COMPONENTS:	EVALUATOR:
1. Strontium sulfite; $SrSO_3$; [13451-02-0] 2. Water; H_2O; [7732-18-5]	H.D. Lutz, Dept. of Chemistry, University of Siegen, FR Germany. August 1983.

CRITICAL EVALUATION:

Strontium sulfite crystallizes from aqueous solutions as the anhydrous salt, $SrSO_3$. Numerical data on the solubility of strontium sulfite in water have been given by Autenrieth *et al.* (1), Rodin *et al.* (2), and Cohen *et al.* (3). Autenrieth *et al.* (1) report a value of 3.3×10^{-2} g $SrSO_3$/kg H_2O ($m(SrSO_3) = 2.0 \times 10^{-4}$ mol kg^{-1}) at 289 - 291 K. Rodin *et al.* (2) report that the solubility of $SrSO_3$ in water increases from 1.38×10^{-3} g/dm^3 ($c(SrSO_3) = 8.2 \times 10^{-6}$ mol dm^{-3}) at 293 K to 3.22×10^{-3}g/dm^3 (1.91×10^{-5} mol dm^{-3}) at 363 K. Cohen *et al.* (3) studied the change of the amount of dissolved strontium sulfite in solutions containing 0.7 mol dm^{-3} NaCl and rapidly precipitated $SrSO_3$. They report that the $SrSO_3$ concentration at 298 K decreases from 7.0×10^{-4} to 3.5×10^{-4} mol kg^{-1} (molality) within 24 hr. The change in the solubility is attributed to a phase transition of the precipitated strontium sulfite.

TENTATIVE VALUES

The solubility of $SrSO_3$ in water at room temperature is approximately 1×10^{-4} mol kg^{-1} (molality scale) (0.015 g/kg H_2O). The temperature coefficient of solubility is positive.

Fragmentary investigations on the ternary systems $SrSO_3$-SO_2-H_2O (4) and $SrSO_3$-ethanol-H_2O (5) indicate that the solubility of strontium sulfite increases to 17.3 g (0.103 mole)/kg soln with increasing SO_2 content of the solution (4) and decreases with increasing ethanol content (5). $SrSO_3$ is described to be practically insoluble in dilute acetic acid (1,6) and readily soluble in other acids, undergoing decomposition.

REFERENCES

1. Autenrieth, W.; Windaus, A. *Z. Anal. Chem.* 1898, *37*, 290.

2. Cohen, A.; Zangen, M.; Goldschmidt, J.M.E. *Rev. Chim. Miner.* 1981, *18*, 142.

3. Rodin, I.V.; Margulis, E.V. *Zh. Neorg. Khim.* 1983, *28*, 255; *Russ. J. Inorg. Chem. (Eng. Transl.)* 1983, *28*, 142.

4. Simon, A.; Waldmann, K. *Naturwissenschaften* 1958, *45*, 128.

5. Arnal, T.G.; Mesorana, J.M.P. *An. Fis. Quim* 1947, *43*, 439.

6. Hinds, J.I.D. *J. Am. Chem. Soc.* 1911, *33*, 510; *Chem. News* 1911, *103*, 157.

COMPONENTS:	ORIGINAL MEASUREMENTS:
1. Strontium sulfite; $SrSO_3$; [13451-02-0] 2. Water; H_2O; [7732-18-5]	Autenrieth, W.; Windaus, A. *Z. Anal. Chem.* 1898, *37*, 290-300.
VARIABLES:	PREPARED BY:
One temperature: 290 K	H.D. Lutz

EXPERIMENTAL VALUES:

The authors report the solubility of strontium sulfite in water at 16-18°C to be

1 part of $SrSO_3$ per 30 000 parts of H_2O.

This value is converted by the compiler to

3.3×10^{-2} g $SrSO_3$/kg H_2O or $m(SrSO_3) = 2.0 \times 10^{-4}$ mol kg^{-1}.

AUXILIARY INFORMATION

METHOD APPARATUS/PROCEDURE:	SOURCE AND PURITY OF MATERIALS:
Saturation method. Equilibrium was established with frequent shaking after several days. Sulfite was determined iodometrically and strontium gravimetrically as the sulfate. The content of strontium in the saturated solution was somewhat higher than the sulfite content due to a little amount of $SrSO_4$. Numerical data are not given by the authors.	Not given.
	ESTIMATED ERROR:
	REFERENCES:

COMPONENTS:	ORIGINAL MEASUREMENTS:
1. Strontium sulfite; $SrSO_3$; [13451-02-0] 2. Water; H_2O; [7732-18-5]	Rodin, I.V.; Margulis, E.V. *Zh. Neorg. Khim.* 1983, *28*, 255-6; **Russ. J. Inorg. Chem. (Eng. Transl.)* 1983, *28*, 142.
VARIABLES:	PREPARED BY:
Four temperatures: 293 - 363 K	B. Engelen

EXPERIMENTAL VALUES:

The solubilities of strontium sulfite in water at various temperatures are reported. The solubility products are defined as $K_{s0}(SrSO_3) = [Sr^{2+}]^2$.

t/°C	Sr	$SrSO_3$		$10^{11}K_{s0}$
	mg/dm^3	mg/dm^3[a]	$10^5 c/mol\ dm^{-3}$	$mol^2\ dm^{-6}$
20	0.72	1.38	0.82	6.72
50	1.13	2.16	1.28	16.4
70	1.49	2.85	1.69	28.6
90	1.68	3.22	1.91	36.5

[a] Calculated by the compiler.

AUXILIARY INFORMATION

METHOD APPARATUS/PROCEDURE:	SOURCE AND PURITY OF MATERIALS:
Saturation method. Equilibrium was established by stirring the saturated solution in thermostatically controlled glass tubes. Equilibrium was tested for analytically - 3 hr was reported to be sufficient. Strontium was determined gravimetrically.	Strontium sulfite was precipitated from $SrCl_2$ solutions with Na_2SO_3.
	ESTIMATED ERROR: Temperature: ±0.5 K
	REFERENCES:

COMPONENTS:	ORIGINAL MEASUREMENTS:
1. Strontium sulfite; $SrSO_3$; [13451-02-0] 2. Sodium chloride; NaCl; [7647-14-5] 3. Water; H_2O; [7732-18-5]	Cohen, A.; Zangen, M.; Goldschmidt, J.M.E. *Rev. Chim. Miner.* 1981, *18*, 142-7.
VARIABLES: One temperature: 298 K One concentration of NaCl: 0.7 mol dm^{-3} Time of stirring	PREPARED BY: H.D. Lutz

EXPERIMENTAL VALUES:

The solubility of rapidly precipitated $SrSO_3$ at 25°C decreases from 7.0 x 10^{-4} to 3.5 x 10^{-4} mol kg^{-1} (molality) within 24 hr. The change of the solubility is attributed to a phase transition of the solid strontium sulfite.

AUXILIARY INFORMATION

METHOD APPARATUS/PROCEDURE:	SOURCE AND PURITY OF MATERIALS:
The solubility of $SrSO_3$ was determined in a stirred solution of aqueous NaCl (concentration 0.7 mol dm^{-3}). Method of analysis not given.	Strontium sulfite was precipitated by mixing equivalent amounts of $SrCl_2$ and Na_2SO_3.
	ESTIMATED ERROR:
	REFERENCES: