4RSH=RSSeSR+RSSR+3H2O)=16.7

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C14H9NO4 H2L Alizarin Maroon CAS 3963-78-8 (1052)  
3-Amino-1,2-dihydroxyanthraquinone;

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Metal Mtd Medium Temp Conc Cal Flags Lg K values Reference ExptNo  
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Se(IV) gl NaClO4 20°C 0.10M U M K1=6.9 B2=12.90 1982ISa (86813) 15  
Se(IV), selenite

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C28H15NO4 L CAS 82-22-4 (3522)  
1,1'-Iminodianthraquinone; (1,1'-dianthrimide)

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Metal Mtd Medium Temp Conc Cal Flags Lg K values Reference ExptNo  
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Se(IV) sp mixed ? 96% U 1966DLA (104654) 16  
K(2HSeO2+HL)=8.75

Medium: 96% H2SO4

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Se(IV) sp oth/un 70°C 96% U 1959LSa (104655) 17  
K(H2SeO3+HL=HSeO2L(?))=5.04

Medium: 96.25% H2SO4

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C28H15NO4 L (4171)

1,2'-Iminodianthraquinone (1,2'-dianthrimide)

Metal	Mtd	Medium	Temp	Conc	Cal	Flags	Lg K values	Reference	ExptNo
Se(IV)	sp	mixed	?	96%	U			1966MLa (104658)	18

K(HSeO<sub>2</sub>+HL)=4.40

Medium: 96.0% H<sub>2</sub>SO<sub>4</sub>

C<sub>28</sub>H<sub>15</sub>N<sub>4</sub>O<sub>4</sub> L CAS 30999-75-8 (4172)  
 2,2'-Iminodianthraquinone (2,2'-dianthrimide)

Metal	Mtd	Medium	Temp	Conc	Cal	Flags	Lg K values	Reference	ExptNo
Se(IV)	sp	mixed	?	96%	U			1966DLA (104659)	19

K(HSeO<sub>2</sub>+HL)=3.89  
 K(2HSeO<sub>2</sub>+2HL)=12.50

Medium: 95.5% H<sub>2</sub>SO<sub>4</sub>

e- HL Electron (442)  
 Electron;

Metal	Mtd	Medium	Temp	Conc	Cal	Flags	Lg K values	Reference	ExptNo
Se(not IV)	oth	none	25°C	0.0	U			1952LAb (933)	20

K=-12.5(-370 mV)

K: Se(s)+2H+2e=H<sub>2</sub>Se(g). From thermodynamic data. K(Se(s)+2e=Se(II))=-31.2 (-920 mV)

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

Metal	Mtd	Medium	Temp	Conc	Cal	Flags	Lg K values	Reference	ExptNo
Se(not IV)	sol	oth/un	0°C	dil	U T			1961HAb (2762)	21

Ks(Se(s)+HL=Se(0)CN+H)=-3.11

At 10.8 C, K=-3.33

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

Metal	Mtd	Medium	Temp	Conc	Cal	Flags	Lg K values	Reference	ExptNo
Se(not IV)	nmr	non-aq	120°C	100%	U T H			1994KRa (2823)	22

Metal:Co(0). Method:NMR. Medium:Carbon monoxide. T. 120-225 C  
 K:Co<sub>2</sub>L<sub>8</sub>=2CoL<sub>4</sub>. DH=79.5 kJ mol<sup>-1</sup>; DS=121

S<sub>03</sub>-- H<sub>2</sub>L Sulfite CAS 7782-99-2 (801)  
 Sulfite;

Metal	Mtd	Medium	Temp	Conc	Cal	Flags	Lg K values	Reference	ExptNo
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 Se(not IV) oth oth/un 20°C var U T 1947GOa (15477) 23  
 $K(L+Se(s)=SeSO_3)=0.64$

By chemical analysis. Medium: Na2L.  $K=-0.09(97.5\text{ C})$

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SeCN- HL Selenocyanate CAS 73102-11-2 (440)  
 Selenocyanate;

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Metal	Mtd	Medium	Temp	Conc	Cal	Flags	Lg	K values	Reference	ExptNo
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Se(not IV) sp non-aq 2°C 100% U 1972CPb (16994) 24  
 $K((SeCN)_2+L)=4.3$

Medium: acetonitrile, 0.1 M LiClO4.  $K_1=4.6$  from current-voltage studies

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

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Metal	Mtd	Medium	Temp	Conc	Cal	Flags	Lg	K values	Reference	ExptNo
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Se(not IV) vlt NaCl 0°C 0.20M U M 1993BSa (22079) 25  
 $Kox((4Fe-4S)+L)=4.55$   
 $Kred((4Fe-4S)+L)=1.01$

Metal:Fe(oxidation state unknown).

(4Fe-4S)++ and (4Fe-4S)+ are in Ferredoxin III.

## REFERENCES

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## EXPLANATORY NOTES

DATA Flags are :-

T Data at other TEMPERATURES  
H Data for THERMOCHEMICAL quantities  
M Data for TERNARY Complexes

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END