COMPONENTS:	ORIGINAL MEASUREMENTS:
(1) Lithium bromate; $LiBrO_3$; [13550-28-2]	Mylius, F.; Funk, R.
(2) Water; H_2O; [7732-18-5]	*Ber. Dtsch. Chem. Ges.* 1897, *30*, 1716-25.
VARIABLES:	**PREPARED BY:**
T/K = 291	Hiroshi Miyamoto

EXPERIMENTAL VALUES:

The solubility of $LiBrO_3$ in water at 18°C was given as follows:

60.4 mass %	(authors)
153.7 g/100g H_2O	(authors)
11.40 mol kg^{-1}	(compiler)

Authors state that the solid phase is the anhydrous salt.

The density of the saturated solution was also given as:

1.833 g cm^{-3}.

AUXILIARY INFORMATION

METHOD/APPARATUS/PROCEDURE:

The salt and water were placed in a bottle. The bottle was agitated in a constant temperature bath for an unspecified time.

After the saturated solution settled, an aliquot for analyses was withdrawn with a pipet, and $LiBrO_3$ was determined by evaporation to dryness.

The density of the saturated solution was also determined.

SOURCE AND PURITY OF MATERIALS:

The salt was purchased as a "pure chemical", and trace impurities were not present.

"The purity sufficed for the solubility determination."

ESTIMATED ERROR:

Soly: precision within 1 %.
Temp: nothing specified.

REFERENCES:

COMPONENTS:	ORIGINAL MEASUREMENTS:
(1) Lithium bromate; $LiBrO_3$; [13550-28-2]	Simmons, J.P.; Waldeck, W.F.
(2) Water; H_2O; [7732-18-5]	*J. Am. Chem. Soc.* 1931, 53, 1725-7.
VARIABLES:	**PREPARED BY:**
T/K = 278 - 373	Hiroshi Miyamoto and Mark Salomon

EXPERIMENTAL VALUES:

Solubility of $LiBrO_3$

t/°C	mass %	mol % (compiler)	mol kg^{-1} (compiler)
5	61.6	17.6	11.9
15	63.3	18.7	12.8
25	65.4	20.2	14.0
35	67.5	21.7	15.4
50	71.5	25.1	18.6
53	72.4	26.0	19.5
56	72.6	26.1	19.6
70.5	74.3	27.9	21.4
85	76.2	30.0	23.7
100	78.0	32.1	26.3

[a]Monodrate → anhydrous salt transition temperature determined graphically is about 52°C, and 50.8°C as determined by cooling studies.

AUXILIARY INFORMATION

METHOD/APPARATUS/PROCEDURE:

Isothermal method used. Water and excess salt were placed in small Pyrex glass-stoppered tubes and agitated until equilibrium was reached (about 3 h). Equilibrium was approached from below because of the tendency to form supersaturated solutions when approaching saturation from above. Samples from 0.5 to 1.5 cm^3 were drawn off by means of pipets into 15 cm^3 weighing bottles. Duplicate samples were evaporated to dryness, and the residues heated to constant mass at 110°C.

Iodometric analyses of the solid phase at "room temperature" showed the solid phase to be the monohydrate. Analyses of the solid phase at 55°C showed it to be the anhydrous salt.

SOURCE AND PURITY OF MATERIALS:

Lithium bromate was prepared by mixing solutions of lithium sulfate and barium bromate by titrating one solution against the other until a drop of either gave no precipitate. The filtrate from the barium sulfate was concentrated, and upon cooling lithium bromate crystallized out. Duplicate iodometric analyses of the dried salt gave results of 99.50 % and 100 % lithium bromate.

ESTIMATED ERROR:

Soly: authors state experimental inaccuracies are negligible. Compilers estimate a precision of ± 0.1 mass % units.

Temp: precision ± 0.02 K to ± 0.1K

REFERENCES:

COMPONENTS:	ORIGINAL MEASUREMENTS:
(1) Lithium bromate; $LiBrO_3$; [13550-28-2]	Averko-Antonovich, I.N.
(2) Water; H_2O; [7732-18-5]	*Zh. Obshch. Khim.* 1943, *13*, 272-8.
VARIABLES:	**PREPARED BY:**
Temperature: 228-416 K	Hiroshi Miyamoto

EXPERIMENTAL VALUES:

t/°C	$LiBrO_3$ Solubility mass %	mol % (compiler)	mol kg^{-1} (compiler)	Nature of the solid phase
- 1.05	10.3	1.51	0.852	Ice
- 4.8	20.3	3.29	1.89	"
- 9.8	30.6	5.56	3.27	"
- 20.2	40.0	8.18	4.94	"
- 40.0	52.0	12.6	8.03	"
- 45.0	54.9	14.0	9.03	$LiBrO_3.H_2O$
- 40.0	55.4	14.2	9.21	"
- 36.7	56.2	14.6	9.52	"
- 31.5	56.8	14.9	9.75	"
- 26.5	57.3	15.2	9.95	"
- 21.0	58.2	15.7	10.3	"
- 16.5	58.5	15.8	10.5	"
- 10.8	59.4	16.4	10.9	"
- 6.8	60.2	16.8	11.2	"
0	61.23	17.42	11.71	$LiBrO_3.H_2O$
20.1	64.51	19.54	13.48	"
24.9	65.54	20.26	14.10	"
35.9	67.78	21.94	15.60	"
45.0	70.4	24.1	17.6	"
50.0	71.8	25.4	18.9	"
4	66.8	21.2	14.9	$LiBrO_3$ (m)
17.5	68.2	22.3	15.9	"
45	71.8	25.4	18.9	"

continued.....

AUXILIARY INFORMATION

METHOD/APPARATUS/PROCEDURE:

Solubilities above 0°C were studied isothermally. Aliquots of satd sln were withdrawn with a pipet and $LiBrO_3$ detd iodometrically. The satd sln in equilibrium with metastable salt was prepd as follows: the sln satd at 52°C or above was slowly cooled, stirred for 3-5 h at 45°C, and then allowed to settle for 4 h at 45°C.

A satd sln at the boiling point (143°C) was prepd by gently heating an unsaturated sln at about 143°C, and excess salt was added to the sln. The resulting satd sln was allowed to settle at the boiling point, and clear sln was withdrawn into a capillary glass tube and allowed to solidify. The tube was cut into three pieces, weighed, and the $LiBrO_3$ content detd iodometrically.

Below 0°C a mixture of $LiBrO_3$ and water was placed in a tube equipped with a stirrer, and the tube cooled in a Dewar flask (acetone and solid CO_2). The satd sln was allowed to settle for a few hours, and aliquots withdrawn with a glass tube equipped with a glass-wool or asbestos filter. A water jet-pump was used to filter off the sln, and the slns were analyzed iodometrically. (contd)

SOURCE AND PURITY OF MATERIALS:

No information given.

ESTIMATED ERROR:

Nothing specified.

REFERENCES:

COMPONENTS:	ORIGINAL MEASUREMENTS:
(1) Lithium bromate; $LiBrO_3$; [13550-28-2]	Averko-Antonovich, I.N.
(2) Water; H_2O; [7732-18-5]	*Zh. Obshch. Khim.* 1943, *13*, 272-8.

EXPERIMENTAL VALUES: (Continued)

t/°C	$KBrO_3$ Solubility mass %	mol % (compiler)	mol kg^{-1} (compiler)	Nature of the solid phase
45	70.4	24.1	17.6	$LiBrO_3$
55	72.72	26.26	19.77	"
65	73.86	27.40	20.95	"
80	75.84	29.55	23.28	"
100.5	78.6	32.9	27.2	"
111	79.6	34.3	28.9	"
121	81.2	36.6	32.0	"
143	84.6	42.3	40.8	"

METHOD/APPARATUS/PROCEDURE (Continued)

The synthetic method was also used with visual observation of temperatures of crystallization. The content of $LiBrO_3$ in solution was previously determined by iodometry.