COMPONENTS:	EVALUATOR:
Tellurites	Mary R. Masson, Dept. of Chemistry, University of Aberdeen, Meston Walk, Old Aberdeen, AB9 2UE, Scotland, UK. July 1984.

CRITICAL EVALUATION:

LITHIUM TELLURITE

The binary system lithium tellurite - water has been studied only once (1). The regression equation for the data is

$$y = 23.5 - 0.505(T - 273.2) + 0.00542(T - 273.2)^2 - 0.0000234(T - 273.2)^3$$

$$s = 0.08 \text{ (6 points)}$$

where $y = 100w_2$ is the concentration of lithium tellurite in mass %, T is the temperature in K, and s is the standard deviation of the dependent variable about the regression line.

TENTATIVE (SMOOTHED) VALUES

T/K	Solubility	
	mass %	molality mol/kg
303.2	12.60	0.761
313.2	10.47	0.617
323.2	8.88	0.514
333.2	7.66	0.438
343.2	6.68	0.378
353.2	5.81	0.326

SODIUM TELLURITE

There has been no study of the binary system sodium tellurite - water, but some data are available from ternary systems (2 - 5). It was not possible to fit a satisfctory regression equation to the available data, because of the lack of good agreement and the small number of points available. The solid phase was $Na_2TeO_3.5H_2O$ [22451-06-5], except at 363.2 K, where it was the anhydrous salt.

TENTATIVE VALUES

T/K	Solubility		Ref.
	mass %	molality mol/kg	
298.2	45.03	3.697	3,4 (mean)
303.2	46.23	3.880	5
333.2	51.68	4.827	5
343.2	55.54	5.638	2
363.2	52.46	4.980	5

COMPONENTS:	EVALUATOR:
Tellurites	Mary R. Masson, Dept. of Chemistry, University of Aberdeen, Meston Walk, Old Aberdeen, AB9 2UE, Scotland, UK. July 1984.

CRITICAL EVALUATION: (continued)

TERNARY SYSTEMS

The ternary systems studied were sodium tellurite - sodium hydroxide - water (2,3), sodium tellurite - sodium carbonate - water (4,5), sodium tellurite - sulfuric acid - water (6), sodium tellurite - perchloric acid - water (7), sodium selenite - sodium tellurite - water (8) and sodium telllurite - ethanol - water (9). No comparisons were possible.

OTHER TELLURITES

The solubility of cesium tellurite was found to be 67.65% (molality 1.550 mol/kg) at 291.1 K (10).

The solubilities of some sparingly soluble tellurites are reported to be as follows:

Ion	K_{sO}	pK_{sO}	T/K	Ref.
Ba^{2+}	8.24×10^{-8} to 2.17×10^{-5} mol^2dm^{-6}	4.66 - 7.08	298.2	11
Co^{2+}	3.1×10^{-7} mol^2dm^{-6}	6.51	298.2?	12
Ni^{2+}	2.34×10^{-10} mol^2dm^{-6} (HCl)	9.63	298.2?	12
	3.84×10^{-10} mol^2dm^{-6} (H_2SO_4)	9.42	298.2?	12
Cu^{2+}	1.11×10^{10} mol^2dm^{-6} (H_2SO_4)	9.95	298.2?	12
	1.6×10^{-11} mol^2dm^{-6} (HCl)	10.80	298.2?	12
Ag^{+}	3.7×10^{-3} mol^3dm^{-9}	2.43??	298.2	13
	1.41×10^{-18} mol^3dm^{-9}	17.85	298.2	14
	1.17×10^{-18} mol^3dm^{-9} (recalc.)	17.93	298.2	
	8.71×10^{-19} mol^3dm^{-9}	18.06	293.2	15
Pb^{2+}	4.07×10^{-11} to 5.93×10^{-8} mol^2dm^{-6}	7.23 - 10.99	298.2	11

GENERAL COMMENTS

It is evident that there is very little information available on the solubility of tellurites, and unfortunately much of what is available appears to be not very reliable. Of the silver tellurite values, the values reported in (14) and (15) are in reasonable agreement, so it seems that the values in (13) should be rejected.

COMPONENTS:	EVALUATOR:
Tellurites	Mary R. Masson, Dept. of Chemistry, University of Aberdeen, Meston Walk, Old Aberdeen, AB9 2UE, Scotland, UK. July 1984.

CRITICAL EVALUATION: (continued)

REFERENCES

1. Breusov, O.N.; Revzina, T.V.; Druz, N.A. *Zh. Neorg. Khim.* 1965, *10*, 1990; **Russ. J. Inorg. Chem. (Eng. Transl.)* 1965, *10*, 1084.
2. Lavut, E.A.; Vorob'eva, O.I.; Shulgina, I.M. *Zh. Neorg. Khim.* 1961, *6*, 2758; **Russ. J. Inorg. Chem. (Eng. Transl.)* 1961, *6*, 1394.
3. Lavut, E.A.; Vorob'eva, O.I. *Zh. Neorg. Khim.* 1960, 5, 1813; **Russ. J. Inorg. Chem. (Eng. Transl.)* 1960, 5, 880.
4. Kunev, D.K.; Vassilev, H. *C.R. Acad. Bulg. Sci.* 1968, *21*, 233.
5. Chimbulev, M.; Vasilev, Kh.; Kunev, D. *Khim. Ind. (Sofia)* 1973, 45, 71.
6. Babayan, G.G.; Kapantsyan, E.E.; Arutyunyan, M.G.; Akopyan, Z.A. *Arm. Khim. Zh.* 1973, *26*, 467.
7. Masson, M.R. *J. Inorg. Nucl. Chem.* 1976, *38*, 545.
8. Chimbulev, M.; Vasilev, Kh. *God. Vissh. Khim.-Tekhnol. Inst., Sofia* 1977, 22, 247.
9. Vorob'eva, O.I.; Lavut, E.A. *Zh. Neorg. Khim.* 1957, 2, 1154; **Russ. J. Inorg. Chem. (Eng. Transl.)* 1957, 2, 261.
10. Lavut, E.A. *Vestn. Mosk. Univ. Ser. II, Khim.* 1966, *21*, 91.
11. Ganelina, E.Sh.; Merzon, V.V.; Biryukov, V.P. *Izv. Vyssh. Ucheb. Zaved. Khim. Khim. Tekhnol.* 1969, *12*, 1465.
12. Ganelina, E.Sh. *Zh. Priklad. Khim.* 1967, *40*, 1019; **J. Appl. Chem. USSR (Eng. Transl.)* 1967, *40*, 983.
13. Ganelina, E.Sh.; Pozhidaeva, T.N. *Zh. Priklad. Khim.* 1965, *38*, 2210; **J. Appl. Chem. (Eng. Transl.)* 1965, *38*, 2168.
14. Mehra, M.C.; Kahn, S.M. *Can. J. Chem.* 1972, *50*, 1788.
15. Chao, E.E.; Cheng, K.L. *Anal. Chem.* 1976, *48*, 267.