COMPONENTS:	EVALUATOR:
(1) Rubidium Bromate; $RbBrO_3$; [13446-70-3]	H. Miyamoto Niigata University Niigata, Japan and M. Salomon US Army ET & DL Fort Monmouth, NJ, USA February 1986
(2) Water; H_2O; [7732-18-5]	

CRITICAL EVALUATION:

THE BINARY SYSTEM

The solubility of rubidium bromate in water has been reported in 3 publications (1-3): note that the compilation for Ref. (3) is given in the $KBrO_3$ chapter. The solid phase in all cases was reported (2,3) to be the anhydrous salt. Breusov et al. (2) report a small break at 311.2 K when log (χ) was plotted as a function of T/K. Since the solid phase is the anhydrous salt and since both dilatometric and X-ray studies showed no signs of polymorphism, these authors concluded that this phenomenon may be due to large changes in hydration of the ions in solution. When the evaluators plotted the simple function of solubility as a function of T/K, a smooth monotonous curve was obtained with no indication of any breaks.

Buell and McCrosky (1) determined a melting point of 603 K for $RbBrO_3$.

In all cases the solubilities of Bruesov et al. (2) are slightly higher than those of Buell and McCrosky (1), the maximum difference being close to 3% at 298.2 K. Since it is not possible to determine any sources of error in either study (1-3), we have uncritically fitted all data points to the smoothing equations (see the compilations for the experimental results and compilers' conversions). For mole fraction solubilities we derive the following smoothing equation:

$$Y_x = -14463.4/(T/K) - 32.984\ell n(T/K) + 218.108 + 0.025875(T/K) \quad [1]$$

$$\sigma_y = 0.024 \qquad \sigma_x = 1.1 \times 10^{-4}$$

For solubilities in mol kg^{-1} units we obtain the following equation:

$$Y_m = -5626.5/(T/K) - 7.185\ell n(T/K) + 63.842 \quad [2]$$

$$\sigma_y = 0.012 \qquad \sigma_m = 0.0071$$

Solubilities calculated from eqs. [1] and [2] are designated as *tentative* solubilities, and values at rounded temperatures are given in the Table following the references.

REFERENCES

1. Buell, H. D.; McCrosky, C. R. *J. Am. Chem. Soc.* 1921, *43*, 2031.

2. Breusov, O. N.; Kashina, N. I.; Revzina, T. V.; Sobolevskaya, N. G. *Zh. Neorg. Khim.* 1967, *12*, 2240; *Russ. J. Inorg. Chem. (Engl. Transl.)* 1967, *12*, 1179.

3. Kirgintsev, A. N.; Shklovskaya, R. M.; Arkhipov, S. M. *Izv. Akad. Nauk SSSR Ser. Khim.* 1971, 2631; *Bull. Acad. Sci. USSR Div. Chem. Sci.* 1971, *2501*.

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CRITICAL EVALUATION:

Table 1. Tentative Solubilities Calculated from the Smoothing Equations [1] and [2]. In all cases the Solid Phase is Anhydrous $RbBrO_3$.

T/K	χ	mol kg^{-1}
273.2	0.000828	0.0462
283.2	0.001327	0.0738
293.2	0.002038	0.1132
298.2	0.002489	0.1383
303.2	0.003012	0.1675
308.2	0.003615	0.2013
313.2	0.004305	0.2400
323.2	0.005970	0.3338
333.2	0.008063	0.4522
343.2	0.01063	0.5980
353.2	0.01373	0.7739
363.2	0.01738	0.9818
373.2	0.02164	1.223