

COMPONENTS: (1) Potassium bromate; KBrO_3 ; [7758-01-2] (2) Lithium chloride; LiCl ; [7447-41-8] (3) Ethanol; $\text{C}_2\text{H}_6\text{O}$; [64-17-5]	ORIGINAL MEASUREMENTS: Gross, P.; Kuzmany, P.; Wald, M. <i>J. Am. Chem. Soc.</i> <u>1937</u> , 59, 2692-4.																																				
VARIABLES: Concentration of LiCl at 288.15 K	PREPARED BY: Hiroshi Miyamoto																																				
EXPERIMENTAL VALUES: The solubility and solubility product of KBrO_3 in 100 % ethanol ^a containing LiCl are: <table border="1" data-bbox="225 560 1064 812" style="margin-left: auto; margin-right: auto;"> <thead> <tr> <th>Concn LiCl $10^4 c_1/\text{mol dm}^{-3b}$</th> <th>Soly KBrO_3 $10^4 c_2/\text{mol dm}^{-3}$</th> <th>$-\log K_{s0}$</th> <th>$-\log K_{s0}^\circ$</th> </tr> </thead> <tbody> <tr><td>0.000</td><td>0.8088</td><td>8.184</td><td>8.251</td></tr> <tr><td>1.191</td><td>0.8583</td><td>8.133</td><td>8.240</td></tr> <tr><td>2.942</td><td>0.8947</td><td>8.097</td><td>8.244</td></tr> <tr><td>5.769</td><td>0.9465</td><td>8.048</td><td>8.242</td></tr> <tr><td>11.07</td><td>1.015</td><td>7.987</td><td>8.248</td></tr> <tr><td>15.87</td><td>1.076</td><td>7.936</td><td>8.246</td></tr> <tr><td>20.34</td><td>1.139</td><td>7.895</td><td>8.243</td></tr> <tr><td>24.52</td><td>1.169</td><td>7.864</td><td>8.246</td></tr> </tbody> </table> <p>^a The authors gave $d_4^{15} = 0.79359$ and $\epsilon = 25.76$ D.</p> <p>^b Initial LiCl concentration (see below).</p> <p>^c $\log K_{s0}^\circ = \log K_{s0} - 7.52I^{\frac{1}{2}}$, where I is the ionic strength.</p>		Concn LiCl $10^4 c_1/\text{mol dm}^{-3b}$	Soly KBrO_3 $10^4 c_2/\text{mol dm}^{-3}$	$-\log K_{s0}$	$-\log K_{s0}^\circ$	0.000	0.8088	8.184	8.251	1.191	0.8583	8.133	8.240	2.942	0.8947	8.097	8.244	5.769	0.9465	8.048	8.242	11.07	1.015	7.987	8.248	15.87	1.076	7.936	8.246	20.34	1.139	7.895	8.243	24.52	1.169	7.864	8.246
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METHOD/APPARATUS/PROCEDURE: Solid KBrO_3 and ethanol containing LiCl were placed in a glass flask, and the flask rotated in a thermostat at 15.000°C for about 12 hours. The authors state that 12 hours are sufficient to insure equilibrium. For the analysis 25 cm^3 of the filtered alcoholic solution was placed in a small flask and evaporated in a boiling water bath while N_2 gas was forced through the liquid. The precipitated KBrO_3 was titrated iodometrically. Although not specifically stated, it appears that the LiCl concentrations in the above table are <i>initial</i> concentrations.	SOURCE AND PURITY OF MATERIALS: Analytical reagent grade KBrO_3 was recrystallized twice. Ethanol was treated first with lime, then with KOH , with silver oxide and with aluminum amalgam. Finally, it was distilled from water-free sulfanilic acid in a stream of N_2 . The boiling point was 78.03°C. LiCl prepared from purified carbonate and HCl , and dried in a stream of HCl . LiCl concentration determined gravimetrically. <table border="1" data-bbox="704 1600 1253 1729" style="margin-top: 10px;"> <tbody> <tr> <td> ESTIMATED ERROR: Soly: precision within 0.6 % (compiler). Temp: precision ± 0.0025 K. </td> </tr> <tr> <td> REFERENCES: </td> </tr> </tbody> </table>	ESTIMATED ERROR: Soly: precision within 0.6 % (compiler). Temp: precision ± 0.0025 K.	REFERENCES:																																		
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COMPONENTS: (1) Potassium bromate; KBrO_3 ; [7758-01-2] (2) 2-Flurancarboxaldehyde (furfural); $\text{C}_5\text{H}_4\text{O}_2$; [98-01-1]	ORIGINAL MEASUREMENTS: Trimble, F. <i>Ind. Eng. Chem.</i> <u>1941</u> , 33, 660-2.				
VARIABLES: $T/K = 298$	PREPARED BY: Hiroshi Miyamoto				
EXPERIMENTAL VALUES: <p>The solubility of KBrO_3 in furfural at 25°C was given as:</p> <table style="margin-left: auto; margin-right: auto;"> <tr> <td style="padding-right: 20px;">0.01 mass %</td> <td>(author)</td> </tr> <tr> <td style="padding-right: 20px;">$6 \times 10^{-4} \text{ mol kg}^{-1}$</td> <td>(compiler)</td> </tr> </table>		0.01 mass %	(author)	$6 \times 10^{-4} \text{ mol kg}^{-1}$	(compiler)
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METHOD/APPARATUS/PROCEDURE: Furfural and an excess of solute were agitated for 24 hours in a constant-temperature bath. After agitation the mixture was filtered at the same temperature as that employed for saturation. For the determination of the amount of the salt in furfural, about 40 grams of the solution were accurately weighed in a beaker, and 100 cm^3 of water added; the resulting solution was evaporated until the total volume was reduced to about 10 cm^3 . The solution was transferred to a weighed crucible, and then the evaporation continued to dryness. The residue contained in the crucible was moistened with a few drops of concentrated H_2SO_4 and ignited at about 700°C , and then weighed as the sulfate. All determinations were made in duplicate.	SOURCE AND PURITY OF MATERIALS: Furfural used was purified by carefully fractionating the technical grade twice under about 12 mm pressure (boiling point $54-55^\circ\text{C}$) through a well insulated 7-foot (2.13 meter) Hempel column packed with 7 mm Rasching rings. C.p. grade KBrO_3 was used.				
	ESTIMATED ERROR: Soly: duplicates checked within 25 % of each other. Temp: nothing specified.				
	REFERENCES:				

COMPONENTS: (1) Potassium bromate; KBrO_3 ; [7758-01-2] (2) N-Methylacetamide; $\text{C}_3\text{H}_7\text{NO}$; [79-16-3]	ORIGINAL MEASUREMENTS: Dawson, L.R.; Berger, J.E.; Vaughn, J.W.; Eckstrom, H.C. <i>J. Phys. Chem.</i> <u>1963</u> , <i>67</i> , 281-3.
VARIABLES: T/K = 313	PREPARED BY: Hiroshi Miyamoto and Mark Salomon
EXPERIMENTAL VALUES: The solubility of KBrO_3 in n-methylacetamide, $\text{CH}_3\text{CONHCH}_3$, at 40°C was given as 0.03 mol dm^{-3}	
AUXILIARY INFORMATION	
METHOD/APPARATUS/PROCEDURE: An "approximate" solubility was determined by the conductivity method. About 0.5 to 1.0 gram of salt and 10 ml of solvent were placed in a large test tube, stoppered and covered with aluminum foil, and heated to 60°C . Upon cooling to 40°C , the occurrence of precipitation was assumed to indicate the existence of a saturated solution. Conductivities were measured in duplicate in "the usual manner." Experimental details and the measured electrolytic conductivities were not given. The concentration of the salt in the saturated solution was determined from the experimental electrolytic conductivities, but details on the calculation were not given. Presumably the limiting law was used as in (1).	SOURCE AND PURITY OF MATERIALS: N-Methylacetamide was prepared by reacting monoethylamine with glacial acetic acid and subsequent heating to distill off the water. The product was purified by fractional distillation followed by five or more fractional freezing cycles. The electrolytic conductance of the purified solvent ranged from 0.5×10^{-5} to $2 \times 10^{-5} \text{ cm}^{-1}$. Reagent grade KBrO_3 was dried in a vacuum desiccator over anhydrous magnesium perchlorate without further treatment. ESTIMATED ERROR: Soly: authors "believe" the solubility to be accurate to within 5%. Temp: not specified. REFERENCES: 1. Dawson, L.R.; Wilhoit, E.D.; Holmes, R.R.; Sears, P.G. <i>J. Am. Chem. Soc.</i> <u>1957</u> , <i>79</i> , 3004 (Λ^∞ values are given in this paper).

COMPONENTS: (1) Potassium bromate; KBrO_3 ; [7789-38-0] (2) Ammonia; NH_3 ; [7664-41-7]	ORIGINAL MEASUREMENTS: Hunt, H.; Boneyk, L. <i>J. Am. Chem. Soc.</i> <u>1933</u> , 55, 3528-30.
VARIABLES: $T/K = 298.15$	PREPARED BY: Mark Salomon and Hiroshi Miyamoto
EXPERIMENTAL VALUES: <p>The solubility of KBrO_3 in liquid ammonia at 25°C was reported as</p> <p style="text-align: center;">0.002 g/100g NH_3.</p>	
AUXILIARY INFORMATION	
METHOD/APPARATUS/PROCEDURE: Two methods were used as described in (1). <u>Method I.</u> 25 ml test tubes with a constriction at the middle were employed. About 10-25 g NH_3 were condensed in the bottom, and the dry salt contained in a small tube tightly covered with cotton cloth was added to the test tube: this small tube remained in the upper part of the test tube as it could not pass the constriction in the middle of the test tube. The top of the test tube was drawn to a tip and sealed, and the tube inverted and placed in a thermostat at 25°C . Equilibrium between NH_3 and the excess salt in the small covered tube required 1-3 weeks with periodic shaking. The test tube was then inverted and only the satd sln drained into the lower end (excess solid remained in the small tube covered with the cotton cloth). The sln was frozen and sealed at the constriction, and weighed. The seal was then broken and the NH_3 boiled off, and the residue weighed. <u>Method II.</u> Excess NH_3 was condensed on a weighed amount of salt in a tube fitted with a stopcock. After thermostating at 25°C , NH_3 was slowly permitted to escape through the stopcock until a crystal of solid appeared and remained undissolved upon prolonged shaking. Authors state that the error due to the condensation of gaseous NH_3 was not significant since the dead space was kept to a minimum of about 30 cm^3 . However this amount of dead space was stated to limit the precision of the method to 0.5 %.	SOURCE AND PURITY OF MATERIALS: Reagent grade KBrO_3 was recrystallized three times from water and then from "a suitable" anhydrous solvent. The salt was dried to a constant weight in a vacuum oven. Purification of NH_3 not specified, but probably similar to that described in (1). In (1) commercial anhyd ammonia was stored over metallic sodium for several weeks before use. ESTIMATED ERROR: Soly: accuracy probably around $\pm 1-2\%$ (compilers). Temp: $25 + 0.025^\circ\text{C}$ accuracy established by NBS calibration as described in (1). REFERENCES: 1. Hunt, H.; <i>J. Am. Chem. Soc.</i> <u>1932</u> , 54, 3509.