

Composition of saturated solutions									
t/°C	Sodium chloride g/100gH <sub>2</sub> O (compiler)	mol % (compiler)	g/100gH <sub>2</sub> O	Potassium chlorate mass % (compiler)	mol % (compiler)	Density g cm <sup>-3</sup>	Nature of the solid phase <sup>a</sup>		
- 22.0	30.3	8.77	2.63	2.56	0.461	1.205	A+C+I		
- 19.2	31.3	9.00	2.91	2.83	0.512	1.2085	A+C		
- 19.2	27.1	7.93	2.82	2.74	0.486	1.188	C+I		
- 9.8	33.4	9.71	3.93	3.78	0.700	1.221	A+C		
- 9.8	14.8	4.50	3.40	3.29	0.548	1.119	C+I		
- 4	5.61	1.75	3.54	3.42	0.538	1.061	"		
- 1.35	35.75	10.45	5.01	4.77	0.902	1.233	A+B+C		
+ 10	36.0	10.7	6.90	6.45	1.245	1.235	B+C		
+ 30	36.3	11.3	11.52	10.33	2.087	1.2437	"		
+ 50	37.0	12.2	18.33	15.49	3.344	1.260	"		
+ 70	37.9	13.6	28.3	22.1	5.22	1.283	"		
+100	39.3	16.9	51.4	33.9	9.69	1.338	"		

a A = NaCl.2H<sub>2</sub>O; B = NaCl; C = KClO<sub>3</sub>; I = Ice

COMPONENTS:

(1) Sodium chloride; NaCl; [7647-14-5]

(2) Potassium chlorate; KClO<sub>3</sub>; [3811-04-9]

(3) Water; H<sub>2</sub>O; [7732-18-5]

ORIGINAL MEASUREMENTS:

Nallet, A.; Paris, R.A.  
*Bull. Soc. Chim. Fr.* 1956, 494-7.

VARIABLES:

Composition

T/K = 251.2 to 373

PREPARED BY:

Hiroshi Miyamoto

EXPERIMENTAL VALUES:

METHOD/APPARATUS/PROCEDURE:

The procedure of equilibration and the method for analysis of the saturated solution were not described in the original paper, but the compiler assumes that the procedure and the method were similar to that given in ref (1). See the compilation of this paper for the KCl-KClO<sub>3</sub>-H<sub>2</sub>O system.

SOURCE AND PURITY OF MATERIALS:

The source and purity of materials were not reported in the original paper, but probably similar to that described in ref (1).

ESTIMATED ERROR:

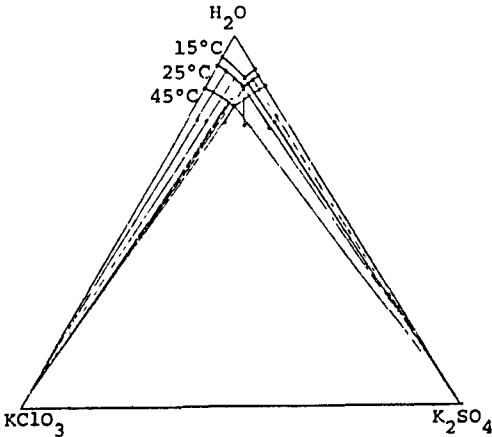
Nothing specified.

REFERENCES:

- Nallet, A.; Paris, R.A.  
*Bull. Soc. Chim. Fr.* 1956, 488.

<b>COMPONENTS:</b> (1) Potassium nitrate; $\text{KNO}_3$ ; [7757-79-1] (2) Potassium chlorate; $\text{KClO}_3$ ; [3811-04-9] (3) Water; $\text{H}_2\text{O}$ ; [7732-18-5]	<b>ORIGINAL MEASUREMENTS:</b> Toda, S. <i>Nippon Kagaku Kaishi (J. Chem. Soc. Japan), 1922, 43, 320-28; Mem. Coll. Sci. Kyoto Imp. Univ. 1922, 377-82.</i>																																																																															
<b>VARIABLES:</b> Composition T/K = 298 K	<b>PREPARED BY:</b> Hiroshi Miyamoto																																																																															
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<table border="1"> <thead> <tr> <th colspan="2">Potassium Chlorate</th> <th colspan="2">Potassium Nitrate</th> <th rowspan="2">Nature of the solid phase<sup>a</sup></th> </tr> <tr> <th>mass %</th> <th>mol % (compiler)</th> <th>mass %</th> <th>mol % (compiler)</th> </tr> </thead> <tbody> <tr> <td>7.745<sup>b</sup></td> <td>1.219</td> <td>-</td> <td>-</td> <td>A</td> </tr> <tr> <td>7.65</td> <td>1.21</td> <td>0.68</td> <td>0.13</td> <td>C</td> </tr> <tr> <td>7.07</td> <td>1.12</td> <td>1.15</td> <td>0.220</td> <td>"</td> </tr> <tr> <td>6.52</td> <td>1.05</td> <td>3.59</td> <td>0.699</td> <td>"</td> </tr> <tr> <td>5.76</td> <td>0.949</td> <td>7.12</td> <td>1.42</td> <td>"</td> </tr> <tr> <td>5.10</td> <td>0.881</td> <td>12.81</td> <td>2.682</td> <td>"</td> </tr> <tr> <td>4.39</td> <td>0.800</td> <td>18.97</td> <td>4.190</td> <td>"</td> </tr> <tr> <td>3.90</td> <td>0.771</td> <td>27.14</td> <td>6.503</td> <td>"</td> </tr> <tr> <td>3.90</td> <td>0.771</td> <td>27.12</td> <td>6.496</td> <td>C+B</td> </tr> <tr> <td>3.90</td> <td>0.771</td> <td>27.14</td> <td>6.503</td> <td>"</td> </tr> <tr> <td>3.90</td> <td>0.771</td> <td>27.16</td> <td>6.509</td> <td>"</td> </tr> <tr> <td>3.61</td> <td>0.712</td> <td>27.21</td> <td>6.503</td> <td>B</td> </tr> <tr> <td>1.63</td> <td>0.315</td> <td>27.57</td> <td>6.468</td> <td>"</td> </tr> <tr> <td>-</td> <td>-</td> <td>27.24</td> <td>6.254</td> <td>"</td> </tr> </tbody> </table>		Potassium Chlorate		Potassium Nitrate		Nature of the solid phase <sup>a</sup>	mass %	mol % (compiler)	mass %	mol % (compiler)	7.745 <sup>b</sup>	1.219	-	-	A	7.65	1.21	0.68	0.13	C	7.07	1.12	1.15	0.220	"	6.52	1.05	3.59	0.699	"	5.76	0.949	7.12	1.42	"	5.10	0.881	12.81	2.682	"	4.39	0.800	18.97	4.190	"	3.90	0.771	27.14	6.503	"	3.90	0.771	27.12	6.496	C+B	3.90	0.771	27.14	6.503	"	3.90	0.771	27.16	6.509	"	3.61	0.712	27.21	6.503	B	1.63	0.315	27.57	6.468	"	-	-	27.24	6.254	"
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<sup>a</sup> A = $\text{KClO}_3$ ;      B = $\text{KNO}_3$ ;      C - Solid solution $\text{K}(\text{ClO}_3, \text{NO}_3)$																																																																																
<sup>b</sup> For the binary system the compiler computes the following: soly of $\text{KClO}_3$ = 0.6850																																																																																
<b>AUXILIARY INFORMATION</b>																																																																																
<b>METHOD/APPARATUS/PROCEDURE:</b> Mixtures of the salts were placed in Erlenmeyer flasks of capacity about 30 cm <sup>3</sup> with well ground stoppers. Flasks were rotated in a thermostat for about 2 days. When equilibrium was attained, the solutions were permitted to settle in the thermostat and satd solution removed by pipet through a short glass tube with a purified cotton wool filter. Exactly 10 cm <sup>3</sup> of the solution was diluted with about 30 cm <sup>3</sup> of water, treated with 40 cm <sup>3</sup> of 10 % aqueous ferrous fulfate and boiled for about 15 minutes. Aqueous ammonia which was absolutely free from chlorine was added to the solution, and the solution gently boiled until the excess ammonia was expelled. The ppt was filtered and washed 5 times with hot water. The filtrate was used for the determination of chloride by a modified Volhard method (1). Potassium was detd as the sulfate by sulfuric acid as described in (2). The composition of the solid phase was also determined by the same method.	<b>SOURCE AND PURITY OF MATERIALS:</b> Both potassium chlorate and nitrate (Japan Pharmacopeia) were recrystallized three times. Distilled water was used.  <b>ESTIMATED ERROR:</b> Nothing specified.  <b>REFERENCES:</b> 1. Rothmund, V.; Burgstaller, A. <i>Z. Anorg. Chem.</i> 1909, 63, 330. 2. Treadwell, F.P.; Hall, W.T. <i>Analytical Chemistry Vol II.</i> 1915. p41.																																																																															

COMPONENTS:		ORIGINAL MEASUREMENTS:				
(1) Potassium sulfate; $K_2SO_4$ ; [7778-80-5]		Ricci, J.E.; Yanick, N.S.				
(2) Potassium chlorate; $KClO_3$ ; [3811-04-9]		J. Am. Chem. Soc. <u>1937</u> , 59, 491-6.				
(3) Water; $H_2O$ ; [7732-18-5]						
VARIABLES:		PREPARED BY:				
Composition and temperature		Hiroshi Miyamoto				
T/K = 288.15, 298.15, 318.15						
EXPERIMENTAL VALUES:		Composition of saturated solutions				
t/°C	$KClO_3$		$K_2SO_4$		Density	Nature of the
	mass %	mol % (compiler)	mass %	mol % (compiler)	$g\ cm^{-3}$	solid phase <sup>a</sup>
15	0.00	0.00	9.258	1.044	1.076	A
	3.29	0.537	7.86	0.901	1.085	A+B
	3.29	0.537	7.86	0.901	1.084	"
	3.29	0.537	7.86	0.901	1.085	"
	5.676 <sup>b</sup>	0.877	0.00	0.000	1.032	B
25	0.00	0.00	10.76	1.231	1.083	A
	1.80	0.295	9.93	1.15	1.089	"
	3.30	0.547	9.43	1.10	1.099	"
	4.95	0.827	8.66	1.02	1.102	A+B
	4.96	0.828	8.62	1.01	1.100	"
	4.96	0.828	8.62	1.01	1.099	"
	4.96	0.828	8.64	1.01	1.100	"
	5.06	0.842	8.19	0.958	1.099	B
	5.77	0.942	5.57	0.639	1.080	"
	6.72	1.08	2.73	0.307	1.063	"
	7.897 <sup>b</sup>	1.245	0.00	0.00	1.048	"
45	0.00	0.00	13.53	1.592		A
	9.80	1.73	9.13	1.13		A+B
	9.80	1.73	9.12	1.13		"
	9.80	1.73	9.13	1.13		"
	13.90 <sup>b</sup>	2.318	0.00	0.00		B
AUXILIARY INFORMATION						
METHOD/APPARATUS/PROCEDURE:			SOURCE AND PURITY OF MATERIALS:			
<p>Weighed mixtures of known composition were brought to equilibrium by stirring at the desired temperature. The time required for attainment of equilibrium was determined by analysis, and required several days. The order of mixing of the components, and the process of seeding or inoculation for required phases had to be varied in accordance with the phase sought.</p> <p>In one sample of the saturated solution, chlorate was determined by the method of Peters and Deutschlander (1): to the chlorate sample (containing about 0.11g of <math>ClO_3^-</math>) is added a definite volume (50 <math>cm^3</math>) of 0.05 mol <math>dm^{-3}</math> arsenious oxide solution. After the addition of a trace of KBr, the solution is acidified strongly with HCl and boiled for ten minutes. The excess arsenious oxide is then titrated by means of 0.033 mol <math>dm^{-3}</math> <math>KBrO_3</math> using indigo sulfonic acid indicator.</p> <p style="text-align: center;">continued.....</p>			<p>Nothing specified.</p>			
			<p>ESTIMATED ERROR: Soly: nothing specified. Temp: precision <math>\pm</math> 0.02 K.</p>			
			<p>REFERENCES: 1. Kolthoff, I.M.; Furman, N.H. <i>Volumetric Analysis, Vol. 2</i> John Wiley and Sons. New York. <u>1929</u>. p 465.</p>			

<p>COMPONENTS:</p> <p>(1) Potassium sulfate; <math>K_2SO_4</math>; [7778-80-5]</p> <p>(2) Potassium chlorate; <math>KClO_3</math>; [3811-04-9]</p> <p>(3) Water; <math>H_2O</math>; [7732-18-5]</p>	<p>ORIGINAL MEASUREMENTS:</p> <p>Ricci, J.E.; Yanick, N.S. <i>J. Am. Chem. Soc.</i> <u>1937</u>, 59, 491-6.</p>
<p>EXPERIMENTAL VALUES: (Continued)</p> <p><sup>a</sup> A = <math>K_2SO_4</math>;      B = <math>KClO_3</math></p> <p><sup>b</sup> For the binary system the compiler computes the following:</p> <p style="margin-left: 40px;">soly of <math>KClO_3</math> = 0.4910 mol <math>kg^{-1}</math> at 15°C</p> <p style="margin-left: 80px;">= 0.6996 mol <math>kg^{-1}</math> at 25°C</p> <p style="margin-left: 80px;">= 1.317 mol <math>kg^{-1}</math> at 45°C</p>	
<p><u>METHOD/APPARATUS/PROCEDURE:</u> (Continued)</p> <p>In other samples the total solid was determined by evaporation to dryness at 100°C followed by 250°C, and the sulfate was then calculated by difference.</p> <p>For the identification of known solid phases, microscopic examination and algebraic extrapolation of tie-lines sufficed.</p> <p>The densities reported for some of the isotherms were obtained by means of volumetric pipets calibrated for delivery.</p> <p><u>COMMENTS AND/OR ADDITIONAL DATA:</u></p> <p>The phase diagram is given below (based on mass % units).</p> <div style="text-align: center;">  </div>	

<b>COMPONENTS:</b> (1) Potassium chlorate; $\text{KClO}_3$ ; [3811-04-9] (2) Potassium chloride; $\text{KCl}$ ; [7446-40-7] (3) Water; $\text{H}_2\text{O}$ ; [7732-18-5]		<b>ORIGINAL MEASUREMENTS:</b> Winteler, F. Z. <i>Electrochem.</i> <u>1900</u> , 7, 360-2.		
<b>VARIABLES:</b> T/K = 293 Concentration of $\text{KCl}$ (see comments below)		<b>PREPARED BY:</b> Hiroshi Miyamoto and Mark Salomon		
<b>EXPERIMENTAL VALUES:</b> Composition of saturated solutions at 20°C				
	concn $\text{KCl}$	soly $\text{KClO}_3$		Density
g $\text{dm}^{-3}$	$c_2/\text{mol dm}^{-3}$ (compiler)	g $\text{dm}^{-3}$	$c_1/\text{mol dm}^{-3}$ (compiler)	g $\text{cm}^{-3}$
0	0	71.1	0.580	1.050
10	0.134	58	0.47	1.050
20	0.268	49	0.40	1.050
30	0.402	43	0.35	1.050
40	0.537	39.5	0.322	1.054
50	0.671	36.5	0.298	1.058
60	0.804	34	0.28	1.064
70	0.939	32	0.26	1.070
80	1.07	30	0.24	1.075
90	1.21	28	0.23	1.081
100	1.34	27	0.22	1.086
110	1.48	25.5	0.208	1.091
120	1.61	24.5	0.200	1.098
130	1.74	23.5	0.192	1.103
140	1.88	22.5	0.184	1.108
150	2.01	21.5	0.175	1.113
160	2.15	21.0	0.171	1.119
170	2.28	20.5	0.167	1.124
180	2.41	20.0	0.163	1.130
190	2.55	20.0	0.163	1.135
200	2.68	20	0.16	1.140
210	2.82	20	0.16	1.145
220	2.95	20	0.16	1.150
230	3.09	20	0.16	1.156
240	3.22	20	0.16	1.161
250	3.35	20	0.16	1.168
The composition of the solid phase is not given in the original paper.				
<b>METHOD/APPARATUS/PROCEDURE:</b> Mixtures of salts and water were placed into a thermostat at 20°C for several days and shaken frequently. Aliquots of the saturated solution were acidified with nitric acid and then titrated with silver nitrate using potassium chromate as an indicator. The compiler assumes that the total salt concentration of the solution was determined gravimetrically, and that the chlorate content was determined by difference.  It appears that the concentrations of $\text{KCl}$ given in the above data are initial concentrations (compilers).		<b>SOURCE AND PURITY OF MATERIALS:</b> No information was given.		
		<b>ESTIMATED ERROR:</b> Nothing specified.		
		<b>REFERENCES:</b>		

<b>COMPONENTS:</b> (1) Potassium chloride; KCl; [7447-40-7] (2) Potassium chlorate; KClO <sub>3</sub> ; [3811-04-9] (3) Water; H <sub>2</sub> O; [7732-18-5]	<b>ORIGINAL MEASUREMENTS:</b> Di Capua, C.; Scaletti, U. <i>Gazz. Chim. Ital.</i> <u>1927</u> , 27, 391-9.																																																																										
<b>VARIABLES:</b> T/K = 293	<b>PREPARED BY:</b> B. Scrosati and H. Miyamoto																																																																										
<b>EXPERIMENTAL VALUES:</b> Composition of saturated solutions at 20°C <sup>a</sup> <table border="1" data-bbox="456 483 1048 887"> <thead> <tr> <th rowspan="2"></th> <th colspan="2">KCl</th> <th colspan="2">KClO<sub>3</sub></th> </tr> <tr> <th>mass %</th> <th>mol % (compiler)</th> <th>mass %</th> <th>mol % (compiler)</th> </tr> </thead> <tbody> <tr><td>0</td><td>0</td><td>0</td><td>6.75<sup>b</sup></td><td>1.05</td></tr> <tr><td>1</td><td></td><td>0.3</td><td>6</td><td>0.9</td></tr> <tr><td>2</td><td></td><td>0.5</td><td>5</td><td>0.8</td></tr> <tr><td>3</td><td></td><td>0.8</td><td>4</td><td>0.6</td></tr> <tr><td>5</td><td></td><td>1</td><td>3.2</td><td>0.50</td></tr> <tr><td>6.5</td><td></td><td>1.7</td><td>3</td><td>0.5</td></tr> <tr><td>9</td><td></td><td>2</td><td>2.5</td><td>0.40</td></tr> <tr><td>12</td><td></td><td>3.3</td><td>2.2</td><td>0.36</td></tr> <tr><td>15</td><td></td><td>4.2</td><td>2</td><td>0.3</td></tr> <tr><td>19</td><td></td><td>5.5</td><td>1.85</td><td>0.324</td></tr> <tr><td>22</td><td></td><td>6.5</td><td>1.5</td><td>0.27</td></tr> <tr><td>25</td><td></td><td>7.5</td><td>1.2</td><td>0.22</td></tr> <tr><td>26.08</td><td></td><td>7.856</td><td>0</td><td>0</td></tr> </tbody> </table> <p data-bbox="154 917 624 957"><sup>a</sup> Nature of solid phases not reported.</p> <p data-bbox="154 977 893 1018"><sup>b</sup> For the binary system the compiler computes the following:  <math display="block">\text{soly of KClO}_3 = 0.591 \text{ mol kg}^{-1}</math></p>			KCl		KClO <sub>3</sub>		mass %	mol % (compiler)	mass %	mol % (compiler)	0	0	0	6.75 <sup>b</sup>	1.05	1		0.3	6	0.9	2		0.5	5	0.8	3		0.8	4	0.6	5		1	3.2	0.50	6.5		1.7	3	0.5	9		2	2.5	0.40	12		3.3	2.2	0.36	15		4.2	2	0.3	19		5.5	1.85	0.324	22		6.5	1.5	0.27	25		7.5	1.2	0.22	26.08		7.856	0	0
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<b>METHOD/APPARATUS/PROCEDURE:</b> The mixtures of salts and water were stirred in a thermostat for 7 days. Samples of saturated solutions were withdrawn with a pipet and weighed.  The chlorate ion concentration was determined by the Volhard method after reduction to chloride ion with zinc and acetic acid. Probably, the potassium content was determined by precipitation as the triple acetate of potassium, uranyl and magnesium, according to the method described by Kling and Lasieur (ref 1).	<b>SOURCE AND PURITY OF MATERIALS:</b> No information given.  <b>ESTIMATED ERROR:</b> Nothing specified.  <b>REFERENCES:</b> 1. Kling and Lasieur. <i>Giorn. Chim. Ind. Applicata</i> <u>1925</u> , 7.																																																																										

<b>COMPONENTS:</b> (1) Potassium chloride; KCl; [7447-40-7] (2) Potassium chlorate; KClO <sub>3</sub> ; [3811-04-9] (3) Water; H <sub>2</sub> O; [7732-18-5]		<b>ORIGINAL MEASUREMENTS:</b> Fleck, J. <i>Bull. Soc. Chem. Fr.</i> 1937, Ser. 5, 4, 558-60 (see also <i>Bull. Soc. Chem. Fr.</i> 1936, Ser. 5, 3, 350).				
<b>VARIABLES:</b> Composition T/K = 273.2 to 323.2		<b>PREPARED BY:</b> Hiroshi Miyamoto				
<b>EXPERIMENTAL VALUES:</b> Composition of saturated solutions						
t/°C	KCl		KClO <sub>3</sub>		Density g cm <sup>-3</sup>	Nature of the solid phase <sup>a</sup>
	mass %	mol % (compiler)	mass %	mol % (compiler)		
0	0.00	0.00	3.05 <sup>b</sup>	0.460	1.022	A
	8.47	2.21	1.09	0.173	1.068	"
	16.21	4.502	0.82	0.14	1.121	"
	21.16	6.135	0.71	0.13	1.157	A+B
	21.90	6.346	0.00	0.00	1.153	B
20	0.00	0.00	6.78 <sup>b</sup>	1.06	1.044	A
	2.84	0.735	5.18	0.815	1.051	"
	7.44	1.97	3.74	0.603	1.070	"
	13.47	3.711	2.44	0.409	1.106	"
	20.26	5.888	1.75	0.309	1.153	"
	24.58	7.421	1.55	0.285	1.184	A+B
	24.63	7.440	1.55	0.285	1.185	"
	25.17	7.588	0.89	0.16	1.183	B
25.70	7.714	0.00	0.00	1.176	"	
30	0.00	0.00	9.24 <sup>b</sup>	1.47	1.058	A
	4.67	1.24	6.62	1.07	-	"
	9.45	2.57	4.82	0.799	1.088	"
	11.03	3.032	4.38	0.733	1.097	"
	13.06	3.634	3.82	0.647	1.108	"
	17.86	5.151	3.12	0.547	1.140	"
continued....						
<b>AUXILIARY INFORMATION</b>						
<b>METHOD/APPARATUS/PROCEDURE:</b> The system was studied by the isothermal method. The KClO <sub>3</sub> was added to the solution, saturated with KCl and stirred to establish equilibrium. The chloride content was determined by Volhard's method. For determination of chlorate, a weighed amount of saturated solution was added to excess FeSO <sub>4</sub> solution and titrated with permanganate solution. The densities were also determined.				<b>SOURCE AND PURITY OF MATERIALS:</b> Potassium chlorate and chloride were purchased from Poulence. No other information was given in the paper.		
				<b>ESTIMATED ERROR:</b> Soly: nothing specified. Temp: precision ± 0.1 K.		
				<b>REFERENCES:</b>		

COMPONENTS:					ORIGINAL MEASUREMENTS:		
(1) Potassium chloride; KCl; [7447-40-7]					Fleck, J.		
(2) Potassium chlorate; KClO <sub>3</sub> ; [3811-04-9]					Bull. Soc. Chem. Fr. 1937, Ser. 5, 4, 558-60 (see also Bull. Soc. Chem. Fr. 1936, Ser. 5, 3, 350).		
(3) Water; H <sub>2</sub> O; [7732-18-5]							
EXPERIMENTAL VALUES: (Continued)							
Composition of saturated solutions							
t/°C	mass %	KCl		KClO <sub>3</sub>		Density g cm <sup>-3</sup>	Nature of the solid phase <sup>a</sup>
		mol % (compiler)	mass %	mol % (compiler)	mol % (compiler)		
30	25.81	7.948	2.29	0.429	1.198	A+B	
	25.86	7.967	2.29	0.429	1.197	"	
	26.64	8.143	0.87	0.16	1.190	B	
	27.30	8.319	0.00	0.00	1.182	"	
40	0.00	0.00	11.65 <sup>b</sup>	1.902	1.074	A	
	4.60	1.25	9.20	1.53	1.084	"	
	7.66	2.11	7.64	1.28	1.092	"	
	8.71	2.41	7.25	1.22	1.098	"	
	10.76	3.010	6.39	1.09	1.106	"	
	13.16	3.725	5.44	0.937	1.116	"	
	18.43	5.408	4.30	0.768	1.148	"	
	20.66	6.162	3.88	0.704	1.165	"	
	26.49	8.289	3.15	0.600	1.206	A+B	
	26.45	8.273	3.14	0.597	1.206	"	
	27.74	8.633	1.54	0.292	1.196	B	
	28.75	8.884	0.00	0.00	1.188	"	
50	0.00	0.00	14.76 <sup>b</sup>	2.482	1.088	A	
	8.51	2.41	9.66	1.66	1.105	"	
	17.55	5.199	6.01	1.08	1.147	"	
	18.53	5.526	5.76	1.04	1.155	"	
	27.45	8.800	4.46	0.870	1.214	A+B	
	28.24	9.003	3.27	0.634	1.207	B	
	30.18	9.457	0.00	0.00	1.194	B	

<sup>a</sup> A = KClO<sub>3</sub>      B = KCl

<sup>b</sup> For the binary system the compiler computes the following:

solubility of KClO<sub>3</sub> = 0.257 mol kg<sup>-1</sup> at 0°C  
= 0.593 mol kg<sup>-1</sup> at 20°C  
= 0.831 mol kg<sup>-1</sup> at 30°C  
= 1.076 mol kg<sup>-1</sup> at 40°C  
= 1.413 mol kg<sup>-1</sup> at 50°C



<b>COMPONENTS:</b> (1) Potassium chloride; KCl; [7447-40-7] (2) Potassium chlorate; KClO <sub>3</sub> ; [3811-04-9] (3) Water; H <sub>2</sub> O; [7732-18-5]	<b>ORIGINAL MEASUREMENTS:</b> Donald, M.B. <i>J. Chem. Soc.</i> <u>1937</u> , 1325-6.																												
<b>VARIABLES:</b> T/K = 293, 323 and 348	<b>PREPARED BY:</b> Hiroshi Miyamoto																												
<b>EXPERIMENTAL VALUES:</b> Composition of saturated solutions at invariant points <sup>a</sup> <table border="1" data-bbox="175 546 1081 741"> <thead> <tr> <th rowspan="2">t/°C</th> <th colspan="2">KCl</th> <th colspan="2">KClO<sub>3</sub></th> <th rowspan="2">Density g cm<sup>-3</sup></th> </tr> <tr> <th>mass %</th> <th>mol % (compiler)</th> <th>mass %</th> <th>mol % (compiler)</th> </tr> </thead> <tbody> <tr> <td>20</td> <td>25.0</td> <td>7.58</td> <td>1.56</td> <td>0.288</td> <td>1.177</td> </tr> <tr> <td>50</td> <td>28.3</td> <td>9.14</td> <td>4.32</td> <td>0.648</td> <td>1.211</td> </tr> <tr> <td>75</td> <td>29.3</td> <td>9.99</td> <td>8.08</td> <td>1.68</td> <td>1.244</td> </tr> </tbody> </table> <p><sup>a</sup> Nature of the solid phases not specified.</p>		t/°C	KCl		KClO <sub>3</sub>		Density g cm <sup>-3</sup>	mass %	mol % (compiler)	mass %	mol % (compiler)	20	25.0	7.58	1.56	0.288	1.177	50	28.3	9.14	4.32	0.648	1.211	75	29.3	9.99	8.08	1.68	1.244
t/°C	KCl		KClO <sub>3</sub>		Density g cm <sup>-3</sup>																								
	mass %	mol % (compiler)	mass %	mol % (compiler)																									
20	25.0	7.58	1.56	0.288	1.177																								
50	28.3	9.14	4.32	0.648	1.211																								
75	29.3	9.99	8.08	1.68	1.244																								
<b>AUXILIARY INFORMATION</b>																													
<b>METHOD/APPARATUS/PROCEDURE:</b> The objective of this study was to determine the solubilities at the invariant points. The chloride was estimated by Mohr's method, the chlorate by Rupp's method (1), and the water by direct weighing. No other information is given in the original paper.	<b>SOURCE AND PURITY OF MATERIALS:</b> Nothing specified.  <b>ESTIMATED ERROR:</b> Nothing specified.  <b>REFERENCES:</b> 1. Rupp, E. Z. <i>Anal. Chem.</i> <u>1917</u> , 56, 580.																												

<b>COMPONENTS:</b>			<b>ORIGINAL MEASUREMENTS:</b>		
(1) Potassium chloride; KCl; [7447-40-7]			Benrath, A.; Braun, A.		
(2) Potassium chlorate; KClO <sub>3</sub> ; [3811-04-9]			Z. Anorg. Allg. Chem. <u>1940</u> , 244, 348-58.		
(3) Water; H <sub>2</sub> O; [7732-18-5]					
<b>VARIABLES:</b>			<b>PREPARED BY:</b>		
T/K = 423, 448 and 473			Hiroshi Miyamoto and Mark Salomon		
Composition					
<b>EXPERIMENTAL VALUES:</b> Composition of saturated solutions					
t/°C	Potassium Chloride mass %	mol % (compiler)	Potassium Chlorate mass %	mol % (compiler)	Nature of the solid phase
150	34.7	12.9	10.40	2.359	KCl
	34.4	12.9	10.88	2.475	"
	31.7	12.6	17.80	4.305	"
	28.5	11.8	23.7	5.99	"
	26.0	11.4	29.5	7.87	"
	18.22	8.175	37.9	10.3	KClO <sub>3</sub>
	16.90	7.562	38.9	10.6	"
175	4.97	2.26	50.6	14.0	"
	35.5	13.9	13.14	3.122	KCl
	32.3	13.3	19.95	5.014	"
	26.6	12.2	32.0	8.95	"
	20.5	10.7	44.9	14.3	KCl + KClO <sub>3</sub>
	20.4	10.9	46.0	14.9	"
	20.0	10.7	46.3	15.0	"
200	9.28	4.95	55.9	18.1	KClO <sub>3</sub>
	38.5	15.4	12.3	3.00	KCl
	35.6	14.7	16.8	4.21	"
	25.2	12.3	36.8	10.9	"
	21.6	11.7	45.9	15.2	"
	14.55	8.903	58.0	21.6	"
	5.76	3.59	66.6	25.2	KCl + KClO <sub>3</sub>
3.29	2.08	69.4	26.6	KClO <sub>3</sub>	
<b>AUXILIARY INFORMATION</b>					
<b>METHOD/APPARATUS/PROCEDURE:</b>			<b>SOURCE AND PURITY OF MATERIALS:</b>		
a 40-50 mg mixture of KCl + KClO <sub>3</sub> and water was placed in a 5 cm long glass tube (inner diam = 1.5 mm) and sealed. The tube was heated in a vertical position at the desired temperature.: the method of ascertaining equilibrium not specified. The tube was then rotated permitting the solution to flow to one end and due to the small diameter of the tube, the solids remained in the other end of the tube. The tube was cooled and broken just below the solid residues. Each part of the tube was weighed and dried by heating to dryness. The dried products were weighed and dissolved in nitric acid, and the chloride content determined gravimetrically by precipitation with silver nitrate.			Nothing specified.		
			<b>ESTIMATED ERROR:</b>		
			Nothing specified.		
			<b>COMMENTS AND/OR ADDITIONAL DATA:</b>		
			Using literature values for solubilities and melting points of 2 component and 1 component systems, the author prepared Janecke phase diagrams and polytherms. From these diagrams the azeotrope points were determined. The phase diagrams are reproduced on the following page. In these diagrams, m is the moles of water per mole of KCl + KClO <sub>3</sub> , and x is the mole fraction of KCl in the total KCl + KClO <sub>3</sub> content.		
			continued....		

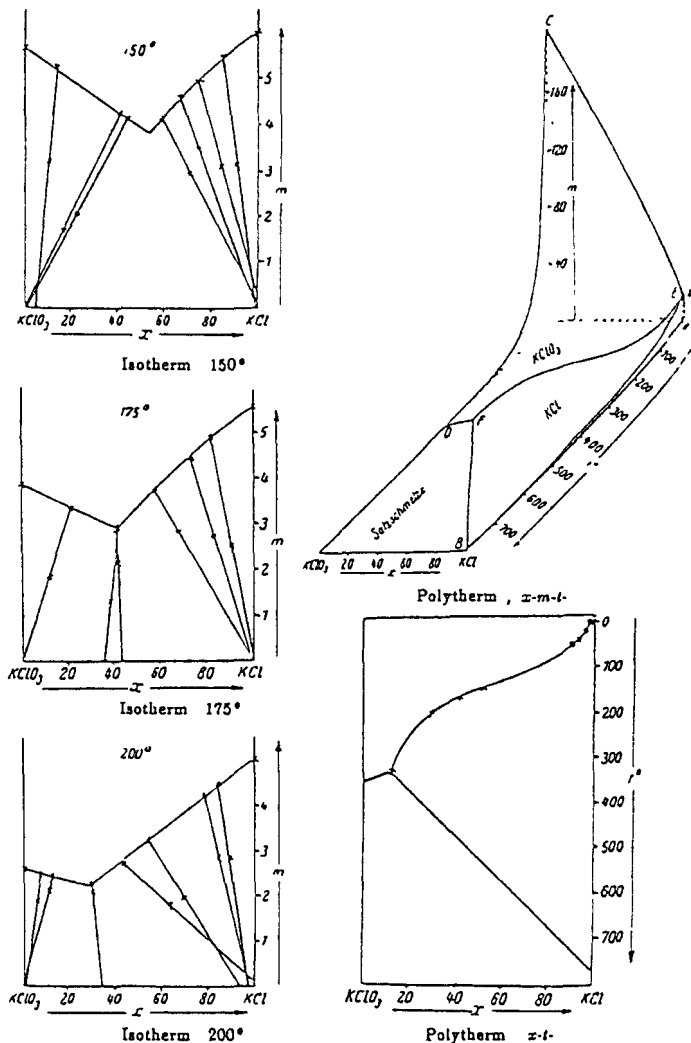
COMPONENTS:

- (1) Potassium chloride; KCl; [7447-40-7]
- (2) Potassium chlorate; KClO<sub>3</sub>; [3811-04-9]
- (3) Water; H<sub>2</sub>O; [7732-18-5]

ORIGINAL MEASUREMENTS:

Benrath, A.; Braun, A.  
*Z. Anorg. Allg. Chem.* 1940, 244, 348-58.

COMMENTS AND/OR ADDITIONAL DATA: (Continued)



point on polytherm	t/°C	mass %		x	m	phases present
		KCl	KClO <sub>3</sub>			
E	-11.8	19.8	0.42	98.6	6.9	sln, ice, vapor, KCl, KClO <sub>3</sub>
A	-10.7	19.82	--	100	17.02	sln, ice, vapor, KCl
C	-0.8	--	2.97	0	220.8	sln, ice, vapor, KClO <sub>3</sub>
D	356	--	--	0	0	m.p. of KClO <sub>3</sub>
F	336	--	--	12.0	0	m.p. of KCl-KClO <sub>3</sub> eutectic
B	771	--	--	100	0	m.p. of KCl

Composition of saturated solutions		Potassium chloride		Potassium chlorate		Density	Nature of the solid phase
t/°C	g/100gH <sub>2</sub> O	mass %	mol % (compiler)	g/100gH <sub>2</sub> O	mass %	g cm <sup>-3</sup>	
- 10.85	24.2	19.5	5.55	0.53	0.53	1.139	A+B+I
- 9.8	24.7	19.8	5.66	0.56	0.56	1.43	A+B
- 9.8	22.05	18.07	5.086	0.565	0.562	1.1295	B+I
- 4	8.93	8.20	2.13	0.968	0.959	1.062	"
+ 10	31.23	23.80	7.120	1.44	1.42	1.1709	A+B
+ 30	37.0	27.0	8.48	3.21	3.11	1.1937	"
+ 50	42.3	29.7	9.91	6.35	5.97	1.215	"
+ 70	46.5	31.7	11.4	11.6	10.4	1.240	"
+100	51.8	34.1	14.5	25.9	20.6	1.280	"

a A = KCl; B = KClO<sub>3</sub>; I = Ice.

COMPONENTS:  
 (1) Potassium chloride; KCl; [7447-40-7]  
 (2) Potassium chlorate; KClO<sub>3</sub>; [3811-04-9]  
 (3) Water; H<sub>2</sub>O; [7732-18-5]

ORIGINAL MEASUREMENTS:  
 Nallet, A.; Paris, R.A.  
*Bull. Soc. Chim. Fr.* 1956, 488-94.

VARIABLES:  
 Composition  
 T/K = 262.30 to 373

PREPARED BY:  
 Hiroshi Miyamoto

EXPERIMENTAL VALUES:

METHOD/APPARATUS/PROCEDURE:

Mixtures of salts and water were placed in bottles and shaken in a thermostat for 2 hours at 100°C and for 2 hours or more at lower temperatures. Equilibrium was approached from supersaturation. The chloride ion concentration was determined by a potentiometric method using silver nitrate solution. After the determination of chloride, the chlorate was reduced with Mohr's salt in mineral acids, and the excess Fe(II) titrated with potassium dichromate solution. The analyses of cations were performed in duplicate. The potassium content was determined by flame photometry and gravimetry. The nature of the solid phase was determined by Schreinemakers' residues method. The densities of the saturated solution were also measured.

SOURCE AND PURITY OF MATERIALS:

Potassium chlorate and chloride were recrystallized twice. The purity of the salts was 99.9 %.

ESTIMATED ERROR:

Soly: precision 0.5 % (compiler).  
 Temp: nothing specified.

REFERENCES:

<b>COMPONENTS:</b> (1) Potassium chloride; KCl; [7447-40-7] (2) Potassium chlorate; KClO <sub>3</sub> ; [3811-04-9] (3) Water; H <sub>2</sub> O; [7732-18-5]	<b>ORIGINAL MEASUREMENTS:</b> Munter, P.A.; Brown, R.L. <i>J. Am. Chem. Soc.</i> <u>1943</u> , <i>65</i> , 2456-7.																		
<b>VARIABLES:</b> Composition T/K = 273.2	<b>PREPARED BY:</b> Hiroshi Miyamoto																		
<b>EXPERIMENTAL VALUES:</b> <p style="text-align: center;">Composition at the isothermally invariant point at 0.0°C</p> <table style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th colspan="2" style="text-align: center;">Potassium chloride</th> <th colspan="2" style="text-align: center;">Potassium chlorate</th> <th colspan="2" style="text-align: center;">Water</th> </tr> <tr> <th style="text-align: center;">mass %</th> <th style="text-align: center;">mol % (compiler)</th> <th style="text-align: center;">mass %</th> <th style="text-align: center;">mol % (compiler)</th> <th style="text-align: center;">mass %</th> <th style="text-align: center;">mol % (compiler)</th> </tr> </thead> <tbody> <tr> <td style="text-align: center;">21.36</td> <td style="text-align: center;">6.204</td> <td style="text-align: center;">0.71</td> <td style="text-align: center;">0.13</td> <td style="text-align: center;">77.93</td> <td style="text-align: center;">93.67</td> </tr> </tbody> </table>		Potassium chloride		Potassium chlorate		Water		mass %	mol % (compiler)	mass %	mol % (compiler)	mass %	mol % (compiler)	21.36	6.204	0.71	0.13	77.93	93.67
Potassium chloride		Potassium chlorate		Water															
mass %	mol % (compiler)	mass %	mol % (compiler)	mass %	mol % (compiler)														
21.36	6.204	0.71	0.13	77.93	93.67														
<b>AUXILIARY INFORMATION</b>																			
<b>METHOD/APPARATUS/PROCEDURE:</b> Mixtures of the solid salts and water sealed in Pyrex bottles were fastened to a rotor suspended in a constant temperature bath. An aq glycerol solution was used as the bath liquid. A preliminary experiment was carried out in which an original mixt of the solid salts and water was gradually augmented by small additions of salt until the density and composition of the resultant solution became constant. From these data, mixtures of the solid salts and water known to result in satd solutions were prepd for the final test. The equilibrated solutions were sampled by withdrawing clear supernatant solution through cotton filtering plugs directly into a density pipet. After determining the density, the samples were diluted. The chloride content was detd by the Volhard method as modified by Caldwell and Moyer (ref 1). The chlorate content was detd by the method of Dietz as described by Kolthoff and Furman (ref 2). The water content was found by difference.	<b>SOURCE AND PURITY OF MATERIALS:</b> All the salts used were of c.p. grade and were used without further purification. The chlorate was found to be average 99.9 % pure.  <b>ESTIMATED ERROR:</b> Soly: nothing specified. Temp: precision ± 0.1 K (authors).  <b>REFERENCES:</b> 1. Caldwell, J.R.; Moyer, H.V. <i>Ind. Eng. Chem. Anal. Ed.</i> <u>1935</u> , <i>7</i> , 38. 2. Kolthoff, I.M.; Furman, N.H. <i>Volumetric Analysis Vol. II</i> , <u>1929</u> , 388.																		

COMPONENTS:		ORIGINAL MEASUREMENTS:				
(1) Potassium chloride; KCl; [7447-40-7]		Turnetskaya, A.F.; Lepeshkov, I.N.				
(2) Potassium chlorate; KClO <sub>3</sub> ; [3811-04-9]		Zh. Neorg. Khim. 1965, 10, 2163-6; Russ. J. Inorg. Chem. (Engl. Transl.) 1965, 10, 1176-8.				
(3) Water; H <sub>2</sub> O; [7732-18-5]						
VARIABLES:		PREPARED BY:				
T/K = 298 and 323		Hiroshi Miyamoto				
Composition						
EXPERIMENTAL VALUES: Composition of saturated solutions						
t/°C	Potassium chloride		Potassium chlorate		Density g cm <sup>-3</sup>	Nature of the solid phase <sup>a</sup>
	mass %	mol % (compiler)	mass %	mol % (compiler)		
25	26.33	7.950	0.00	0.00	1.1798	A
	26.26	7.949	0.30	0.055	1.1877	"
	25.91	7.935	1.7	0.32	1.189	"
	25.85	7.968	2.35	0.441	-	A+B
	25.84	7.962	2.32	0.435	-	"
	25.59	7.871	2.38	0.445	-	"
	25.63	7.891	2.43	0.455	-	"
	25.56	7.861	2.40	0.449	1.189	"
	25.78	7.950	2.45	0.460	-	"
	25.58	7.871	2.42	0.453	-	"
	25.54	7.853	2.39	0.447	1.1732	"
	21.11	6.228	2.44	0.438	1.1567	B
	17.27	4.933	2.7	0.47	1.1348	"
	11.95	3.280	3.4	0.57	-	"
	5.17	1.36	4.9	0.78	1.0645	"
	1.34	0.344	5.83	0.912	1.058	"
	0.00	0.00	7.99 <sup>b</sup>	1.26	1.0568	"
continued.....						
AUXILIARY INFORMATION						
METHOD/APPARATUS/PROCEDURE:			SOURCE AND PURITY OF MATERIALS:			
The isothermal method was used. At 25°C equilibrium in the system was reached after 4-5 days. The potassium was determined gravimetrically with sodium tetraphenylborate. At high concentrations, chloride was determined volumetrically by mercurimetric method, and at low concentrations chloride was detd gravimetrically. ClO <sub>3</sub> <sup>-</sup> was determined volumetrically after reduction to chloride with zinc dust.			KClO <sub>3</sub> and KCl were recrystallized twice and had a purity of 99.7 - 99.8 %.			
			ESTIMATED ERROR:			
			Nothing specified.			
REFERENCES:						

<b>COMPONENTS:</b> (1) Potassium chloride; KCl; [7447-40-7] (2) Potassium chlorate; KClO <sub>3</sub> ; [3811-04-9] (3) Water; H <sub>2</sub> O; [7732-18-5]	<b>ORIGINAL MEASUREMENTS:</b> Turnetskaya, A.F.; Lepeshkov, I.N. <i>Zh. Neorg. Khim.</i> 1965, 10, 2163-6; <i>Russ. J. Inorg. Chem.</i> (Encl. Transl.) 1965, 10, 1176-8.
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**EXPERIMENTAL VALUES: (Continued)**

## Composition of saturated solutions

t/°C	Potassium chloride		Potassium Chlorate		Density g cm <sup>-3</sup>	Nature of the solid phase <sup>a</sup>
	mass %	mol % (compiler)	mass %	mol % (compiler)		
50	30.06	9.409	0.00	0.00	1.194	A
	29.67	9.359	1.05	0.201	1.196	"
	28.30	9.204	4.97	0.983	1.216	A+B
	19.84	6.098	7.42	1.39	1.166	B
	7.2	2.1	12.04	2.100	1.1067	"
	2.88	0.814	14.41	2.477	1.097	"
	0.00	0.00	15.84 <sup>b</sup>	2.692	1.091	"

<sup>a</sup> A = KCl; B = KClO<sub>3</sub>

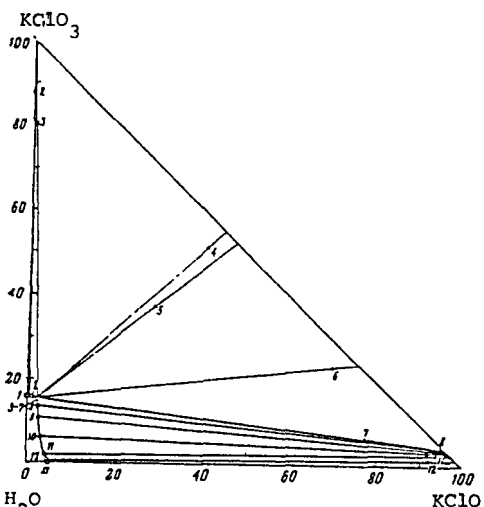
<sup>b</sup> For the binary system the compiler computed the following:

$$\text{solv of KClO}_3 = 0.709 \text{ mol kg}^{-1} \text{ at } 25^\circ\text{C}$$

$$= 1.536 \text{ mol kg}^{-1} \text{ at } 50^\circ\text{C}$$

<b>COMPONENTS:</b> (1) Potassium chloride; KCl; [7447-40-7] (2) Potassium chlorate; KClO <sub>3</sub> ; [3811-04-9] (3) Water; H <sub>2</sub> O; [7732-18-5]		<b>ORIGINAL MEASUREMENTS:</b> Arkhipov, S.M.; Kashina, N.I.; Kuzina, V.A. <i>Zh. Neorg. Khim.</i> 1969, 14, 567-70; <i>Russ. J. Inorg. Chem. (Engl. Transl.)</i> 1969, 14, 294-6.		
<b>VARIABLES:</b> Composition T/K = 298.2		<b>PREPARED BY:</b> Hiroshi Miyamoto		
<b>EXPERIMENTAL VALUES:</b> Composition of saturated solutions at 25.0°C				
Potassium chlorate mass %      mol % (compiler)		Potassium chloride mass %      mol % (compiler)		Nature of the solid phase <sup>a</sup>
7.93 <sup>b</sup>	1.25	--	--	
6.21	0.979	1.95	0.505	
4.65	0.741	5.04	1.32	
4.07	0.664	8.54	2.29	
3.11	0.518	11.89	3.253	
2.80	0.478	15.06	4.222	
2.53	0.443	18.40	5.300	
2.00	0.362	22.47	6.683	
1.93	0.360	25.91	7.955	
1.94	0.363	26.10	8.029	
1.92	0.359	26.10	8.027	
1.33	0.248	26.29	8.049	
--	--	26.72	8.098	
<sup>a</sup> A = KClO <sub>3</sub> ;      B = KCl				
<sup>b</sup> For the binary system the compiler computes the following: $\text{soly of KClO}_3 = 0.703 \text{ mol kg}^{-1}$				
<b>AUXILIARY INFORMATION</b>				
<b>METHOD/APPARATUS/PROCEDURE:</b> The isothermal method was used. The solids (KClO <sub>3</sub> and KCl) and water were placed into glass test-tubes held in a thermostat. The rate of rotation of the test-tubes was 45 rev min <sup>-1</sup> , and equilibrium was reached in 30 hours. Potassium in the liquid phase was analyzed by flame photometry. Chloride was determined by titration of a specimen of the solution with silver nitrate by using potassium chromate as an indicator. The chlorate ion concentration was determined volumetrically by addition of an excess of iron(II) sulfate solution and back-titration of the latter with potassium permanganate solution. The solid phases were identified by the method of residues, crystal optics, and by X-ray diffraction.		<b>SOURCE AND PURITY OF MATERIALS:</b> The purity of KClO <sub>3</sub> and KCl was within 99.9 %.		
		<b>ESTIMATED ERROR:</b> Soly: the relative error in potassium determination by flame photometry did not exceed 3-5 %. Temp: precision ± 0.1 K (authors).		
		<b>REFERENCES:</b>		



<b>COMPONENTS:</b> (1) Potassium chloride; $KCl$ ; [7447-40-7] (2) Potassium chlorate; $KClO_3$ ; [3811-04-9] (3) Potassium perchlorate; $KClO_4$ ; [7778-74-7] (4) Water; $H_2O$ ; [7732-18-5]	<b>ORIGINAL MEASUREMENTS:</b> Karnaukhov, A.S.; Lepeshkov, I.N.; Fursova, A.F.  <i>Zh. Neorg. Khim.</i> 1969, 14, 2211-3; <i>Russ. J. Inorg. Chem. (Engl. Transl.)</i> 1969, 14, 1160-1.
<b>VARIABLES:</b> T/K = 323 Composition	<b>PREPARED BY:</b> Hiroshi Miyamoto
<b>COMMENTS AND/OR ADDITIONAL DATA:</b>  The phase diagram of the $KClO_3$ - $KClO_4$ - $H_2O$ system at 50°C is given below (based on mass % units). <div style="text-align: center;">  </div> <p style="text-align: right;">continued.....</p>	
<b>AUXILIARY INFORMATION</b>	
<b>METHOD/APPARATUS/PROCEDURE:</b> The isothermal method was used. At 25°C equilibrium was reached in 4-5 days. The potassium content was determined gravimetrically with tetraphenylborate. The chlorate ion concentration at high concentrations was determined volumetrically by the mercurimetric method, and at lower concentrations, gravimetrically. The chlorate ion concentration was determined volumetrically after reduction to chloride with zinc dust. The compositions and the nature of the solid phases were found by chemical analysis with Schreinemakers' method of residues and checked by X-ray diffraction.	<b>SOURCE AND PURITY OF MATERIALS:</b> Potassium chloride and chlorate were recrystallized twice. The resulting purity was 99.7 - 99.8 %.  <b>ESTIMATED ERROR:</b> Nothing specified.  <b>REFERENCES:</b>

## Composition of saturated solutions at 50°C

Potassium Chloride mass %	Potassium Chloride mol % (compiler)	Potassium Chlorate mass %	Potassium Chlorate mol % (compiler)	Potassium Perchlorate mass %	Potassium Perchlorate mol % (compiler)	Density g cm <sup>-3</sup>	Nature of the solid phase <sup>a</sup>
29.67	9.385	--	--	1.27	0.216	1.197	D+C
29.65	9.457	1.00	0.194	1.03	0.177	1.197	D+E
29.24	9.450	2.56	0.503	1.00	0.174	--	"
28.17	9.213	4.64	0.923	0.91	0.160	1.218	D+E+B
28.30	9.204	4.97	0.983	--	--	1.216	A+B
28.04	9.286	5.68	1.144	1.06	0.189	--	E+B
17.06	5.177	7.21	1.331	1.47	0.240	1.163	"
10.66	3.145	10.02	1.798	1.68	0.267	--	"
8.33	2.44	11.35	2.022	1.70	0.268	1.120	"
6.25	1.82	12.36	2.187	1.87	0.293	--	"
4.17	1.20	13.28	2.331	2.04	0.317	--	"
2.08	0.596	14.25	2.484	2.22	0.342	1.1002	"
--	--	15.21	2.632	2.39	0.366	1.0982	B+E
--	--	0.49	0.075	4.68	0.637	1.0179	E+C
0.45	0.11	0.42	0.064	3.97	0.539	--	"
0.90	0.23	0.36	0.055	3.27	0.442	--	"
1.67	0.423	0.355	0.0547	3.51	0.479	--	"
2.44	0.623	0.35	0.054	3.75	0.515	1.0257	"
3.72	0.957	0.34	0.053	3.43	0.475	--	"
4.99	1.29	0.32	0.050	3.10	0.432	--	"
7.53	1.99	0.29	0.047	2.85	0.405	--	"
12.61	3.441	0.23	0.038	1.94	0.285	--	"
21.14	6.195	0.12	0.021	1.61	0.254	--	"
25.41	7.731	0.06	0.011	1.44	0.236	--	E+D+C
29.99	9.415	--	--	0.33	0.056	--	A+D

<sup>a</sup> A = KCl; B = KClO<sub>3</sub>; C = KClO<sub>4</sub>; D - nKCl.mKClO<sub>4</sub>; E - nKClO<sub>4</sub>.mKClO<sub>3</sub>

COMPONENTS:  
 (1) Potassium chloride; KCl; [7447-40-7]  
 (2) Potassium chlorate; KClO<sub>3</sub>; [3811-04-9]  
 (3) Potassium perchlorate; KClO<sub>4</sub>;  
 [7778-74-7]  
 (4) Water; H<sub>2</sub>O; [7732-18-5]

ORIGINAL MEASUREMENTS:  
 Karnaukhov, A.S.; Lepeshkov, I.N.;  
 Fursova, A.F.  
 Zh. Neorg. Khim. 1969, 14, 2211-3;  
 Russ. J. Inorg. Chem. (Engl. Transl.)  
 1969, 14, 1160-1.

EXPERIMENTAL VALUES: (Continued)

<b>COMPONENTS:</b> (1) Potassium chloride; KCl; [7447-40-7] (2) Potassium chlorate; KClO <sub>3</sub> ; [3811-04-9] (3) Rubidium chloride; RbCl; [7791-11-9] (4) Rubidium chlorate; RbClO <sub>3</sub> ; [13446-71-4] (5) Water; H <sub>2</sub> O; [7732-18-5]	<b>ORIGINAL MEASUREMENTS:</b> Arkhipov, S.M.; Kashina, N.I.; Kuzina, V.A.  <i>Zh. Neorg. Khim.</i> 1969, 14, 567-70; <i>Russ. J. Inorg. Chem. (Engl. Transl.)</i> 1969, 14, 294-6.
<b>VARIABLES:</b> Composition at 298.2 K	<b>PREPARED BY:</b> Hiroshi Miyamoto
<b>EXPERIMENTAL VALUES:</b>  Experimental data are given on the following page.	
<b>AUXILIARY INFORMATION</b>	
<b>METHOD/APPARATUS/PROCEDURE:</b> The isothermal method was used. KClO <sub>3</sub> , RbClO <sub>3</sub> , KCl, RbCl and water were mixed in glass test tubes held in a thermostat. The rate of rotation of the test tubes was 45 rev min <sup>-1</sup> , and equilibrium was reached in 30 days. Specimens of the liquid phases were analyzed for potassium and rubidium by flame photometry. The chloride content was determined by titration of a specimen of the solution with silver nitrate and potassium chromate as indicator. The chlorate ion concentration was determined volumetrically by addition of excess iron(II) sulfate solution and back titration of the latter with potassium permanganate. The solid phases were identified by the method of residues, crystal optics, and by X-ray diffraction.	<b>SOURCE AND PURITY OF MATERIALS:</b> The purity of the salts used was 99.9 % or better.  <b>ESTIMATED ERROR:</b> The relative error in potassium and rubidium determinations by flame photometry did not exceed 3-5 %. Temp: precision ± 0.1 K (authors).  <b>REFERENCES:</b>

## Composition of saturated solutions at 25.0°C

Potassium Chloride		Potassium Chlorate		Rubidium Chloride		Rubidium Chlorate		Nature of the solid phase <sup>a</sup>
mass %	mol % (compiler)	mass %	mol % (compiler)	mass %	mol % (compiler)	mass %	mol % (compiler)	
--	--	6.52	1.05	--	--	3.58	0.418	A+B
0.44	0.12	6.25	1.01	--	--	3.55	0.415	"
1.07	0.285	6.09	0.986	--	--	3.58	0.421	"
1.99	0.529	4.96	0.801	--	--	3.67	0.430	"
3.09	0.824	4.51	0.732	--	--	3.63	0.427	"
3.62	0.969	4.08	0.643	--	--	3.91	0.462	"
5.23	1.40	2.77	0.452	--	--	4.05	0.480	"
7.84	2.11	0.56	0.092	--	--	4.22	0.501	"
11.47	3.216	0.61	0.10	--	--	5.14	0.636	"
15.23	4.431	--	--	1.83	0.328	4.29	0.551	"
18.88	5.672	--	--	2.42	0.448	3.56	0.472	"
19.94	6.033	--	--	2.42	0.451	3.31	0.442	"
--	--	--	--	48.20	12.33	0.82	0.150	C+B
2.09	0.882	--	--	47.39	12.33	0.90	0.168	B+E
4.29	1.704	--	--	41.19	10.08	0.94	0.16	"
6.55	2.611	--	--	39.42	9.687	0.96	0.17	"
7.78	3.057	--	--	37.28	9.030	0.97	0.17	"
8.20	3.205	--	--	36.31	8.750	1.18	0.204	"
13.79	5.017	--	--	25.37	5.690	1.71	0.275	"
26.10	8.028	1.93	0.361	--	--	--	--	A+D
24.66	7.710	2.03	0.386	2.68	0.517	--	--	A+E
23.02	7.245	2.11	0.404	4.66	0.904	--	--	"
22.51	7.098	2.00	0.384	5.39	1.05	--	--	"
21.53	7.073	--	--	9.19	1.86	2.57	0.373	B+E
17.15	6.034	--	--	19.18	4.161	2.23	0.346	"
19.17	6.701	--	--	16.92	3.646	2.16	0.333	"
17.82	6.209	--	--	17.93	3.852	2.10	0.323	"
11.48	4.321	--	--	30.47	7.071	1.30	0.216	"
11.63	4.392	--	--	30.56	7.115	1.32	0.220	"
19.01	6.496	--	--	14.79	3.116	2.55	0.385	"
19.90	6.738	--	--	13.04	2.722	2.74	0.409	"
25.30	7.903	1.96	0.372	2.09	0.402	--	--	A+E
23.80	7.626	4.85	0.945	2.82	0.557	--	--	"

<sup>a</sup> A =  $\text{KClO}_3$ ; B =  $\text{RbClO}_3$ ; C =  $\text{RbCl}$ ; D =  $\text{KCl}$ ; E = Solid solution (K,Rb)Cl

COMPONENTS:  
 (1) Potassium chloride; KCl; [7447-40-7]  
 (2) Potassium chlorate;  $\text{KClO}_3$ ; [3811-04-9]  
 (3) Rubidium chloride;  $\text{RbCl}$ ; [7791-11-9]  
 (4) Rubidium chlorate;  $\text{RbClO}_3$ ; [13446-71-4]  
 (5) Water;  $\text{H}_2\text{O}$ ; [7732-18-5]

ORIGINAL MEASUREMENTS:  
 Arkhipov, S.M.; Kashina, N.I.;  
 Kuzina, V.A.  
 Zh. Neorg. Khim. 1969, 14, 567-70;  
 Russ. J. Inorg. Chem. (Engl. Transl.)  
 1969, 14, 294-6.

EXPERIMENTAL VALUES: (Continued)

<b>COMPONENTS:</b> (1) Potassium chlorate; $\text{KClO}_3$ ; [3811-04-9] (2) Potassium bromide; $\text{KBr}$ ; [7758-02-3] (3) Water; $\text{H}_2\text{O}$ ; [7732-18-5]	<b>ORIGINAL MEASUREMENTS:</b> Ricci, J.E. <i>J. Am. Chem. Soc.</i> <u>1937</u> , 59, 866-7.
<b>VARIABLES:</b> Composition at 298.15 K	<b>PREPARED BY:</b> Hiroshi Miyamoto

**EXPERIMENTAL VALUES:** Composition of saturated solutions at 25.00°C

$\text{KClO}_3$		$\text{KBr}$		Density $\text{g cm}^{-3}$	Nature of the solid phase <sup>a</sup>
mass %	mol % (compiler)	mass %	mol % (compiler)		
7.905 <sup>b</sup>	1.246	0.00	0.00	1.047	A
4.59	0.765	9.30	1.596	1.100	"
3.21	0.570	16.99	3.105	1.160	"
2.41	0.458	24.20	4.733	1.216	"
1.87	0.384	31.66	6.700	1.292	"
1.42	0.320	39.47	9.151	1.376	"
1.43	0.324	40.00	9.340	1.385	A+B
1.42	0.322	40.01	9.342	1.386	"
1.37	0.311	40.06	9.354	1.387	"
1.42(Av ± .5)	0.322	40.01	9.342	1.385	"
0.00	0.000	40.63	9.388	1.380	B

<sup>a</sup> A =  $\text{KClO}_3$ ; B =  $\text{KBr}$

<sup>b</sup> For the binary system the compiler computes the following:

$$\text{soly of } \text{KClO}_3 = 0.7004 \text{ mol kg}^{-1}$$

**AUXILIARY INFORMATION****METHOD/APPARATUS/PROCEDURE:**

Mixtures of known composition were stirred in a bath thermostatically controlled at 25°C for at least two days.

Potassium bromide was determined by titration with standard silver nitrate solution using Mohr's method. The total solid was determined by evaporation at 100°C followed by heating to 250°C. Potassium chlorate was calculated by difference.

**SOURCE AND PURITY OF MATERIALS:**

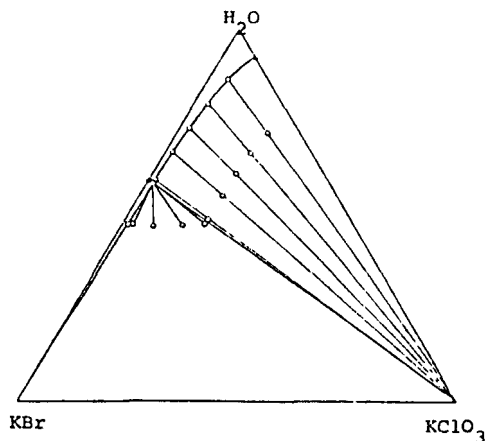
Nothing specified.

**ESTIMATED ERROR:**

Soly: nothing specified.  
Temp: precision ± 0.02 K.

**COMMENTS AND/OR ADDITIONAL DATA:**

The phase diagram is given below (based on mass %).



<b>COMPONENTS:</b>		<b>ORIGINAL MEASUREMENTS:</b>				
(1) Potassium chlorate; $\text{KClO}_3$ ; [3811-04-9]		Swenson, T.; Ricci, J.E.				
(2) Potassium bromate; $\text{KBrO}_3$ ; [7758-01-2]		J. Am. Chem. Soc. <u>1939</u> , 61, 1974-7.				
(3) Water; $\text{H}_2\text{O}$ ; [7732-18-5]						
<b>VARIABLES:</b>		<b>PREPARED BY:</b>				
Composition at 298 K		Hiroshi Miyamoto				
<b>EXPERIMENTAL VALUES:</b> Composition of saturated solutions at 25°C						
	$\text{KBrO}_3$		$\text{KClO}_3$		Density	Nature of the
mass %	mol %	mass %	mol %	$\text{g cm}^{-3}$	solid phase <sup>a</sup>	
	(compiler)		(compiler)			
7.533 <sup>b</sup>	0.8712	0	0	1.054	A	
6.46	0.755	2.26	0.360	-	SSI	
5.75	0.679	4.08	0.656	1.067	"	
5.63	0.665	4.29	0.691	-	"	
4.936	0.5916	6.546	1.069	1.078	SSI +SSII	
4.945	0.5951	6.531	1.067	1.078	"	
4.02	0.478	6.75	1.09	1.072	SSII	
2.79	0.329	7.08	1.14	1.064	"	
2.07	0.243	7.26	1.16	-	"	
1.02	0.119	7.60	1.21	1.053	"	
0	0	7.895 <sup>b</sup>	1.244	1.048	B	
<sup>a</sup> A = $\text{KBrO}_3$ ; B = $\text{KClO}_3$ ;						
SSI = solid solution containing up to 3 % $\text{KClO}_3$ in $\text{KBrO}_3$ .						
SSII = solid solution containing up to 5 % $\text{KBrO}_3$ in $\text{KClO}_3$ .						
<sup>b</sup> For binary systems the compiler computes the following:						
soly of $\text{KClO}_3$ = 0.6995 mol $\text{kg}^{-1}$						
soly of $\text{KBrO}_3$ = 0.4878 mol $\text{kg}^{-1}$						
<b>AUXILIARY INFORMATION</b>						
<b>METHOD/APPARATUS/PROCEDURE:</b>			<b>SOURCE AND PURITY OF MATERIALS:</b>			
Solubilities were determined according to the usual procedure insofar as method of stirring, sampling, filtering, density determination, and temperature control are concerned. Starting with complexes of known composition, and analyzing the saturated solutions at equilibrium, the solid phases were then determined by the methods of graphical or algebraic extrapolation, in addition to occasional analyses of wet and centrifuged residues. The analytical method for the saturated solutions depended on the combined percentage of the $\text{KClO}_3$ and $\text{KBrO}_3$ . For large $\text{KBrO}_3$ compositions solutions were analyzed by evaporation, and iodometric titration of the bromate with thiosulfate solution thus allowing the calculation of the percentage of the chlorate by difference. In the presence of a large amount of chlorate, small quantities of bromate were determined as follows. To about 100 ml of solution was added 5 g of sodium iodide (20 ml of 25% solution) giving a concentration of 0.33N after dilution to 100 ml; 1.5 ml of concentrated HCl (0.18 to 0.2N after dilution); titration with 0.2N sodium thiosulfate solution to be started after continued.....			High grade (99.9 %) potassium bromate was used as received. Potassium chlorate contained small amounts of the corresponding bromate; this bromate content was determined by iodometric titration and the necessary corrections were made when preparing the ternary complexes.			
			<b>ESTIMATED ERROR:</b>			
			Soly: precision 2 % (compiler). Temp: nothing specified.			
			<b>REFERENCES:</b>			

## COMPONENTS:

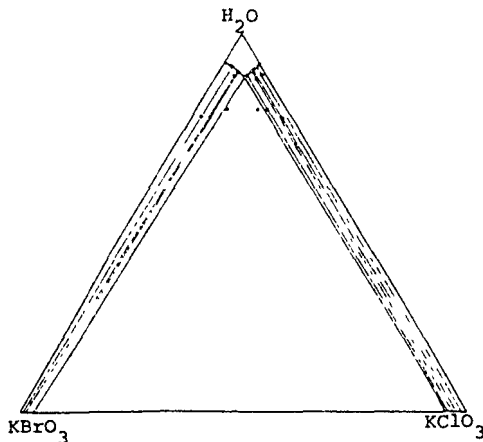
- (1) Potassium chlorate;  $\text{KClO}_3$ ; [3811-04-9]
- (2) Potassium bromate;  $\text{KBrO}_3$ ; [7758-01-2]
- (3) Water;  $\text{H}_2\text{O}$ ; [7732-18-5]

## ORIGINAL MEASUREMENTS:

Swenson, T.; Ricci, J.E.  
*J. Am. Chem. Soc.* 1939, *61*, 1974-7.

## COMMENTS AND/OR ADDITIONAL DATA:

The phase diagram is given below (based on mass %).

METHOD/APPARATUS/PROCEDURE: (Continued)

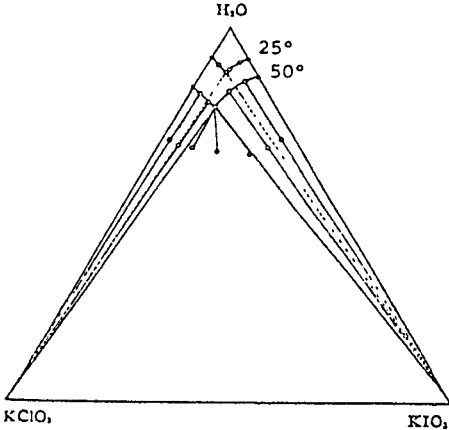
1.5 min.

The same conditions, using a 0.02 N sodium thiosulfate solution for titration and applying the time correction can be used for the detection of quantities as small as 0.001 ( $\pm 0.0005$ ) % of bromate in chlorate.

<b>COMPONENTS:</b>				<b>ORIGINAL MEASUREMENTS:</b>		
(1) Potassium chlorate; $KClO_3$ ; [3811-04-9]				Ricci, J.E.		
(2) Potassium iodide; KI; [7681-11-0]				J. Am. Chem. Soc. <u>1937</u> , 59, 866-7.		
(3) Water; $H_2O$ ; [7732-18-5]						
<b>VARIABLES:</b>				<b>PREPARED BY:</b>		
Composition at 298.15 K				Hiroshi Miyamoto		
<b>EXPERIMENTAL VALUES:</b> Composition of saturated solutions at 25.00°C						
	$KClO_3$			KI		Density $g\ cm^{-3}$
mass %	mol % (compiler)	mass %	mol % (compiler)	Nature of the solid phase <sup>a</sup>		
7.905 <sup>b</sup>	1.246	0.00	0.00	1.047	A	
5.04	0.848	9.33	1.159	1.103	"	
3.35	0.612	18.74	2.528	1.178	"	
2.30	0.467	28.72	4.303	1.275	"	
1.60	0.370	39.26	6.695	1.400	"	
1.10	0.296	49.94	9.937	1.555	"	
0.82	0.255	58.34	13.39	1.702	"	
0.81	0.256	59.27	13.84	1.724	A+B	
0.84	0.266	59.30	13.86	1.723	"	
0.84	0.266	59.26	13.84	1.725	"	
0.83	0.263	59.28	13.85	1.724	"	
0.64	0.212	59.36	13.85	1.724	B	
0.00	0.000	59.76	13.88	1.718	"	
<sup>a</sup> A = $KClO_3$ ; B = KI						
<sup>b</sup> For the binary system the compiler computes the following:						
soly of $KClO_3$ = 0.7004 mol $kg^{-1}$						
<b>AUXILIARY INFORMATION</b>						
<b>METHOD/APPARATUS/PROCEDURE:</b>				<b>SOURCE AND PURITY OF MATERIALS:</b>		
Mixtures of known composition were stirred in a bath thermostatically controlled at 25°C for at least two days. Potassium iodide was titrated argentometrically by Fajans' method using eosin as an absorption indicator. The total solid was determined by evaporation at 100°C followed by heating to 250°C. Potassium chlorate was calculated by difference.				Nothing specified.		
				<b>ESTIMATED ERROR:</b>		
				Soly: nothing specified. Temp: precision $\pm 0.02$ K.		
				<b>REFERENCES:</b>		



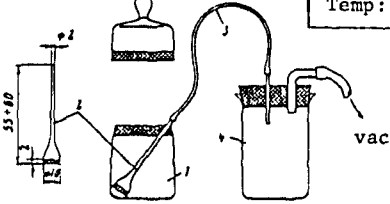
<b>COMPONENTS:</b>				<b>ORIGINAL MEASUREMENTS:</b>			
(1) Potassium chlorate; $KClO_3$ ; [3811-04-9]				Ricci, J.E.			
(2) Potassium iodate; $KIO_3$ ; [7758-05-6]				J. Am. Chem. Soc. <u>1938</u> , 60, 2040-3.			
(3) Water; $H_2O$ ; [7732-18-5]							
<b>VARIABLES:</b>				<b>PREPARED BY:</b>			
T/K = 298, 323				Hiroshi Miyamoto			
Composition							
<b>EXPERIMENTAL VALUES:</b> Composition of saturated solutions							
t/°C	$KIO_3$		$KClO_3$		Density g cm <sup>-3</sup>	Nature of the solid phase <sup>a</sup>	
	mass %	mol % (compiler)	mass %	mol % (compiler)			
25	8.45 <sup>b</sup>	0.771	0.00	0.000	1.043	A	
	7.05	0.648	2.31	0.371	1.070	"	
	5.85	0.547	5.31	0.866	1.082	"	
	5.43	0.512	6.78	1.117	1.091	A+B	
	5.44	0.513	6.79	1.119	1.092	"	
	5.44	0.513	6.81	1.122	1.089	"	
	5.42	0.511	6.81	1.122	1.086	"	
	5.43	0.512	6.80	1.120	1.090(av)	"	
	2.92	0.270	7.31	1.180	1.068	B	
	0.00	0.000	7.90	1.245	1.048	"	
	50	13.21 <sup>b</sup>	1.265	0.00	0.000		A
		10.87	1.053	3.71	0.628		"
8.76		0.871	8.58	1.490		"	
7.26		0.749	13.76	2.479		A+B	
7.27		0.750	13.77	2.481		"	
7.27		0.750	13.77	2.481		"	
7.27		0.750	13.77(av)	2.481		"	
5.27		0.535	14.31	2.536		B	
2.41		0.239	15.11	2.616		"	
0.00		0.000	15.78	2.681		"	
continued.....							
<b>AUXILIARY INFORMATION</b>							
<b>METHOD/APPARATUS/PROCEDURE:</b>				<b>SOURCE AND PURITY OF MATERIALS:</b>			
Mixtures of $KIO_3$ , $KClO_3$ and $H_2O$ were stirred for 5-7 days.				Potassium iodate (c.p. grade) was recrystallized and dried at 100-110°C. Analysis by titration with standard sodium thiosulfate solution showed it to be 100.0 % pure.			
The iodate content was determined by treatment with excess potassium iodide and a limited amount of acetic acid, and titration of the liberated iodine with standard thiosulfate solution. The total dissolved solid was determined by evaporation to dryness, and the chlorate salt calculated by difference.				Potassium chlorate (c.p. grade) was powdered, and then dried at 150-200°C.			
				<b>ESTIMATED ERROR:</b>			
				Soly: nothing specified.			
				Temp: precision $\pm$ 0.01 K.			
				<b>REFERENCES:</b>			

<p>COMPONENTS:</p> <p>(1) Potassium chlorate; <math>\text{KClO}_3</math>; [3811-04-9]</p> <p>(2) Potassium iodate; <math>\text{KIO}_3</math>; [7758-05-6]</p> <p>(3) Water; <math>\text{H}_2\text{O}</math>; [7732-18-5]</p>	<p>ORIGINAL MEASUREMENTS:</p> <p>Ricci, J.E.  <i>J. Am. Chem. Soc.</i> <u>1938</u>, <i>60</i>, 2040-3.</p>
<p>EXPERIMENTAL VALUES: (Continued)</p> <p><sup>a</sup> A = <math>\text{KIO}_3</math>;      B = <math>\text{KClO}_3</math></p> <p><sup>b</sup> For the binary system the compiler computes the following:</p> <p style="padding-left: 40px;">soly of <math>\text{KIO}_3</math> = <math>0.431 \text{ mol kg}^{-1}</math> at <math>25^\circ\text{C}</math>                    = <math>0.7112 \text{ mol kg}^{-1}</math> at <math>50^\circ\text{C}</math></p> <p><u>COMMENTS AND/OR ADDITIONAL DATA:</u></p> <p>The phase diagram is given below (based on mass % units).</p> <div style="text-align: center; margin: 20px 0;">  </div>	

<b>COMPONENTS:</b> (1) Potassium chlorate; $\text{KClO}_3$ ; [3811-04-9] (2) Potassium hydroxide; $\text{KOH}$ ; [1310-58-3] (3) Water; $\text{H}_2\text{O}$ ; [7732-18-5]	<b>ORIGINAL MEASUREMENTS:</b> Bronsted, J.N. <i>J. Am. Chem. Soc.</i> <u>1920</u> , 40, 1448-54.																								
<b>VARIABLES:</b> Concentration of potassium hydroxide $T/K = 293$	<b>PREPARED BY:</b> Hiroshi Miyamoto																								
<b>EXPERIMENTAL VALUES:</b> <table style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="text-align: center;">Concn of <math>\text{KOH}</math> <math>\text{mol/dm}^{-3}</math></th> <th style="text-align: center;">Soly of <math>\text{KClO}_3</math> <math>\text{mol dm}^{-3}</math></th> </tr> </thead> <tbody> <tr><td style="text-align: center;">4.71</td><td style="text-align: center;">0.0924</td></tr> <tr><td style="text-align: center;">5.06</td><td style="text-align: center;">0.0882</td></tr> <tr><td style="text-align: center;">6.35</td><td style="text-align: center;">0.0609</td></tr> <tr><td style="text-align: center;">7.95</td><td style="text-align: center;">0.0445</td></tr> <tr><td style="text-align: center;">8.60</td><td style="text-align: center;">0.0410</td></tr> <tr><td style="text-align: center;">9.41</td><td style="text-align: center;">0.0351</td></tr> <tr><td style="text-align: center;">10.95</td><td style="text-align: center;">0.0287</td></tr> <tr><td style="text-align: center;">12.19</td><td style="text-align: center;">0.0254</td></tr> <tr><td style="text-align: center;">14.02</td><td style="text-align: center;">0.0215</td></tr> <tr><td style="text-align: center;">14.85</td><td style="text-align: center;">0.0195</td></tr> <tr><td style="text-align: center;">15.02</td><td style="text-align: center;">0.0191</td></tr> </tbody> </table>		Concn of $\text{KOH}$ $\text{mol/dm}^{-3}$	Soly of $\text{KClO}_3$ $\text{mol dm}^{-3}$	4.71	0.0924	5.06	0.0882	6.35	0.0609	7.95	0.0445	8.60	0.0410	9.41	0.0351	10.95	0.0287	12.19	0.0254	14.02	0.0215	14.85	0.0195	15.02	0.0191
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<b>METHOD/APPARATUS/PROCEDURE:</b> No details given.	<b>SOURCE AND PURITY OF MATERIALS:</b> Nothing specified.  <b>ESTIMATED ERROR:</b> Nothing specified.  <b>REFERENCES:</b>																								

<b>COMPONENTS:</b> (1) Potassium chlorate; $KClO_3$ ; [3811-04-9] (2) Rubidium chlorate; $RbClO_3$ ; [13446-71-4] (3) Water; $H_2O$ ; [7732-18-5]		<b>ORIGINAL MEASUREMENTS:</b> Kirgintsev, A.N.; Kashina, N.I.; Vulikh, A.I.; Korotkevich, B.I.  <i>Zh. Neorg. Khim.</i> 1965, 10, 1225-8; <i>Russ. J. Inorg. Chem. (Engl. Transl.)</i> 1965, 10, 662-4.			
<b>VARIABLES:</b> Composition T/K = 298.2		<b>PREPARED BY:</b> Hiroshi Miyamoto			
<b>EXPERIMENTAL VALUES:</b> Composition of saturated solution at 25.0°C					
<b>total salts</b> mol $kg^{-1}$		<b>potassium chlorate</b>		<b>rubidium chlorate</b>	
	$y_1^a$	$g_1/100 g_3$	mass % <sup>b</sup>	$g_2/100 g_3$	mass % <sup>b</sup>
3.94	0.0	0.0	0.0	6.65	6.24
4.76	0.24	1.37	1.35	5.99	5.65
5.11	0.34	2.15	2.10	5.64	5.33
5.18	0.38	2.41	2.35	5.43	5.14
5.11	0.39	2.43	2.37	5.26	5.00
5.85	0.49	3.53	3.41	5.04	4.80
6.07	0.53	3.91	3.76	4.87	4.64
8.04	0.73	6.16	6.68	3.72	3.59
8.40	0.76	7.81	7.24	3.38	3.27
8.41	0.76	7.86	7.29	3.38	3.27
8.40	0.77	7.89	7.31	3.26	3.16
8.25	0.72	7.25	6.76	3.94	3.79
8.23	0.70	7.10	6.63	4.09	3.93
8.28	0.72	7.26	6.77	3.98	3.83
8.35	0.74	7.55	7.02	3.70	3.57
8.22	0.78	7.88	7.30	3.02	2.93
7.59	0.88	8.22	7.60	1.49	1.47
7.21	0.92	8.15	7.54	0.95	0.94
6.98	1.0	8.59	7.91	0.0	0.0
7.02	1.0	8.60	7.92	0.0	0.0
<sup>a</sup> $y_1$ = mol fraction of $KClO_3$ in mixture of chlorates.					
<sup>b</sup> Calculated by the compiler.					
<b>AUXILIARY INFORMATION</b>					
<b>METHOD/APPARATUS/PROCEDURE:</b> Solubilities were determined by the method of isothermal relief of supersaturation. Weighed amounts of chlorates were dissolved in water in 50 cm <sup>3</sup> test tubes by heating in a water bath at 65-70°C: the test tubes were then placed in a thermostat at 25°C for 20 m. Supersaturation was removed by stirring at a rate of 60 rev min <sup>-1</sup> for 10 h. After settling, 2 samples of liquid phase were removed for analysis. The first was evaporated in a drying cupboard at 70-80°C and dried to constant weight at 105°C. The other sample was analyzed for $ClO_3^-$ by adding $FeSO_4$ solution and back-titrating excess iron(II) with permanganate solution. Solid phase compositions were not reported.			<b>SOURCE AND PURITY OF MATERIALS:</b> The purity of chlorates used was 99.9 % or better.		
			<b>ESTIMATED ERROR:</b> Soly: accuracy of $y_1 \pm 0.01$ (authors). Temp: precision $\pm 0.1$ K (authors).		
			<b>REFERENCES:</b>		

<b>COMPONENTS:</b> (1) Potassium chlorate; $KClO_3$ ; [3811-04-9] (2) Cesium chlorate; $CsClO_3$ ; [13763-67-2] (3) Water; $H_2O$ ; [7732-18-5]	<b>ORIGINAL MEASUREMENTS:</b> Kirgintsev, A.N.; Kashina, N.I.; Vulikh, A.I.; Korotkevich, B.I.  <i>Zh. Neorg. Khim.</i> 1965, 10, 1225-8; <i>Russ. J. Inorg. Chem. (Engl. Transl.)</i> 1965, 10, 662-4.																																																																													
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<b>AUXILIARY INFORMATION</b>																																																																														
<b>METHOD/APPARATUS/PROCEDURE:</b> Solubility in this system was studied by the isothermal relief of supersaturation method. Weighed amounts of chlorates were dissolved in water in 50 cm <sup>3</sup> test tubes by heating on a water bath at 65-70°C; the test-tubes were then placed in a thermostat at 25°C for 20 min. Supersaturation was then removed by stirring at 60 rpm for 10 h. After settling two samples of liquid phase were removed for analysis. The first was evaporated in a drying cupboard at 70-80°C and then dried to constant weight at 105°C. The other sample was analyzed for $ClO_3$ by adding $FeSO_4$ solution and back-titrating excess iron(II) with permanganate solution. Solid phase compositions not reported.	<b>SOURCE AND PURITY OF MATERIALS:</b> The purity of chlorates used was 99.9 % or better.  <b>ESTIMATED ERROR:</b> Soly: accuracy of $y_1 \pm 0.01$ (authors). Temp: precision $\pm 0.1$ K (authors).																																																																													
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<b>COMPONENTS:</b> (1) Potassium chlorate; $KClO_3$ ; [3811-04-9] (2) Calcium chlorate; $Ca(ClO_3)_2$ ; [10137-74-3] (3) Water; $H_2O$ ; [7732-18-5]		<b>ORIGINAL MEASUREMENTS:</b> Kirgintsev, A.N.; Kozitskii, V.P.  <i>Zh. Neorg. Khim.</i> 1968, 13, 3342-45; <i>Russ. J. Inorg. Chem. (Engl. Transl.)</i> 1968, 13, 1723-5.		
<b>VARIABLES:</b> Composition T/K = 298		<b>PREPARED BY:</b> Hiroshi Miyamoto		
<b>EXPERIMENTAL VALUES:</b> Composition of saturated solutions at 25°C <sup>b</sup>				
$y_1^a$	potassium chlorate		calcium chlorate	
	mass %	mol % (compiler)	mass %	mol % (compiler)
1.000	7.87 <sup>c</sup>	1.24	0	0
0.900	7.23	1.15	1.36	0.128
0.816	6.52	1.04	2.49	0.235
0.665	5.60	0.906	4.75	0.455
0.518	4.76	0.785	7.50	0.733
0.438	4.24	0.708	9.20	0.910
0.210	2.73	0.491	17.38	1.85
0.104	1.83	0.363	26.64	3.13
0.103	1.81	0.359	26.63	3.13
0.068	1.47	0.318	33.73	4.32
0.054	1.17	0.254	34.35	4.42
0.052	1.25	0.287	38.31	5.21
0.034	1.14	0.342	54.81	9.74
0.033	1.20	0.387	58.42	11.14
<sup>a</sup> The mole fraction of potassium chlorate based on moles $KClO_3$ and $Ca(ClO_3)_2$ . <sup>b</sup> In mol kg <sup>-1</sup> units, the authors report the solubility of $KClO_3$ in terms of the following smoothing equation. $\log m_1 = -0.157 - 0.778 \log y_1 - 0.302 (1-y_1)$				
<b>AUXILIARY INFORMATION</b>				
<b>METHOD/APPARATUS/PROCEDURE:</b> Solubility was measured by the method of isothermal relief of supersaturation. Equilibrium was reached in 6-8 hours. The apparatus for the solubility determination is shown in figure below.		<b>SOURCE AND PURITY OF MATERIALS:</b> "Analytical reagent" grade calcium chlorate and potassium chlorate were used.		
		<b>ESTIMATED ERROR:</b> Soly: nothing specified. Temp: precision $\pm 0.05$ K (authors).		
		Samples of satd sln to be analyzed were placed in container 1 which had been previously weighed together with the filter stick. Sodium tetraphenylborate solution was added dropwise over a period of 30 min. The precipitate was allowed to settle, and the mother-liquor withdrawn through the filter stick and transferred into beaker 4 through the fine polyvinyl chloride tube 3. The precipitate was washed twice with 0.06 % aqueous sodium tetraphenylborate, then four or five times with a few millilitres of distilled water. The container with the precipitate and filter stick was dried for 1.5 hours at 105°C, cooled and weighed. The calcium content of the solution in beaker 4 was determined by titration with Trilon B.		

<b>COMPONENTS:</b>				<b>ORIGINAL MEASUREMENTS:</b>		
(1) Potassium chlorate; $KClO_3$ ; [3811-04-9]				Taylor, A.E.		
(2) Ethanol, $C_2H_6O$ ; [64-17-5]				<i>J. Phys. Chem.</i> <u>1897</u> , 1, 718-33.		
(3) Water; $H_2O$ ; [7732-18-5]						
<b>VARIABLES:</b>				<b>PREPARED BY:</b>		
Concentration of ethanol T/K = 303 and 313				Hiroshi Miyamoto		
<b>EXPERIMENTAL VALUES:</b>						
t/°C	Concn of ethanol		g/g satd soln	Solubility		mol kg <sup>-1</sup> (compiler)
	mass %	mol % (compiler)		mol % (compiler)	g/g H <sub>2</sub> O	
30	0	0	0.0923	1.47	0.1017	0.8299
	5	2	0.0772	1.21	0.0880	0.718
	10	4.2	0.0644	1.00	0.0765	0.624
	20	8.9	0.0451	0.690	0.0590	0.481
	30	14	0.0321	0.485	0.0474	0.387
	40	21	0.0235	0.352	0.0400	0.326
	50	28	0.0164	0.245	0.0333	0.272
	60	37	0.0101	0.150	0.0253	0.206
	70	48	0.0054	0.080	0.0182	0.149
	80	61	0.0024	0.035	0.0122	0.100
40	0	0	0.1223	2.007	0.1393	1.136
	5	2	0.1048	1.691	0.1233	1.006
	10	4.2	0.0884	1.405	0.1077	0.879
	20	8.9	0.0640	0.995	0.0856	0.698
	30	14	0.0467	0.715	0.0700	0.571
	40	21	0.0341	0.516	0.0588	0.480
	50	28	0.0241	0.362	0.0494	0.403
	60	37	0.0146	0.217	0.0369	0.301
	70	48	0.0078	0.115	0.0263	0.215
	80	61	0.0034	0.050	0.0173	0.141
90	78	0.0012	0.018	0.0117	0.095	
continued.....						
<b>AUXILIARY INFORMATION</b>						
<b>METHOD/APPARATUS/PROCEDURE:</b>				<b>SOURCE AND PURITY OF MATERIALS:</b>		
Small bottles containing the aqueous alcohol and a large excess of powdered salt were placed in an Ostwald thermostat for about half a day at a temperature some ten degrees higher than that at which the solubility was to be determined. During this time, the bottles were shaken frequently and thoroughly. The temperature was lowered and maintained at the desired value for about a day. The solubility was very nearly constant at the end of 3 days, but at least six days were required for many solutions. About 5 cm <sup>3</sup> of the saturated solution were withdrawn using a pipet and weighed. The solution was evaporated to dryness and weighed.				Potassium chlorate was recrystallized two or three times and dried in an air bath. Ethanol was distilled from lime, stored over dehydrated copper sulfate for one or two days, and finally distilled.		
				<b>ESTIMATED ERROR:</b>		
				Soly: accuracy 0.1 % (author). Temp: nothing specified.		
				<b>REFERENCES:</b>		

<p>COMPONENTS:</p> <p>(1) Potassium chlorate; <math>KClO_3</math>; [3811-04-9]</p> <p>(2) Ethanol; <math>C_2H_6O</math>; [64-17-5]</p> <p>(3) Water; <math>H_2O</math>; [7732-18-5]</p>	<p>ORIGINAL MEASUREMENTS:</p> <p>Taylor, A.E.</p> <p><i>J. Phys. Chem.</i> <u>1897</u>, 1, 718-33.</p>
<p>EXPERIMENTAL VALUES: (Continued)</p> <p>Fitting equations were given as:</p> <p>(1) The concentration of ethanol: 0 - 40 mass %</p> <p style="padding-left: 40px;">- <math>\log w = (1/1.57) \times 2.260 + \log (x + 0.20)</math> at 30°C</p> <p style="padding-left: 40px;">- <math>\log w = (1/1.57) \times 2.000 + \log (x + 0.22)</math> at 40°C</p> <p>(2) The concentration of ethanol: 50 - 90 mass %</p> <p style="padding-left: 40px;">- <math>\log w = (1/1.2) \times 1.690 + \log (x + 0.20)</math> at 30°C</p> <p style="padding-left: 40px;">- <math>\log w = (1/1.2) \times 1.482 + \log (x + 0.22)</math> at 40°C</p> <p>where <math>w</math> is the amount of salt in one gram of water, and <math>x</math> is the amount of alcohol in one gram of water.</p>	



<b>COMPONENTS:</b> (1) Potassium chlorate: $KClO_3$ ; [3811-04-9] (2) 1,2,3-Propanetriol (glycerol); $C_3H_8O$ ; [56-81-5] (3) Water; $H_2O$ ; [7732-18-5]	<b>ORIGINAL MEASUREMENTS:</b> Holm, K, <i>Pharm. Weekblad</i> <u>1921</u> , 58, 1033-7. <sup>1</sup>						
<b>VARIABLES:</b> T/K = 293	<b>PREPARED BY:</b> T.P. Dirkse						
<b>EXPERIMENTAL VALUES:</b> <table data-bbox="381 526 949 681" style="margin-left: auto; margin-right: auto;"> <thead> <tr> <th style="text-align: center;">glycerol composition mass %<sup>a</sup></th> <th style="text-align: center;">solubility <math>KClO_3</math> g/100 g glycerol<sup>b</sup></th> </tr> </thead> <tbody> <tr> <td style="text-align: center;">86.5</td> <td style="text-align: center;">1.32</td> </tr> <tr> <td style="text-align: center;">98.5</td> <td style="text-align: center;">1.03</td> </tr> </tbody> </table> <p><sup>a</sup> Author only specified % glycerol, and the compiler <i>assumes</i> this to mean mass %.</p> <p><sup>b</sup> Presumably this refers to grams of <math>KClO_3</math> per 100 grams of the mixed solvent.</p>		glycerol composition mass % <sup>a</sup>	solubility $KClO_3$ g/100 g glycerol <sup>b</sup>	86.5	1.32	98.5	1.03
glycerol composition mass % <sup>a</sup>	solubility $KClO_3$ g/100 g glycerol <sup>b</sup>						
86.5	1.32						
98.5	1.03						
<b>AUXILIARY INFORMATION</b>							
<b>METHOD/APPARATUS/PROCEDURE:</b> Isothermal method used with approach from above and below. An excess of dried powdered salt was added to the glycerol-water mixture in a flask, and the cork covered with a layer of paraffin. One set of flasks were agitated in the constant temperature bath while another set of flasks were first heated to 90°C for 1 hour before equilibrating at 20°C. Attainment of equilibrium required weeks to months. Method of analyses not specified.	<b>SOURCE AND PURITY OF MATERIALS:</b> Two glycerol-water mixtures were prep'd with specific gravities of 1.2326 and 1.2645 at 15°C. The compositions of these mixtures were given as 86.5 % and 98.5 % glycerol, respectively (the compiler <u>assumes</u> these are mass % values). No other information given.  <b>ESTIMATED ERROR:</b> Soly: nothing specified. Temp: precision $\pm 0.05-0.1$ K (author).  <b>REFERENCES:</b> 1. The data in this paper were also presented at a meeting and published in <i>Pharm. Weekblad</i> before the full paper was published. Holm, K. <i>Pharm. Weekblad</i> <u>1921</u> , 58, 860-2. The paper was read by a Mr. Kok on behalf of Mr. Holm.						

<b>COMPONENTS:</b>				<b>ORIGINAL MEASUREMENTS:</b>		
(1) Potassium chlorate; $KClO_3$ ; [3811-04-9]				Taylor, A.E.		
(2) 2-Propanone (acetone); $C_3H_6O$ ; [67-64-1]				J. Phys. Chem. <u>1897</u> , 1, 718-33.		
(3) Water; $H_2O$ ; [7732-18-5]						
<b>VARIABLES:</b>				<b>PREPARED BY:</b>		
Concentration of acetone				Hiroshi Miyamoto		
T/K = 303 and 313						
<b>EXPERIMENTAL VALUES:</b>						
t/°C	Concn of Acetone		g/g satd soln	Solubility		mol $kg^{-1}$ (compiler)
	mass %	mol % (compiler)		mol % (compiler)	g/g $H_2O$	
30	0	0	0.0923	1.47	0.1017	0.8299
	5	1.6	0.0832	1.32	0.0956	0.7801
	9.09	3.01	0.0763	1.20	0.0909	0.7417
	20	7.2	0.0609	0.944	0.0810	0.6610
	30	12	0.0493	0.757	0.0740	0.6038
	40	17	0.0390	0.593	0.0676	0.5516
	50	24	0.0290	0.437	0.0598	0.4880
	60	32	0.0203	0.304	0.0517	0.4219
	70	42	0.0124	0.184	0.0418	0.3411
	80	55	0.0057	0.084	0.0288	0.2350
90	74	0.0018	0.027	0.0182	0.1485	
40	0	0	0.1223	2.026	0.1393	1.137
	5	1.6	0.1110	1.802	0.1311	1.070
	9.09	3.01	0.1028	1.656	0.1260	1.028
	20	7.2	0.0827	1.31	0.1126	0.9188
	30	12	0.0669	1.04	0.1024	0.8356
	40	17	0.0536	0.826	0.0945	0.7711
	50	24	0.0403	0.614	0.0840	0.6854
	60	32	0.0286	0.431	0.0735	0.5998
	70	47	0.0286	0.251	0.0568	0.4635
	80	55	0.0079	0.117	0.0397	0.3240
90	74	0.0024	0.035	0.0245	0.1999	
continued.....						
<b>AUXILIARY INFORMATION</b>						
<b>METHOD/APPARATUS/PROCEDURE:</b>				<b>SOURCE AND PURITY OF MATERIALS:</b>		
Small bottles containing the aqueous acetone and a large excess of powdered salt were placed in an Ostwald thermostat for about half a day at a temperature some ten degrees higher than that at which the solubility was to be determined. During this time the bottles were shaken frequently and thoroughly. The temperature was lowered and maintained at the desired value for about a day. The solubility was very nearly constant at the end of three days, but at least six days were required for many solutions. About 5 $cm^3$ of the saturated solution were withdrawn using a pipet and weighed. The solution was evaporated to dryness and weighed.				Potassium chlorate was recrystallized two or three times and dried in an air bath. Acetone was purified by distillation.		
				<b>ESTIMATED ERROR:</b>		
				Soly: accuracy 0.1 %. Temp: nothing specified.		
				<b>REFERENCES:</b>		

<p>COMPONENTS:</p> <p>(1) Potassium chlorate; <math>KClO_3</math>; [3811-04-9]</p> <p>(2) 2-Propanone (acetone); <math>C_3H_6O</math>; [67-64-1]</p> <p>(3) Water; <math>H_2O</math>; [7732-18-5]</p>	<p>ORIGINAL MEASUREMENTS:</p> <p>Taylor, A.E.</p> <p><i>J. Phys. Chem.</i> <u>1897</u>, 1, 718-33.</p>
<p>EXPERIMENTAL VALUES: (Continued)</p> <p>Fitting equations were given as follows:</p> <p>(1) The concentration of acetone; 0 - 50 mass %</p> <p style="padding-left: 40px;">- <math>\log w = (1/3.6) \times 4.273 + \log (x + 0.20)</math> at 30°C</p> <p style="padding-left: 40px;">- <math>\log w = (1/3.6) \times 3.640 + \log (x + 0.22)</math> at 40°C</p> <p>(2) The concentration of acetone; 60 - 90 mass %</p> <p style="padding-left: 40px;">- <math>\log w = (1/1.55) \times 1.760 + \log (x + 0.20)</math> at 30°C</p> <p style="padding-left: 40px;">- <math>\log w = (1/1.55) \times 1.525 + \log (x + 0.22)</math> at 40°C</p> <p>where <math>y</math> is the amount of salt in one gram of water, and <math>x</math> is the amount of acetone in one gram of water.</p>	

<b>COMPONENTS:</b> (1) Potassium chlorate; $KClO_3$ ; [3811-04-9] (2) 2-Propanone (acetone); $C_2H_6O$ ; [67-64-1] (3) Water; $H_2O$ ; [7732-18-5]			<b>ORIGINAL MEASUREMENTS:</b> Hartley, G.S. <i>Trans. Faraday Soc.</i> <u>1931</u> , 27, 10-29.		
<b>VARIABLES:</b> T/K = 290.8 Concentration of acetone			<b>PREPARED BY:</b> Hiroshi Miyamoto		
<b>EXPERIMENTAL VALUES:</b>					
	acetone		potassium chlorate		
t/°C	$N_2^a$	mass % (compiler)	$N_1^b$	mass % (compiler)	mol/kg <sup>-1</sup> (compiler)
17.6	0.0000	0.00	0.00953	6.14	0.534
	0.0233	7.14	0.00847	5.24	
	0.0409	12.1	0.00779	4.67	
	0.0513	14.8	0.00740	4.04	
<p><sup>a</sup> Mole ratio of acetone in the mixture of acetone and water</p> <p><sup>b</sup> Mole fraction of solute in saturated solution.</p>					
<b>AUXILIARY INFORMATION</b>					
<b>METHOD/APPARATUS/PROCEDURE:</b> Excess recrystallized potassium chlorate was placed in tubes with weighed amounts of water and acetone. The tube was placed in a thermostat and agitated from time to time for several days. Samples of the liquid were quickly transferred to weighed flasks fitted with stoppers. The potassium chlorate samples were carefully evaporated to dryness and weighed.			<b>SOURCE AND PURITY OF MATERIALS:</b> Potassium chlorate was recrystallized. No other information given.		
			<b>ESTIMATED ERROR:</b> Nothing specified.		
			<b>REFERENCES:</b>		