

COMPONENTS:	ORIGINAL MEASUREMENTS:		
(1) Potassium dihydrogenphosphate; KH_2PO_4 ; [7778-77-0] (2) Potassium acetate; $\text{CH}_3\text{CO}_2\text{K}$; [127-08-2] (3) Water; H_2O ; [7732-18-5]	Apfel, O. Dissertation, Technical University, Darmstadt 1911.		
VARIABLES:	PREPARED BY:		
Composition at 25°C.	J. Eysseltová		
EXPERIMENTAL VALUES:			
Composition of saturated solutions in the $\text{KH}_2\text{PO}_4-\text{CH}_3\text{CO}_2\text{K}-\text{H}_2\text{O}$ system at 25°C.			
PO_4^{3-} ^a ^b conc	CH_3CO_2^- ^a ^b conc	KH_2PO_4 ^a mass% mol/kg	$\text{CH}_3\text{CO}_2\text{K}^a$ mass% mol/kg
1.28	0.50	17.42	1.65
1.06	0.98	14.43	1.40
^a These values were calculated by the compiler.			
^b The concentration unit is: mol/1000 g of solution.			
AUXILIARY INFORMATION			
METHOD/APPARATUS/PROCEDURE:	SOURCE AND PURITY OF MATERIALS:		
The isothermal method was used. Equilibrium was checked by repeated analysis. The solid and liquid phases were separated from each other by filtration through a platinum mat. Phosphate content was determined gravimetrically as $\text{Mg}_2\text{P}_2\text{O}_7$, potassium was determined gravimetrically as KClO_4 .	No information is given.		
ESTIMATED ERROR:			
No information is given.			
REFERENCES:			

COMPONENTS: (1) Potassium dihydrogenphosphate; KH_2PO_4 ; [7778-77-0] (2) Potassium carbonate; K_2CO_3 ; [584-08-7] (3) Water; H_2O ; [7732-18-5]		ORIGINAL MEASUREMENTS: Apfel, O. Dissertation, Technical University, Darmstadt <u>1911</u> .			
VARIABLES: Composition at 25°C.		PREPARED BY: J. Eysseltova			
EXPERIMENTAL VALUES:					
Composition of saturated solutions in the KH_2PO_4 - K_2CO_3 - H_2O system at 25°C.					
PO_4^{3-} conc ^b	CO_3^{2-} conc ^b	KH_2PO_4^a mass%	KH_2PO_4^a mol/kg	K_2CO_3^a mass%	K_2CO_3^a mol/kg
1.69	0.12	23.00	2.24	1.66	0.16
2.34	0.415	31.86	3.75	5.74	0.66
^a These values were calculated by the compiler.					
^b The concentration unit is: mol/1000 g of solution.					
COMMENT: The author observed a vigorous evolution of CO_2 , and, therefore, expresses doubt about the establishment of equilibrium in the system.					
AUXILIARY INFORMATION					
METHOD/APPARATUS/PROCEDURE: The isothermal method was used. The solid and liquid phases were separated from each other by filtration through a platinum wire mat. Analyses were done gravimetrically: phosphorus as $\text{Mg}_2\text{P}_2\text{O}_7$, and potassium as KCLO_4 .	SOURCE AND PURITY OF MATERIALS: No information is given.				
ESTIMATED ERROR: No information is given.					
REFERENCES:					

COMPONENTS: (1) Potassium dihydrogenphosphate; KH_2PO_4 ; [7778-77-0] (2) Dipotassium sulfate; K_2SO_4 ; [7778-80-5] (3) Water; H_2O ; [7732-18-5]		ORIGINAL MEASUREMENTS: Apfel, O. Dissertation, Technical University, Darmstadt, 1911.			
VARIABLES: Composition at 25°C.		PREPARED BY: J. Eyseltova			
EXPERIMENTAL VALUES:					
Composition of saturated solutions in the $\text{KH}_2\text{PO}_4-\text{K}_2\text{SO}_4-\text{H}_2\text{O}$ system at 25°C.					
PO_4^{3-} conc. ^a _b	SO_4^{2-} concn. ^a _b	KH_2PO_4 mass% ^a	KH_2PO_4 mol/kg ^a	K_2SO_4 mass% ^a	K_2SO_4 mol/kg ^a
1.47	----	19.87	1.82	----	----
1.43	0.08	19.46	1.81	1.39	0.10
1.34	0.18	18.24	1.70	3.14	0.23
1.30	0.36	17.69	1.71	6.27	0.47
1.24	0.39	16.88	1.62	6.80	0.51
1.25	0.39	17.01	1.64	6.80	0.51
1.23	0.36	16.74	1.60	6.27	0.47
^a These values were calculated by the compiler.					
^b The concentration unit is: mol/1000 g solution.					
AUXILIARY INFORMATION					
METHOD/APPARATUS/PROCEDURE: The isothermal method was used. Equilibrium was checked by repeated analysis. The liquid and solid phases were separated from each other by filtration through a platinum wire mat. Analysis was done gravimetrically. Phosphate was determined as $\text{Mg}_2\text{P}_2\text{O}_7$, potassium was determined as KClO_4 , and sulfate was determined as BaSO_4 .	SOURCE AND PURITY OF MATERIALS: No details are given.				
		ESTIMATED ERROR: No information is given.			
REFERENCES:					

COMPONENTS:		ORIGINAL MEASUREMENTS:								
(1) Potassium dihydrogenphosphate; KH_2PO_4 ; [7778-77-0]		Apfel, O. Dissertation, Technical University, Darmstadt, 1911.								
(2) Potassium nitrate; KNO_3 ; [7757-79-1]										
(3) Water; H_2O ; [7732-18-5]										
VARIABLES:										
Composition at 25°C.		PREPARED BY:								
J. Eysseltová										
EXPERIMENTAL VALUES:										
Composition of saturated solutions in the KH_2PO_4 - KNO_3 - H_2O system at 25°C.										
PO_4^{3-} concn. ^b	NO_3^- concn. ^b	KH_2PO_4 ^a mass%	KH_2PO_4 ^a mol/kg	KNO_3 ^a mass%	KNO_3 ^a mol/kg					
1.20	0.55	16.33	1.54	5.56	0.70					
1.03	1.19	14.01	1.39	12.03	1.61					
^a These values were calculated by the compiler.										
^b The concentration unit is: mol/1000 g of solution.										
AUXILIARY INFORMATION										
METHOD/APPARATUS/PROCEDURE:	SOURCE AND PURITY OF MATERIALS:									
The isothermal method was used. Equilibrium was checked by repeated analysis of the liquid phase. The liquid and solid phases were separated from each other by filtration through a platinum wire mat. Analyses were done gravimetrically: phosphate as $\text{Mg}_2\text{P}_2\text{O}_7$, and potassium as KCIO_4 .	No information is given.									
ESTIMATED ERROR:										
Nothing is stated.										
REFERENCES:										

COMPONENTS: (1) Potassium dihydrogenphosphate; KH_2PO_4 ; [7778-77-0] (2) Hydrogen peroxide; H_2O_2 ; [7722-84-1] (3) Water; H_2O ; [7732-18-5]		ORIGINAL MEASUREMENTS: Menzel, H.; Gabler, C. <i>Z. Anorg. Chem.</i> 1929, 177, 187-214.		
VARIABLES: Composition at 0°C.		PREPARED BY: J. Eysseltova		
EXPERIMENTAL VALUES:				
Solubility in the $\text{KH}_2\text{PO}_4-\text{H}_2\text{O}_2-\text{H}_2\text{O}$ system at 0°C.				
H_2O_2	KH_2PO_4			
mol P : mol O_2^{2-}	g/1000 g soln	mol/kg	g/1000 g soln	mol/kg
1 : 0	-----	----	124.8	1.047
1 : 1.69	65.90	2.506	160.7	1.527
1 : 1.78	82.42	3.313	186.7	1.876
AUXILIARY INFORMATION				
METHOD/APPARATUS/PROCEDURE: Equilibrium was reached isothermally in an ice-water bath. Repeated analyses were made to check the equilibrium. The dihydrogenphosphate ion content was determined gravimetrically as ammonium phosphomolybdate. The hydrogen peroxide content was determined by titration with potassium permanganate.	SOURCE AND PURITY OF MATERIALS: Kahlbaum KH_2PO_4 intended for use in enzyme investigation according to Soerensen was used. The H_2O_2 was the purest Merck reagent grade.			
	ESTIMATED ERROR: The temperature was controlled to within ± 0.1 K. No other details are given.			
		REFERENCES:		

COMPONENTS: (1) Potassium dihydrogenphosphate; KH_2PO_4 ; [7778-77-0] (2) Ammonium dihydrogenphosphate; $\text{NH}_4\text{H}_2\text{PO}_4$; [7722-76-1] (3) Water; H_2O ; [7732-18-5]	ORIGINAL MEASUREMENTS: Askenasy, P.; Nessler, F. <i>Z. Anorg. Chem.</i> , <u>1930</u> , 189, 305-28.
VARIABLES: Composition at 0°C.	PREPARED BY: J. Eysseltová

EXPERIMENTAL VALUES:

Composition of saturated solutions in the KH_2PO_4 - $\text{NH}_4\text{H}_2\text{PO}_4$ - H_2O system at 0°C.

d g cm $^{-3}$	conc. mass%	KH_2PO_4 mass% ^b	mol/kg ^b	conc. mass%	$\text{NH}_4\text{H}_2\text{PO}_4$ mass% ^b	mol/kg ^b	conc. mass%	H_2O mass% ^b
1.1151	100	15.5	1.35	0	0	0	4125	85.5
1.1169	80.6	14.7	1.32	19.4	3.6	0.32	3400	81.7
1.1393	67.4	13.8	1.27	32.6	7.0	0.62	2950	79.2
1.1472	54.7	12.8	1.20	45.3	10.2	0.89	2540	77.0
1.1577	49.3	12.4	1.17	50.7	12.2	1.21	2325	75.4
1.1571	44.2	11.4	1.10	55.8	13.7	1.38	2240	74.9
1.1603	38.1	10.2	0.89	61.9	15.7	1.61	2130	74.1
1.1604	36.4	9.8	0.86	63.6	16.1	1.67	2120	74.1
1.1611	35.2	9.6	0.83	64.8	16.4	1.71	2105	74.0
1.1574	31.2	8.4	0.82	68.8	17.1	1.73	2130	74.5
1.1568	26.4	7.0	0.67	73.6	17.6	1.86	2200	76.4
1.1447	18.2	4.6	0.44	81.8	18.7	1.99	2280	76.7
1.1350	15.3	2.8	0.36	84.7	19.7	2.00	2350	77.5
1.1312	12.4	3.0	0.28	87.6	18.6	1.97	2450	78.4
1.1043	0	0	0	100	18.6	1.97	2815	81.4

^aThe concentration unit is: mol/100 mol of solute.

^b These values were calculated by the compiler.

AUXILIARY INFORMATION

METHOD/APPARATUS/PROCEDURE: Mixtures of salts and water were shaken in a thermostat for 2-4 days. The solid phase was isolated by centrifuging and analyzed. No details about the analytical procedures are given.	SOURCE AND PURITY OF MATERIALS: No information is given.
	ESTIMATED ERROR: The temperature was controlled to within ± 0.1 K. No other information is given.
	REFERENCES:

COMPONENTS:								ORIGINAL MEASUREMENTS:					
(1) Potassium dihydrogenphosphate; KH_2PO_4 ; [7778-77-0]								Krasil'shtschikov, A.I. Izv. In-ta Fiz.-khim. Anal. 1933, 6, 159-68.					
(2) Potassium chloride; KCl; [7747-40-7]													
(3) Water; H_2O ; [7732-18-5]													
VARIABLES:								PREPARED BY:					
Temperature and composition.								J. Eysseltová					
EXPERIMENTAL VALUES:								Solubility isotherms in the KH_2PO_4 -KCl- H_2O system.					
No	$t/^\circ\text{C.}$	d g cm^{-3}	KH_2PO_4 conc ^a	KH_2PO_4 conc ^b	KCl mass%	KCl conc ^a	KCl conc ^b	H_2O mass%	H_2O mass%	H_2O conc ^b	solid ^c	phase	
1	0	1.094	19.3	100	12.7	----	----	87.30	687.4	A			
2	0	1.095	16.0	81.4	10.5	6.6	18.6	2.4	87.10	675.2	"		
3	0	1.097	11.7	54.7	7.6	17.7	45.3	1.3	91.10	619.4	"		
4	0	1.165	4.3	10.7	2.5	65.8	89.3	20.9	76.60	327.3	A + B		
5	0	1.156	----	----	----	69.0	100	22.2	77.80	350.4	B		
6	25	1.147	32.9	100	19.92	----	----	----	80.08	402.0	A		
7	25	1.144	30.1	92.6	18.28	4.3	7.4	1.45	80.27	406.8	"		
8	25	1.137	22.4	70.1	13.65	17.4	29.9	5.83	80.52	413.3	"		
9	25	1.138	21.0	65.3	12.75	20.6	35.0	6.87	80.38	409.6	"		
10	25	1.139	19.8	60.2	11.98	23.9	39.8	7.92	80.10	402.5	"		
11	25	1.140	18.3	54.6	11.05	27.8	45.4	9.18	79.77	394.3	"		
12	25	1.148	14.5	39.6	8.54	40.3	60.4	13.05	78.41	363.2	"		
13	25	1.179	8.8	18.2	4.83	71.3	81.8	21.67	73.50	277.4	"		
14	25	1.196	6.5	12.6	3.57	83.9	87.4	24.82	71.61	252.2	A + B		
15	25	1.184	2.7	5.3	1.44	85.8	94.7	25.81	72.75	267.0	B		
16	25	1.179	----	----	----	86.8	100	26.40	73.60	278.0	"		
17	50	----	54.3	100	29.10	----	----	----	60.90	243.7	A		
18	50	----	38.1	75.5	20.8	22.6	24.7	6.8	72.40	262.3	"		
19	50	----	23.2	45.7	12.7	50.4	54.3	15.1	72.20	260.0	"		
20	50	----	10.2	15.96	5.23	99.0	84.04	27.5	67.23	205.2	A + B		
21	50	----	----	----	104.0	100	30.1	69.90	232.2	B			
^a The concentration unit is: mol/1000 mol H_2O .													
^b The concentration unit is: g/100 g salts.													
^c The solid phases are: A = KH_2PO_4 ; B = KCl.													
AUXILIARY INFORMATION													
METHOD/APPARATUS/PROCEDURE:								SOURCE AND PURITY OF MATERIALS:					
The isothermal method was used, with 12-15 hours being allowed for equilibration. Chloride ion content was determined argentimetrically, the amount of total salts was determined by evaporating and drying a sample of the saturated solution.								Kahlbaum KH_2PO_4 was used. The source of the KCl is not specified.					
ESTIMATED ERROR:								The temperature was controlled to within $\pm 0.1 \text{ K}$.					
REFERENCES:													

COMPONENTS:				ORIGINAL MEASUREMENTS:			
(1) Potassium dihydrogenphosphate; KH_2PO_4 ; [7778-77-0]				Krasil'shtschikov, A.I. Izv. In-ta Fiz.-khim. Anal. 1933, 6, 159-68.			
(2) Potassium chloride; KCl; [7747-40-7]							
(3) Water; H_2O ; [7732-18-5]							

EXPERIMENTAL VALUES cont'd:

The compiler has recalculated the above results to give the following:

No	KH_2PO_4 mol/kg	KCl mol/kg	No	KH_2PO_4 mol/kg	KCl mol/kg	No	KH_2PO_4 mol/kg	KCl mol/kg
1	1.068	----	6	1.827	----	17	3.015	----
2	0.885	0.369	7	1.673	0.242	18	2.110	1.259
3	0.612	0.191	8	1.245	0.971	19	1.292	2.805
4	0.239	3.659	9	1.166	1.146	20	0.571	5.494
5	----	3.827	10	1.098	1.326	21	----	5.775
			11	1.017	1.543			
			12	0.800	2.232			
			13	0.482	3.954			
			14	0.366	4.648			
			15	0.145	4.758			
			16	----	4.810			

Potassium Dihydrogenphosphate

COMPONENTS: (1) Potassium dihydrogenphosphate; KH_2PO_4 ; [7778-77-0] (2) Ammonium dihydrogenphosphate; $\text{NH}_4\text{H}_2\text{PO}_4$; [7722-76-1] (3) Water; H_2O ; [7732-18-5]	ORIGINAL MEASUREMENTS: 1. Dombrovskaya, N.S.; Zvorykin, A.J. <i>Kal'iy</i> 1937, 2, 24-8. 2. Zvorykin, A.J.; Kuznetsov, V.G. <i>Izv. AN SSSR. ser. khim.</i> 1938, 195-201.																																																																																																																																
VARIABLES: Temperature and composition.	PREPARED BY: J. Eysseltova																																																																																																																																
EXPERIMENTAL VALUES:																																																																																																																																	
<p>The solubility in the $\text{KH}_2\text{PO}_4-\text{NH}_4\text{H}_2\text{PO}_4-\text{H}_2\text{O}$ system has been reported by Zvorykin and co-workers in 2 publications. Source paper (1) reports the solubility isotherms at 25 and 50°C. Source paper (2) repeats only the data at 50°C. The solubility data are:</p>																																																																																																																																	
<table> <thead> <tr> <th rowspan="2">$t/\text{^{\circ}C}$</th> <th colspan="2">KH_2PO_4</th> <th colspan="2">$\text{NH}_4\text{H}_2\text{PO}_4$</th> <th rowspan="2">$t/\text{^{\circ}C}$</th> <th colspan="2">$\text{KH}_2\text{PO}_4$</th> <th colspan="2">$\text{NH}_4\text{H}_2\text{PO}_4$</th> </tr> <tr> <th>mass%</th> <th>mol/kg^a</th> <th>mass%</th> <th>mol/kg^a</th> <th>mass%</th> <th>mol/kg^a</th> <th>mass%</th> <th>mol/kg^a</th> </tr> </thead> <tbody> <tr><td>25</td><td>20.42</td><td>1.88</td><td>----</td><td>----</td><td>25</td><td>7.98</td><td>0.88</td><td>25.42</td><td>3.31</td></tr> <tr><td>25</td><td>19.12</td><td>1.92</td><td>7.87</td><td>0.93</td><td>25</td><td>----</td><td>----</td><td>29.45</td><td>3.62</td></tr> <tr><td>25</td><td>18.52</td><td>1.85</td><td>8.04</td><td>0.95</td><td>50</td><td>28.09</td><td>2.87</td><td>----</td><td>----</td></tr> <tr><td>25</td><td>18.14</td><td>1.85</td><td>9.98</td><td>1.20</td><td>50</td><td>25.23</td><td>2.83</td><td>9.49</td><td>1.26</td></tr> <tr><td>25</td><td>17.66</td><td>1.80</td><td>10.44</td><td>1.26</td><td>50</td><td>18.97</td><td>2.52</td><td>25.91</td><td>4.08</td></tr> <tr><td>25</td><td>17.94</td><td>1.84</td><td>10.52</td><td>1.27</td><td>50</td><td>15.92</td><td>2.12</td><td>29.12</td><td>4.60</td></tr> <tr><td>25</td><td>16.78</td><td>1.75</td><td>13.09</td><td>1.62</td><td>50</td><td>14.38</td><td>1.93</td><td>30.96</td><td>4.92</td></tr> <tr><td>25</td><td>14.80</td><td>1.60</td><td>17.47</td><td>2.24</td><td>50</td><td>11.79</td><td>1.57</td><td>33.22</td><td>5.25</td></tr> <tr><td>25</td><td>12.74</td><td>1.40</td><td>20.82</td><td>2.72</td><td>50</td><td>7.69</td><td>0.98</td><td>35.19</td><td>5.35</td></tr> <tr><td>25</td><td>10.17</td><td>1.12</td><td>23.16</td><td>3.01</td><td>50</td><td>3.45</td><td>0.43</td><td>38.42</td><td>5.74</td></tr> <tr><td>25</td><td>10.02</td><td>1.09</td><td>22.93</td><td>2.97</td><td>50</td><td>----</td><td>----</td><td>39.88</td><td>5.76</td></tr> </tbody> </table>	$t/\text{^{\circ}C}$	KH_2PO_4		$\text{NH}_4\text{H}_2\text{PO}_4$		$t/\text{^{\circ}C}$	KH_2PO_4		$\text{NH}_4\text{H}_2\text{PO}_4$		mass%	mol/kg ^a	25	20.42	1.88	----	----	25	7.98	0.88	25.42	3.31	25	19.12	1.92	7.87	0.93	25	----	----	29.45	3.62	25	18.52	1.85	8.04	0.95	50	28.09	2.87	----	----	25	18.14	1.85	9.98	1.20	50	25.23	2.83	9.49	1.26	25	17.66	1.80	10.44	1.26	50	18.97	2.52	25.91	4.08	25	17.94	1.84	10.52	1.27	50	15.92	2.12	29.12	4.60	25	16.78	1.75	13.09	1.62	50	14.38	1.93	30.96	4.92	25	14.80	1.60	17.47	2.24	50	11.79	1.57	33.22	5.25	25	12.74	1.40	20.82	2.72	50	7.69	0.98	35.19	5.35	25	10.17	1.12	23.16	3.01	50	3.45	0.43	38.42	5.74	25	10.02	1.09	22.93	2.97	50	----	----	39.88	5.76							
$t/\text{^{\circ}C}$		KH_2PO_4		$\text{NH}_4\text{H}_2\text{PO}_4$			$t/\text{^{\circ}C}$	KH_2PO_4		$\text{NH}_4\text{H}_2\text{PO}_4$																																																																																																																							
	mass%	mol/kg ^a	mass%	mol/kg ^a	mass%	mol/kg ^a		mass%	mol/kg ^a																																																																																																																								
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25	12.74	1.40	20.82	2.72	50	7.69	0.98	35.19	5.35																																																																																																																								
25	10.17	1.12	23.16	3.01	50	3.45	0.43	38.42	5.74																																																																																																																								
25	10.02	1.09	22.93	2.97	50	----	----	39.88	5.76																																																																																																																								
^a The mol/kg H_2O values were calculated by the compiler.																																																																																																																																	
(continued next page)																																																																																																																																	
AUXILIARY INFORMATION																																																																																																																																	
METHOD/APPARATUS/PROCEDURE: <p>The isothermal method was used. The mixtures were agitated continuously in a thermostat for 2-5 days. Equilibrium was checked by repeated analysis. Potassium was determined as KClO_4, nitrogen was determined by the Kjeldahl method, and phosphorus was determined as $\text{Mg}_2\text{P}_2\text{O}_7$.</p>	SOURCE AND PURITY OF MATERIALS: No information is given.																																																																																																																																
	ESTIMATED ERROR: The temperature was controlled to within $\pm 0.1 \text{ K}$.																																																																																																																																
	REFERENCES:																																																																																																																																

COMPONENTS:				ORIGINAL MEASUREMENTS:					
(1) Potassium dihydrogenphosphate; KH_2PO_4 ; [7778-77-0]				1. Dombrovskaya, N.S.; Zvorykin, A.J. Kaliy 1937, 2, 24-8.					
(2) Ammonium dihydrogenphosphate; $\text{NH}_4\text{H}_2\text{PO}_4$; [7722-76-1]				2. Zvorykin, A.J.; Kuznetsov, V.G. Izv. AN SSSR. ser. khim. 1938, 195-201.					
(3) Water; H_2O ; [7732-18-5]									

EXPERIMENTAL VALUES cont'd:

COMMENTS: The authors also express the composition of the saturated solutions in units other than mass% and mol/kg. These are given below.

$t/\text{^{\circ}C}$	KH_2PO_4			$\text{NH}_4\text{H}_2\text{PO}_4$			H_2O		
	mol%	conc. ^a	conc. ^b	mol%	conc.	conc.	mass%	mol%	concn.
25	3.28	33.91	100	----	----	----	79.58	96.72	2949
25	3.22	34.64	67.2	1.61	16.87	32.8	73.01	95.17	1941
25	3.17	33.37	66.07	1.63	17.14	33.93	73.44	95.20	1980
25	3.16	33.34	60.54	2.06	21.74	39.46	71.88	94.78	1816
25	3.08	32.50	58.84	2.15	22.73	41.16	71.90	94.77	1810
25	3.14	33.19	59.04	2.18	23.03	40.96	71.54	94.68	1779
25	2.98	31.66	52.02	2.75	29.22	47.98	70.13	94.27	1643
25	2.70	28.92	41.72	3.78	40.39	58.28	67.73	93.52	1443
25	2.36	25.37	34.09	4.56	49.05	65.91	66.44	93.08	1344
25	1.88	20.18	27.07	5.06	54.38	72.93	66.67	93.06	1344
25	1.83	19.63	26.88	4.98	53.45	73.12	67.05	93.19	1368
25	1.47	15.85	20.99	5.55	59.74	79.01	66.60	92.98	1325
25	----	----	----	6.13	65.36	100	70.55	93.87	1530
50	4.91	51.69	100	----	----	----	71.91	95.09	1935
50	4.76	51.15	69.23	2.12	22.76	30.77	65.28	93.12	1354
50	4.07	45.56	38.22	6.58	73.69	67.77	55.12	89.35	839
50	3.41	38.33	31.62	7.40	82.97	68.38	54.96	89.19	825
50	3.10	34.81	27.71	7.89	95.01	72.29	54.66	89.01	810
50	2.52	28.35	23.18	8.42	94.52	77.26	54.99	89.10	817.4
50	1.60	17.82	15.58	8.66	96.45	84.37	57.12	89.74	874.7
50	0.71	7.86	7.05	9.31	103.5	92.95	58.13	89.98	898
50	----	----	----	9.41	102.7	100	60.12	91.59	974

^aThe concentration unit is: mol/1000 mol H_2O .

^bThe concentration unit is: mol/100 mol solute.

The authors state that the composition of the solution which is in equilibrium with a solid phase of the same composition is:

30.41 mol KH_2PO_4 /100 mol solute and 69.59 mol $\text{NH}_4\text{H}_2\text{PO}_4$ /100 mol solute at 25°C.
and

26.19 mol KH_2PO_4 /100 mol solute and 73.81 mol $\text{NH}_4\text{H}_2\text{PO}_4$ /100 mol solute at 50°C.

COMPONENTS:						ORIGINAL MEASUREMENTS:									
(1) Potassium dihydrogenphosphate; KH_2PO_4 ; [7778-77-0]						Bergman, A.G.; Bochkarev, N.F.									
(2) Potassium nitrate; KNO_3 ; [7757-79-1]						Izv. Akad. Nauk SSSR 1938, 237-65.									
(3) Water; H_2O ; [7732-18-5]															
VARIABLES:						PREPARED BY:									
Temperature and composition.						J. Eysseltová									
EXPERIMENTAL VALUES:															
Solubility isotherms in the KH_2PO_4 - KNO_3 - H_2O system.															
$t/\text{°C.}$		KH_2PO_4			KNO_3			H_2O							
		mass%	conc. ^a	mol/kg ^b	mass%	conc. ^a	mol/kg ^b	mass%	conc. ^a	solid phase ^c					
0		0	0	0	11	100	1.22	89	4532	A					
0		3.6	21.0	0.30	9.9	79.0	1.13	86.5	3872	"					
0		6.0	32.4	0.52	9.3	67.6	1.08	84.7	3457	"					
0		9.0	44.0	0.80	8.5	56.0	1.01	82.5	3053	"					
0		9.8	46.5	0.88	8.4	53.5	1.01	81.8	2929	A + B					
0		10.5	65.3	0.90	4.2	34.7	0.48	85.3	4013	B					
0		11.8	100	0.98	0	0	0	88.2	5628	"					
10		0	0	0	16.6	100	1.98	83.4	2823	A					
10		3.4	14.2	0.30	15.3	85.8	1.86	81.3	2564	"					
10		8.6	32.5	0.80	13.2	67.5	1.66	78.2	2238	"					
10		10.2	37.1	0.97	12.8	62.9	1.64	77	2116	A + B					
10		11.2	48.0	1.02	8.9	52.0	1.10	79.9	2594	B					
10		12.6	65.5	1.12	5.0	34.5	0.60	82.4	3221	"					
10		15	100	1.29	0	0	0	85	4290	"					
20		0	0	0	23.0	100	2.95	77.0	1875	A					
20		3.0	9.3	0.29	21.6	90.7	2.83	75.4	1773	"					
20		8.0	23.9	0.80	19.0	76.1	2.57	73.0	1640	"					
20		10.4	30.0	1.06	17.9	70.0	2.46	71.7	1573	A + B					
20		10.8	33.2	1.08	16.1	66.8	2.17	73.1	1705	B					
20		13.2	53.0	1.24	8.7	77.0	1.10	78.1	2369	"					
20		14.6	65.2	1.34	5.8	34.8	0.72	79.6	2694	"					
20		18.2	100	1.63	0	0	0	81.8	3388	"					
(continued next page)															
AUXILIARY INFORMATION															
METHOD/APPARATUS/PROCEDURE:						SOURCE AND PURITY OF MATERIALS:									
A visual polythermic method was used. The isotherms were obtained by interpolation. No details are given.						Chemically pure KH_2PO_4 and KNO_3 were recrystallized twice before being used.									
ESTIMATED ERROR:															
No details are given.															
REFERENCES:															

COMPONENTS:

- (1) Potassium dihydrogenphosphate; KH_2PO_4 ; [7778-77-0]
 (2) Potassium nitrate; KNO_3 ; [7757-79-1]
 (3) Water; H_2O ; [7732-18-5]

ORIGINAL MEASUREMENTS:

Bergman, A.G.; Bochkarev, N.F.
 Izv. Akad. Nauk SSSR 1938, 237-65.

EXPERIMENTAL VALUES cont'd:

Solubility isotherms in the KH_2PO_4 - KNO_3 - H_2O system.

$t/^\circ\text{C.}$	KH_2PO_4		KNO_3		H_2O		solid ^c phase		
	mass%	conc. ^a	mol/kg ^b	mass%	conc. ^a	mol/kg ^b			
30	0	0	0	31.0	100	4.44	69.0	1248	A
30	2.8	6.8	0.30	28.8	93.1	4.16	68.4	1241	"
30	7.4	17.6	0.81	25.6	82.4	3.77	67.0	1211	"
30	10.9	26.1	1.21	23.2	73.9	3.48	65.9	1180	A + B
30	12.2	36.6	1.24	15.8	63.4	2.17	72	1624	B
30	15.8	58.3	1.53	8.4	41.7	1.09	75.8	2114	"
30	17	65.1	1.63	6.8	34.9	0.88	76.2	2203	"
30	21.4	100	2.00	0	0	0	78.6	2779	"

^aThe concentration unit is: mol/100 mol of solute.

^bThe mol/kg H_2O values were calculated by the compiler.

^cThe solid phases are: A = KNO_3 ; B = KH_2PO_4 .

Ternary eutectic point: temperature is -3.8°C .

composition is 7 mass% KNO_3 (0.84 mol/kg-compiler)

9.3 mass% KH_2PO_4 (0.82 mol/kg-compiler)

COMPONENTS:						ORIGINAL MEASUREMENTS:											
(1) Potassium dihydrogenphosphate; KH_2PO_4 ; [7778-77-0]						Polosin, V.A.; Shakharonov, M.I. <i>Zh. Obshch. Khim.</i> 1947, 17, 397-401.											
(2) Urea; $\text{CH}_4\text{N}_2\text{O}$; [57-13-6]																	
(3) Water; H_2O ; [7732-18-5]																	
VARIABLES:						PREPARED BY:											
Temperature and composition.						J. Eyseltová											
EXPERIMENTAL VALUES:																	
Part 1. Solubility isotherms in the KH_2PO_4 -urea- H_2O system.																	
$t/^\circ\text{C}.$		KH_2PO_4			$\text{CO}(\text{NH}_2)_2$			H_2O			solid phase						
mass%	conc ^b	conc ^b	mol/kg ^a	mass%	conc ^b	conc ^b	mol/kg ^a	mass%	conc ^b	conc ^b							
-10	0	0	0.00	30.70	100	7.37	69.30	752			ice						
-10	2.00	1.50	0.21	29.70	98.50	7.24	69.30	765			"						
-10	2.92	4.60	0.30	27.10	95.40	6.44	69.98	820			"						
-10	6.86	11.20	0.72	23.80	88.80	5.71	69.34	859			"						
-10	7.60	10.70	0.86	27.72	89.30	7.13	64.68	694			KH_2PO_4						
-10	6.16	7.80	0.72	31.60	92.20	8.45	62.24	602			urea						
-10	2.69	3.50	0.30	32.60	96.50	8.38	64.71	638			"						
-10	0	0	0.00	33.50	100	8.38	66.50	660			"						
0	12.15	100	1.01	0	0	0.00	87.85	5460			KH_2PO_4						
0	10.65	34.50	0.97	8.93	65.50	1.84	80.42	1967			"						
0	9.85	19.60	1.01	18.10	80.40	4.18	71.95	1065			"						
0	8.80	12.50	1.01	27.36	87.50	7.13	63.84	680			"						
0	5.60	6.10	0.72	37.70	93.90	11.07	56.70	470			urea						
0	2.45	2.70	0.30	38.80	97.30	10.99	58.75	491			"						
0	0	0	0.00	39.80	100	11.00	60.20	520			"						
+10	14.95	100	1.29	0	0	0.00	85.06	4300			KH_2PO_4						
+10	13.25	40.30	1.24	8.67	59.70	1.84	78.08	1793			"						
+10	11.60	22.50	1.20	17.68	77.50	4.16	70.72	1033			"						
+10	10.00	14.10	1.16	27.00	85.90	7.13	63.00	669			"						
+10	8.20	8.90	1.09	36.70	91.10	11.08	55.10	455			"						
+10	7.40	7.20	1.06	41.65	92.80	13.62	50.95	377			"						
(continued next page)																	
AUXILIARY INFORMATION																	
METHOD/APPARATUS/PROCEDURE:						SOURCE AND PURITY OF MATERIALS:											
A polythermic method was used in the temperature range -12.9 to 35°C.						No information is given.											
ESTIMATED ERROR:						No information is given.											
REFERENCES:																	

COMPONENTS:

- (1) Potassium dihydrogenphosphate; KH_2PO_4 ; [7778-77-0]
 (2) Urea; $\text{CH}_4\text{N}_2\text{O}$; [57-13-6]
 (3) Water; H_2O ; [7732-18-5]

ORIGINAL MEASUREMENTS:

Polosin, V.A.; Shakharonov, M.I.
Zh. Obshch. Khim. 1947, 17, 397-401.

EXPERIMENTAL VALUES cont'd:

Part 1. Solubility isotherms in the KH_2PO_4 -urea- H_2O system.

$t/^\circ\text{C.}$	KH_2PO_4			$\text{CO}(\text{NH}_2)_2$			H_2O			solid phase
	mass%	conc ^b	mol/kg ^a	mass%	conc ^b	mol/kg ^a	mass%	conc ^b		
+10	5.06	4.80	0.72	43.70	95.20	14.19	51.24	371	urea	
+10	2.20	2.10	0.30	45.10	97.90	14.24	52.70	380	"	
+10	0	0	0.00	46.00	100	14.18	54.00	391	"	
+20	18.20	100	1.63	0	0	0.00	81.80	3398	KH_2PO_4	
+20	15.85	45.40	1.53	8.41	54.60	1.84	75.74	1639	"	
+20	10.40	25.50	1.05	17.32	74.50	3.98	69.28	993	"	
+20	11.40	15.80	1.35	26.58	84.20	7.13	62.02	654	"	
+20	9.20	10.00	1.24	36.30	90.00	11.08	54.50	449	"	
+20	8.00	7.90	1.16	41.40	92.10	13.62	50.60	375	"	
+20	7.60	6.80	1.20	46.20	93.20	16.65	46.20	311	"	
+20	4.57	3.80	0.72	49.20	96.20	17.71	46.23	300	urea	
+20	1.97	1.70	0.30	50.60	98.30	17.76	47.43	306	"	
+20	0	0	0.00	51.80	100	17.89	48.20	310	"	
+25	19.80	100	1.81	0	0	0.00	80.20	3056	KH_2PO_4	
+25	17.10	45.40	1.68	8.29	54.60	1.85	74.61	1639	"	
+25	14.40	27.20	1.54	17.12	72.80	4.16	68.48	972	"	
+25	12.20	17.00	1.45	26.34	83.00	7.18	61.46	645	"	
+25	9.70	10.60	1.31	36.10	89.40	11.08	54.20	446	"	
+25	8.50	8.40	1.24	41.15	91.60	13.60	50.45	374	"	
+25	8.00	7.10	1.27	46.00	93.20	16.65	46.00	309	"	
+25	4.32	3.40	0.72	52.00	96.60	19.82	43.69	269	urea	
+25	1.86	1.50	0.30	53.40	98.50	19.87	44.74	275	"	
+25	0	0	0.00	54.50	100	19.94	45.50	278	"	
+35	22.90	100	2.18	0	0	0.00	77.10	2545	KH_2PO_4	
+35	19.70	52.00	2.00	8.03	48.00	1.85	72.27	1440	"	
+35	16.70	30.80	1.84	16.66	69.20	4.16	66.64	924	"	
+35	14.40	19.39	1.76	25.80	80.70	7.13	60.20	627	"	
+35	11.20	12.20	1.54	35.50	87.80	11.09	53.30	435	"	
+35	9.80	9.60	1.45	40.55	90.40	13.61	49.65	368	"	
+35	8.70	7.80	1.40	40.65	92.20	16.65	45.65	306	"	
+35	8.00	6.30	1.41	50.60	93.70	20.35	41.40	256	"	
+35	3.82	2.80	0.72	57.50	97.20	24.75	39.68	226	urea	
+35	1.64	1.20	0.30	59.00	98.80	24.95	39.36	218	"	
+35	0	0	0.00	59.50	100	24.46	40.50	227	"	

Part 2. Monovariant and invariant points.

$t/^\circ\text{C}$	KH_2PO_4			$\text{CO}(\text{NH}_2)_2$			H_2O			solid phases
	mass%	conc ^b	mol/kg ^a	mass%	conc ^b	mol/kg ^a	mass%	conc ^b		
-5.1	9.40	31.40	0.84	9.06	68.60	1.85	81.50	2057	ice	
-8.5	8.30	16.70	0.83	18.34	83.30	4.16	73.36	1111	"	
-12.0	7.30	10.40	0.82	27.81	89.60	7.13	64.89	696	"	
+0.6	7.20	7.80	0.94	37.10	92.20	11.09	55.70	460	$\text{urea} + \text{KH}_2\text{PO}_4$	
+8.6	7.31	7.10	1.05	41.70	92.90	13.61	51.00	377	"	
+18.2	7.60	6.80	1.20	46.20	93.20	16.65	46.20	311	"	
+27.5	7.80	6.10	1.38	50.70	93.90	20.34	41.50	255	"	
-11.7	2.74	3.70	0.30	31.15	96.30	7.84	65.76	670	urea + ice	
+10.0	2.20	2.10	0.30	45.10	97.90	14.24	52.70	380	α -urea + β -urea	
-12.8	6.31	8.50	0.72	29.90	91.50	7.80	63.79	649	urea + ice	
+2.0	5.48	5.80	0.72	39.20	54.20	11.79	55.32	442	α -urea + β -urea	
-10.8	0	0	0.00	33.30	100	8.20	67.00	676	urea + ice	
+22.5	0	0	0.00	53.30	100	19.00	46.70	292	α -urea + β -urea	
-2.4	11.70	100	0.97	0	0	0.00	88.30	5700	ice + KH_2PO_4	
-12.9	7.00	90.60	0.81	29.70	9.40	7.81	63.30	643	ice + urea + KH_2PO_4	
+1.0	7.20	7.90	0.85	37.50	92.10	11.29	55.90	482	α -urea + β -urea + KH_2PO_4	

^aThe mol/kg H_2O values were calculated by the compiler.

^bThe concentration unit is: mol/100 mol of salts.

Potassium Dihydrogenphosphate

COMPONENTS:		ORIGINAL MEASUREMENTS:																																															
(1) Potassium dihydrogenphosphate; KH_2PO_4 ; [7778-77-0]		Kuznetsov, D.I.; Kozhukhovskij, A.A.; Borovaya, F.E.																																															
(2) Ammonium dihydrogenphosphate; $\text{NH}_4\text{H}_2\text{PO}_4$; [7722-76-1]		<i>Zh. Prikl. Khim.</i> 1948, 21, 1278-81																																															
(3) Water; H_2O ; [7732-18-5]																																																	
VARIABLES:		PREPARED BY:																																															
Composition at 25°C.		J. Eysseltova																																															
EXPERIMENTAL VALUES:																																																	
Solubility in the $\text{KH}_2\text{PO}_4-\text{NH}_4\text{H}_2\text{PO}_4-\text{H}_2\text{O}$ system at 25°C.																																																	
<table> <thead> <tr> <th>KH_2PO_4 mass%</th> <th>$\text{NH}_4\text{H}_2\text{PO}_4$ mass%</th> <th>H_2O mol/kg^a</th> <th>H_2O mass%</th> <th>vapor press mm Hg</th> </tr> </thead> <tbody> <tr> <td>20.21</td> <td>1.86</td> <td>----</td> <td>79.79</td> <td>22.66</td> </tr> <tr> <td>17.53</td> <td>1.72</td> <td>7.85</td> <td>74.62</td> <td>22.08</td> </tr> <tr> <td>16.19</td> <td>1.68</td> <td>13.05</td> <td>70.76</td> <td>21.90</td> </tr> <tr> <td>15.48</td> <td>1.65</td> <td>15.84</td> <td>69.68</td> <td>21.84</td> </tr> <tr> <td>14.27</td> <td>1.53</td> <td>17.53</td> <td>67.20</td> <td>----</td> </tr> <tr> <td>13.08</td> <td>1.43</td> <td>20.12</td> <td>66.80</td> <td>21.61</td> </tr> <tr> <td>7.97</td> <td>0.86</td> <td>24.48</td> <td>67.55</td> <td>21.95</td> </tr> <tr> <td>----</td> <td>0.00</td> <td>28.85</td> <td>71.15</td> <td>22.00</td> </tr> </tbody> </table>					KH_2PO_4 mass%	$\text{NH}_4\text{H}_2\text{PO}_4$ mass%	H_2O mol/kg ^a	H_2O mass%	vapor press mm Hg	20.21	1.86	----	79.79	22.66	17.53	1.72	7.85	74.62	22.08	16.19	1.68	13.05	70.76	21.90	15.48	1.65	15.84	69.68	21.84	14.27	1.53	17.53	67.20	----	13.08	1.43	20.12	66.80	21.61	7.97	0.86	24.48	67.55	21.95	----	0.00	28.85	71.15	22.00
KH_2PO_4 mass%	$\text{NH}_4\text{H}_2\text{PO}_4$ mass%	H_2O mol/kg ^a	H_2O mass%	vapor press mm Hg																																													
20.21	1.86	----	79.79	22.66																																													
17.53	1.72	7.85	74.62	22.08																																													
16.19	1.68	13.05	70.76	21.90																																													
15.48	1.65	15.84	69.68	21.84																																													
14.27	1.53	17.53	67.20	----																																													
13.08	1.43	20.12	66.80	21.61																																													
7.97	0.86	24.48	67.55	21.95																																													
----	0.00	28.85	71.15	22.00																																													
^a The mol/kg H_2O values were calculated by the compiler.																																																	
AUXILIARY INFORMATION																																																	
METHOD/APPARATUS/PROCEDURE:			SOURCE AND PURITY OF MATERIALS:																																														
The method has been described elsewhere (1). The nitrogen content was determined by using the Kjeldahl method, potassium was determined as KCIO_4 after removal of the NH_3 , and phosphorus was weighed as $\text{NH}_4\text{MgPO}_4 \cdot 6\text{H}_2\text{O}$. The vapor pressure was measured using the apparatus described by Vrevskiy (2).			The KH_2PO_4 and $\text{NH}_4\text{H}_2\text{PO}_4$ were recrystallized three times before use and dried at 100°C.																																														
			ESTIMATED ERROR:																																														
			No information is given.																																														
			REFERENCES:																																														
			1. Kuznetsov, D.I.; Kozhukhovskij, A.A. <i>Zh. Prikl. Khim.</i> 1936, 9, 185.																																														
			2. Vrevskiy, M.S.; Zavaritskiy, N.N.; Sharlova, L.E. <i>Zh. Russ. Fiz. Khim. Obschch.</i> 1923, 54, 360.																																														

COMPONENTS: (1) Potassium dihydrogenphosphate; KH_2PO_4 ; [7778-77-0] (2) Dipotassium sulfate, K_2SO_4 ; [7778-80-5] (3) Water; H_2O ; [7732-18-5]		ORIGINAL MEASUREMENTS: Bel'teschev, F.V. <i>Trudy Beloruss. S.-Kh. Akad.</i> <u>1953</u> , 19, 145-9.	
VARIABLES: Temperature and composition.		PREPARED BY: J. Eysseltova	
EXPERIMENTAL VALUES:			
The following sections were studied in the binary salt-water systems:			
No 1	(4% KH_2PO_4 + 96% H_2O) - K_2SO_4		
No 2	(9% KH_2PO_4 + 91% H_2O) - K_2SO_4		
No 3	(3% K_2SO_4 + 97% H_2O) - KH_2PO_4		
No 4	(5% K_2SO_4 + 95% H_2O) - KH_2PO_4		
No 5	(12% KH_2PO_4 + 88% H_2O) - K_2SO_4		
No 6	(16% KH_2PO_4 + 84% H_2O) - K_2SO_4		
Solubility isotherms at various temperatures.			
sect No	KH_2PO_4 mass% concn ^a mol/kg ^b	K_2SO_4 mass% concn ^a mol/kg ^b	H_2O mass% concn ^a solid phase ^c
temp. = 0°C.			
bin.	0	0	A
1	3.8	30.43	"
2	8.6	54.38	"
	10.8	61.90	A + B
3	11.3	73.2	B
bin.	12.2	100	"
(continued next page)			
AUXILIARY INFORMATION			
METHOD/APPARATUS/PROCEDURE: A visual polythermic method was used (1). The isotherms were constructed by interpolation.		SOURCE AND PURITY OF MATERIALS: Chemically pure KH_2PO_4 and K_2SO_4 were recrystallized twice.	
		ESTIMATED ERROR: No information is given.	
		REFERENCES: 1. Bel'teschev, F.V.; Bergman, A.G. <i>Zh. Prikl. Khim.</i> <u>1944</u> , 17, 9.	

COMPONENTS:	ORIGINAL MEASUREMENTS:
(1) Potassium dihydrogenphosphate; KH_2PO_4 ; [7778-77-0]	Bel'tschev, F.V.
(2) Dipotassium sulfate; K_2SO_4 ; [7778-80-5]	Trudy Beloruss. S.-Kh. Akad. 1953, 19, 145-9.
(3) Water; H_2O ; [7732-18-5]	

EXPERIMENTAL VALUES cont'd:

The following sections were studied in the binary salt-water systems:

- No 1 (4% KH_2PO_4 + 96% H_2O) - K_2SO_4
 No 2 (9% KH_2PO_4 + 91% H_2O) - K_2SO_4
 No 3 (3% K_2SO_4 + 97% H_2O) - KH_2PO_4
 No 4 (5% K_2SO_4 + 95% H_2O) - KH_2PO_4
 No 5 (12% KH_2PO_4 + 88% H_2O) - K_2SO_4
 No 6 (16% KH_2PO_4 + 84% H_2O) - K_2SO_4

Solubility isotherms at various temperatures.

sect No	KH_2PO_4			K_2SO_4			H_2O			solid phase ^c
	mass%	concn ^a	mol/kg ^b	mass%	concn ^a	mol/kg ^b	mass%	concn ^a		
temp. = 10°C.										
bin.	0	0	0	8.4	100	0.52	91.6	10591	A	
1	3.8	25.91	0.31	7.1	74.09	0.45	89.1	9157	"	
2	8.4	47.62	0.21	5.8	52.38	0.38	85.8	7558	"	
5	11.4	59.42	1.00	5.1	40.58	0.35	83.5	6526	"	
	14.3	64.06	1.29	4.8	36.0	0.34	81.9	6060	A + B	
4	13.4	67.12	1.19	4.3	32.88	0.29	82.3	6257	B	
3	14.0	78.46	1.23	2.4	21.54	0.16	83.6	7138	"	
bin.	14.9	100	1.28	0	0	0	85.1	8746	"	
temp. = 20°C.										
bin.	0	0	0	9.8	100	0.62	90.2	8939	A	
1	3.7	22.58	0.30	8.5	77.42	0.55	87.8	7859	"	
2	8.3	42.25	0.72	7.2	57.75	0.48	84.5	6605	"	
5	11.2	52.56	0.99	6.5	47.44	0.45	82.3	5855	"	
	16.0	66.66	1.49	5.2	33.34	0.37	78.8	5028	A + B	
4	16.3	71.08	1.50	4.2	28.92	0.30	79.5	5316	B	
5	17.0	81.58	1.54	2.4	18.42	0.17	80.6	5813	"	
bin.	17.8	100	1.59	0	0	0	82.2	7018	"	
temp. = 30°C.										
bin.	0	0	0	11.4	100	0.73	88.6	7566	A	
1	3.6	18.57	0.30	10.0	81.43	0.66	86.47	6850	"	
2	8.2	38.46	0.72	8.4	61.54	0.57	83.4	5934	"	
5	11.1	48.19	1.00	7.6	51.81	0.53	81.3	5436	"	
6	15.0	59.78	1.40	6.4	40.22	0.40	78.6	4742	"	
	18.6	68.0	1.82	6.6	32.0	0.50	75.8	4207	A + B	
4	19.1	75.26	1.82	4.0	24.74	0.29	76.9	4589	B	
5	19.8	85.58	1.86	2.2	14.12	0.16	78.0	5094	"	
bin.	21	100	1.95	0	0	0	79	5693	"	

^aThe concentration unit is: mol/100 mol solute.

^bThese values were calculated by the compiler.

^cThe solid phases are: A = K_2SO_4 ; B = KH_2PO_4 .

(continued next page)

COMPONENTS:

- (1) Potassium dihydrogenphosphate; KH_2PO_4 ; [7778-77-0]
 (2) Dipotassium sulfate; K_2SO_4 ; [7778-80-5]
 (3) Water; H_2O ; [7732-18-5]

ORIGINAL MEASUREMENTS:

Bel'tschev, F.V.
Trudy Beloruss. S.-Kh. Akad. 1953, 19,
 145-9.

EXPERIMENTAL VALUES cont'd:

Composition and crystallization temperature of the monovariant points.

sect No.	KH_2PO_4 mass%	concn ^a mol/kg	K_2SO_4 mass%	concn ^a mol/kg	H_2O mass%	concn ^a mol/kg	t/°C.	solid ^b phases
bin.	11.4	100	0.94	0	88.6	11708	-2.4	A + B
3	10.7	67.24	0.90	2.6	32.76	0.17	86.7	A + B
	10.3	62.29	0.88	4.2	38.71	0.28	85.5	7655 -3.1 A + B + C
2	8.6	55.35	0.72	4.3	44.64	0.28	87.1	B + C
	3.8	31.11	0.30	5.4	68.89	0.34	90.8	11198 -1.7 B + C
bin.	0	0	6.6	100	0.40	93.4	13531 -1.5	B + C

^aThe concentration unit is: mol/100 mol of solute.

^bThe solid phases are: A = KH_2PO_4 ; B = ice; C = K_2SO_4 .

Potassium Dihydrogenphosphate

COMPONENTS:								ORIGINAL MEASUREMENTS:					
(1) Potassium dihydrogenphosphate; KH_2PO_4 ; [7778-77-0]								Brunisholz, G.; Bodmer, M. <i>Helv. Chim. Acta</i> <u>1963</u> , 46, 288, 2566-74.					
(2) Potassium chloride; KCl; [7747-40-7]													
(3) Water; H_2O ; [7732-18-5]													
VARIABLES:								PREPARED BY:					
Temperature and composition.								J. Eysseltova					
EXPERIMENTAL VALUES:													
Solubility isotherms in the KH_2PO_4 -KCl- H_2O system.													
K^+ ion%	Cl^- ion%	H_2O conc ^a	mass% temp. = 0°C.	KH_2PO_4 mass% temp. = 25°C.	KH_2PO_4 mol/kg temp. = 50°C.	KCl ^b mass% KCl ^b mol/kg solid ^c phase							
93.84	90.73	1358	77.28	1.32	0.12	21.38	3.71	A					
88.55	82.76	1271	76.69	2.62	0.25	20.68	2.62	A + B					
77.07	65.48	1627	81.95	4.38	0.39	13.66	2.23	B					
62.12	42.81	1888	85.45	6.52	0.58	8.02	1.25	"					
61.23	41.55	1901	85.61	6.63	0.56	7.75	1.21	"					
48.13	21.91	1919	86.96	8.91	0.75	4.11	0.63	"					
47.66	20.99	1925	87.06	9.00	0.76	3.93	0.60	"					
33.33	0	1778	87.58	12.41	1.04	0.00	0.00	"					
93.02	89.62	1057	72.67	1.79	0.18	25.52	4.71	A					
87.18	80.71	972	71.73	3.58	0.36	24.67	4.61	A + B					
75.03	62.02	1158	76.65	6.33	0.60	17.00	2.97	B					
60.00	40.00	1248	79.74	9.66	0.89	10.58	1.78	"					
46.23	18.86	1177	80.63	14.01	1.27	5.35	0.89	"					
33.33	0	1012	80.06	19.93	1.82	0.00	0.00	"					
(continued next page)													
AUXILIARY INFORMATION													
METHOD/APPARATUS/PROCEDURE:						SOURCE AND PURITY OF MATERIALS:							
A previously described method was used (1). The analytical procedures were the following: chloride was titrated potentiometrically with AgNO_3 ; H_2PO_4^- was converted to H_3PO_4 by ion exchange and then titrated acidimetrically using chlorophenol red as indicator; potassium was determined gravimetrically as KClO_4 or as the tetraphenylborate; water was determined by difference.						No information is given.							
						ESTIMATED ERROR:							
						No information is given.							
						REFERENCES:							
						1. Flatt, R. <i>Chimia</i> <u>1962</u> , 6, 62.							

COMPONENTS:				ORIGINAL MEASUREMENTS:				
(1) Potassium dihydrogenphosphate; KH_2PO_4 ; [7778-77-0]				Brunisholz, G.; Bodmer, M.				
(2) Potassium chloride; KCl; [7747-40-7]				<i>Helv. Chim. Acta</i> 1963, 46, 288, 2566-74.				
(3) Water; H_2O ; [7732-18-5]								

EXPERIMENTAL VALUES cont'd:

Solubility isotherma in the KH_2PO_4 -KCl- H_2O system.

K^+	Cl^-	H_2O		KH_2PO_4 ^b	KCl ^b			
ion%	ion%	conc ^a	mass%	mass%	mol/kg	mass%	mol/kg	solid phase ^c
temp. = 75°C.								
91.90	87.85	753.0	65.61	2.66	0.29	31.71	6.48	A
87.12	80.67	704.9	64.80	4.47	0.50	30.71	6.35	"
80.43	70.61	629.5	63.19	7.43	0.86	29.36	6.23	A + B
70.92	56.43	659.5	65.74	10.94	1.22	23.30	4.75	B
55.65	33.40	615.0	66.76	18.22	2.00	15.01	3.01	"
46.30	19.56	563.3	66.50	23.93	2.64	9.56	1.92	"
33.00	0	400.7	61.38	38.61	4.62	0.00	0.00	"

^aThe concentration unit is: mol $\text{H}_2\text{O}/100$ g equiv of the salts.

^bThese values were calculated by the compiler.

^cThe solid phases are: A = KCl; B = KH_2PO_4 .

COMPONENTS: (1) Potassium dihydrogenphosphate; KH_2PO_4 ; [7778-77-0] (2) Potassium chloride; KCl; [7747-40-7] (3) Water; H_2O ; [7732-18-5]	ORIGINAL MEASUREMENTS: Filipescu, L. <i>Rev. Chim. (Bucharest)</i> <u>1971</u> , 22, 533-40.
VARIABLES: Composition and temperature.	PREPARED BY: J. Eysseltová

EXPERIMENTAL VALUES:

Solubility isotherms in the KH_2PO_4 -KCl-H₂O system.

$t/^\circ\text{C}$	$d \text{ g cm}^{-3}$	PO_4^{3-} concen ^a	Cl^- concen ^a	H_2O M	$\text{KH}_2\text{PO}_4^{\text{c}}$ mass%	$\text{KH}_2\text{PO}_4^{\text{c}}$ mol/kg	KCl^{c} mass%	KCl^{c} mol/kg	solid ^d phase
20	1.175	0.0000	0.4591	1210.0	0.00	0.00	25.50	4.59	A
20	----	0.0301	0.4526	1149.6	1.01	0.10	24.97	4.52	"
20	----	0.0691	0.4443	1082.0	2.30	0.23	24.31	4.44	"
20	1.170	0.1009	0.4358	1035.1	3.33	0.33	23.70	4.35	A + B
20	----	0.1387	0.4256	1106.6	4.55	0.46	22.99	4.25	B
20	----	0.1753	0.2789	1223.1	6.17	0.58	16.15	2.78	"
20	----	0.2275	0.2021	1293.2	8.23	0.75	12.01	2.02	"
20	----	0.2774	0.1472	1308.3	10.18	0.92	8.88	1.47	"
20	----	0.3443	0.0898	1278.3	12.77	1.14	5.47	0.89	"
20	----	0.4186	0.0380	1216.6	15.58	1.39	2.32	0.38	"
20	1.131	0.4855	0.0000	1144.2	18.04	0.01	0.00	0.00	"
40	1.187	0.0000	0.5399	1028.9	0.00	0.00	28.70	5.39	A
40	----	0.0214	0.5366	994.5	0.68	0.07	28.37	5.36	"
40	----	0.0872	0.5223	911.4	2.76	0.29	27.25	5.22	"
40	1.185	0.1370	0.5126	855.3	4.30	0.45	26.46	5.12	A + B
40	----	0.2197	0.3757	933.0	7.22	0.73	20.30	3.75	B
40	----	0.3131	0.2701	952.6	10.57	1.04	14.99	2.70	"
40	----	0.4438	0.1644	913.3	15.20	1.47	9.25	1.64	"
40	----	0.6008	0.0655	833.2	20.62	2.00	3.69	0.65	"
40	----	0.7348	0.0000	756.1	25.00	2.44	0.00	0.00	"

(continued next page)

AUXILIARY INFORMATION

METHOD/APPARATUS/PROCEDURE:	SOURCE AND PURITY OF MATERIALS:
<p>The mixtures were equilibrated isothermally for 5 hours while being stirred by a stream of inert gas. The potassium content was determined by using a flame photometer, the dihydrogenphosphate was determined acidimetrically using thymolphthalein as indicator, and chloride was determined mercurimetrically.</p>	<p>The KC1 and the KH_2PO_4 were recrystallized three times before being used.</p>
ESTIMATED ERROR:	
	<p>The temperature at 20 and 40°C were controlled to within $\pm 0.05^\circ\text{C}$ while the temperatures at 60 and 80°C were controlled to within $\pm 0.1^\circ\text{C}$.</p>
REFERENCES:	

COMPONENTS:				ORIGINAL MEASUREMENTS:				
(1) Potassium dihydrogenphosphate; KH_2PO_4 ; [7778-77-0]				Filipescu, L.				
(2) Potassium chloride; KCl; [7747-40-7]				Rev. Chim. (Bucharest) <u>1971</u> , 22, 533-40.				
(3) Water; H_2O ; [7732-18-5]								

EXPERIMENTAL VALUES cont'd:

Solubility isotherms in the KH_2PO_4 -KCl- H_2O system.										
$t/\text{ }^{\circ}\text{C}$	g cm^{-3}	PO_4^{3-}	Cl^-	H_2O	$\text{KH}_2\text{PO}_4^{\text{c}}$	KCl^{c}	solid ^d phase			
		concn ^a	concn ^a	M ^b	mass%	mol/kg	mass%	mol/kg		
60	1.201	0.0000	0.6151	903.1	0.00	0.00	31.44	6.15	A	
60	----	0.0643	0.6059	828.9	1.96	0.21	30.50	6.05	"	
60	----	0.1539	0.5908	746.0	4.62	0.51	29.16	5.90	"	
60	1.204	0.1931	0.5832	715.6	5.75	0.64	28.56	5.83	A + B	
60	----	0.2604	0.4695	761.1	8.04	0.86	23.84	4.69	B	
60	----	0.3771	0.3342	781.0	12.04	1.25	17.54	3.34	"	
60	----	0.5116	0.2388	740.3	16.45	1.70	12.62	2.38	"	
60	----	0.7121	0.1424	650.1	22.60	2.37	7.42	1.42	"	
60	1.240	1.0554	0.0000	526.4	32.37	3.51	0.00	0.00	"	
80	1.214	0.0000	0.6836	812.6	0.00	0.00	33.76	6.83	A	
80	----	0.0888	0.6731	729.1	2.61	0.29	32.54	6.73	"	
80	----	0.1970	0.6553	652.6	5.66	0.65	30.96	6.55	"	
80	1.230	0.2870	0.6370	601.2	8.11	0.95	29.58	6.37	A + B	
80	----	0.4256	0.4604	627.0	12.56	1.41	22.34	4.60	B	
80	----	0.6005	0.3327	595.3	17.91	2.00	16.31	3.32	"	
80	----	0.9132	0.1871	504.9	26.66	3.04	8.97	1.87	"	
80	----	1.2355	0.0832	421.3	34.54	4.11	3.82	0.83	"	
80	1.309	1.5162	0.0000	366.4	40.75	5.05	0.00	0.00	"	

^aThe concentration unit is: equiv/100 g water.

^bThe concentration unit is: mol/100 equiv of salts.

^cThese values were calculated by the compiler.

^dThe solid phases are: A = KCl; B = KH_2PO_4 .

COMPONENTS:		ORIGINAL MEASUREMENTS:									
(1) Potassium dihydrogenphosphate; KH_2PO_4 ; [7778-77-0]		Bergman, A.G.; Gladkovskaya, A.A.; Galushkina, R.A.									
(2) Ammonium dihydrogenphosphate; $\text{NH}_4\text{H}_2\text{PO}_4$; [7722-76-1]		<i>Zh. Neorg. Khim.</i> 1972, 17, 2055-6.									
(3) Water; H_2O ; [7732-18-5]											
VARIABLES: Temperature and composition.		PREPARED BY: J. Eysseltova									
EXPERIMENTAL VALUES:											
Original mixture	Component added	conc. ^a	<i>t</i> /°C.	solid phases ^b							
12.5% KH_2PO_4 + 87.5% H_2O	$\text{NH}_4\text{H}_2\text{PO}_4$	11.5	+6.0	A + B							
15.0% KH_2PO_4 + 85.0% H_2O	"	11.6	+14.2	"							
"	"	17.3	+17.6	"							
71.72% $\text{NH}_4\text{H}_2\text{PO}_4$ + 28.28% KH_2PO_4	H_2O	20.5	-4.5	B + C							
"	"	32.6	+25.0	A + B							
45.81% $\text{NH}_4\text{H}_2\text{PO}_4$ + 54.19% KH_2PO_4	"	18.2	-4.0	A + C							
"	"	24.5	+13.6	A + B							
"	"	25.0	+14.0	"							
25.0% $\text{NH}_4\text{H}_2\text{PO}_4$ + 75.0% KH_2PO_4	"	14.3	-3.6	A + C							
10.0% $\text{NH}_4\text{H}_2\text{PO}_4$ + 90.0% H_2O	KH_2PO_4	10.3	-4.0	"							
<i>a</i> This is the mass% of the component added.											
<i>b</i> The solid phases are: A = β -solid soln; B = $\alpha\text{-NH}_4\text{H}_2\text{PO}_4$; C = ice.											
Compiler's comment: It is not possible to construct a legitimate phase diagram on the basis of the data that are given. The conc. of component added has the meaning given to it only if the added component is a salt. When water is the added component, the relation $w_{\text{H}_2\text{O}} = 100 - \text{conc. of added component}$ is valid. With this assumption the following compositions of points lying on the eutectic curve were calculated.											
(continued next page)											
AUXILIARY INFORMATION											
METHOD/APPARATUS/PROCEDURE:		SOURCE AND PURITY OF MATERIALS:									
The only information given is that a visually polythermic method (1) was used.		Chemically pure KH_2PO_4 and $\text{NH}_4\text{H}_2\text{PO}_4$ were recrystallized and dried before being used. Bidistilled water was used.									
ESTIMATED ERROR:											
No information is given.											
REFERENCES:											
1. Bergman, A.G.; Luzhnaya, N.P. <i>Fiziko-Khimicheskie Osnovy Izucheniya i Ispol'zovaniya Solyanykh Mestorozhdeniy Klorid-sul'fatnogo Tipa</i> , Moscow, IAN SSSR, 1951.											

COMPONENTS:

- (1) Potassium dihydrogenphosphate; KH_2PO_4 ; [7778-77-0]
 (2) Ammonium dihydrogenphosphate; $\text{NH}_4\text{H}_2\text{PO}_4$; [7722-76-1]
 (3) Water; H_2O ; [7732-18-5]

ORIGINAL MEASUREMENTS:

Bergman, A.G.; Gladkovskaya, A.A.;
 Galushkina, R.A.
Zh. Neorg. Khim. 1972, 17, 2055-6.

EXPERIMENTAL VALUES cont'd:

KH_2PO_4 mass%	KH_2PO_4 mol/kg	$\text{NH}_4\text{H}_2\text{PO}_4$ mass%	$\text{NH}_4\text{H}_2\text{PO}_4$ mol/kg	H_2O mass%	$t/^\circ\text{C.}$	solid phases ^a
11.21	1.06	11.50	1.29	77.28	+6.0	A + B
13.44	1.32	11.60	1.34	74.95	+14.2	"
12.78	1.34	17.30	2.15	69.91	+17.6	"
5.80	0.53	14.70	1.60	79.50	-4.5	B + C
9.22	1.00	23.38	3.01	67.40	+25.0	A + B
9.86	0.88	8.33	0.88	81.80	-4.0	A + C
13.28	1.29	11.22	1.29	75.50	+13.6	A + B
13.55	1.32	11.45	1.32	75.00	+14.0	"
7.72	0.63	2.58	0.24	89.70	-3.6	A + C
10.30	0.94	9.06	0.98	80.63	-4.0	"

The composition of the eutectic point is:

8.50	0.07	11.40	0.53	80.10	-4.5	A + B + C
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^aThe solid phases are the same as those given in footnote b above.

Potassium Dihydrogenphosphate

COMPONENTS:			ORIGINAL MEASUREMENTS:																																																																																																																																												
(1) Potassium dihydrogenphosphate; KH_2PO_4 ; [7778-77-0]			Shenkin, Ya.S.; Ruchnova, S.A.; Rodionova, N.A.																																																																																																																																												
(2) Ammonium dihydrogenphosphate; $\text{NH}_4\text{H}_2\text{PO}_4$; [7722-76-1]			<i>Zh. Neorg. Khim.</i> <u>1972</u> , 17, 3368-9.																																																																																																																																												
(3) Water; H_2O ; [7732-18-5]																																																																																																																																															
VARIABLES: Composition and temperature at atmospheric pressure.			PREPARED BY: J. Eyseltová																																																																																																																																												
EXPERIMENTAL VALUES:																																																																																																																																															
Composition and boiling points of saturated solutions in the $\text{NH}_4\text{H}_2\text{PO}_4$ - KH_2PO_4 - H_2O system.																																																																																																																																															
<table style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="text-align: left;">KH_2PO_4</th> <th style="text-align: left;">$\text{NH}_4\text{H}_2\text{PO}_4$</th> <th style="text-align: left;">H_2O</th> <th style="text-align: left;"></th> <th style="text-align: left;"></th> <th style="text-align: left;"></th> </tr> <tr> <th>mass%</th> <th>mol/kg</th> <th>mass%</th> <th>mol/kg</th> <th>mass%</th> <th>b.p./°C.</th> </tr> </thead> <tbody> <tr><td>52.70</td><td>8.18</td><td>0</td><td>0</td><td>47.30</td><td>105.1</td></tr> <tr><td>51.78</td><td>8.46</td><td>3.28</td><td>0.63</td><td>44.94</td><td>105.3</td></tr> <tr><td>49.40</td><td>8.30</td><td>6.90</td><td>1.37</td><td>43.70</td><td>106.2</td></tr> <tr><td>47.46</td><td>8.32</td><td>10.67</td><td>2.21</td><td>41.87</td><td>105.7</td></tr> <tr><td>44.58</td><td>8.20</td><td>15.52</td><td>3.38</td><td>39.90</td><td>106.9</td></tr> <tr><td>43.60</td><td>8.25</td><td>17.57</td><td>3.93</td><td>38.83</td><td>107.1</td></tr> <tr><td>42.60</td><td>8.30</td><td>19.70</td><td>4.54</td><td>37.70</td><td>108.0</td></tr> <tr><td>38.78</td><td>8.07</td><td>25.94</td><td>6.39</td><td>35.28</td><td>108.9</td></tr> <tr><td>38.44</td><td>8.41</td><td>28.00</td><td>7.25</td><td>33.56</td><td>108.6</td></tr> <tr><td>37.23</td><td>8.19</td><td>29.39</td><td>7.65</td><td>33.38</td><td>106.6</td></tr> <tr><td>35.31</td><td>8.12</td><td>32.76</td><td>8.91</td><td>31.93</td><td>108.8</td></tr> <tr><td>35.08</td><td>7.75</td><td>31.69</td><td>8.28</td><td>33.23</td><td>108.8</td></tr> <tr><td>32.64</td><td>7.31</td><td>34.56</td><td>9.15</td><td>32.80</td><td>106.4</td></tr> <tr><td>30.57</td><td>6.89</td><td>36.86</td><td>9.83</td><td>32.57</td><td>106.9</td></tr> <tr><td>28.15</td><td>6.54</td><td>40.23</td><td>11.05</td><td>31.62</td><td>109.7</td></tr> <tr><td>27.92</td><td>6.79</td><td>41.87</td><td>12.04</td><td>30.21</td><td>110.6</td></tr> <tr><td>27.09</td><td>6.62</td><td>42.86</td><td>12.39</td><td>30.05</td><td>109.8</td></tr> <tr><td>25.36</td><td>6.16</td><td>44.42</td><td>12.77</td><td>30.22</td><td>110.3</td></tr> <tr><td>24.79</td><td>6.09</td><td>45.32</td><td>13.17</td><td>29.89</td><td>109.5</td></tr> <tr><td>21.91</td><td>5.50</td><td>48.85</td><td>14.52</td><td>29.24</td><td>109.4</td></tr> <tr><td>20.24</td><td>4.92</td><td>49.59</td><td>14.28</td><td>30.17</td><td>111.4</td></tr> </tbody> </table>						KH_2PO_4	$\text{NH}_4\text{H}_2\text{PO}_4$	H_2O				mass%	mol/kg	mass%	mol/kg	mass%	b.p./°C.	52.70	8.18	0	0	47.30	105.1	51.78	8.46	3.28	0.63	44.94	105.3	49.40	8.30	6.90	1.37	43.70	106.2	47.46	8.32	10.67	2.21	41.87	105.7	44.58	8.20	15.52	3.38	39.90	106.9	43.60	8.25	17.57	3.93	38.83	107.1	42.60	8.30	19.70	4.54	37.70	108.0	38.78	8.07	25.94	6.39	35.28	108.9	38.44	8.41	28.00	7.25	33.56	108.6	37.23	8.19	29.39	7.65	33.38	106.6	35.31	8.12	32.76	8.91	31.93	108.8	35.08	7.75	31.69	8.28	33.23	108.8	32.64	7.31	34.56	9.15	32.80	106.4	30.57	6.89	36.86	9.83	32.57	106.9	28.15	6.54	40.23	11.05	31.62	109.7	27.92	6.79	41.87	12.04	30.21	110.6	27.09	6.62	42.86	12.39	30.05	109.8	25.36	6.16	44.42	12.77	30.22	110.3	24.79	6.09	45.32	13.17	29.89	109.5	21.91	5.50	48.85	14.52	29.24	109.4	20.24	4.92	49.59	14.28	30.17	111.4
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AUXILIARY INFORMATION																																																																																																																																															
METHOD/APPARATUS/PROCEDURE: The method used to determine the solubility has been described earlier (1).			SOURCE AND PURITY OF MATERIALS: Chemically pure KH_2PO_4 and $\text{NH}_4\text{H}_2\text{PO}_4$ were used.																																																																																																																																												
ESTIMATED ERROR:																																																																																																																																															
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1. Shenkin, Ya.S.; Ruchnova, S.A.; Shenkina, A.P. <i>Zh. Neorg. Khim.</i> <u>1968</u> , 13, 256.																																																																																																																																															

COMPONENTS:	ORIGINAL MEASUREMENTS:
(1) Potassium dihydrogenphosphate; KH_2PO_4 ; [7778-77-0]	Shenkin, Ya.S.; Ruchnova, S.A.; Rodionova, N.A.
(2) Ammonium dihydrogenphosphate; $\text{NH}_4\text{H}_2\text{PO}_4$; [7722-76-1]	Zh. Neorg. Khim. 1972, 17, 3368-9.
(3) Water; H_2O ; [7732-18-5]	

EXPERIMENTAL VALUES cont'd:

Composition and boiling points of saturated solutions
in the $\text{NH}_4\text{H}_2\text{PO}_4$ - KH_2PO_4 - H_2O system.

KH_2PO_4 mass%	$\text{NH}_4\text{H}_2\text{PO}_4$ mass%	H_2O , mass%	b.p./°C.
mol/kg	mol/kg		
19.07	5.14	53.69	110.9
17.01	4.35	54.27	112.0
14.82	3.72	55.91	109.6
14.71	3.76	56.57	110.8
8.26	2.05	62.15	110.4
6.83	1.80	65.35	109.9
0	0	68.30	110.5
		18.72	

Potassium Dihydrogenphosphate

COMPONENTS:				ORIGINAL MEASUREMENTS:									
(1) Potassium dihydrogenphosphate; KH_2PO_4 ; [7778-77-0]				Zbořilová, L.; Krejčí, J.									
(2) Potassium hydrogenselenate; KHSeO_4 ; [25105-33-3]				Scripta Fac. Sci. Nat. UJEP Brunensis, Chemie 1 1972, 77-80.									
(3) Water; H_2O ; [7732-18-5]													
VARIABLES:				PREPARED BY:									
Composition at 20°C.				J. Eyseltová									
EXPERIMENTAL VALUES:													
Composition of the phases in the KH_2PO_4 - KHSeO_4 - H_2O system at 20°C.													
saturated solution solid phase													
KH_2PO_4	KHSeO ₄	H_2O	Se	P	KHSeO_4	KH_2PO_4							
mass%	mol/kg ^a	mass%	mol/kg ^a	mass%	mass%	mass%	mass%	mass%					
0	0	43.31	4.16	56.69									
1.51	0.18	38.88	3.56	59.50	35.40	4.20	80.93	19.10					
3.21	0.38	35.96	3.22	60.86	34.70	4.46	80.00	19.60					
4.29	0.51	34.64	3.09	61.03	24.75	8.90	56.98	40.85					
5.06	0.55	28.28	2.31	66.66	25.30	9.40	58.20	41.80					
5.37	0.55	23.49	1.80	71.18	24.40	9.47	56.85	41.90					
8.18	0.84	20.87	1.60	70.94	24.80	10.08	57.80	41.60					
7.64	0.75	17.77	1.30	74.57	8.06	18.46	18.50	81.50					
8.15	0.75	12.94	0.89	78.89	1.18	21.80	2.72	96.80					
8.91	0.75	4.46	0.28	86.53	0.33	22.40	0.76	98.40					
18.50	1.66	0	0	81.50									
calculated for $\text{KH}_2\text{PO}_4 \cdot \text{KHSeO}_4$							57.36	42.67					
calculated for $3\text{KH}_2\text{PO}_4 \cdot \text{KHSeO}_4$							80.15	19.85					
^a The mol/kg H_2O values were calculated by the compiler.													
AUXILIARY INFORMATION													
METHOD/APPARATUS/PROCEDURE:	SOURCE AND PURITY OF MATERIALS:												
Saturated solutions containing KHSeO_4 and KH_2PO_4 in molar ratios of 9:1 to 1:9 were prepared at higher temperatures and equilibrated in a thermostat for several hours. Solid and liquid phases were analyzed. Selenium was determined iodometrically (2) and phosphorus was determined colorimetrically (3, 4).	KHSeO_4 was synthesized by the reaction of K_2SeO_4 with H_2SeO_4 (1). No other details are given.												
ESTIMATED ERROR:				No information is given.									
REFERENCES:				<ol style="list-style-type: none"> Dostál, K.; Krejčí, J. Z. Anorg. Allg. Chem. 1958, 296, 29. Blanka, B.; et al. Coll. Czech. Chem. Soc. 1963, 28, 3424. Bernhart, D.N.; Wreath, A.R. Anal. Chem. 1955, 27, 440. Netherton, L.E.; Wreath, A.R. Anal. Chem. 1955, 27, 860. 									

COMPONENTS: (1) Potassium dihydrogenphosphate; KH_2PO_4 ; [7778-77-0] (2) Dipotassium sulfate; K_2SO_4 ; [7778-80-5] (3) Water; H_2O ; [7732-18-5]	ORIGINAL MEASUREMENTS: Gladkovskaya, A.A.; Bergman, A.G. Tr. Kuban. S.-Kh. In-ta 1975, 102, 130, 31-4.
VARIABLES: Composition and temperature.	PREPARED BY: J. Eysseltová

EXPERIMENTAL VALUES:

original mixture	added	A ^a	t/°C.	solid phases
10% KH ₂ PO ₄ + 90% K ₂ SO ₄	H ₂ O	8.6	+7.2	K ₂ SO ₄ ·H ₂ O + K ₂ SO ₄
" " "	"	7.0	-1.2	K ₂ SO ₄ ·H ₂ O + ice
20% KH ₂ PO ₄ + 80% K ₂ SO ₄	"	8.6	+3.0	K ₂ SO ₄ + K ₂ SO ₄ ·H ₂ O
" " "	"	7.5	-1.2	ice + K ₂ SO ₄ ·H ₂ O
43.85% KH ₂ PO ₄ + 56.15% K ₂ SO ₄	"	8.6	-2.0	ice + K ₂ SO ₄
16% KH ₂ PO ₄ + 84% H ₂ O	K ₂ SO ₄	7.0	+15.6	KH ₂ PO ₄ + K ₂ SO ₄

^aThis is the mass% of the component added.

COMMENT: It is impossible to construct a valid phase diagram on the basis of the above data. The compiler's opinion is that the value A had its given meaning only if the component added is a salt. In the case of water, the relation $w_{H_2O} = 100 - A$ is valid. On the basis of this assumption the compiler has calculated the following values.

KH_2PO_4		K_2SO_4		H_2O			
mass%	mol/kg	mass%	mol/kg	mass%	$t/\text{ }^\circ\text{C}.$		solid phases ^a
0.86	0.06	7.74	0.48	91.4	+7.2		A + B
0.70	0.05	6.30	0.38	93.0	-1.2		A + C
1.72	0.13	6.88	0.43	91.4	+3.0		A + B
1.50	0.11	6.00	0.37	92.5	-1.2		A + C
3.77	0.30	4.83	0.30	91.4	-2.0		B + C
14.95	1.40	7.00	0.51	78.05	+15.6		B + D

The solid phases are: A = $K_2SO_4 \cdot H_2O$; B = K_2SO_4 ; C = ice; D = KH_2PO_4 .

(continued next page)

AUXILIARY INFORMATION

METHOD/APPARATUS/PROCEDURE: A visual polythermic method was used (1). Solid carbon dioxide was used as the cooling agent.	SOURCE AND PURITY OF MATERIALS: No information is given.
	ESTIMATED ERROR: No details are given.
	REFERENCES:

COMPONENTS:	ORIGINAL MEASUREMENTS:
(1) Potassium dihydrogenphosphate; KH_2PO_4 ; [7778-77-0]	Gladkovskaya, A.A.; Bergman, A.G.
(2) Dipotassium sulfate; K_2SO_4 ; [7778-80-5]	<i>Tr. Kuban. S.-Kh. In-ta</i> 1975, 102, 130,
(3) Water; H_2O ; [7732-18-5]	31-4.

EXPERIMENTAL VALUES cont'd:

The authors give the following triple points:

KH_2PO_4 mass%	KH_2PO_4 mol/kg ^a	K_2SO_4 mass%	K_2SO_4 mol/kg ^a	H_2O mass%	t/°C.	solid phases
10.3	0.07	4.2	0.01	88.5	+3.1	ice + KH_2PO_4 + K_2SO_4
2.5	0.01	6.2	0.02	91.3	+1.2	ice + K_2SO_4 + $\text{K}_2\text{SO}_4 \cdot \text{H}_2\text{O}$

^aThese values were calculated by the compiler.

COMPONENTS:		ORIGINAL MEASUREMENTS:							
(1) Potassium dihydrogenphosphate; KH_2PO_4 ; [7778-77-0]		Mráz, R.; Srb, V.; Tichý, S.; Vosolsobě, J. <i>Chem. Prům.</i> 1976, 26, 511-4.							
(2) Potassium chloride; KCl; [7747-40-7]									
(3) Water; H_2O ; [7732-18-5]									
VARIABLES:		PREPARED BY:							
Composition and temperature.		J. Eysseltova							
EXPERIMENTAL VALUES:									
Solubility isotherms in the KH_2PO_4 -KCl- H_2O system.									
KH_2PO_4	KCl	H_2O							
mass%	mol/kg ^a	mass%	mol/kg ^a	mass% ^a	solid phases				
temp. = 25°C.									
20.3	1.87	0	0	79.7	KH_2PO_4				
20.8	1.93	0	0	79.2	"				
17.6	1.61	2.2	0.37	80.2	"				
16.6	1.55	4.8	0.82	78.6	"				
13.5	1.21	6.0	1.00	80.7	"				
13.3	1.25	8.3	1.42	78.4	"				
11.0	1.05	12.0	2.09	77.0	"				
8.7	0.83	14.0	2.43	77.3	"				
7.5	0.71	15.4	2.68	77.1	"				
7.0	0.69	18.6	3.36	74.4	"				
7.1	0.72	20.2	3.73	72.7	"				
5.7	0.57	20.4	3.70	73.9	"				
5.5	0.57	23.4	4.41	71.1	"				
5.0	0.52	23.8	4.48	71.2	$\text{KH}_2\text{PO}_4 + \text{KCl}$				
5.6	0.59	24.9	4.80	69.5	KCl				
3.0	0.31	25.3	4.73	71.7	"				
1.5	0.15	25.5	4.69	73.0	"				
0	0	26.6	4.86	73.4	"				
0	0	26.4	4.81	73.6	"				

(continued next page)

AUXILIARY INFORMATION

METHOD/APPARATUS/PROCEDURE:	SOURCE AND PURITY OF MATERIALS:
Solutions were saturated at a temperature 5 K higher than that of the respective isotherm. The samples were equilibrated by stirring for 4 hours. The mixtures were then allowed to stand for 1 hour before samples were taken for analyses. Chlorides were precipitated by adding excess AgNO_3 and then back-titrating the excess AgNO_3 with rhodanine. The dihydrogenphosphate ions were precipitated by adding excess bismuth nitrate and the excess bismuth was back-titrated with Komplexon III.	No information is given.
	ESTIMATED ERROR: The temperature was controlled to within ± 0.2 K. The accuracy of the phosphorus analysis was at least $\pm 3\%$.
	REFERENCES:

COMPONENTS:	ORIGINAL MEASUREMENTS:
(1) Potassium dihydrogenphosphate; KH_2PO_4 ; [7778-77-0]	Mráz, R.; Srb, V.; Tichý, S.; Vosolsobě, J. <i>Chem. Prům.</i> 1976, 26, 511-4.
(2) Potassium chloride; KCl; [7747-40-7]	
(3) Water; H_2O ; [7732-18-5]	

EXPERIMENTAL VALUES cont'd:

Solubility isotherms in the KH_2PO_4 -KCl- H_2O system.

KH_2PO_4 mass%	KCl mass%	H_2O mass% ^a	solid phases
temp. = 50°C.			
29.0	3.00	0	KH_2PO_4
22.0	2.17	3.5	"
14.9	1.42	8.0	"
12.4	1.20	11.7	"
12.5	1.24	13.6	"
9.7	0.95	15.6	"
6.5	0.66	21.4	"
5.0	0.53	25.5	"
5.3	0.58	27.0	$\text{KH}_2\text{PO}_4 + \text{KCl}$
0	0	29.6	KCl
temp. = 75°C.			
39.2	4.73	0	KH_2PO_4
34.7	4.00	1.7	"
31.5	3.51	2.6	"
27.3	3.04	6.7	"
25.0	2.83	10.1	"
20.1	2.22	13.5	"
16.1	1.78	17.4	"
16.4	1.89	20.0	"
12.2	1.43	25.0	"
9.1	1.11	30.6	$\text{KH}_2\text{PO}_4 + \text{KCl}$
5.0	0.59	32.5	KCl
2.9	0.33	31.8	"
0	0	32.2	"

^aThese values were calculated by the compiler.

COMPONENTS:				ORIGINAL MEASUREMENTS:										
(1) Potassium dihydrogenphosphate; KH_2PO_4 ; [7778-77-0]				Shenkin, Ya.S.; Gorozhankin, E.V. <i>Zh. Neorg. Khim.</i> <u>1976</u> , 21, 2293-5.										
(2) Potassium nitrate; KNO_3 ; [7757-79-1]														
(3) Water; H_2O ; [7732-18-5]														
VARIABLES:				PREPARED BY:										
Composition and temperature at atmospheric pressure.				J. Eyseltová										
EXPERIMENTAL VALUES:														
Composition and boiling points in the KH_2PO_4 - KNO_3 - H_2O system.														
KH_2PO_4 mass%	KH_2PO_4 mol/kg ^a	KNO_3 mass%	KNO_3 mol/kg ^a	H_2O mass%	b.p./°C	-lg N ^b	solid phase ^c							
52.7	8.18	0	0	47.3	105.1		A							
47.3	6.96	2.8	0.555	49.9	105.1	0.0564	"							
46.2	6.78	3.7	0.730	50.1	105.1	0.0495	"							
42.6	6.20	6.9	1.35	50.5	105.5	0.0560	"							
41.4	6.08	8.6	1.70	50.0	105.5	0.0570	"							
37.8	5.63	12.9	2.59	49.3	106.0	0.0603	"							
35.5	5.32	15.5	3.13	49.0	106.4	0.0610	"							
32.1	4.79	18.7	3.76	49.2	106.9	0.0623	"							
32.5	4.91	18.9	3.85	48.6	106.5	0.0618	"							
30.6	4.72	21.8	4.53	47.6	106.9	0.0623	"							
29.8	5.10	27.3	6.29	42.9	107.2	0.0717	A + B							
26.4	4.47	30.2	6.88	43.4	107.7	0.0826	B							
24.5	4.10	31.6	7.12	43.9	107.9	0.0736	"							
23.7	3.93	32.0	7.14	44.3	106.7	0.0801	"							
22.2	3.61	32.7	7.18	45.1	107.2	0.0781	"							
21.2	3.57	35.2	7.99	43.6	107.2		"							
15.7	2.86	43.9	10.75	40.4	108.7	0.0880	"							
15.0	2.83	46.0	11.67	39.0	109.2	0.1016	"							
14.8	2.86	47.0	12.17	38.2	109.2	0.1016	"							
12.3	2.45	51.1	13.81	36.6	109.9	0.1077	"							
11.7	2.36	51.8	14.04	36.5	110.0	0.1125	"							
10.5	2.20	54.5	15.40	35.0	110.2	0.1134	"							
8.1	1.94	61.2	19.71	30.7	112.8	0.1258	"							
7.7	2.00	64.0	22.37	28.3	115.1	0.1438	"							
(continued next page)														
AUXILIARY INFORMATION														
METHOD/APPARATUS/PROCEDURE:	SOURCE AND PURITY OF MATERIALS:													
The method is the same as that described earlier (1). Phosphorus was determined gravimetrically as $\text{Mg}_2\text{P}_2\text{O}_7$. Nitrate ion was reduced with Deward alloy and the NH_3 was distilled, but no further information is given.	Chemically pure salts were recrystallized before being used.													
ESTIMATED ERROR:														
No information is given.														
REFERENCES:														
1. Shenkin, Ya.S.; Rushnova, S.A.; Shenkina, A.P. <i>Zh. Neorg. Khim.</i> <u>1968</u> , 13, 256.														

COMPONENTS:	ORIGINAL MEASUREMENTS:
(1) Potassium dihydrogenphosphate; KH_2PO_4 ; [7778-77-0]	Shenkin, Ya.S; Gorozhankin, E.V. Zh. Neorg. Khim. 1976, 21, 2293-5.
(2) Potassium nitrate; KNO_3 ; [7757-79-1]	
(3) Water; H_2O ; [7732-18-5]	

EXPERIMENTAL VALUES cont'd:

Composition and boiling points in the $\text{KH}_2\text{PO}_4-\text{KNO}_3-\text{H}_2\text{O}$ system.

KH_2PO_4 mass%	KNO_3 mass%	H_2O mass%	b.p./°C	$-\lg N^b$	solid ^c phase
5.9	1.64	67.6	25.23	26.5	115.6
4.1	1.10	68.4	24.60	27.5	116.2
4.0	1.21	71.7	29.19	24.3	118.0
3.3	1.02	73.0	30.47	23.7	118.0
0	0	74.6	29.05	25.4	114.5

^aThese values were calculated by the compiler.^bN is the mol fraction of water in the system.^cThe solid phases are: A = KH_2PO_4 ; B = KNO_3 .According to the authors, the "temperature depression" (not defined) is a nearly linear function of $-\lg N$.

COMPONENTS:	ORIGINAL MEASUREMENTS:
(1) Potassium dihydrogenphosphate; KH_2PO_4 ; [7778-77-0]	Solov'ev, A.P.; Balashova, E.F.; Verendyakina, N.A.; Zyuzina, L.F.
(2) Potassium chloride; KCl; [7747-40-7]	Vzaymodeystvie Khloridov Kaliya, Magniya, Amoniyas ich Nitratami i Fosfatami 1977, 3-11.
(3) Water; H_2O ; [7732-18-5]	

VARIABLES:	PREPARED BY:
Composition at 25°C.	J. Eysseltova

EXPERIMENTAL VALUES: Solubility in the KH_2PO_4 -KCl- H_2O system at 25°C.							
KH_2PO_4		KCl		H_2O		refr.	
mass%	mol/kg ^a	mass%	mol/kg ^a	mass%	index	index	solid phase
----	0.000	26.30	4.786	73.70	1.3714		KCl
2.25	0.226	24.75	4.547	73.00	1.3711		"
4.47	0.458	23.90	4.475	71.63	1.3710		KCl + KH_2PO_4
4.90	0.485	20.98	3.796	74.12	1.3669		KH_2PO_4
6.50	0.636	18.42	3.290	75.08	1.3643		"
7.60	0.726	15.52	2.707	76.88	1.3611		"
10.92	1.047	12.51	2.191	76.57	1.3591		"
12.59	1.187	9.48	1.631	77.93	1.3571		"
14.65	1.354	5.90	0.995	79.45	1.3566		"
20.30	1.871	-----	0.000	79.70	1.3550		"

^aThese values were calculated by the compiler.

AUXILIARY INFORMATION

METHOD/APPARATUS/PROCEDURE:	SOURCE AND PURITY OF MATERIALS:
Equilibrium was reached isothermally during the course of 1 to 3 days. The chloride content was determined by the Volhard method, the dihydrogenphosphate was precipitated as NH_4MgPO_4 , the excess of Mg was titrated compleximetrically. The index of refraction was measured with an IRF-22 refractometer.	The salts were either reagent grade or chemically pure. They were recrystallized twice before being used.
	ESTIMATED ERROR:
	The temperature was controlled to within $\pm 0.1^\circ\text{C}$. No other information is given.
	REFERENCES:

COMPONENTS:		ORIGINAL MEASUREMENTS:																																																																																																					
(1) Potassium dihydrogenphosphate; KH_2PO_4 ; [7778-77-0]		Solov'ev, A.P.; Balashova, E.F.; Verendyakina, N.A.; Zyuzina, L.F.																																																																																																					
(2) Ammonium dihydrogenphosphate; $\text{NH}_4\text{H}_2\text{PO}_4$; [7722-76-1]		Vzaymodeystvie Khloridov Kaliya, Magniya, Amoniya s ich Nitratami i Fosfatami 1977, 3-11.																																																																																																					
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<table> <thead> <tr> <th>KH_2PO_4</th> <th></th> <th>$\text{NH}_4\text{H}_2\text{PO}_4$</th> <th></th> <th>$\text{H}_2\text{O}$</th> <th></th> <th>refr. index</th> <th></th> </tr> <tr> <th>mass%</th> <th>mol/kg^a</th> <th>mass%</th> <th>mol/kg^a</th> <th>mass%</th> <th>mass%</th> <th></th> <th>solid phases</th> </tr> </thead> <tbody> <tr> <td>21.60</td> <td>2.024</td> <td>----</td> <td>0.00</td> <td>78.40</td> <td>1.3550</td> <td></td> <td>KH_2PO_4</td> </tr> <tr> <td>20.80</td> <td>2.034</td> <td>4.08</td> <td>0.472</td> <td>75.12</td> <td>1.3630</td> <td>" "</td> <td>solid soln</td> </tr> <tr> <td>19.24</td> <td>1.890</td> <td>5.98</td> <td>0.695</td> <td>74.78</td> <td>1.3665</td> <td>" "</td> <td></td> </tr> <tr> <td>16.10</td> <td>1.698</td> <td>14.25</td> <td>1.778</td> <td>69.65</td> <td>1.3720</td> <td>" "</td> <td></td> </tr> <tr> <td>13.60</td> <td>1.478</td> <td>18.80</td> <td>2.417</td> <td>67.60</td> <td>1.3742</td> <td>" "</td> <td></td> </tr> <tr> <td>11.37</td> <td>1.264</td> <td>22.57</td> <td>2.969</td> <td>66.06</td> <td>1.3750</td> <td>" "</td> <td></td> </tr> <tr> <td>9.24</td> <td>0.995</td> <td>24.20</td> <td>2.877</td> <td>66.56</td> <td>1.3760</td> <td>" "</td> <td></td> </tr> <tr> <td>7.00</td> <td>0.771</td> <td>26.30</td> <td>3.427</td> <td>66.70</td> <td>1.3770</td> <td>" "</td> <td></td> </tr> <tr> <td>0.30</td> <td>0.030</td> <td>28.05</td> <td>3.403</td> <td>71.65</td> <td>1.3780</td> <td>" "</td> <td></td> </tr> <tr> <td>-----</td> <td>0.000</td> <td>29.30</td> <td>3.613</td> <td>70.70</td> <td>1.3780</td> <td></td> <td>$\text{NH}_4\text{H}_2\text{PO}_4$</td> </tr> </tbody> </table>								KH_2PO_4		$\text{NH}_4\text{H}_2\text{PO}_4$		H_2O		refr. index		mass%	mol/kg ^a	mass%	mol/kg ^a	mass%	mass%		solid phases	21.60	2.024	----	0.00	78.40	1.3550		KH_2PO_4	20.80	2.034	4.08	0.472	75.12	1.3630	" "	solid soln	19.24	1.890	5.98	0.695	74.78	1.3665	" "		16.10	1.698	14.25	1.778	69.65	1.3720	" "		13.60	1.478	18.80	2.417	67.60	1.3742	" "		11.37	1.264	22.57	2.969	66.06	1.3750	" "		9.24	0.995	24.20	2.877	66.56	1.3760	" "		7.00	0.771	26.30	3.427	66.70	1.3770	" "		0.30	0.030	28.05	3.403	71.65	1.3780	" "		-----	0.000	29.30	3.613	70.70	1.3780		$\text{NH}_4\text{H}_2\text{PO}_4$
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AUXILIARY INFORMATION																																																																																																							
METHOD/APPARATUS/PROCEDURE:				SOURCE AND PURITY OF MATERIALS:																																																																																																			
The mixtures were equilibrated for 1-3 days in a thermostat. The ammonium ion content was determined by the Kjeldahl method. The H_2PO_4^- was precipitated as NH_4MgPO_4 , and the excess magnesium was titrated compleximetrically. The refractive index was measured with a IRF-22 refractometer.				The salts were reagent grade or chemically pure and were recrystallized before being used.																																																																																																			
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COMPONENTS:	ORIGINAL MEASUREMENTS:
(1) Potassium dihydrogenphosphate; KH_2PO_4 ; [7778-77-0] (2) Potassium borate, KBO_2 ; [13709-94-9] (3) Water; H_2O ; [7732-18-5]	Beremzhanov, B.A.; Voronina, L.V.; Savich, R.F. Khim. Khim. Tekhnol. (Alma Ata) 1978, 173-8.
VARIABLES:	PREPARED BY:
Composition at 25 and 50°C.	J. Eyseltová

EXPERIMENTAL VALUES: Composition of saturated solutions in the KH_2PO_4 - KBO_2 - H_2O system.									
KH_2PO_4		KBO_2		refr.		solid ^b		temp. = 25°C.	phase
mass%	mol%	mass%	mol%	index	pH	phase			
----- ^a	-----	0.367 ^a	0.081	0.450	1.441	13.95	A		
89.5	53.12	62.9	-----	-----	1.360	7	B		
66.05	20.34	14.30	0.023	0.012	0.0083	1.410	7.23	"	"
41.47	8.74	5.21	0.054	0.017	0.0113	1.399	6.98	"	"
39.17	7.67	4.74	0.055	0.018	0.0110	1.396	6.53	"	"
38.40	7.56	4.58	0.056	0.018	0.0111	1.394	6.32	"	"
35.52	6.73	4.05	0.057	0.018	0.0108	1.390	6.24	"	"
29.18	5.07	3.03	0.094	0.026	0.0162	1.385	5.97	"	"
27.65	4.75	2.81	0.129	0.035	0.0218	1.374	5.81	"	"
27.26	4.72	2.76	0.145	0.040	0.0244	1.371	5.74	"	"
26.50	4.47	2.66	0.164	0.047	0.0273	1.366	5.59	"	"
25.73	4.19	2.55	0.176	0.048	0.0290	1.361	5.31	"	"
24.96	4.13	2.45	0.201	0.055	0.0328	1.360	5.06	"	"
20.16	3.28	1.86	0.293	0.076	0.0450	1.368	4.32	"	"
17.28	2.56	1.54	0.374	0.096	0.0554	1.356	4.64	A + B	"
13.44	1.84	1.15	0.328	0.076	0.0464	1.367	4.91	A	"
11.52	1.61	0.96	0.304	0.071	0.0421	1.386	6.82	"	"
10.37	1.39	0.85	0.300	0.071	0.0410	1.416	8.05	"	"
9.60	1.37	0.78	0.323	0.076	0.0438	1.425	11.24	"	"
9.22	1.31	0.75	0.304	0.072	0.0410	1.430	12.07	"	"
6.91	0.96	0.55	0.339	0.078	0.0446	1.435	13.05	"	"
4.61	0.56	0.36	0.351	0.079	0.0451	1.440	13.60	"	"
0.77	0.09	0.06	0.363	0.080	0.0449	1.441	13.85	"	"

(continued next page)

AUXILIARY INFORMATION	
METHOD/APPARATUS/PROCEDURE:	SOURCE AND PURITY OF MATERIALS:
No details are given other than that a solubility method was used.	No information is given.
ESTIMATED ERROR:	No information is given.
REFERENCES:	

COMPONENTS:				ORIGINAL MEASUREMENTS:											
(1) Potassium dihydrogenphosphate; KH_2PO_4 ; [7778-77-0]				Beremzhanov, B.A.; Voronina, L.V.; Savich, R.F.											
(2) Potassium borate; KBO_2 ; [13709-94-9]				Khim. Khim. Tekhnol. (Alma Ata) 1978, 173-8.											
(3) Water; H_2O ; [7732-18-5]															
EXPERIMENTAL VALUES cont'd:															
Composition of saturated solutions in the KH_2PO_4 - KBO_2 - H_2O system.															
KH_2PO_4		KBO_2		refr.		solid ^b									
mass%	mol%	mol/kg ^a	mass%	mol%	mol/kg ^a	index	pH								
temp. = 50°C.															
---	---	---	0.409 ^a	0.090	0.0502	1.445	14.0	A							
95.3 ^a	72.91	149.8	-----	-----	-----	1.365	7.20	B							
55.30	13.94	9.10	0.051	0.020	0.0139	1.360	6.21	"							
47.62	10.73	6.69	0.059	0.021	0.0138	1.364	6.03	"							
43.78	9.30	5.73	0.059	0.017	0.0128	1.366	6.00	"							
40.32	8.06	4.97	0.059	0.016	0.0121	1.368	5.98	"							
36.48	7.12	4.22	0.063	0.021	0.0121	1.371	5.95	"							
30.34	5.39	3.20	0.070	0.018	0.0123	1.374	5.90	"							
29.95	5.36	3.14	0.073	0.022	0.0127	1.376	5.89	"							
28.18	5.07	2.89	0.075	0.022	0.0128	1.379	5.87	"							
27.65	4.73	2.81	0.103	0.031	0.0174	1.381	5.85	"							
20.54	3.29	1.90	0.090	0.024	0.0139	1.384	5.82	A + B							
13.06	1.83	1.10	0.059	0.014	0.0083	1.386	8.96	A							
10.37	1.38	0.85	0.054	0.012	0.0074	1.388	9.88	"							
8.45	1.17	0.68	0.070	0.015	0.0093	1.390	10.61	"							
8.06	0.97	0.64	0.082	0.019	0.0109	1.394	11.15	"							
5.38	0.74	0.42	0.117	0.026	0.0151	1.398	12.08	"							
3.46	0.37	0.26	0.178	0.039	0.0225	1.405	12.46	"							
2.69	0.36	0.20	0.199	0.044	0.0250	1.423	12.95	"							
1.54	0.18	0.12	0.288	0.064	0.0358	1.432	13.20	"							

^aThese values were calculated by the compiler.

^bThe solid phases are: A = KBO_2 ; B = KH_2PO_4 .

COMPONENTS: (1) Potassium dihydrogenphosphate; KH_2PO_4 ; [7778-77-0] (2) Potassium chloride; KCl; [7747-40-7] (3) Water; H_2O ; [7732-18-5]		ORIGINAL MEASUREMENTS: Khallieva, Sh.D. <i>Izv. AN Turkon. SSR. ser. khim.</i> <u>1978</u> , 3, 125-6.			
VARIABLES: Composition at 40°C.		PREPARED BY: J. Eysseltová			
EXPERIMENTAL VALUES:					
Solubility isotherm for the KH_2PO_4 -KCl- H_2O system at 40°C.					
KH_2PO_4	KC1	H_2O			
mass%	mol/kg ^a	mass%	mol/kg ^a	mass%	solid phase
27.15	2.738	----	----	72.85	KH_2PO_4
17.12	1.658	7.04	1.244	75.84	"
12.82	1.243	11.46	2.029	75.72	"
9.73	0.929	13.39	2.335	76.88	"
7.29	0.741	20.47	3.800	72.24	"
4.21	0.443	25.97	4.988	69.82	$\text{KH}_2\text{PO}_4 + \text{KCl}$
3.945	0.416	26.48	5.104	68.575	"
----	----	28.01	5.218	71.99	KC1
^a The mol/kg H_2O values were calculated by the compiler.					
AUXILIARY INFORMATION					
METHOD/APPARATUS/PROCEDURE: The isothermal method was used. Equilibrium was checked by repeated analysis. Standard analytical methods were used to determine the amount of chloride, potassium and dihydrogenphosphate ions.	SOURCE AND PURITY OF MATERIALS: Reagent grade salts were used.				
		ESTIMATED ERROR: The deviation from 40°C was no greater than ± 0.5 K. No other information is given.			
		REFERENCES:			

COMPONENTS:				ORIGINAL MEASUREMENTS:					
(1) Potassium dihydrogenphosphate; KH_2PO_4 ; [7778-77-0]				Girich, T.E.; Gulyamov, Yu.M.; Ganz, S.N. <i>Zh. Neorg. Khim.</i> , 1979, 24, 1084-6.					
(2) Potassium nitrate; KNO_3 ; [7757-79-1]									
(3) Water; H_2O ; [7732-18-5]									

EXPERIMENTAL VALUES cont'd:

no	mass percent			concn. ^a		indices ^b		mol/kg ^c		solid phase ^d
	KH_2PO_4	KNO_3	H_2O	KH_2PO_4	KNO_3	KH_2PO_4	H_2O	KH_2PO_4	KNO_3	
temp. = 50°C.										
22	10.70	28.90	60.40	23.39	85.14	21.55	920.1	1.30	4.73	A
23	7.84	36.80	55.36	18.72	115.86	13.92	742.8	1.04	6.58	"
24	7.54	38.90	53.56	18.61	129.42	12.58	675.5	1.03	7.18	"
25	7.44	39.41	53.15	18.52	132.11	12.30	663.7	0.96	7.34	A + B
26	6.98	39.63	53.39	17.30	132.29	11.56	668.5	1.03	7.33	"
27	5.60	41.06	53.34	13.86	137.18	9.18	662.0	0.77	7.61	B
28	5.16	41.48	53.36	12.79	138.51	8.45	661.0	0.71	7.69	"
29	4.50	42.28	53.22	11.16	141.82	7.31	654.7	0.62	7.86	"
30	0	46.25	53.75	0	153.35	0	652.1	0	8.51	"

^aThe concentration unit is: mol/1000 mol water.^bThe concentration unit is: mol/100 mol of solute.^cThese mol/kg H_2O values were calculated by the compiler.^dThe solid phases are: A = KH_2PO_4 ; B = KNO_3 .

The physical properties of the above solutions are given below.

no	viscosity/cP	density/g cm^{-3}	$\kappa/\text{s cm}^{-1}$
1	1.722	1.156	0.100
2	1.325	1.160	0.110
3	1.281	1.169	0.115
4	1.285	1.184	0.120
5	1.277	1.189	0.130
6	1.276	1.203	0.135
7	1.278	1.212	0.140
8	1.280	1.222	0.143
9	1.299	1.230	0.145
10	1.299	1.231	0.145
11	1.237	1.220	0.147
12	1.189	1.212	0.150
13	1.051	1.197	0.155
14	1.487	1.225	1.05
15	1.301	1.234	1.10
16	1.119	1.236	1.15
17	1.117	1.243	1.15
18	1.116	1.247	1.25
19	1.115	1.264	1.40
20	1.115	1.271	1.45
21	1.115	1.287	1.50
22	1.116	1.302	1.60
23	1.117	1.329	1.90
24	1.118	1.335	2.05
25	1.119	1.340	2.15
26	1.119	1.339	2.15
27	1.117	1.332	2.10
28	1.112	1.331	2.05
29	1.112	1.330	1.99
30	1.050	1.325	1.95

REFERENCES cont'd:

3. Lure, Yu.Yu.; Rybnikova, A.I.
Khimicheskii Analiz Proizvodstvennykh Stochnykh Vod, Izd. Khimiya, Moscow
 1974.

Potassium Dihydrogenphosphate

COMPONENTS:	ORIGINAL MEASUREMENTS:
(1) Potassium dihydrogenphosphate; KH_2PO_4 ; [7778-77-0]	Askenasy, F.; Nessler, F.
(2) Potassium chloride; KCl; [7747-40-7]	Z. Anorg. Chem. 1930, 189, 305-28.
(3) Ammonium dihydrogenphosphate; $\text{NH}_4\text{H}_2\text{PO}_4$; [7722-76-1]	
(4) Ammonium chloride; NH ₄ Cl; [12125-02-9]	
(5) Water; H ₂ O; [7732-18-5]	
VARIABLES:	PREPARED BY:
Composition at 0°C.	J. Eysseltová

EXPERIMENTAL VALUES:

Points of simultaneous crystallization of several solid phases
in the K^+ , NH_4^+ || Cl^- , H_2PO_4^- - H_2O system at 0°C.

$d/\text{g cm}^{-3}$	mol/100 mol solute					
	H_2PO_4^-	Cl^-	K^+	NH_4^+	H_2O	solid phases ^a
1.1100	7.6	92.4	8.0	92.0	925	" NH_4Cl " + " $\text{NH}_4\text{H}_2\text{PO}_4$ "
1.1134	7.7	92.3	12.1	87.9	905	" " "
1.1300	8.1	91.9	17.9	82.1	888	" " "
1.1335	8.5	91.5	24.4	75.6	850	" " "
1.1385	8.7	91.3	28.7	71.3	810	ternary eutectic point
1.1504	8.3	91.7	29.8	70.2	865	" KCl " + " KH_2PO_4 "
1.1514	8.3	91.7	32.7	67.3	887	" " "
1.1657	7.5	92.5	66.6	33.4	1135	" " "
1.1695	7.7	92.3	85.8	14.2	1310	" " "
1.1740	7.3	92.7	90.0	10.0	1380	" " "
1.1272	3.6	96.4	28.2	71.8	845	" KCl " + " NH_4Cl "

^aA formula in quotation marks refers to a solid solution rich in that component.

(continued next page)

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

Binary eutonic solutions were prepared on the basis of a preliminary investigation of the boundary ternary systems. Samples on the curves for simultaneous crystallization of 2 salts were then prepared by adding a third component. The mixtures were shaken in a thermostat for 2-4 days. The solid phase was isolated by centrifuging. The analytical methods are not described.

SOURCE AND PURITY OF MATERIALS:

No information is given.

ESTIMATED ERROR:

The temperature was controlled to within ± 0.1 K. No other information is given.

REFERENCES:

COMPONENTS:

- (1) Potassium dihydrogenphosphate; KH_2PO_4 ; [778-77-0]
- (2) Potassium chloride; KCl; [7747-40-7]
- (3) Ammonium dihydrogenphosphate; $\text{NH}_4\text{H}_2\text{PO}_4$; [7722-76-1]
- (4) Ammonium chloride; NH_4Cl ; [12125-02-9]
- (5) Water; H_2O ; [7732-18-5]

ORIGINAL MEASUREMENTS:

Askenasy, F.; Nessler, F.
Z. Anorg. Chem. 1930, 189, 305-28.

EXPERIMENTAL VALUES, cont'd:

Distribution of K^+ and NH_4^+ in the solid and liquid phases of some of the saturated solutions in the $(\text{K}, \text{NH}_4)\text{H}_2\text{PO}_4$ system.

H_2PO_4^-	liquid phase mol/100 mol of solute					solid phase mol%	
	Cl^-	K^+	NH_4^+	H_2O		K^+	NH_4^+
9.8	90.2	57.8	42.2	1090		85.5	14.5
45.9	54.1	49.2	50.8	1690		78.9	21.1
33.8	66.2	45.5	54.5	1680		71.7	28.3
27.4	72.6	42.7	57.3	1450		66.1	33.9
27.2	72.8	43.3	56.7	1565		64.8	35.2
19.7	80.3	40.9	59.1	1135		62.2	37.8
13.1	86.9	38.9	61.1	1130		62.2	37.8
26.7	73.3	44.2	55.8	1555		56.4	45.6
24.5	75.5	36.9	63.1	1665		55.7	44.3
9.8	90.2	26.6	73.4	925		31.2	68.8
18.3	81.7	28.7	71.3	1235		29.2	70.8

The compiler has recalculated the data to give the following values:

H_2PO_4^-	Cl^-	K^+	NH_4^+	H_2O	solid ^a phase				
mass%	mol/kg	mass%	mol/kg	mass%	mol/kg	mass%	solid ^a phase		
3.25	0.45	14.47	5.54	1.38	0.48	7.32	5.52	73.55	A + B
3.33	0.47	14.63	5.66	2.11	0.74	7.08	5.39	72.82	"
3.53	0.50	14.67	5.74	3.15	1.11	6.66	5.13	71.96	"
3.80	0.55	14.96	5.98	4.39	1.59	6.28	4.94	70.54	"
4.00	0.59	15.36	6.26	5.32	1.96	6.10	4.89	69.19	C
3.64	0.53	14.74	5.88	5.28	1.91	5.73	4.50	70.58	D + E
3.57	0.51	14.44	5.74	5.67	2.04	5.39	4.21	70.91	"
2.63	0.36	11.86	4.52	9.41	3.25	2.17	1.63	73.90	"
2.39	0.32	10.48	3.91	10.74	3.63	0.82	0.60	75.54	"
2.17	0.29	10.10	3.73	10.81	3.62	0.55	0.40	76.34	"
1.63	0.23	15.99	6.33	5.15	1.85	6.05	4.72	71.15	D + F

^aThe solid phases are: A = "NH₄Cl"; B = "NH₄H₂PO₄"; C = ternary eutectic point;

D = "KCl"; E = "KH₂PO₄"; F = "NH₄Cl". These have the same meaning as in the table on the preceding page.

3.54	0.49	11.94	4.59	8.43	2.94	2.84	2.15	73.23	G ^b
11.23	1.50	4.84	1.77	4.85	1.61	2.31	1.66	76.65	"
8.48	1.11	6.07	2.18	4.60	1.50	2.54	1.80	78.28	"
7.80	1.04	7.56	2.78	4.90	1.63	3.03	2.19	76.68	"
7.30	0.96	7.15	2.58	4.68	1.53	2.83	2.01	78.02	"
6.86	0.96	10.22	3.93	5.74	2.00	3.82	2.89	73.34	"
4.65	0.64	11.28	4.27	5.56	1.91	4.03	3.00	74.46	"
7.21	0.95	7.23	2.61	4.81	1.57	2.80	1.99	77.93	"
6.31	0.81	7.12	2.51	3.83	1.23	3.02	2.10	79.69	"
4.10	0.58	13.81	5.41	4.49	1.59	5.71	4.40	71.88	"
6.05	0.82	9.88	3.67	3.82	1.29	4.38	3.20	75.84	"

^bThe solid phase, G, here refers to a precipitate designated as $(\text{K}, \text{NH}_4)\text{H}_2\text{PO}_4$.

Potassium Dihydrogenphosphate

COMPONENTS:				ORIGINAL MEASUREMENTS:					
(1) Potassium dihydrogenphosphate; KH_2PO_4 ; [7778-77-0]				Flatt, R.; Brunisholz, G.; Bourgeois, J. <i>Helv. Chim. Acta</i> 1956, 39, 841-53.					
(2) Calcium dihydrogenphosphate; $\text{Ca}(\text{H}_2\text{PO}_4)_2$; [10103-46-5]									
(3) Phosphoric acid; H_3PO_4 ; [7664-38-2]									
(4) Water; H_2O ; [7732-18-5]									
VARIABLES:				PREPARED BY:					
Composition at 25°C.				J. Eysseltová					
EXPERIMENTAL VALUES:									
Part 1. Composition of saturated solutions in the KH_2PO_4 - $\text{Ca}(\text{H}_2\text{PO}_4)_2$ - H_3PO_4 - H_2O system at 25°C.									
soln. no.	eq% Ca^{2+}	eq% K^+	eq% H^+	mol $\text{H}_2\text{O}/100$ equiv of solute	solid phases ^a				
1	2.0	12.6	85.4	68.5	A + B + C				
2	8.2	12.4	79.4	162.6	A + B + D				
3	11.2	14.0	74.8	278.5	B + D + E				
4	16.1	6.6	77.3	260.0	A + D + E				
5	0.9	7.6	91.5	55.0	A + C				
6	1.6	10.0	88.4	63.8	"				
7	1.9	11.8	86.3	66.3	"				
8	2.7	12.7	84.6	81.3	A + B				
9	4.7	12.5	82.8	114.6	"				
10	5.8	12.3	81.9	133.7	"				
11	7.0	12.5	80.5	147.8	"				
12	8.1	12.3	79.6	159.1	"				
13	9.0	11.1	79.9	162.4	A + D				
14	11.0	9.6	79.4	184.5	"				
15	12.6	8.6	78.8	221.5	"				
16	13.8	7.6	78.6	234.5	"				
17	17.1	4.8	78.1	288.3	A + E				
18	18.9	2.1	79.0	309.0	"				
19	9.0	12.5	78.5	183.4	B + D				
20	9.4	12.7	77.9	192.0	"				
21	9.5	12.8	77.7	199.4	"				
22	9.9	12.9	77.2	216.1	"				
23	10.3	13.1	76.6	231.8	"				
24	9.5	15.6	74.9	324.4	B + E				

(continued next page)

AUXILIARY INFORMATION

METHOD/APPARATUS/PROCEDURE:	SOURCE AND PURITY OF MATERIALS:
No experimental details are given. The composition of the double salt was calculated on the basis of the analysis of the saturated solution and of the wet residue. A small amount of KNO_3 was added to the solid phase in order to determine the amount of mother liquid adsorbed on the surface of the solid phase.	No information is given.
	ESTIMATED ERROR:
	No information is given.
	REFERENCES:

COMPONENTS:

- (1) Potassium dihydrogenphosphate; KH_2PO_4 ; [7778-77-0]
(2) Calcium dihydrogenphosphate; $\text{Ca}(\text{H}_2\text{PO}_4)_2$; [10103-46-5]
(3) Phosphoric acid; H_3PO_4 ; [7664-38-2]
(4) Water; H_2O ; [7732-18-5]

ORIGINAL MEASUREMENTS:

Flatt, R.; Brunisholz, G.; Bourgeois, J.
Helv. Chim. Acta 1956, 39, 841-53.

EXPERIMENTAL VALUES cont'd:

Part 1. Composition of saturated solutions in the KH_2PO_4 - $\text{Ca}(\text{H}_2\text{PO}_4)_2$ - H_3PO_4 - H_2O system at 25°C.

soln. no.	eq% Ca^{2+}	eq% K^+	eq% H^+	mol $\text{H}_2\text{O}/100$ equiv of solute	solid phases ^a
25	7.2	19.6	73.2	481.2	B + E
26	4.8	24.0	71.2	681.4	"
27	3.0	27.4	69.6	812.3	"
28	12.6	11.7	75.7	278.1	D + E
29	13.8	9.8	76.4	277.9	"
30	2.6	4.1	93.3	99.4	A
31	6.5	3.9	89.6	154.2	"
32	7.6	8.9	83.5	159.5	"
33	9.8	10.1	80.1	185.9	"
34	10.8	9.1	80.1	200.2	"
35	10.7	3.7	85.6	208.8	"
36	12.4	7.9	79.7	221.2	"
37	16.9	3.5	79.6	290.2	"
38	5.9	13.1	81.0	160.0	B
39	5.2	15.0	79.8	242.4	"
40	2.7	19.3	78.0	397.8	"
41	1.8	26.3	71.9	722.0	"
42	9.1	11.8	79.1	169.1	D
43	8.5	12.4	79.1	169.5	"
44	8.6	12.4	79.0	173.7	"
45	10.3	10.1	79.6	186.5	"
46	10.7	9.8	79.5	191.9	"
47	10.0	11.9	78.1	193.2	"
48	10.1	12.2	77.7	196.3	"
49	10.3	11.2	78.5	198.5	"
50	12.0	9.3	78.7	215.1	"
51	11.1	12.1	76.8	234.0	"
52	13.7	8.0	78.3	237.6	"
53	14.0	8.5	77.5	246.3	"

^aThe solid phases are: A = $\text{Ca}(\text{H}_2\text{PO}_4)_2$; B = KH_2PO_4 ; C = $\text{KH}_5(\text{PO}_4)_2$;

D = $\text{Ca}_9\text{K}_4\text{H}_{32}(\text{PO}_4)_{18} \cdot 10\text{H}_2\text{O}$; E = CaHPO_4 .

Part 2. The compiler has calculated the following values from the data given in Part 1 above.

soln. no.	$\text{Ca}(\text{H}_2\text{PO}_4)_2$		KH_2PO_4		H_3PO_4		H_2O	
	mass%	mol/kg	mass%	mol/kg	mass%	mol/kg	mass%	
1	8.91	1.62	32.65	10.22	34.96	15.19	23.48	
2	24.67	2.80	21.69	4.23	16.04	4.35	37.61	
3	25.36	2.23	18.43	2.79	7.71	1.62	48.49	
4	36.28	3.44	8.65	1.41	10.03	2.27	45.05	
5	4.51	0.91	22.16	7.68	52.13	25.08	21.20	
6	7.45	1.39	27.14	8.71	42.48	18.92	22.90	
7	8.60	1.59	31.04	9.89	37.23	16.45	23.09	
8	11.32	1.84	30.97	8.68	31.49	12.25	26.22	
9	17.07	2.28	26.40	6.06	24.53	7.82	32.00	
10	19.59	2.41	24.15	5.11	21.54	6.33	34.72	
11	22.27	2.63	23.13	4.70	18.43	5.20	36.17	
12	24.62	2.83	21.74	4.29	16.46	4.52	37.18	
13	26.88	3.08	19.28	3.80	16.55	4.53	37.30	
14	30.47	3.31	15.46	2.89	14.77	3.83	39.30	
15	31.73	3.16	12.59	2.16	12.79	3.04	42.89	
16	33.46	3.27	10.71	1.80	12.11	2.83	43.72	
17	36.50	3.30	5.96	0.92	10.22	2.20	47.32	
18	38.54	3.40	2.49	0.38	10.53	2.22	47.32	
19	25.48	2.73	20.57	3.79	14.02	3.58	39.92	
20	25.93	2.72	20.37	3.67	12.97	3.25	40.73	
21	25.75	2.65	20.17	3.57	12.52	3.07	41.56	
22	25.76	2.54	19.52	3.31	11.48	2.71	43.24	

(continued next page)

COMPONENTS:				ORIGINAL MEASUREMENTS			
(1) Potassium dihydrogenphosphate; KH_2PO_4 ; [7778-77-0]				Flatt, R.; Brunisholz, G.; Bourgeois, J.			
(2) Calcium dihydrogenphosphate; $\text{Ca}(\text{H}_2\text{PO}_4)_2$; [10103-46-5]				<i>Helv. Chim. Acta</i> 1956, 39, 841-53			
(3) Phosphoric acid; H_3PO_4 ; [7664-38-2]							
(4) Water; H_2O ; [7732-18-5]							

EXPERIMENTAL VALUES cont'd:

Part 2. The compiler has calculated the following values from the data given in Part 1 above.

soln. no.	$\text{Ca}(\text{H}_2\text{PO}_4)_2$ mass%	$\text{Ca}(\text{H}_2\text{PO}_4)_2$ mol/kg	KH_2PO_4 mass%	KH_2PO_4 mol/kg	H_3PO_4 mass%	H_3PO_4 mol/kg	H_2O mass%
23	25.81	2.47	19.09	3.14	10.42	2.38	44.67
24	20.23	1.63	19.31	2.67	7.34	1.41	53.12
25	12.34	0.83	19.54	2.26	4.69	0.75	63.42
26	6.57	0.39	19.10	1.96	2.60	0.37	71.73
27	3.63	0.20	19.28	1.87	1.49	0.20	75.60
28	28.27	2.52	15.26	2.34	8.48	1.80	47.98
29	30.70	2.76	12.68	1.60	9.07	1.94	47.55
30	10.93	1.45	10.02	2.29	46.89	14.88	32.14
31	21.50	2.34	7.50	1.40	31.76	8.26	39.23
32	23.68	2.65	16.13	3.10	21.96	5.86	38.22
33	27.53	2.93	16.50	3.02	15.80	4.01	40.16
34	29.10	3.00	14.26	2.52	15.16	3.73	41.48
35	29.05	2.85	5.84	0.98	21.52	5.04	43.59
36	31.42	3.11	11.64	1.98	13.83	3.27	43.11
37	36.2	3.23	4.36	0.67	11.60	2.48	47.82
38	18.54	2.05	23.94	4.55	18.86	4.98	38.66
39	13.66	1.19	22.92	3.44	14.45	3.01	48.98
40	5.48	0.38	22.78	2.70	9.63	1.58	62.10
41	2.41	0.14	20.44	2.02	2.93	0.40	74.22
42	26.63	2.99	20.08	3.88	15.23	4.08	38.06
43	25.04	2.79	21.24	4.06	15.33	4.08	38.39
44	25.05	2.75	21.00	3.96	15.04	3.94	38.91
45	28.67	3.07	16.34	3.01	15.07	3.85	39.92
46	29.29	3.10	15.60	2.84	14.71	3.72	40.40
47	27.35	2.88	18.92	3.42	13.09	3.29	40.63
48	27.34	2.86	19.22	3.45	12.515	3.12	40.90
49	27.82	2.88	17.58	3.13	13.38	3.31	41.22
50	30.78	3.10	13.87	2.40	12.92	3.11	42.43
51	27.49	2.64	17.43	2.87	10.51	2.40	44.57
52	33.02	3.20	11.21	1.87	11.74	2.72	44.03
53	33.00	3.16	11.65	1.92	10.69	2.44	44.65

COMPONENTS:	ORIGINAL MEASUREMENTS:
(1) Potassium dihydrogenphosphate; KH_2PO_4 ; [7778-77-0]	Iovi, A.; Haiduc, C.
(2) Potassium chloride; KC1; [7747-40-7]	Rev. Roum. Chim. 1971, 16, 1743-7.
(3) Ammonium dihydrogenphosphate; $\text{NH}_4\text{H}_2\text{PO}_4$; [7722-76-1]	
(4) Ammonium chloride; NH ₄ Cl; [12125-02-9]	
(5) Water; H ₂ O; [7732-18-5]	

EXPERIMENTAL VALUES cont'd:

Molar solubility in equimolar mixtures in the K^+ , NH_4^+ || Cl^- , H_2PO_4^- - H_2O system.

The following concentrations are expressed as: mol/100 mol of solute

Nr	H_2PO_4^-	chloride	potassium	ammonium	water
1(A,B)	11.17	88.83	40.64	59.36	818
2(A)	12.78	87.22	39.94	60.06	798
2(B)	12.89	87.19	40.26	59.74	807
3(A)	18.15	81.85	42.83	57.17	804
3(B)	18.48	81.52	42.78	57.22	796
4(A,B)	25.59	74.41	41.62	58.38	694
5(A)	33.50	66.50	43.03	56.97	586
5(B)	34.05	65.95	43.68	56.32	599
6(A)	37.16	62.84	43.90	56.10	556
6(B)	37.17	62.83	43.93	56.07	557

COMPONENTS:	ORIGINAL MEASUREMENTS:
(1) Potassium oxide; K ₂ O; [12136-45-7] (2) Ammonia; NH ₃ ; [7664-42-7] (3) Phosphoric acid; H ₃ PO ₄ ; [7664-38-2] (4) Diphosphoric acid; H ₄ P ₂ O ₇ ; [2466-09-3] (5) Water; H ₂ O; [7732-18-5]	Frazier, A.W.; Dillard, E.F.; Thrasher, R.D.; Waerstad, K.R. <i>J. Agr. Food Chem.</i> <u>1973</u> , <u>21</u> , 700-4
VARIABLES: Composition at 298 K.	PREPARED BY: J. Eysseltova

EXPERIMENTAL VALUES:

Soln. no.	pH	(NH ₄) ₂ O		total mass%	ortho P ₂ O ₅ mass%	P ₂ O ₅ mass% of total	pyro P ₂ O ₅ % of total	solid α phases
		K ₂ O mass%	P ₂ O ₅ mass%					
1	7.18	12.4	14.9	34.0	14.2	58	A,C,L	
2	6.65	16.1	8.9	36.9	13.0	65	A,C,L	
3	6.30	19.6	5.5	40.1	13.5	66	A,B,C,L	
4	6.00	18.7	5.7	39.0	12.3	68	B,C,L	
5	5.93	18.5	6.5	40.3	18.0	55	B,C,L,M	
6	5.88	18.8	5.0	41.2	16.3	60	B,C,M	
7	5.28	16.9	5.5	42.3	9.6	77	B,C,M	
8	5.18	16.6	6.8	42.6	9.1	79	B,C,E,M	
9	5.10	17.3	5.4	42.6	8.6	80	B,E,M	
10	6.95	11.2	16.5	34.5	17.5	49	C,L,M	
11	6.30	15.7	9.7	37.7	17.8	53	C,L,M	
12	6.13	16.9	8.0	38.9	17.9	54	C,L,M	
13	4.55	9.8	13.5	39.9	6.8	83	D,E,M	
14	5.08	9.9	14.3	40.7	5.8	86	D,E,M	
15	4.95	13.5	16.3	41.2	4.8	88	C,M	
16	5.18	11.1	17.9	39.2	4.7	88	C,M	
17	6.10	8.5	22.7	33.6	10.0	70	C,M	
18	7.40	3.6	27.4	32.8	10.1	69	C,J,M	
19	6.95	3.1	27.4	34.0	4.2	79	C,J,M	
20	6.49	2.7	27.7	36.0	5.0	86	C,G,J,M	
21	6.23	3.3	26.3	36.1	5.8	84	C,G,M	
22	5.45	7.3	16.9	38.7	5.8	85	C,G,M	

(continued next page)

AUXILIARY INFORMATION

METHOD/APPARATUS/PROCEDURE: For each mixture the pH was adjusted to a selected value. The most acidic solutions were prepared by the use of a cation exchange resin. The mixtures were equilibrated in a water bath for 4 weeks.	SOURCE AND PURITY OF MATERIALS: Reagent grade KH ₂ PO ₄ , NH ₄ H ₂ PO ₄ , KOH, and NH ₄ OH were used. The K ₂ H ₂ P ₂ O ₇ and (NH ₄) ₃ P ₂ O ₇ ·H ₂ O were recrystallized.
	ESTIMATED ERROR: No information is given.
	REFERENCES:

Potassium Dihydrogenphosphate

COMPONENTS:				ORIGINAL MEASUREMENTS:			
(1) Potassium oxide; K ₂ O; [12136-45-7]				Frazier, A.W.; Dillard, E.F.; Thrasher, R.D.; Waerstad, K.R.			
(2) Ammonia; NH ₃ ; [7664-42-7]				J. Agr. Food Chem. 1973, 21, 700-4			
(3) Phosphoric acid; H ₃ PO ₄ ; [7664-38-2]							
(4) Diphosphoric acid; H ₄ P ₂ O ₇ ; [2466-09-3]							
(5) Water; H ₂ O; [7732-18-5]							

EXPERIMENTAL VALUES cont'd:

Solubility in the NH₃-K₂O-H₃PO₄-H₄P₂O₇-H₂O system at 25°C.

Soln no.	pH	(NH ₄) ₂ O mass%	K ₂ O mass%	total P ₂ O ₅ mass%	ortho P ₂ O ₅ mass%	pyro P ₂ O ₅ % of total	solid phases ^a
23	5.11	9.3	16.2	40.1	1.7	88	C,G,M
24	5.10	9.9	15.9	41.0	6.7	84	C,F,G,M
25	4.75	8.5	12.4	39.9	4.9	88	F,G,M
26	4.0	---	6.9	10.2	10.2	0	M
27	6.1	---	17.7	18.1	18.1	0	M
28	7.9	---	35.0	29.2	29.2	0	M,N
29	10.1	---	34.1	25.2	25.2	0	N

^aThe solid phases are: A = (NH₄)₄P₂O₇; B = (NH₄)₃HP₂O₇·H₂O; C = (NH₄,K)₃HP₂O₇·H₂O, mole ratio N/P 1.0 to 2.8; D = (NH₄)₂H₂P₂O₇; E = (NH₄,K)₂H₂P₂O₇, mole ratio N/P is 1.9 to 3.0; F = (NH₄,K)₂H₂P₂O₇·0.5H₂O, mole ratio N/P is 0.61 to 0.74; G = K₂H₂P₂O₇; J = K₃HP₂O₇·3H₂O; L = (NH₄)₂HPO₄; M = (NH₄,K)H₂PO₄; N = K₂HPO₄·3H₂O.

COMMENT: The "mole ratio N/P" is probably a typographical error and should be "mole ratio N/K"--compiler.

The compiler has recalculated the above values to give the following.

Soln no	(NH ₄) ₂ O mol/kg	K ₂ O mol/kg	total P ₂ O ₅ mol/kg	ortho P ₂ O ₅ mol/kg
1	6.15	4.09	6.19	2.58
2	8.11	2.48	6.82	2.40
3	10.82	1.68	8.12	2.73
4	9.81	1.65	7.51	2.37
5	10.24	1.99	8.18	3.65
6	10.32	1.52	8.29	3.28
7	9.20	1.65	8.44	1.92
8	9.38	2.12	8.83	1.89
9	9.58	1.65	8.65	1.75
10	5.69	4.63	6.43	3.26
11	8.17	2.79	7.20	3.40
12	8.98	2.35	7.57	3.48
13	5.11	3.89	7.64	1.30
14	5.42	4.32	8.17	1.16
15	8.94	5.97	10.01	1.17
16	6.70	5.98	8.68	1.04
17	4.64	6.85	6.72	2.00
18	1.91	8.04	6.38	1.97
19	1.68	8.19	6.75	0.83
20	1.54	8.75	7.55	1.05
21	1.85	8.14	7.41	1.19
22	3.78	4.84	7.35	1.10
23	5.19	5.00	8.21	0.35
24	5.73	5.08	8.70	1.42
25	4.16	3.36	7.17	0.88
26	----	0.88	0.87	0.87
27	----	2.93	1.97	1.97
28	----	10.38	5.74	5.74
29	----	9.64	4.09	4.09

COMPONENTS:	ORIGINAL MEASUREMENTS:
(1) Potassium dihydrogenphosphate; KH_2PO_4 ; [7778-77-0]	Timoshenko, Yu.M.; Gilyazova, G.N.
(2) Potassium chloride; KCl; [7447-40-7]	Zh. Neorg. Khim. 1981, 26, 1104-6.
(3) Calcium dihydrogenphosphate; $\text{Ca}(\text{H}_2\text{PO}_4)_2$; [10103-46-5]	
(4) Calcium chloride; CaCl_2 ; [10043-52-4]	
(5) Water; H_2O ; [7732-18-5]	
VARIABLES:	PREPARED BY:
Composition at 25°C.	J. Eyseltová

EXPERIMENTAL VALUES:

Composition of saturated solutions at 25°C.

$d \text{ cm}^{-3}$ g cm ⁻³	$\text{Ca}(\text{H}_2\text{PO}_4)_2$ n/cP	CaCl_2 mass%	KH_2PO_4 mass%	KCl mass%	mol/100 mol Ca^{2+}	H_2PO_4^-	solute H_2O	solid phase ^a
1.1594	1.374	1.14	----	19.94	----	6.21	100	5609 A + B
1.1672	1.118	1.21	----	12.78	8.61	4.69	47.43	3911 "
1.1781	0.983	1.26	----	4.30	22.89	3.09	9.04	2273 A + B + C
1.1874	0.901	1.22	----	----	26.01	2.89	2.95	2248 A + C
1.3805	7.083	1.23	19.08	----	16.17	62.04	1.82	1236 "
1.4473	9.256	1.14	44.97	----	----	100	1.18	729 A + D
1.4730	10.91	1.21	43.50	----	3.82	93.86	1.23	684 A + C + D

^aThe solid phases are: A = $\text{Ca}(\text{H}_2\text{PO}_4)_2 \cdot \text{H}_2\text{O}$; B = KH_2PO_4 ; C = KCl; D = $\text{CaCl}_2 \cdot 6\text{H}_2\text{O}$.

COMMENT: The authors emphasize that in the $\text{Ca}(\text{H}_2\text{PO}_4)_2 - \text{KH}_2\text{PO}_4 - \text{H}_2\text{O}$ and $\text{Ca}(\text{H}_2\text{PO}_4)_2 - \text{CaCl}_2 - \text{H}_2\text{O}$ systems the solubility of each salt component is not influenced appreciably by the presence of the other one.

AUXILIARY INFORMATION

METHOD/APPARATUS/PROCEDURE:	SOURCE AND PURITY OF MATERIALS:
The solutions were equilibrated with excess solid phase for 3-7 days. Viscosity was measured with an Ostwald viscometer. The density was measured with a pycnometer. The chloride content was determined by the Volhard method, the H_2PO_4^- content was determined alkalimetrically after ion exchange, calcium content was determined by a compleximetric titration. Where the amount of phosphate ion was small, it was determined gravimetrically as ammonium phosphomolybdate.	No information is given.
	ESTIMATED ERROR:
	No information is given.
	REFERENCES:

Potassium Dihydrogenphosphate

COMPONENTS:			ORIGINAL MEASUREMENTS:					
(1) Potassium dihydrogenphosphate; KH_2PO_4 ; [7778-77-0]			Becker, B. <i>J. Chem. Eng. Data</i> <u>1969</u> , 14, 431-2.					
(2) Formamide; CH_3NO ; [75-12-7]								
(3) Water; H_2O ; [7732-18-5]								
VARIABLES:			PREPARED BY:					
Composition at 25°C.			J. Eysseltová					
EXPERIMENTAL VALUES:								
Solubility in the KH_2PO_4 - HCONH_2 - H_2O system at 25°C.								
Initial composition (mass%)			saturated solution (mass%)					
KH_2PO_4	HCONH_2	H_2O	KH_2PO_4	HCONH_2	H_2O			
40.7	7.6	51.7	15.2	10.9	73.9			
29.8	20.3	49.9	10.3	25.6	64.1			
32.9	33.6	33.5	5.8	46.5	44.7			
28.6	43.0	28.4	3.9	58.4	37.7			
32.2	49.5	18.3	2.7	71.0	26.3			
29.6	59.7	10.7	1.6	82.7	15.7			
			1.6	85.1	13.3			
20.0	74.0	6.0	0.9	91.4	7.5			
			1.0	95.1	3.9			
40	60	0	1.0	99.0	0			
The only solid phase in equilibrium with the above saturated solutions was KH_2PO_4 .								
AUXILIARY INFORMATION								
METHOD/APPARATUS/PROCEDURE:			SOURCE AND PURITY OF MATERIALS:					
Excess salt was added to aqueous formamide, the mixture was shaken vigorously for at least 24 hours and then filtered through a fritted glass filter. The nitrogen content was determined by the Kjeldahl method, potassium was determined by the Perrin method and phosphorus was determined gravimetrically by the quinoline molybdate method.			Fresh reagent grade salts were used without further purification. Matheson, Coleman, Bell 99% formamide was used without further purification. It had a m.p. of $2.5 \pm 0.1^\circ\text{C}$ in good agreement with the literature value (1).					
			ESTIMATED ERROR:					
			No information is given.					
			REFERENCES:					
			1. Smith, G.F. <i>J. Chem. Soc.</i> <u>1931</u> , 3527.					

COMPONENTS:				ORIGINAL MEASUREMENTS:				
(1) Potassium dihydrogenphosphate; KH_2PO_4 ; [7778-77-0]				Filipescu, L. Rev Chim. (Bucharest) 1971, 22, 533-40.				
(2) Ethanamine,N,N,diethylphosphate 1:1 (triethylamine phosphate); $\text{C}_6\text{H}_{18}\text{NO}_4\text{P}$; [10138-93-9]								
(3) Water; H_2O ; [7732-18-5]								
VARIABLES:				PREPARED BY:				
Temperature and composition.				J. Eysseltová				

EXPERIMENTAL VALUES:

Solubility isotherms in the $\text{KH}_2\text{PO}_4 - ((\text{C}_2\text{H}_5)_3\text{N})\text{H}_3\text{PO}_4 - \text{H}_2\text{O}$ system.

$t/\text{^{\circ}C.}$	$d \text{ g cm}^{-3}$	K^+	$(\text{C}_2\text{H}_5)_3\text{N}$	H_2O	KH_2PO_4^a	mass%	mol/kg	$(\text{C}_2\text{H}_5)_3\text{NH}_3\text{PO}_4^a$	mass%	mol/kg	solid phase ^d
20	-----	0.1124	0.0417	1201.1	4.49	1.12	7.32	0.41	A		
20	-----	0.0765	0.0896	1113.9	2.86	0.76	14.71	0.89	"		
20	-----	0.0602	0.1839	758.0	1.95	0.60	26.28	1.83	"		
20	1.118	0.0664	0.3391	456.6	1.76	0.66	39.60	3.39	"		
20	1.144	0.0798	0.5540	292.1	1.69	0.79	51.57	5.54	"		
20	1.205	0.3719	3.4538	48.4	2.00	3.71	85.48	34.53	A + B		
40	-----	0.1623	0.0746	781.1	6.02	1.62	12.15	0.74	A		
40	-----	0.1045	0.2427	533.3	3.09	1.04	31.58	2.42	"		
40	-----	0.1026	0.3534	406.9	2.65	1.02	40.21	3.53	"		
40	1.1311	0.1096	0.4039	360.6	2.68	1.09	43.39	4.03	"		
40	1.229	0.6778	4.6127	35.0	2.92	6.77	87.54	46.12	A + B		
60	1.181	0.2559	0.0762	557.5	9.15	2.55	11.97	0.76	A		
60	-----	0.2415	0.0894	559.5	8.50	2.41	13.83	0.89	"		
60	1.138	0.1800	0.2251	457.0	5.33	1.80	29.30	2.25	"		
60	-----	0.2434	1.1271	135.1	3.29	2.43	66.90	11.27	"		
60	-----	0.9418	5.6949	27.9	3.34	9.41	88.82	56.94	A + B		
80	1.221	0.3778	0.0963	390.5	12.57	3.77	14.07	0.96	A		
80	1.197	0.3361	0.1694	366.3	10.23	3.36	22.64	1.69	"		
80	-----	0.2459	0.5914	221.2	4.87	2.45	51.45	5.91	"		

^aThese values were calculated by the compiler.^bThe concentration unit is: equiv/100 g water.^cThe concentration unit is: mol/100 equiv of solute.^dThe solid phases are: A = KH_2PO_4 ; B = $((\text{C}_2\text{H}_5)_3\text{NH}_3\text{PO}_4$.

AUXILIARY INFORMATION

METHOD/APPARATUS/PROCEDURE:	SOURCE AND PURITY OF MATERIALS:
The samples were equilibrated isothermally by stirring for 5 hours with a stream of inert gas. The potassium content was determined with a flame photometer, the $(\text{C}_2\text{H}_5)_3\text{NH}^+$ content was determined by the Kjeldahl method.	The KH_2PO_4 was recrystallized 3 times before use. The triethylamine phosphate was synthesized from phosphoric acid and triethylamine.
ESTIMATED ERROR:	The temperature was controlled to within $\pm 0.05^\circ\text{C}$ at 20 and 40°C and to within $\pm 0.1^\circ\text{C}$ at 60 and 80°C .
REFERENCES:	

COMPONENTS:	ORIGINAL MEASUREMENTS:
(1) Potassium dihydrogenphosphate; KH_2PO_4 ; [7778-77-0]	Bergman, A.G.; Gladkovskaya, A.A.; Galushkina, R.A.
(2) Ammonium dihydrogenphosphate; $\text{NH}_4\text{H}_2\text{PO}_4$; [7722-76-1]	Zh. Neorg. Khim. 1973, 18, 1978-80.
(3) Urea; $\text{CH}_4\text{N}_2\text{O}$; [57-13-6]	
(4) Water; H_2O ; [7732-18-5]	

EXPERIMENTAL VALUES cont'd:

Four sections through the system were investigated. The sections are:

- No. 1 ($45.81\% \text{NH}_4\text{H}_2\text{PO}_4 + 54.19\% \text{KH}_2\text{PO}_4$) - urea - water
 No. 2 ($71.72\% \text{NH}_4\text{H}_2\text{PO}_4 + 28.28\% \text{KH}_2\text{PO}_4$) - urea - water
 No. 3 ($65.70\% \text{NH}_4\text{H}_2\text{PO}_4 + 34.30\% \text{urea}$) - $\text{KH}_2\text{PO}_4 - \text{H}_2\text{O}$
 No. 4 ($85.18\% \text{NH}_4\text{H}_2\text{PO}_4 + 14.82\% \text{urea}$) - $\text{KH}_2\text{PO}_4 - \text{H}_2\text{O}$

Solubility data for saturated solutions in the $\text{urea}-\text{NH}_4\text{H}_2\text{PO}_4-\text{KH}_2\text{PO}_4-\text{H}_2\text{O}$ system.

sect no	urea mass%	$\text{NH}_4\text{H}_2\text{PO}_4$ mol/kg ^a	$\text{NH}_4\text{H}_2\text{PO}_4$ mass%	$\text{NH}_4\text{H}_2\text{PO}_4$ mol/kg ^a	KH_2PO_4 mass%	KH_2PO_4 mol/kg ^a	H_2O mass%	t/°C	solid phases ^b
4	4.30	10.52	24.70	3.15	3.00	0.32	68.00	+17.0	A + B + C
	2.70	5.22	15.70	1.74	3.50	0.32	78.10	-5.2	A + B + D

^aThe mol/kg H_2O values were calculated by the compiler.

^bThe solid phases are: A = $\alpha\text{-NH}_4\text{H}_2\text{PO}_4$; B = $(\alpha\text{-NH}_4,\text{K})\text{H}_2\text{PO}_4$; C = $(\beta\text{-NH}_4,\text{K})\text{H}_2\text{PO}_4$;

D = ice; E = α -urea; F = β -urea; G = γ -urea.

COMPONENTS:				ORIGINAL MEASUREMENTS:		
(1) Potassium dihydrogenphosphate; KH_2PO_4 ; [7778-77-0]				Beglov, B.M.; Tukhtaev, S.; Yugai, M.R. <i>Zh. Neorg. Khim.</i> 1980, 25, 2283-5.		
(2) Formamide; CH_3NO ; [75-12-7]						
(3) Water; H_2O ; [7732-18-5]						
VARIABLES:				PREPARED BY:		
Temperature and composition.				J. Eysseltova		
EXPERIMENTAL VALUES:						
Solutions coexisting with two or three solid phases.						
composition (mass%)						
HCONH ₂	KH_2PO_4	H_2O	$t/^\circ\text{C}.$	solid phases		
0	11.5	88.5	-2.5	ice + KH_2PO_4		
11.0	8.9	80.1	-7.6	"		
18.4	8.0	73.6	-11.5	"		
37.7	5.7	56.6	-25.0	"		
57.8	3.6	38.6	-43.5	"		
65.4	0	34.6	-45.5	ice + formamide		
64.2	3.1	32.7	-51.2	ice + formamide + KH_2PO_4		
68.1	2.7	29.2	-44.5	KH_2PO_4 + formamide		
88.9	1.0	10.1	-15.0	"		
94.4	1.1	4.5	-8.5	"		
95.7	1.1	3.2	-6.3	"		
98.8	1.2	0	-2.0	"		
Solubility isotherms in the temperature range of -40 to 50°C are given only in graphical form.						
AUXILIARY INFORMATION						
METHOD/APPARATUS/PROCEDURE:			SOURCE AND PURITY OF MATERIALS:			
A visual polythermic method was used (1) but no details are given.			Chemically pure KH_2PO_4 was recrystallized before use. Pure formamide was dehydrated and distilled under vacuum at 80-82°C.			
ESTIMATED ERROR:						
No details are given.						
REFERENCES:						
1. Bergman, A.G.; Luzhnaya, N.P. <i>Fiziko-Khimicheskie Osnovy Izucheniya i Ispol'zovaniya Solyanykh Mestorozhdeniy Klorid-Sulfatnogo Tipa</i> , Moscow, IAN SSSR, 1951.						

COMPONENTS:	ORIGINAL MEASUREMENTS:
(1) Potassium dihydrogenphosphate; KH_2PO_4 ; [7778-77-0]	Yugai, M.R.; Tukhtaev, S.; Beglov, B.M. Uzb. Khim. Zh. 1981, 6, 15-8.
(2) Formamide; CH_3NO ; [75-12-7]	
(3) Water; H_2O ; [7732-18-5]	

VARIABLES: Composition at 50°C.	PREPARED BY: J. Eysseltova
EXPERIMENTAL VALUES: Composition of saturated solutions in the KH_2PO_4 - HCONH_2 - H_2O system at 50°C.	

HCONH_2 mass%	KH_2PO_4 mass%	H_2O mass%
0	29.42	70.58
3.68	25.82	70.50
12.80	18.67	68.53
23.59	13.83	81.33
37.44	10.31	52.25
51.07	7.46	41.47
61.35	5.26	33.39
77.42	3.58	19.00
91.29	2.73	5.98
98.16	1.84	0

AUXILIARY INFORMATION	
METHOD/APPARATUS/PROCEDURE: Equilibrium was approached isothermally by stirring for 1-2 days. Nitrogen content was determined by the Kjeldahl method, phosphorus was determined gravimetrically, and potassium was determined as the tetraphenylborate. The composition of the solid phase was determined by the Schreinemakers' method.	SOURCE AND PURITY OF MATERIALS: Chemically pure or analytically pure KH_2PO_4 was used. The formamide was dried and distilled under vacuum at 80-82°C.
	ESTIMATED ERROR: The temperature was controlled to within 0.1 K.
	REFERENCES:

COMPONENTS:	EVALUATOR:
(1) Dipotassium hydrogenphosphate; K_2HPO_4 ; [7758-11-4]	J. Eysseľtová Charles University Prague, Czechoslovakia
(2) Water; H_2O ; [7732-18-5]	May, 1985

CRITICAL EVALUATION:

THE BINARY SYSTEM

The only study of this system has been made by Ravich (1). A few other solubility values have been reported as part of a study of a multicomponent system (6,7). In both these studies the values reported are about 1% lower than those reported by Ravich (1). Ravich reports the eutectic of this system to be 36.78 mass% (3.33 mol/kg) K_2HPO_4 at 259.8 K; the transition of the hexahydrate to the trihydrate occurs at 287.5 K (solution composition is not given); and the transition of the trihydrate to the anhydrous salt takes place at 319 to 324 K and 71.26 to 72.64 mass% K_2HPO_4 . He also observed metastable solutions saturated with the hexahydrate and the trihydrate. The regions in which the various phases exist are rather narrow. Because of the lack of solubility data from other sources, the treatment of data described in chapter 3 could not be used. The system has a pronounced tendency to form supersaturated solutions (2-5).

MULTICOMPONENT SYSTEMS

Solubility measurements have been reported for several multicomponent systems.

1. The $K_2HPO_4-KBO_2-H_2O$ system. Data have been reported for 298 and 323 K (8). The data cannot be evaluated but it should be noted that the values reported for the $K_2HPO_4-H_2O$ system differ from the values of Ravich (1) by about +30%.
2. The $K_2HPO_4-CO(NH_2)_2-H_2O$ system. Two unspecified ternary compounds have been reported for this system (9). A later study of this system (10) gave a more detailed description and mentioned K_2HPO_4 and the α -, β -, γ -, and δ - modifications of urea as solid phases.
3. The $K_2HPO_4-K_2CO_3-H_2O$ system. Solubility measurements have been made over the temperature interval of 253 to 353 K (11). Later these same investigators published the solubility polytherm of the quaternary system $K_2HPO_4-K_2CO_3-CO(NH_2)_2-H_2O$ (12).
4. The $K_2HPO_4-KNO_3-H_2O$ system. Only the components and their hydrates were found as solid phases in this system (13).
5. The $K_2HPO_4-KCl-H_2O$ system. Solubility values have been determined at 298, 323 and 348 K (6). The authors reported $2KCl \cdot K_2HPO_4 \cdot 5H_2O$ as a solid phase at 298 K. They also emphasized the tendency of all solutions existing in contact with a phosphate-containing solid to form supersaturated solutions.
6. The $K_2HPO_4-(NH_4)_2HPO_4-H_2O$ system. No ternary compounds were observed in this system (7,9,14). In contrast to this, the compound $NaNH_4HPO_4$ is present in the $Na_2HPO_4-(NH_4)_2HPO_4-H_2O$ system (15). An analogous compound exists in the $Na_2HPO_4-K_2HPO_4-H_2O$ system (16). This system is discussed in chapter 5.

Data have also been published for the $K_2HPO_4-NH_4H_2PO_4-(NH_4)_2HPO_4-H_2O$ system (17), but the paper contains many uncertainties which make it impossible to discuss and evaluate the data.

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(continued next page)

COMPONENTS:	EVALUATOR:
(1) Dipotassium hydrogenphosphate; K_2HPO_4 ; [7758-11-4] (2) Water; H_2O ; [7732-18-5]	J. Eysseletová Charles University Prague, Czechoslovakia May, 1985

CRITICAL EVALUATION: (cont'd)

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COMPONENTS:				ORIGINAL MEASUREMENTS:			
(1) Dipotassium hydrogenphosphate; K_2HPO_4 ; [7758-11-4]				Ravich, M.I. Izv. AN SSSR, Ser. Khim. 1938, 141-6.			
(2) Water; H_2O ; [7732-18-5]							
VARIABLES: Temperature and composition.				PREPARED BY: J. Eyssettova			

EXPERIMENTAL VALUES:

Composition and crystallization temperatures of saturated solutions
in the $K_2HPO_4 - H_2O$ system.

$t/^\circ C.$	K_2HPO_4			solid phase	$t/^\circ C.$	K_2HPO_4			solid phase
	mass%	mol%	mol/kg ^a			mass%	mol%	mol/kg ^a	
-4.2	16.78	2.04	1.16	ice	8.2	69.09	18.75	12.83	A ^c
-6.4	23.60	3.09	1.77	"	0	57.05	12.01	7.62	B
-9	29.61	4.17	2.41	"	10.0	59.08	12.96	8.28	"
-11.7	34.10	5.07	2.97	"	15.0	60.16	13.49	8.66	B
-13.5	36.78	5.67	3.33	ice + A	20.0	61.52	14.16	9.17	"
0	46.11	8.12	4.91	A	25.0	62.74	14.83	9.66	"
4.95	50.12	9.40	5.76	"	30.0	64.13	15.60	10.26	"
9.7	54.43	10.99	6.85	"	35	65.68	16.51	10.98	"
13.15	57.89	12.44	7.89	"	39.5	67.54	17.68	11.94	"
14.3	-----	-----	-----	A + B	44	69.83	19.29	13.28	"
14.6	60.82	13.82	8.91	A ^c	46	71.26	20.42	14.23	"
14.85	71.73	14.29	9.26	"	51	72.64	21.55	15.24	C
14.7	62.96	14.94	9.75	"	56	72.50	21.38	15.13	"
12.8	65.95	16.68	11.11	"	63	72.79	21.66	15.35	"

^aThe mol/kg H_2O values were calculated by the compiler.

^bThe solid phases are: A = $K_2HPO_4 \cdot 6H_2O$; B = $K_2HPO_4 \cdot 3H_2O$; C = KH_2PO_4 .

^cThis is a metastable solution.

AUXILIARY INFORMATION

METHOD/APPARATUS/PROCEDURE:	SOURCE AND PURITY OF MATERIALS:	
For the systems in which the trihydrate or the anhydrous salt was the solid phase, the solubility was determined by evaporating the solution to dryness. Where the hexahydrate was the solid phase, a visual polythermic method was used. Analyses were carried out gravimetrically: K_2O was determined as $KClO_4$; P_2O_5 was determined as $Mg_2P_2O_7$; and water was determined by weight loss during calcination.	The K_2HPO_4 was prepared from twice recrystallized KH_2PO_4 and KOH.	
	Analysis:	
	found	calcd for $K_2HPO_4 \cdot 6H_2O$
	K_2O	33.37
	P_2O_5	25.20
	H_2O	41.52
		33.38
		25.26
		41.46
	ESTIMATED ERROR:	
	No information is given.	
	REFERENCES:	