COMPONENTS:	ORIGINAL MEASUREMENTS:
(1) Potassium bromate; $KBrO_3$; [7758-01-2]	Ricci, J.E.
(2) Water; H_2O; [7732-18-5]	*J. Am. Chem. Soc.* 1934, 56, 299-303.
VARIABLES:	**PREPARED BY:**
T/K = 278 - 323	Hiroshi Miyamoto

EXPERIMENTAL VALUES: Solubility of $KBrO_3$

t/°C	mass %	mol % (compiler)	mol kg^{-1} (compiler)	Density g cm^{-3}	Solid phase
5	3.642	0.4061	0.2263	1.024	$KBrO_3$
10	4.510	0.5069	0.2828	1.035	"
15	5.397	0.6117	0.3416	1.042	"
20	6.460	0.7395	0.4135	1.048	"
25	7.533	0.8712	0.4878	1.054	"
30	8.785	1.028	0.5767	1.062	"
35	10.13	1.201	0.6750	1.074	"
40	11.58	1.393	0.7842	1.083	"
45	13.08	1.597	0.9011	-	"
50	14.69	1.824	1.031	-	"

AUXILIARY INFORMATION

METHOD/APPARATUS/PROCEDURE:
Mixtures of $KBrO_3$ and water were placed in bottles and rotated in a large water thermostat for two days, a time found to be sufficient for attaining equilibrium. Samples of the saturated solution were withdrawn by means of a calibrated pipet provided with a folded filter paper at the tip. The bromate was determined by titration with standard sodium thiosulfate solution.

SOURCE AND PURITY OF MATERIALS:
C.p. grade $KBrO_3$ was recrystallized, dried to the anhydrous state, and stored in a 100°C oven.

ESTIMATED ERROR:
Soly: accuracy within 0.2 %.
Temp: precision ± 0.01 K.
Densities: precision about 0.1 %.

REFERENCES:

COMPONENTS:	ORIGINAL MEASUREMENTS:
(1) Potassium bromate; $KBrO_3$; [7758-01-2] (2) Water; H_2O; [7732-18-5]	Benrath, A.; Gjedebo, F.; Schiffers, B.; Wunderlich, H. *Z. Anorg. Allg. Chem.* 1937, *231*, 285-97.
VARIABLES:	**PREPARED BY:**
T/K = 407 to 585	Hiroshi Miyamoto

EXPERIMENTAL VALUES:

t/°C	Solubility mass %	Solubility mol kg^{-1} (compiler)
134	43.6	4.63
149	48.4	5.62
160	51.1	6.26
167	53.5	6.89
170	54.1	7.06
172	57.3	8.04
186	59.9	8.94
193	63.2	10.3
204	64.2	10.7
211	67.4	12.4
226	70.6	14.4
230	72.6	15.9
249	72.6	15.9
254	74.4	17.4
265	77.2	20.3
274	79.1	22.7
279	81.1	25.7
286	81.4	26.2
297	83.1	29.4
312	86.4	38.0

AUXILIARY INFORMATION

METHOD/APPARATUS/PROCEDURE:

Synthetic method used with visual observation of temperature of crystallization and solubilization (ref 1).
The weighed salt and water were placed in a small tube. The tubes were set in an oven equipped with a mica window. A thermometer was immersed in the oven.

SOURCE AND PURITY OF MATERIALS:

No information was given.

ESTIMATED ERROR:

Nothing specified.

REFERENCES:

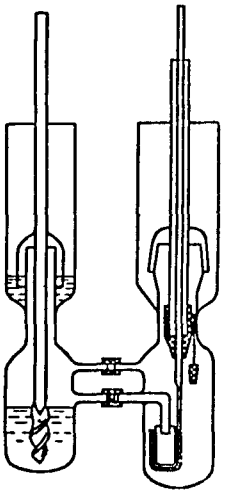
1. Jaenecke, E. *Z. Physik. Chem.* 1936, *A177*, 7.

COMPONENTS:	ORIGINAL MEASUREMENTS:
(1) Potassium bromate; $KBrO_3$; [7758-01-2] (2) Water; H_2O; [7732-18-5]	Breusov, O. N.; Kashina, N. I.; Revzina, T. V.; Sobolevskaya, N. G. *Zh. Neorg. Khim.* 1967, *12*, 2240-3; *Russ. J. Inorg. Chem.* (*Engl. Transl.*) 1967, *12*, 1179-81.
VARIABLES:	PREPARED BY:
T/K = 273 to 373	M. Salomon and H. Miyamoto

EXPERIMENTAL VALUES:

	Solubility of $KBrO_3$[a]		
t/°C	mass %	mol %	mol kg^{-1}
0	2.98	0.3303	0.1839
10	4.54	0.5104	0.2848
20	6.42	0.7346	0.4108
25	7.55	0.8733	0.4890
30	8.84	1.035	0.5806
40	11.67	1.405	0.7911
50	14.82	1.842	1.042
60	18.08	2.325	1.322
70	21.76	2.913	1.665
80	25.35	3.534	2.033
90	29.40	4.299	2.494
100	33.31	5.113	2.991

[a]Mol % and mol kg^{-1} solubilities calcd by compilers.



AUXILIARY INFORMATION

METHOD/APPARATUS/PROCEDURE:

Isothermal method. Equilibrium reached in 4-5 h. From 90-100°C, the solubility was determined in the apparatus shown in the figure. At equilibrium the apparatus was tilted to allow saturated solution to filter through connecting tube into weighed test tubes. The test tubes were closed with a stopper, withdrawn and weighed. Condensation on the walls of the apparatus and loss of water by evaporation was thus prevented. At the lower temperatures, ordinary solubility vessels were used, and pipets with glass filters were used for sampling (no other details given). Above 50°C, the pipets were preheated in the thermostat.

Bromate was determined iodometrically.

SOURCE AND PURITY OF MATERIALS:

Results of analysis of $KBrO_3$:

content of $KBrO_3$ = 99.3 %, and impurities are Rb (0.1 %), Cs (0.01 %), Na (0.016 %), SO_4 (0.005 %), and Fe (0.0001 %).

The alkali metal impurities were dtd by flame photometry, the iron colorimetrically, and sulfate nephelometrically.

ESTIMATED ERROR:

Soly: nothing specified.

Temp: precision ± 0.1 K.

REFERENCES:

COMPONENTS:	ORIGINAL MEASUREMENTS:
(1) Potassium bromate; $KBrO_3$; [7758-01-2] (2) Water-d_2; D_2O; [7789-20-0] (3) Water; H_2O; [7732-18-5]	Chang, T.L.; Hsieh, Y.Y. *Sci. Repts. Natl. Tsing Hua Univ.* 1948, A5, 252-9.
VARIABLES: T/K = 298.15	**PREPARED BY:** G. Jansco and H. Miyamoto

EXPERIMENTAL VALUES:

t/°C	Water-d_2 mol %	Potassium Bromate mole/55.51 moles of H_2O-D_2O mixture
25	0	0.494
		0.495
		(Av) 0.495[a]
	32.5	0.479
		0.479
		(Av) 0.479
	66.2	0.460
		0.458
		(Av) 0.459
	100	0.443[b]

[a] Average values calculated by compiler.

[b] The solubility in 100 % D_2O was obtained from the solubilities in the H_2O-D_2O mixtures by linear extrapolation.

AUXILIARY INFORMATION

METHOD/APPARATUS/PROCEDURE:

Saturated solutions of $KBrO_3$ in the H_2O-D_2O mixtures were prepared by the method of supersaturation. The supersaturated solutions were prepared by agitating excess salt with the water mixture for one hour at 60°C; the time of agitation in the 25°C bath was 3 hours.
A sample of the clear solution was delivered into a weighing bottle, the solvent evaporated and the residual pure salt was dried in vacuum at 100°C and weighed.

SOURCE AND PURITY OF MATERIALS:

Potassium bromate was purified by recrystallization from conductivity water and found to be free from bromide. The salt was dried over calcium chloride in a desiccator for several days before use. D_2O content of the water mixture was determined by pycnometer both before and after each measurement. The mole percentage was calculated from the specific gravity at 25°C (ref 1).

ESTIMATED ERROR:

Soly: accuracy about 1 % (authors).
Temp: precision ± 0.03 K.

REFERENCES:

1. Swift, E. Jr. *J. Am. Chem. Soc.* 1939, *61*, 198.