

<b>COMPONENTS:</b> (1) Sodium dihydrogenphosphate; $\text{NaH}_2\text{PO}_4$ ; [7558-80-7] (2) Potassium dihydrogenphosphate; $\text{KH}_2\text{PO}_4$ ; [7778-70-0] (3) Sodium chloride; $\text{NaCl}$ ; [7647-14-5] (4) Potassium chloride; $\text{KCl}$ ; [7747-40-7] (5) Water; $\text{H}_2\text{O}$ ; [7732-18-5]	<b>ORIGINAL MEASUREMENTS:</b> Brunishloz, G.; Bodmer, M. <i>Helv. Chim. Acta</i> <u>1963</u> , <i>46</i> , 7, 289, 2575-86.																																																																																																																																																						
<b>VARIABLES:</b> Temperature and composition.	<b>PREPARED BY:</b> J. Eysseltová																																																																																																																																																						
<b>EXPERIMENTAL VALUES:</b> Part 1. Solubility in the $\text{K}^+$ , $\text{Na}^+   \text{Cl}^-$ , $\text{H}_2\text{PO}_4^-$ - $\text{H}_2\text{O}$ system. <table border="1" data-bbox="329 531 1001 1212"> <thead> <tr> <th>soln. no.</th> <th><math>\text{K}^+</math> eq%</th> <th><math>\text{H}^+</math> eq%</th> <th><math>\text{Cl}^-</math> eq%</th> <th><math>\text{H}_2\text{O}</math> concn. <sup>a</sup></th> <th>solid phases <sup>b</sup></th> </tr> </thead> <tbody> <tr><td colspan="6" style="text-align: center;">temp. = 0°C</td></tr> <tr><td>1</td><td>17.65</td><td>14.31</td><td>78.58</td><td>682.5</td><td>A + B + C</td></tr> <tr><td>2</td><td>10.40</td><td>25.25</td><td>62.16</td><td>598.7</td><td>B + C + D</td></tr> <tr><td>3</td><td>18.93</td><td>8.77</td><td>86.80</td><td>731.1</td><td>A + B</td></tr> <tr><td>4</td><td>19.08</td><td>7.96</td><td>88.08</td><td>738.4</td><td>"</td></tr> <tr><td>5</td><td>67.33</td><td>11.73</td><td>82.36</td><td>1132</td><td>A + C</td></tr> <tr><td>6</td><td>52.28</td><td>12.46</td><td>81.31</td><td>1016</td><td>"</td></tr> <tr><td>7</td><td>35.16</td><td>12.95</td><td>80.64</td><td>876.7</td><td>"</td></tr> <tr><td>8</td><td>9.59</td><td>30.36</td><td>54.47</td><td>589.1</td><td>C + D</td></tr> <tr><td>9</td><td>8.76</td><td>38.93</td><td>41.57</td><td>555.8</td><td>"</td></tr> <tr><td>10</td><td>7.07</td><td>49.68</td><td>25.43</td><td>492.3</td><td>"</td></tr> <tr><td>11</td><td>5.51</td><td>24.28</td><td>63.52</td><td>627.6</td><td>B + D</td></tr> <tr><td>12</td><td>14.92</td><td>17.23</td><td>74.21</td><td>660.4</td><td>B + C</td></tr> <tr><td>13</td><td>11.38</td><td>22.80</td><td>65.80</td><td>618.5</td><td>"</td></tr> <tr><td>14</td><td>75.45</td><td>6.89</td><td>88.68</td><td>1241</td><td>A</td></tr> <tr><td>15</td><td>7.54</td><td>15.04</td><td>77.42</td><td>719.8</td><td>B</td></tr> <tr><td>16</td><td>50.20</td><td>44.64</td><td>33.05</td><td>1807</td><td>C</td></tr> <tr><td>17</td><td>49.60</td><td>44.76</td><td>32.96</td><td>1797</td><td>"</td></tr> <tr><td>18</td><td>60.52</td><td>29.38</td><td>56.00</td><td>1628</td><td>"</td></tr> <tr><td>19</td><td>44.64</td><td>36.48</td><td>46.85</td><td>1467</td><td>"</td></tr> <tr><td>20</td><td>29.13</td><td>58.27</td><td>12.60</td><td>1396</td><td>"</td></tr> <tr><td>21</td><td>58.45</td><td>20.36</td><td>69.47</td><td>1322</td><td>"</td></tr> <tr><td>22</td><td>26.01</td><td>52.02</td><td>21.97</td><td>1183</td><td>"</td></tr> <tr><td>23</td><td>22.73</td><td>45.45</td><td>31.82</td><td>1028</td><td>" (continued next page)</td></tr> </tbody> </table>		soln. no.	$\text{K}^+$ eq%	$\text{H}^+$ eq%	$\text{Cl}^-$ eq%	$\text{H}_2\text{O}$ concn. <sup>a</sup>	solid phases <sup>b</sup>	temp. = 0°C						1	17.65	14.31	78.58	682.5	A + B + C	2	10.40	25.25	62.16	598.7	B + C + D	3	18.93	8.77	86.80	731.1	A + B	4	19.08	7.96	88.08	738.4	"	5	67.33	11.73	82.36	1132	A + C	6	52.28	12.46	81.31	1016	"	7	35.16	12.95	80.64	876.7	"	8	9.59	30.36	54.47	589.1	C + D	9	8.76	38.93	41.57	555.8	"	10	7.07	49.68	25.43	492.3	"	11	5.51	24.28	63.52	627.6	B + D	12	14.92	17.23	74.21	660.4	B + C	13	11.38	22.80	65.80	618.5	"	14	75.45	6.89	88.68	1241	A	15	7.54	15.04	77.42	719.8	B	16	50.20	44.64	33.05	1807	C	17	49.60	44.76	32.96	1797	"	18	60.52	29.38	56.00	1628	"	19	44.64	36.48	46.85	1467	"	20	29.13	58.27	12.60	1396	"	21	58.45	20.36	69.47	1322	"	22	26.01	52.02	21.97	1183	"	23	22.73	45.45	31.82	1028	" (continued next page)
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<b>METHOD/APPARATUS/PROCEDURE:</b> Nothing is stated, but it probably is the same as in ref. (1).	<b>SOURCE AND PURITY OF MATERIALS:</b> Nothing is stated, but it probably is the same as in ref. (1).  <b>ESTIMATED ERROR:</b> No information is given.  <b>REFERENCES:</b> 1. Brunisholz, G.; Bodmer, M. <i>Helv. Chim. Acta</i> <u>1963</u> , <i>46</i> , 288, 2566-74.																																																																																																																																																						

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## EXPERIMENTAL VALUES cont'd:

Part 1. Solubility in the  $\text{K}^+$ ,  $\text{Na}^+ || \text{Cl}^- | \text{H}_2\text{PO}_4^- - \text{H}_2\text{O}$  system.

soln. no.	$\text{K}^+$ eq%	$\text{H}^+$ eq%	$\text{Cl}^-$ eq%	$\text{H}_2\text{O}$ concn. <sup>a</sup>	solid phases <sup>a</sup>
temp. = 0°C					
24	32.71	19.59	70.64	957.9	C
25	19.41	38.81	41.78	898.7	"
26	13.54	51.95	22.06	747.5	"
27	15.15	30.32	54.53	744.2	"
28	19.08	17.44	73.43	730.6	"
29	3.73	38.51	42.49	598.9	D
temp. = 25°C					
30	24.60	16.74	74.89	606.1	A + B + C
31	6.38	51.88	22.23	303.6	B + C + D
32	28.23	3.83	94.26	725.3	A + B
33	27.31	7.19	89.20	695.2	"
34	26.56	9.65	85.45	673.3	"
35	25.35	14.52	78.25	627.5	"
36	75.84	12.85	80.73	926.9	A + C
37	69.29	13.28	80.06	889.8	"
38	50.79	13.76	79.30	800.4	"
39	35.16	15.12	77.42	696.8	"
40	5.57	58.93	11.62	258.7	C + D
41	1.48	48.48	27.67	366.2	B + D
42	14.45	28.90	56.65	523.5	B + C
43	10.39	38.49	42.47	443.1	"
44	6.33	51.79	22.57	308.0	"
45	71.18	5.34	92.02	1002	A
46	58.43	6.82	89.82	896.0	"
47	39.70	7.00	89.55	791.0	"
48	4.31	8.61	87.08	794.0	B
49	10.27	20.55	69.18	638.5	"
50	5.07	40.42	39.41	443.4	"
51	57.90	34.84	47.68	1149	C
52	57.29	24.78	62.81	1015	"
53	45.76	34.22	48.71	987.7	"
54	35.72	42.47	36.46	913.9	"
55	29.73	59.45	10.82	881.5	"
56	33.80	31.30	53.20	823.1	"
57	39.91	21.71	67.44	806.1	"
58	26.63	52.67	21.00	786.4	"
59	23.27	46.55	30.18	713.0	"
60	19.87	39.75	40.48	639.4	"
61	16.28	32.57	51.15	564.3	"
62	12.17	51.63	22.43	466.5	"
63	6.39	59.08	11.62	283.7	"
64	2.76	56.71	14.89	296.5	D
temp. = 50°C					
65	29.62	21.36	68.07	518.5	A + B + C
66	5.01	64.08	3.86	131.9	B + C + E
67	37.76	0	100	702.8	A + B
68	33.65	9.72	85.34	621.1	"
69	19.84	32.95	50.70	444.0	B + C
70	12.81	45.67	31.63	336.0	"
71	6.15	62.03	7.00	162.0	"
72	5.10	64.00	3.89	133.2	"

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COMPONENTS:		ORIGINAL MEASUREMENTS:							
(1) Sodium dihydrogenphosphate; $\text{NaH}_2\text{PO}_4$ ; [7558-80-7]		Brunishloz, G.; Bodmer, M.							
(2) Potassium dihydrogenphosphate; $\text{KH}_2\text{PO}_4$ ; [7778-70-0]		Helv. Chim. Acta 1963, 46, 7, 289, 2575-86.							
(3) Sodium chloride; $\text{NaCl}$ ; [7647-14-5]									
(4) Potassium chloride; $\text{KCl}$ ; [7747-40-7]									
(5) Water; $\text{H}_2\text{O}$ ; [7732-18-5]									
EXPERIMENTAL VALUES cont'd:									
Part 1. Solubility in the $\text{K}^+$ , $\text{Na}^+$   $\text{Cl}^-$ , $\text{H}_2\text{PO}_4^-$ - $\text{H}_2\text{O}$ system.									
soln. no.	$\text{K}^+$ eq%	$\text{H}^+$ eq%	$\text{Cl}^-$ eq%	$\text{H}_2\text{O}$ concn. <sup>a</sup>	solid phases <sup>b</sup>				
temp. = 75°C									
73	31.14	29.73	55.47	402.2	A + B + C				
74	6.77	64.85	2.88	102.8	B + C + E				
75	39.70	10.85	83.70	556.5	A + B				
76	69.77	20.51	69.24	613.0	A + C				
77	54.56	23.08	65.46	534.6	"				
78	25.72	36.04	46.04	365.3	B + C				
79	21.08	42.16	36.76	317.9	"				
80	14.97	51.89	22.09	237.0	"				
81	9.74	61.15	8.15	149.8	"				
82	6.80	64.60	3.02	102.5	"				
83	61.31	10.06	84.90	649.7	A				
84	10.00	20.00	70.00	603.8	B				
85	15.63	31.26	53.11	457.8	"				
86	59.39	36.58	45.34	622.9	C				
87	38.70	46.08	30.90	503.7	"				
88	30.24	60.49	9.27	393.6	"				
89	28.42	56.84	14.74	381.9	"				
temp. = 100°C									
90	27.84	43.16	35.40	256.6	A + B + C				
91	8.47	65.27	2.10	71.6	B + C + E				
92	50.41	0	100	594.2	A + B				
93	44.56	11.88	82.22	418.6	"				
94	35.98	27.85	58.34	375.8	"				
95	24.04	48.08	27.88	223.5	B + C				
96	20.20	52.93	20.56	191.7	"				
97	15.15	59.27	10.85	138.1	"				
98	12.65	61.99	6.89	115.5	"				
99	12.10	62.73	5.74	105.6	"				
100	9.29	64.91	2.39	76.1	"				
101	8.70	65.11	2.30	74.4	"				
<sup>a</sup> The concentration units are: mol/100 eq% of solute.									
<sup>b</sup> The solid phases are: A = $\text{KCl}$ ; B = $\text{NaCl}$ ; C = $\text{KH}_2\text{PO}_4$ ; D = $\text{NaH}_2\text{PO}_4 \cdot 2\text{H}_2\text{O}$ ; E = $\text{NaH}_2\text{PO}_4$ .									
Part 2. The compiler has calculated the following results from the data in Part 1.									
soln. no.	$\text{K}^+$		$\text{Na}^+$		$\text{Cl}^-$		$\text{H}_2\text{PO}_4^-$		$\text{H}_2\text{O}$
	mass%	mol/kg	mass%	mol/kg	mass%	mol/kg	mass%	mol/kg	mass%
temp. = 0°C									
1	3.83	1.44	8.68	5.53	15.46	6.38	3.84	0.58	68.18
2	2.53	0.96	9.19	5.97	13.70	5.75	7.60	1.17	66.98
3	3.88	1.44	8.72	5.49	16.14	6.58	2.23	0.33	69.02
4	3.88	1.44	8.73	5.49	16.25	6.61	2.00	0.30	69.14
5	9.78	3.30	1.78	1.03	10.82	4.03	2.11	0.29	75.52
6	8.30	2.86	3.29	1.93	11.70	4.43	2.45	0.34	74.25
7	6.30	2.23	5.46	3.29	13.10	5.10	2.87	0.41	72.28
8	2.38	0.90	8.76	5.66	12.25	5.12	9.33	1.43	67.27
9	2.30	0.88	8.06	5.23	9.88	4.14	12.67	1.95	67.09
10	2.06	0.80	7.40	4.88	6.71	2.86	17.93	2.80	65.91
11	1.30	0.49	9.75	6.22	13.60	5.61	7.12	1.08	68.22
12	3.33	1.26	8.92	5.71	15.04	6.23	4.78	0.72	67.94
13	2.69	1.02	9.15	5.91	14.11	5.90	6.69	1.02	67.35
14	10.10	3.34	1.39	0.79	10.77	3.96	1.25	0.17	76.49
15	1.59	0.58	9.62	5.98	14.83	5.96	3.94	0.58	70.01

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## COMPONENTS:

- (1) Sodium dihydrogenphosphate:  $\text{NaH}_2\text{PO}_4$ ; [7558-80-7]  
 (2) Potassium dihydrogenphosphate;  $\text{KH}_2\text{PO}_4$ ; [7778-70-0]  
 (3) Sodium chloride;  $\text{NaCl}$ ; [7647-14-5]  
 (4) Potassium chloride;  $\text{KCl}$ ; [7747-40-7]  
 (5) Water:  $\text{H}_2\text{O}$ ; [7732-18-5]

## ORIGINAL MEASUREMENTS:

Brunishloz, G.; Bodmer, M.  
*Helv. Chim. Acta* 1963, *46*, 7, 289, 2575-86.

## EXPERIMENTAL VALUES cont'd:

Part 2. The compiler has calculated the following results from the data in Part 1.

soln. no.	$\text{K}^+$		$\text{Na}^+$		$\text{Cl}^-$		$\text{H}_2\text{PO}_4^-$		$\text{H}_2\text{O}$
	mass%	mol/kg	mass%	mol/kg	mass%	mol/kg	mass%	mol/kg	mass%
temp. = 0°C									
16	5.17	1.54	0.31	0.16	3.09	1.01	5.70	0.67	85.72
17	5.14	1.53	0.34	0.17	3.10	1.02	5.74	0.69	85.68
18	6.70	2.06	0.66	0.34	5.62	1.91	4.03	0.50	82.99
19	5.46	1.69	1.36	0.71	5.20	1.77	5.38	0.67	82.61
20	3.82	1.16	0.97	0.50	1.50	0.50	9.47	1.16	84.24
21	7.61	2.46	1.62	0.89	8.20	2.91	3.29	0.43	79.27
22	3.89	1.22	1.93	1.03	2.98	1.03	9.66	1.22	81.53
23	3.79	1.23	3.12	1.72	4.81	1.72	9.40	1.23	78.88
24	5.54	1.90	4.75	2.77	10.86	4.09	4.11	0.57	74.73
25	3.57	1.20	4.52	2.58	6.97	2.58	8.85	1.20	76.09
26	2.93	1.01	4.39	2.56	4.33	1.64	13.94	1.93	74.42
27	3.18	1.13	6.72	4.07	10.37	4.06	7.88	1.13	71.84
28	3.96	1.45	7.72	4.80	13.84	5.57	4.57	0.67	69.91
29	0.93	0.35	8.50	5.36	9.64	3.93	11.90	1.78	69.02
temp. = 25°C									
30	5.76	2.25	8.08	5.38	15.91	6.85	4.86	0.77	65.38
31	2.50	1.17	9.62	7.64	7.90	4.06	25.20	4.74	54.77
32	5.73	2.16	8.11	5.20	17.36	7.20	0.96	0.15	67.82
33	5.74	2.18	8.10	5.23	17.00	7.11	1.88	0.29	67.28
34	5.73	2.19	8.09	5.26	16.72	7.03	2.60	0.40	66.87
35	5.78	2.24	8.06	5.32	16.18	6.91	4.10	0.64	65.87
36	12.68	4.54	1.11	0.68	12.24	4.83	2.66	0.38	71.31
37	11.98	4.33	1.77	1.09	12.56	4.98	2.85	0.41	70.84
38	9.60	3.52	3.94	2.46	13.59	5.49	3.24	0.48	69.64
39	7.42	2.80	6.17	3.96	14.81	6.16	3.94	0.60	67.67
40	2.43	1.20	9.11	7.62	4.60	2.49	31.89	6.33	51.97
41	0.52	0.22	10.35	7.59	8.82	4.19	21.03	3.66	59.28
42	3.84	1.53	8.86	6.01	13.66	6.00	9.53	1.53	64.10
43	3.14	1.30	9.09	6.41	11.65	5.31	14.39	2.40	61.72
44	2.46	1.14	9.58	7.56	7.96	4.06	24.49	4.66	55.11
45	11.19	3.95	2.17	1.30	13.11	5.09	1.04	0.15	72.49
46	10.05	3.62	3.52	2.15	14.01	5.55	1.45	0.21	70.97
47	7.56	2.79	5.97	3.74	15.47	6.27	1.64	0.24	69.36
48	0.84	0.30	10.03	6.09	15.46	6.08	2.09	0.30	71.57
49	2.37	0.89	9.39	6.02	14.48	6.00	5.88	0.89	67.88
50	1.55	0.64	9.80	6.83	10.93	4.92	15.32	2.53	62.41
51	8.54	2.80	0.63	0.35	6.38	2.30	6.38	0.84	78.06
52	9.20	3.14	1.69	0.98	9.14	3.43	4.94	0.68	75.02
53	7.64	2.57	1.96	1.13	7.38	2.73	7.08	0.96	75.93
54	6.44	2.17	2.31	1.32	5.96	2.21	9.47	1.29	75.82
55	5.66	1.87	1.21	0.68	1.87	0.68	14.03	1.87	77.22
56	6.50	2.28	3.94	2.36	9.27	3.58	7.44	1.05	72.84
57	7.65	2.75	4.33	2.64	11.72	4.64	5.16	0.75	71.14
58	5.49	1.88	2.51	1.46	3.92	1.48	13.46	1.86	74.61
59	5.12	1.81	3.91	2.35	6.02	2.34	12.71	1.81	72.24
60	4.69	1.73	5.60	3.51	8.66	3.51	11.61	1.72	69.44
61	4.14	1.60	7.65	5.04	11.80	5.02	10.28	1.60	66.11
62	3.66	1.45	6.40	4.31	6.11	2.66	19.28	3.08	64.55
63	2.65	1.25	8.43	6.77	4.37	2.27	30.34	5.77	54.21
64	1.12	0.52	9.65	7.59	5.47	2.78	28.50	5.32	55.27
temp = 50°C									
65	7.69	3.17	7.48	5.25	16.02	7.28	6.85	1.14	61.96
66	3.00	2.11	10.89	13.02	2.10	1.62	47.63	13.50	36.38
67	7.73	2.98	7.49	4.92	18.56	7.88	0	0	66.22
68	7.61	3.01	7.53	5.06	17.49	7.61	2.74	0.44	64.63
69	5.86	2.48	8.19	5.91	13.57	6.33	12.04	2.06	60.34

(continued next page)

COMPONENTS:	ORIGINAL MEASUREMENTS:
(1) Sodium dihydrogenphosphate; $\text{NaH}_2\text{PO}_4$ ; [7558-80-7]	Brunishloz, G.; Bodmer, M.
(2) Potassium dihydrogenphosphate; $\text{KH}_2\text{PO}_4$ ; [7778-70-0]	<i>Helv. Chim. Acta</i> 1963, 46, 7, 289, 2575-86.
(3) Sodium chloride; $\text{NaCl}$ ; [7647-14-5]	
(4) Potassium chloride; $\text{KCl}$ ; [7747-40-7]	
(5) Water; $\text{H}_2\text{O}$ ; [7732-18-5]	

## EXPERIMENTAL VALUES cont'd:

Part 2. The compiler has calculated the following results from the data in Part 1.

soln. no.	$\text{K}^+$		$\text{Na}^+$		$\text{Cl}^-$		$\text{H}_2\text{PO}_4^-$		$\text{H}_2\text{O}$
	mass%	mol/kg	mass%	mol/kg	mass%	mol/kg	mass%	mol/kg	mass%
temp. = 50°C									
70	4.62	2.12	8.81	6.86	10.35	5.22	20.40	3.77	55.82
71	3.37	2.11	10.24	10.91	3.47	2.39	42.10	10.63	40.82
72	3.04	2.13	10.84	12.89	2.10	1.62	47.42	13.36	36.59
temp. = 75°C									
73	9.54	4.30	7.05	5.40	15.41	7.64	11.28	2.05	56.72
74	4.40	3.66	10.86	15.34	1.70	1.55	52.25	17.50	30.78
75	9.58	3.96	7.02	4.94	18.32	8.33	3.25	0.54	61.83
76	15.65	6.32	1.28	0.88	14.08	6.26	5.70	0.93	63.29
77	13.58	5.67	3.27	2.32	14.78	6.79	7.11	1.20	61.26
78	8.50	3.91	7.43	5.82	13.79	6.98	14.74	2.74	55.55
79	7.67	3.68	7.87	6.42	12.14	6.41	19.04	3.68	53.28
80	6.56	3.51	8.54	7.77	8.78	5.16	28.25	6.09	47.85
81	5.44	3.61	9.55	10.80	4.12	3.01	42.39	11.35	38.49
82	4.42	3.68	10.95	15.50	1.78	1.63	52.16	17.52	30.69
83	13.14	5.24	3.61	2.45	16.50	7.24	2.68	0.43	64.09
84	2.40	0.92	9.86	6.44	15.21	6.42	5.94	0.92	66.59
85	4.54	1.90	9.06	6.44	13.98	6.43	11.25	1.90	61.17
86	13.66	5.30	0.54	0.36	9.46	4.03	10.39	1.63	65.95
87	10.61	4.27	2.45	1.68	7.68	3.40	15.67	2.54	63.58
88	10.07	4.27	1.81	1.31	2.80	1.30	24.98	4.27	60.33
89	9.58	4.13	2.92	2.14	4.50	2.14	23.76	4.13	59.24
temp. = 100°C									
90	11.20	6.03	6.86	6.28	12.92	7.64	21.49	4.66	47.53
91	6.06	6.57	11.05	20.38	1.36	1.62	57.94	25.32	23.59
92	11.36	4.71	6.57	4.64	20.43	9.32	0	0	61.64
93	12.65	5.91	7.27	5.78	21.17	10.88	4.18	0.79	54.72
94	11.33	5.32	6.70	5.35	16.66	8.60	10.85	2.05	54.47
95	10.53	5.98	7.18	6.93	11.08	6.91	26.13	5.98	45.08
96	9.68	5.85	7.57	7.79	8.94	5.94	31.49	7.67	42.31
97	8.54	6.09	8.48	10.29	5.55	4.35	41.57	11.95	35.85
98	7.71	6.08	9.09	12.20	3.81	3.30	46.96	14.93	32.42
99	7.63	6.36	9.33	13.24	3.28	3.01	49.13	16.53	30.64
100	6.52	6.78	10.66	18.83	1.52	1.74	56.69	23.75	24.60
101	6.16	6.50	10.90	19.56	1.48	1.71	57.21	24.32	24.25

Part 3. The points of simultaneous crystallization of  $\text{NaCl} + \text{KH}_2\text{PO}_4 + \text{NaH}_2\text{PO}_4 \cdot x\text{H}_2\text{O}$ .

soln. no.	$t/^\circ\text{C}$	eq% $\text{K}^+$	eq% $\text{H}^+$	eq% $\text{Cl}^-$	conc $\text{H}_2\text{O}^a$	x
102	0	10.40	25.25	62.16	598.7	2
103	12.5	8.52	36.77	44.93	475.0	2
104	25	6.38	51.88	22.23	303.6	2
105	30	5.47	57.33	14.00	239.0	2
106	35	4.98	61.16	8.33	186.3	2
107	40	4.85	62.60	5.99	163.1	1
108	45	5.00	63.59	4.75	145.7	1
109	50	5.01	64.08	3.86	131.9	0
110	75	6.77	64.85	2.88	102.8	0
111	100	8.47	65.27	2.10	71.6	0
112	36.0	4.90	61.86	7.20	177.5	2+1 <sup>b</sup>
113	48.2	4.90	64.06	3.91	133.9	1+0 <sup>c</sup>

<sup>a</sup>The concentration unit is mol/100 eq% of solute.<sup>b</sup>An invariant point, the solid phases being  $\text{NaCl} + \text{KH}_2\text{PO}_4 + \text{NaH}_2\text{PO}_4 \cdot 2\text{H}_2\text{O} + \text{NaH}_2\text{PO}_4 \cdot \text{H}_2\text{O}$ .<sup>c</sup>An invariant point, the solid phases being  $\text{NaCl} + \text{KH}_2\text{PO}_4 + \text{NaH}_2\text{PO}_4 \cdot 2\text{H}_2\text{O} + \text{NaH}_2\text{PO}_4$ .

<p>COMPONENTS:</p> <p>(1) Sodium dihydrogenphosphate; <math>\text{NaH}_2\text{PO}_4</math>; [7558-80-7]</p> <p>(2) Potassium dihydrogenphosphate; <math>\text{KH}_2\text{PO}_4</math>; [7778-70-0]</p> <p>(3) Sodium chloride; <math>\text{NaCl}</math>; [7647-14-5]</p> <p>(4) Potassium chloride; <math>\text{KCl}</math>; [7747-40-7]</p> <p>(5) Water; <math>\text{H}_2\text{O}</math>; [7732-18-5]</p>	<p>ORIGINAL MEASUREMENTS:</p> <p>Brunishloz, G.; Bodmer, M.  <i>Helv. Chim. Acta</i> <u>1963</u>, 46, 7, 289, 2575-86.</p>
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## EXPERIMENTAL VALUES cont'd:

Part 4. The compiler has calculated the following values from the data in Part 3.

soln. no.	$\text{K}^+$		$\text{Na}^+$		$\text{Cl}^-$		$\text{H}_2\text{PO}_4^-$		$\text{H}_2\text{O}$
	mass%	mol/kg	mass%	mol/kg	mass%	mol/kg	mass%	mol/kg	mass%
102	2.55	0.96	9.19	5.97	13.70	5.75	7.60	1.17	66.98
103	2.46	1.00	9.31	6.40	11.79	5.24	13.18	2.15	63.26
104	2.50	1.17	9.62	7.64	7.90	4.06	25.20	4.74	54.77
105	2.47	1.27	9.89	8.65	5.74	3.25	32.15	6.66	49.74
106	2.57	1.49	10.26	10.10	3.89	2.48	39.07	9.11	44.20
107	2.66	1.65	10.50	11.09	2.98	2.04	42.66	10.67	41.20
108	2.88	1.91	10.64	11.98	2.48	1.81	45.37	12.11	38.63
109	3.00	2.11	10.89	13.02	2.10	1.62	47.63	13.50	36.38
110	4.40	3.66	10.86	15.34	1.70	1.55	52.25	17.50	30.78
111	6.06	6.57	11.05	20.38	1.36	1.62	57.94	25.32	23.59
112	2.59	1.53	10.32	10.40	3.45	2.25	40.51	9.68	43.14
113	2.92	2.03	10.88	12.88	2.11	1.62	47.35	13.29	36.74

<b>COMPONENTS:</b> (1) Sodium dihydrogenphosphate; $\text{NaH}_2\text{PO}_4$ ; [7558-80-7] (2) Ammonium dihydrogenphosphate; $\text{NH}_4\text{H}_2\text{PO}_4$ ; [7722-76-1] (3) Diammonium hydrogenphosphate; $(\text{NH}_4)_2\text{HPO}_4$ ; [7783-28-0] (4) Water; $\text{H}_2\text{O}$ ; [7732-18-5]	<b>ORIGINAL MEASUREMENTS:</b> Babenko, A.M.; Vorob'eva, T.A. <i>Zh. Prikl. Khim.</i> <u>1976</u> , 49, 1502-6.																																																																																																																																																														
<b>VARIABLES:</b> Temperature and concentration of $\text{NaH}_2\text{PO}_4$ in a mixture containing a mol ratio of $\frac{\text{NH}_4\text{H}_2\text{PO}_4}{(\text{NH}_4)_2\text{HPO}_4} = 1$ .	<b>PREPARED BY:</b> J. Eysseľtová																																																																																																																																																														
<b>EXPERIMENTAL VALUES:</b> Part 1. Points of simultaneous crystallization of two or three solid phases in the $\text{NH}_4\text{H}_2\text{PO}_4$ - $(\text{NH}_4)_2\text{HPO}_4$ - $\text{NaH}_2\text{PO}_4$ - $\text{H}_2\text{O}$ system. <table border="1" data-bbox="246 572 1166 1124"> <thead> <tr> <th colspan="2">mixture<sup>a</sup></th> <th><math>\text{NH}_4\text{H}_2\text{PO}_4</math></th> <th><math>(\text{NH}_4)_2\text{HPO}_4</math></th> <th colspan="2"><math>\text{NaH}_2\text{PO}_4</math></th> <th rowspan="2"><math>t/^\circ\text{C}</math></th> <th rowspan="2">solid phases<sup>c</sup></th> </tr> <tr> <th>mass%</th> <th>mol/kg<sup>b</sup></th> <th>mass%<sup>b</sup></th> <th>mass%<sup>b</sup></th> <th>mass%</th> <th>mol/kg<sup>b</sup></th> </tr> </thead> <tbody> <tr><td>38.6</td><td>2.54</td><td>17.97</td><td>20.63</td><td>0.00</td><td>0.00</td><td>-8.6</td><td>A + C</td></tr> <tr><td>32.0</td><td>2.11</td><td>14.90</td><td>17.10</td><td>6.8</td><td>0.92</td><td>-8.4</td><td>A + C</td></tr> <tr><td>20.4</td><td>1.29</td><td>9.50</td><td>10.90</td><td>15.92</td><td>2.08</td><td>-8.4</td><td>A + C</td></tr> <tr><td>9.8</td><td>0.63</td><td>4.56</td><td>5.24</td><td>27.06</td><td>3.57</td><td>-9.4</td><td>A + C</td></tr> <tr><td>21.25</td><td>1.35</td><td>9.89</td><td>11.36</td><td>15.0</td><td>1.96</td><td>-8.0</td><td>A + C</td></tr> <tr><td>16.0</td><td>1.01</td><td>7.45</td><td>8.55</td><td>20.0</td><td>2.60</td><td>-9.0</td><td>A + C</td></tr> <tr><td>6.8</td><td>0.45</td><td>3.16</td><td>3.63</td><td>32.0</td><td>4.36</td><td>-11.0</td><td>A + C</td></tr> <tr><td>6.0</td><td>0.43</td><td>2.79</td><td>3.21</td><td>37.6</td><td>5.55</td><td>+0.5</td><td>A + B + C</td></tr> <tr><td>0.0</td><td>0.00</td><td>0.0</td><td>0.0</td><td>33.5</td><td>4.20</td><td>-8.8</td><td>A + B</td></tr> <tr><td>2.4</td><td>0.17</td><td>1.12</td><td>1.28</td><td>40.0</td><td>5.79</td><td>-12.0</td><td>A + B</td></tr> <tr><td>8.0</td><td>0.64</td><td>3.72</td><td>4.28</td><td>41.4</td><td>6.82</td><td>19.2</td><td>B + C</td></tr> <tr><td>8.0</td><td>0.70</td><td>3.72</td><td>4.28</td><td>46.0</td><td>8.33</td><td>25.2</td><td>B + C</td></tr> <tr><td>9.8</td><td>0.96</td><td>4.56</td><td>5.24</td><td>48.708</td><td>9.78</td><td>35.0</td><td>B + C + D</td></tr> <tr><td>61.0</td><td>6.33</td><td>28.40</td><td>32.60</td><td>0.0</td><td>0.0</td><td>39.0</td><td>C + D</td></tr> <tr><td>56.0</td><td>5.72</td><td>26.07</td><td>29.93</td><td>4.4</td><td>0.92</td><td>45.6</td><td>C + D</td></tr> <tr><td>48.0</td><td>4.67</td><td>22.34</td><td>25.65</td><td>10.4</td><td>2.08</td><td>48.3</td><td>C + D</td></tr> <tr><td>36.0</td><td>3.25</td><td>16.76</td><td>19.24</td><td>19.2</td><td>3.57</td><td>44.6</td><td>C + D</td></tr> <tr><td>28.0</td><td>2.62</td><td>13.04</td><td>14.96</td><td>28.8</td><td>5.55</td><td>50.3</td><td>C + D</td></tr> </tbody> </table> <p style="text-align: right;">(continued next page)</p>		mixture <sup>a</sup>		$\text{NH}_4\text{H}_2\text{PO}_4$	$(\text{NH}_4)_2\text{HPO}_4$	$\text{NaH}_2\text{PO}_4$		$t/^\circ\text{C}$	solid phases <sup>c</sup>	mass%	mol/kg <sup>b</sup>	mass% <sup>b</sup>	mass% <sup>b</sup>	mass%	mol/kg <sup>b</sup>	38.6	2.54	17.97	20.63	0.00	0.00	-8.6	A + C	32.0	2.11	14.90	17.10	6.8	0.92	-8.4	A + C	20.4	1.29	9.50	10.90	15.92	2.08	-8.4	A + C	9.8	0.63	4.56	5.24	27.06	3.57	-9.4	A + C	21.25	1.35	9.89	11.36	15.0	1.96	-8.0	A + C	16.0	1.01	7.45	8.55	20.0	2.60	-9.0	A + C	6.8	0.45	3.16	3.63	32.0	4.36	-11.0	A + C	6.0	0.43	2.79	3.21	37.6	5.55	+0.5	A + B + C	0.0	0.00	0.0	0.0	33.5	4.20	-8.8	A + B	2.4	0.17	1.12	1.28	40.0	5.79	-12.0	A + B	8.0	0.64	3.72	4.28	41.4	6.82	19.2	B + C	8.0	0.70	3.72	4.28	46.0	8.33	25.2	B + C	9.8	0.96	4.56	5.24	48.708	9.78	35.0	B + C + D	61.0	6.33	28.40	32.60	0.0	0.0	39.0	C + D	56.0	5.72	26.07	29.93	4.4	0.92	45.6	C + D	48.0	4.67	22.34	25.65	10.4	2.08	48.3	C + D	36.0	3.25	16.76	19.24	19.2	3.57	44.6	C + D	28.0	2.62	13.04	14.96	28.8	5.55	50.3	C + D
mixture <sup>a</sup>		$\text{NH}_4\text{H}_2\text{PO}_4$	$(\text{NH}_4)_2\text{HPO}_4$	$\text{NaH}_2\text{PO}_4$		$t/^\circ\text{C}$	solid phases <sup>c</sup>																																																																																																																																																								
mass%	mol/kg <sup>b</sup>	mass% <sup>b</sup>	mass% <sup>b</sup>	mass%	mol/kg <sup>b</sup>																																																																																																																																																										
38.6	2.54	17.97	20.63	0.00	0.00	-8.6	A + C																																																																																																																																																								
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6.0	0.43	2.79	3.21	37.6	5.55	+0.5	A + B + C																																																																																																																																																								
0.0	0.00	0.0	0.0	33.5	4.20	-8.8	A + B																																																																																																																																																								
2.4	0.17	1.12	1.28	40.0	5.79	-12.0	A + B																																																																																																																																																								
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28.0	2.62	13.04	14.96	28.8	5.55	50.3	C + D																																																																																																																																																								
<b>AUXILIARY INFORMATION</b>																																																																																																																																																															
<b>METHOD/APPARATUS/PROCEDURE:</b> An improved polythermic method (1) was used.	<b>SOURCE AND PURITY OF MATERIALS:</b> Reagent grade salts were recrystallized and dried before use. The ammonium salts were dried at 40-50°C. The sodium salt was dried at 105°C. The material designated "mixture" was prepared by mixing equimolar amounts of $\text{NH}_4\text{H}_2\text{PO}_4$ and $(\text{NH}_4)_2\text{HPO}_4$ and homogenizing them by grinding in a mortar.  <b>ESTIMATED ERROR:</b> No information is given.  <b>REFERENCES:</b> 1. Erajzer, L.N.; Kaganskii, I.M., <i>Zavod. Lab.</i> 1967, 1, 119.																																																																																																																																																														

COMPONENTS:	ORIGINAL MEASUREMENTS:
(1) Sodium dihydrogenphosphate; $\text{NaH}_2\text{PO}_4$ ; [7558-80-7]	Babenko, A.M.; Vorob'eva, T.A.
(2) Ammonium dihydrogenphosphate; $\text{NH}_4\text{H}_2\text{PO}_4$ ; [7722-76-1]	<i>Zh. Prikl. Khim.</i> 1976, 49, 1502-6.
(3) Diammonium hydrogenphosphate; $(\text{NH}_4)_2\text{HPO}_4$ ; [7783-28-0]	
(4) Water; $\text{H}_2\text{O}$ ; [7732-18-5]	

## EXPERIMENTAL VALUES cont'd:

Part 1. Points of simultaneous crystallization of two or three solid phases in the  $\text{NH}_4\text{H}_2\text{PO}_4$ - $(\text{NH}_4)_2\text{HPO}_4$ - $\text{NaH}_2\text{PO}_4$ - $\text{H}_2\text{O}$  system.

mixture <sup>a</sup>		$\text{NH}_4\text{H}_2\text{PO}_4$	$(\text{NH}_4)_2\text{HPO}_4$	$\text{NaH}_2\text{PO}_4$		$t/^\circ\text{C}$	solid phases <sup>c</sup>
mass%	mol/kg <sup>b</sup>	mass% <sup>b</sup>	mass% <sup>b</sup>	mass%	mol/kg <sup>b</sup>		
24.0	2.27	11.17	12.83	33.2	6.46	56.0	C + D
20.0	2.02	9.31	10.69	40.0	8.33	55.0	C + D
20.0	2.20	9.31	10.69	43.2	9.78	67.0	C + D
0.0	0.0	0.0	0.0	56.0	10.60	40.2	B + E
1.8	0.17	0.84	0.96	55.0	10.61	43.5	B + E
4.75	0.45	2.21	2.54	52.5	10.23	46.0	B + E
8.0	0.82	3.72	4.28	52.44	11.04	42.0	D + E
8.0	0.88	3.72	4.28	55.2	12.50	50.5	D + E
8.9	1.01	4.14	4.76	55.5	12.99	49	D + E + F
0.0	0.0	0.0	0.0	60.8	12.92	57.2	E + F
1.6	0.17	0.74	0.86	60.0	13.02	59.8	E + F
4.2	0.45	1.96	2.24	58.0	12.78	63.5	E + F
11.25	1.35	5.24	6.01	55.0	13.58	68.4	E + F

Part 2. Solubility isotherms in the  $\text{NH}_4\text{H}_2\text{PO}_4$ - $(\text{NH}_4)_2\text{HPO}_4$ - $\text{NaH}_2\text{PO}_4$ - $\text{H}_2\text{O}$  system.

mixture <sup>a</sup>		$\text{NH}_4\text{H}_2\text{PO}_4$	$(\text{NH}_4)_2\text{HPO}_4$	$\text{NaH}_2\text{PO}_4$		$\text{H}_2\text{O}$	$(\text{N} + \text{P}_2\text{O}_5)$
mass%	mol/kg <sup>b</sup>	mass% <sup>b</sup>	mass% <sup>b</sup>	mass%	mol/kg <sup>b</sup>	mass%	mass%
temp. = -5°C							
0.0	0.0	0.0	0.0	35.4	4.56	64.6	21.0
6.7	0.45	3.12	3.58	33.0	4.56	60.3	24.5
12.0	0.79	5.59	6.41	26.4	3.57	61.6	24.5
2.392	0.17	1.11	1.28	40.2	5.83	57.408	25.5
22.0	1.43	10.24	11.76	15.6	2.08	62.4	25.6
33.4	2.25	15.55	17.85	6.66	0.92	59.94	28.78
40.2	2.72	18.71	21.48	0.0	0.0	59.8	29.9
temp. = 0°C							
0.0	0.0	0.0	0.0	37.6	5.02	62.4	22.1
14.0	0.94	6.51	7.48	25.8	3.57	60.2	25.5
6.58	0.45	3.06	3.52	34.2	4.81	59.22	26.2
2.38	0.17	1.11	1.27	41.87	6.26	55.87	26.4
24.4	1.63	11.36	13.04	15.12	2.08	60.48	27.1
33.6	2.28	15.64	17.96	6.64	0.92	59.76	28.98
42.6	3.00	19.83	22.77	0.0	0.0	57.4	31.6
temp. = 10°C							
0.0	0.0	0.0	0.0	42.2	6.08	57.8	25.0
6.38	0.45	2.97	3.41	36.2	5.25	57.42	26.24
19.0	1.36	8.85	10.15	24.3	3.57	56.7	28.63
29.0	2.06	13.50	15.50	14.18	2.08	56.72	29.9
2.28	0.17	1.06	1.22	44.8	7.05	52.992	28.29
40.0	3.00	18.62	21.38	6.0	0.92	54.0	33.36
47.0	3.59	21.88	25.12	0.0	0.0	53.0	35.0

<sup>a</sup>"Mixture" is an equimolar mixture of  $\text{NH}_4\text{H}_2\text{PO}_4$  and  $(\text{NH}_4)_2\text{HPO}_4$ .

<sup>b</sup>These values were calculated by the compiler.

<sup>c</sup>The solid phases are: A = ice; B =  $\text{NaH}_2\text{PO}_4 \cdot 2\text{H}_2\text{O}$ ; C =  $\text{NH}_4\text{H}_2\text{PO}_4$ ; D =  $(\text{NH}_4)_2\text{HPO}_4$ ;  
E =  $\text{NaH}_2\text{PO}_4 \cdot \text{H}_2\text{O}$ ; F =  $\text{NaH}_2\text{PO}_4$ .



<b>COMPONENTS:</b> (1) Sodium dihydrogenphosphate; $\text{NaH}_2\text{PO}_4$ ; [7558-80-7] (2) Potassium dihydrogenphosphate; $\text{KH}_2\text{PO}_4$ ; [7778-77-0] (3) Sodium chloride, $\text{NaCl}$ ; [7647-14-5] (4) Potassium chloride; $\text{KCl}$ ; [7747-40-7] (5) Water; $\text{H}_2\text{O}$ ; [7732-18-5]	<b>ORIGINAL MEASUREMENTS:</b> Khalieva, Sh.D. Izv. Akad. Nauk Turkm. SSR, Ser. Fiz.-Tekh., Khim. Geol. Nauk <u>1977</u> , 3,125-8.																																																																																																																																																																	
<b>VARIABLES:</b> Composition at 40°C.	<b>PREPARED BY:</b> J. Eysseltová																																																																																																																																																																	
<b>EXPERIMENTAL VALUES:</b> Part 1. Solubility in the $\text{Na}^+$ , $\text{K}^+    \text{Cl}^-   \text{H}_2\text{PO}_4^- - \text{H}_2\text{O}$ system at 40°C. Jänecke's indices <sup>a</sup> <table border="1" data-bbox="308 582 1166 1175"> <thead> <tr> <th>soln. no.</th> <th><math>\text{Na}^+</math></th> <th><math>\text{K}^+</math></th> <th><math>\text{Cl}^-</math></th> <th><math>\text{H}_2\text{PO}_4^-</math></th> <th><math>\text{H}_2\text{O}</math></th> <th>solid phase<sup>b</sup></th> </tr> </thead> <tbody> <tr><td>1</td><td>64.75</td><td>35.25</td><td>100</td><td>-----</td><td>752.69</td><td>A + B</td></tr> <tr><td>2</td><td>64.85</td><td>35.15</td><td>96.20</td><td>3.80</td><td>725.80</td><td>"</td></tr> <tr><td>3</td><td>64.80</td><td>35.20</td><td>93.08</td><td>6.92</td><td>697.90</td><td>"</td></tr> <tr><td>4</td><td>65.06</td><td>34.94</td><td>90.78</td><td>9.22</td><td>696.95</td><td>"</td></tr> <tr><td>5</td><td>65.58</td><td>34.42</td><td>89.82</td><td>10.18</td><td>694.38</td><td>"</td></tr> <tr><td>6</td><td>66.30</td><td>33.70</td><td>88.93</td><td>11.07</td><td>680.58</td><td>"</td></tr> <tr><td>7</td><td>66.27</td><td>33.73</td><td>88.68</td><td>11.32</td><td>660.76</td><td>"</td></tr> <tr><td>8</td><td>68.31</td><td>31.69</td><td>87.57</td><td>12.43</td><td>657.31</td><td>"</td></tr> <tr><td>9</td><td>68.40</td><td>31.60</td><td>87.55</td><td>12.45</td><td>633.20</td><td>A + B + C</td></tr> <tr><td>10</td><td>-----</td><td>100</td><td>92.42</td><td>7.55</td><td>990.59</td><td>B + D</td></tr> <tr><td>11</td><td>16.72</td><td>83.28</td><td>91.84</td><td>8.16</td><td>860.17</td><td>"</td></tr> <tr><td>12</td><td>26.80</td><td>73.20</td><td>90.95</td><td>9.05</td><td>853.50</td><td>"</td></tr> <tr><td>13</td><td>43.45</td><td>56.55</td><td>89.83</td><td>10.17</td><td>766.98</td><td>"</td></tr> <tr><td>14</td><td>56.15</td><td>43.85</td><td>89.16</td><td>10.84</td><td>762.84</td><td>"</td></tr> <tr><td>15</td><td>63.94</td><td>36.05</td><td>88.19</td><td>11.81</td><td>716.00</td><td>"</td></tr> <tr><td>16</td><td>83.92</td><td>16.08</td><td>-----</td><td>100</td><td>449.24</td><td>C + D</td></tr> <tr><td>17</td><td>84.43</td><td>15.57</td><td>5.93</td><td>94.07</td><td>441.34</td><td>"</td></tr> <tr><td>18</td><td>84.01</td><td>15.99</td><td>15.52</td><td>84.48</td><td>394.02</td><td>"</td></tr> <tr><td>19</td><td>84.38</td><td>15.62</td><td>23.46</td><td>76.54</td><td>446.46</td><td>"</td></tr> <tr><td>20</td><td>83.87</td><td>16.13</td><td>30.41</td><td>69.59</td><td>484.40</td><td>"</td></tr> <tr><td>21</td><td>83.83</td><td>16.17</td><td>34.66</td><td>65.34</td><td>465.75</td><td>"</td></tr> <tr><td>22</td><td>83.62</td><td>16.38</td><td>43.12</td><td>56.88</td><td>595.07</td><td>"</td></tr> </tbody> </table> <p style="text-align: right;">(continued next page)</p>		soln. no.	$\text{Na}^+$	$\text{K}^+$	$\text{Cl}^-$	$\text{H}_2\text{PO}_4^-$	$\text{H}_2\text{O}$	solid phase <sup>b</sup>	1	64.75	35.25	100	-----	752.69	A + B	2	64.85	35.15	96.20	3.80	725.80	"	3	64.80	35.20	93.08	6.92	697.90	"	4	65.06	34.94	90.78	9.22	696.95	"	5	65.58	34.42	89.82	10.18	694.38	"	6	66.30	33.70	88.93	11.07	680.58	"	7	66.27	33.73	88.68	11.32	660.76	"	8	68.31	31.69	87.57	12.43	657.31	"	9	68.40	31.60	87.55	12.45	633.20	A + B + C	10	-----	100	92.42	7.55	990.59	B + D	11	16.72	83.28	91.84	8.16	860.17	"	12	26.80	73.20	90.95	9.05	853.50	"	13	43.45	56.55	89.83	10.17	766.98	"	14	56.15	43.85	89.16	10.84	762.84	"	15	63.94	36.05	88.19	11.81	716.00	"	16	83.92	16.08	-----	100	449.24	C + D	17	84.43	15.57	5.93	94.07	441.34	"	18	84.01	15.99	15.52	84.48	394.02	"	19	84.38	15.62	23.46	76.54	446.46	"	20	83.87	16.13	30.41	69.59	484.40	"	21	83.83	16.17	34.66	65.34	465.75	"	22	83.62	16.38	43.12	56.88	595.07	"
soln. no.	$\text{Na}^+$	$\text{K}^+$	$\text{Cl}^-$	$\text{H}_2\text{PO}_4^-$	$\text{H}_2\text{O}$	solid phase <sup>b</sup>																																																																																																																																																												
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<b>AUXILIARY INFORMATION</b>																																																																																																																																																																		
<b>METHOD/APPARATUS/PROCEDURE:</b> The standard isothermal method was used. The mixtures were stirred until the liquid phase had a constant composition. The chloride ion content was determined argentometrically, potassium was determined as potassium tetraphenylborate, phosphorus was determined by differential colorimetry on an FEK-56 apparatus, and sodium was determined by difference.	<b>SOURCE AND PURITY OF MATERIALS:</b> No information is given.																																																																																																																																																																	
	<b>ESTIMATED ERROR:</b> No information is given.																																																																																																																																																																	
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<b>COMPONENTS:</b> (1) Sodium dihydrogenphosphate; $\text{NaH}_2\text{PO}_4$ ; [7558-80-7] (2) Potassium dihydrogenphosphate; $\text{KH}_2\text{PO}_4$ ; [7778-77-0] (3) Sodium chloride; $\text{NaCl}$ ; [7647-14-5] (4) Potassium chloride; $\text{KCl}$ ; [7747-40-7] (5) Water; $\text{H}_2\text{O}$ ; [7732-18-5]	<b>ORIGINAL MEASUREMENTS:</b> Khallieva, Sh.D. Izv. Akad. Nauk Turkm. SSR, Ser. Fiz.-Tekh., Khim. Geol. Nauk 1977, 3, 125-8.
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## EXPERIMENTAL VALUES cont'd:

Part 1. Solubility in the  $\text{Na}^+$ ,  $\text{K}^+||\text{Cl}^-$ ,  $\text{H}_2\text{PO}_4^-$ - $\text{H}_2\text{O}$  system at 40°C.

soln. no.	Jänecke's indices <sup>a</sup>					solid <sub>b</sub> phase
	$\text{Na}^+$	$\text{K}^+$	$\text{Cl}^-$	$\text{H}_2\text{PO}_4^-$	$\text{H}_2\text{O}$	
23	83.28	16.72	47.78	52.22	578.00	C + D
24	82.42	17.58	56.32	43.68	629.80	"
25	80.03	19.97	69.54	30.48	624.76	"
26	74.85	25.15	79.28	20.72	640.42	"
27	70.02	29.98	83.72	16.28	662.04	"

<sup>a</sup>The units are: mol/100 mol of solute.

<sup>b</sup>The solid phases are: A =  $\text{NaCl}$ ; B =  $\text{KCl}$ ; C =  $\text{NaH}_2\text{PO}_4 \cdot \text{H}_2\text{O}$ ; D =  $\text{KH}_2\text{PO}_4$ .

Part 2. The compiler has calculated the following results from the data in Part 1.

soln. no.	$\text{Na}^+$		$\text{K}^+$		$\text{Cl}^-$		$\text{H}_2\text{PO}_4^-$		$\text{H}_2\text{O}$
	mass%	mol/kg	mass%	mol/kg	mass%	mol/kg	mass%	mol/kg	mass%
1	7.44	4.78	6.90	2.60	17.76	7.38	0.00	0.00	67.88
2	7.55	4.96	6.98	2.69	17.31	7.36	1.85	0.29	66.31
3	7.67	5.16	7.08	2.80	17.02	7.41	3.43	0.55	64.78
4	7.65	5.19	7.00	2.78	16.50	7.24	4.54	0.73	64.31
5	7.71	5.25	6.89	2.75	16.32	7.19	5.01	0.81	64.06
6	7.88	5.41	6.82	2.75	16.33	7.26	5.50	0.90	63.46
7	8.02	5.57	6.95	2.84	16.58	7.46	5.73	0.95	62.72
8	8.28	5.77	6.54	2.68	16.40	7.40	6.30	1.05	62.48
9	8.48	6.00	6.68	2.77	16.78	7.68	6.46	1.09	61.60
10	0.00	0.00	15.19	5.61	12.73	5.18	2.82	0.42	69.27
11	1.66	1.08	14.06	5.38	14.06	5.93	3.38	0.53	66.84
12	2.68	1.74	12.48	4.76	14.06	5.92	3.79	0.59	66.99
13	4.71	3.15	10.44	4.10	15.04	6.51	4.61	0.74	65.20
14	6.16	4.09	8.19	3.19	15.10	6.49	4.97	0.79	65.59
15	7.28	4.96	7.58	3.03	15.52	6.84	5.63	0.92	63.98
16	9.52	10.38	3.11	1.99	0.00	0.00	47.43	12.37	39.96
17	9.82	10.63	3.09	1.96	1.06	0.75	45.77	11.84	40.26
18	10.53	11.85	3.42	2.25	3.01	2.19	44.30	11.91	38.74
19	10.32	10.50	3.25	1.94	4.43	2.92	39.16	9.52	42.83
20	10.06	9.56	3.32	1.85	5.67	3.49	35.12	7.98	45.84
21	10.43	10.00	3.43	1.93	6.66	4.13	34.01	7.79	45.46
22	9.47	7.81	3.16	1.53	7.55	4.02	26.95	5.31	52.87
23	9.71	8.00	3.32	1.61	8.61	4.59	25.48	5.02	52.88
24	9.41	7.27	3.42	1.55	9.93	4.97	20.86	3.85	56.38
25	9.54	7.12	4.06	1.78	12.80	6.18	15.20	2.71	58.40
26	9.03	6.49	5.17	2.18	14.77	6.88	10.45	1.80	60.58
27	8.36	5.88	6.10	2.52	15.44	7.03	8.13	1.37	61.98

COMPONENTS:		ORIGINAL MEASUREMENTS:										
(1) Sodium dihydrogenphosphate; $\text{NaH}_2\text{PO}_4$ ; [7558-80-7] (2) Sodium chloride; $\text{NaCl}$ ; [7647-14-5] (3) Ammonium dihydrogenphosphate; $\text{NH}_4\text{H}_2\text{PO}_4$ ; [7722-76-1] (4) Ammonium chloride; $\text{NH}_4\text{Cl}$ ; [12125-02-9] (5) Water; $\text{H}_2\text{O}$ ; [7732-18-5]		Solov'ev, A.P.; Balashova, E.F.; Verendyakina, N.A.; Zjuzina, L.F. Resp. Sb. Nauch. Tr.-Varoslav. Gos. Pedagog, In.-t. 1978, 169, 79-84.										
VARIABLES:		PREPARED BY:										
Composition at 25°C.		J. Eysseltová										
EXPERIMENTAL VALUES:												
Solubility in the $\text{Na}^+, \text{NH}_4^+   \text{Cl}^-, \text{H}_2\text{PO}_4^- - \text{H}_2\text{O}$ system at 25°C.												
$\text{NaH}_2\text{PO}_4$		$\text{NaCl}$		$\text{NH}_4\text{H}_2\text{PO}_4$		$\text{NH}_4\text{Cl}$		$\text{Na}^+$		$\text{H}_2\text{PO}_4^-$		solid <sup>a</sup>
mass%	mol/kg <sup>b</sup>	mass%	mol/kg <sup>b</sup>	mass%	mol/kg <sup>b</sup>	mass%	mol/kg <sup>b</sup>	ion% <sup>c</sup>	ion% <sup>c</sup>			phase <sup>a</sup>
25.01	3.48	15.13	4.33	----	----	----	----	100.0	44.63			A + B
24.74	3.63	13.97	4.21	4.55	0.70	----	----	91.75	50.72			"
23.26	3.51	12.90	4.00	8.59	1.35	----	----	84.69	54.90			"
24.19	3.85	11.01	3.60	12.40	2.06	----	----	78.31	62.25			A + B + C
43.47	8.12	----	----	11.93	2.35	----	----	77.68	100.0			B + C
38.32	7.25	4.54	1.76	13.11	2.59	----	----	77.69	84.72			"
32.90	5.20	8.00	2.96	12.79	2.40	----	----	78.74	73.75			"
30.54	5.37	9.33	3.37	12.78	2.35	----	----	78.86	69.71			"
12.30	1.78	16.87	4.96	12.58	1.88	----	----	78.20	42.40			A + C
----	----	20.85	5.75	17.10	2.40	----	----	70.77	29.23			"
----	----	16.07	4.21	5.64	0.75	12.93	3.70	48.58	8.66			A + C + D
----	----	17.07	4.41	2.82	0.37	13.88	3.92	50.69	4.34			A + D
----	----	17.15	4.40	----	----	16.14	4.52	49.24	----			"
----	----	8.68	2.18	4.48	0.57	18.75	5.15	27.55	7.26			C + D
----	----	5.89	1.48	5.15	0.66	21.11	5.82	18.67	8.32			"
----	----	1.59	0.39	5.60	0.70	22.91	6.13	5.36	9.72			"
----	----	----	----	6.12	0.78	25.54	6.98	----	10.17			"
<sup>a</sup> The solid phases are: A = $\text{NaCl}$ ; B = $\text{NaH}_2\text{PO}_4 \cdot 2\text{H}_2\text{O}$ ; C = $\text{NH}_4\text{H}_2\text{PO}_4$ ; D = $\text{NH}_4\text{Cl}$ .												
<sup>b</sup> The mol/kg $\text{H}_2\text{O}$ values were calculated by the compiler.												
<sup>c</sup> The units here are: mol/100 mol of solute (compiler).												
AUXILIARY INFORMATION												
METHOD/APPARATUS/PROCEDURE:						SOURCE AND PURITY OF MATERIALS:						
The method of invariant points was used. A third component was added to eutectic systems until a new solid phase appeared. At equilibrium both liquid and solid phases were analyzed. Chloride ion content was determined by the Volhard method. $\text{H}_2\text{PO}_4^-$ ions were precipitated as $\text{NH}_4\text{MgPO}_4 \cdot 6\text{H}_2\text{O}$ , and the excess of Mg was titrated complexometrically (1). Ammonium ions were removed and the excess of base used was titrated with HCl.						No information is given.						
ESTIMATED ERROR:						REFERENCES:						
No information is given.						1. Shemyakin, F.M.; Zelenina, E.N., <i>Zavod. Lab.</i> 1969, 6.						

COMPONENTS:		ORIGINAL MEASUREMENTS:					
(1) Sodium dihydrogenphosphate; $\text{NaH}_2\text{PO}_4$ ; [7558-80-7] (2) Potassium dihydrogenphosphate; $\text{KH}_2\text{PO}_4$ ; [7778-77-0] (3) Sodium chloride; $\text{NaCl}$ ; [7647-14-6] (4) Potassium chloride; $\text{KCl}$ ; [7747-40-7] (5) Water; $\text{H}_2\text{O}$ ; [7732-18-5]		Solov'ev, A.P.; Balashova, E.F.; Verendjakina, N.A.; Zjzina, L.F. Resp. Sb. Nauchn. Tr.-Varoslov. Gos. Pedagog. In-t. 1978, 169, 79-84.					
VARIABLES:		PREPARED BY:					
Composition at 25°C.		J. Eysseltová					
EXPERIMENTAL VALUES:		SOLUBILITY IN THE $\text{K}^+$ , $\text{Na}^+    \text{Cl}^-$ , $\text{H}_2\text{PO}_4^-$ - $\text{H}_2\text{O}$ SYSTEM AT 25°C.					
	$\text{NaCl}$	$\text{NaH}_2\text{PO}_4$	$\text{KCl}$	$\text{KH}_2\text{PO}_4$	$\text{K}^+$	$\text{H}_2\text{PO}_4^-$	solid phase <sup>c</sup>
	mass% mol/kg <sup>a</sup>	mass% mol/kg <sup>a</sup>	mass% mol/kg <sup>a</sup>	mass% mol/kg <sup>a</sup>	ion% <sup>b</sup>	ion% <sup>b</sup>	
	15.13 4.33	25.01 3.48	-----	-----	-----	44.63	A + B
	13.74 4.31	27.72 4.23	-----	4.01 0.54	5.95	52.58	"
	12.85 4.47	30.72 5.20	-----	7.22 1.08	10.04	58.46	A + B + C
	-----	46.65 8.71	-----	9.14 1.51	14.79	100.0	B + C
	5.93 2.21	39.75 7.21	-----	8.37 1.34	12.45	79.48	"
	17.73 5.01	11.57 1.56	-----	10.18 1.23	15.78	36.11	A + C
	21.11 5.64	-----	4.16 0.87	10.70 1.23	27.22	15.93	"
	18.62 4.75	-----	8.69 1.74	5.62 0.62	33.15	8.68	A + C + D
	19.49 4.86	-----	8.23 1.61	3.67 0.39	29.38	5.96	A + D
	20.90 5.22	-----	10.58 2.07	-----	28.44	-----	"
	14.75 3.67	-----	11.00 2.14	5.22 0.56	42.46	8.76	C + D
	7.78 1.87	-----	16.85 3.18	4.34 0.49	65.96	8.15	"
	-----	-----	23.50 4.28	2.90 0.29	100.0	6.33	"
<sup>a</sup> The mol/kg $\text{H}_2\text{O}$ values were calculated by the compiler.							
<sup>b</sup> The authors' ion% values are to be understood as mol/100 mol solute.							
<sup>c</sup> The solid phases are: A = $\text{NaCl}$ ; B = $\text{NaH}_2\text{PO}_4 \cdot 2\text{H}_2\text{O}$ ; C = $\text{KH}_2\text{PO}_4$ ; D = $\text{KCl}$ .							
AUXILIARY INFORMATION							
METHOD/APPARATUS/PROCEDURE:				SOURCE AND PURITY OF MATERIALS:			
The method of invariant points was used. A third component was added to eutectic systems until a new solid appeared. The solid and liquid phases were each analyzed. Chloride ion content was determined by the Volhard method. $\text{H}_2\text{PO}_4^-$ ions were precipitated as $\text{NH}_4\text{MgPO}_4 \cdot 6\text{H}_2\text{O}$ , the excess of $\text{Mg}^{2+}$ being titrated compleximetrically (1). $\text{NH}_4^+$ ions were removed and the excess of base used was titrated with 0.1 M HCl.				No information is given.			
ESTIMATED ERROR:				REFERENCES:			
No information is given.				1. Shemjakina, F.M.; Zelenina, E.N. Zavod. Lab. 1969, 6.			

<b>COMPONENTS:</b> (1) Sodium dihydrogenphosphate; $\text{NaH}_2\text{PO}_4$ ; [7558-80-7] (2) Potassium dihydrogenphosphate; $\text{KH}_2\text{PO}_4$ ; [7778-70-0] (3) Sodium nitrate; $\text{NaNO}_3$ ; [7631-99-4] (4) Potassium nitrate; $\text{KNO}_3$ ; [7757-79-1] (5) Water; $\text{H}_2\text{O}$ ; [7732-18-5]	<b>ORIGINAL MEASUREMENTS:</b> Girich, T.E.; Guljamov, Yu.M. <i>Vopr. Khim. Khim. Tekhnol.</i> 1979, 57, 54-7.																																																																																																																													
<b>VARIABLES:</b> Composition and temperature.	<b>PREPARED BY:</b> J. Eysseltová																																																																																																																													
<b>EXPERIMENTAL VALUES:</b> Composition of saturated solutions in the $\text{K}^+, \text{Na}^+    \text{NO}_3^-, \text{H}_2\text{PO}_4^- - \text{H}_2\text{O}$ system. <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="text-align: center;">soln. no.</th> <th style="text-align: center;"><math>\text{K}^+</math> ion%</th> <th style="text-align: center;"><math>\text{NO}_3^-</math> ion%</th> <th style="text-align: center;"><math>\text{H}_2\text{O}</math> conc.<sup>a</sup></th> <th style="text-align: center;">solid phases<sup>b</sup></th> </tr> </thead> <tbody> <tr> <td colspan="5" style="text-align: center;">temp. = 323 K</td> </tr> <tr><td>1</td><td>91.54</td><td>89.68</td><td>633.0</td><td>A + C</td></tr> <tr><td>2</td><td>81.09</td><td>90.22</td><td>534.2</td><td>"</td></tr> <tr><td>3</td><td>67.25</td><td>90.20</td><td>458.7</td><td>"</td></tr> <tr><td>4</td><td>61.59</td><td>90.47</td><td>437.2</td><td>"</td></tr> <tr><td>5</td><td>56.26</td><td>90.87</td><td>390.7</td><td>"</td></tr> <tr><td>6</td><td>52.33</td><td>90.87</td><td>285.5</td><td>"</td></tr> <tr><td>7</td><td>47.09</td><td>92.09</td><td>285.5</td><td>"</td></tr> <tr><td>8</td><td>42.68</td><td>92.44</td><td>260.3</td><td>"</td></tr> <tr><td>9</td><td>40.89</td><td>93.02</td><td>244.5</td><td>"</td></tr> <tr><td>10</td><td>39.25</td><td>92.14</td><td>217.1</td><td>"</td></tr> <tr><td>11</td><td>37.10</td><td>93.42</td><td>192.9</td><td>A + B + C</td></tr> <tr><td>12</td><td>38.95</td><td>100.0</td><td>208.2</td><td>A + B</td></tr> <tr><td>13</td><td>37.98</td><td>98.25</td><td>193.8</td><td>"</td></tr> <tr><td>14</td><td>37.81</td><td>95.99</td><td>193.0</td><td>"</td></tr> <tr><td>15</td><td>16.57</td><td>0.00</td><td>365.9</td><td>C + E</td></tr> <tr><td>16</td><td>14.29</td><td>18.01</td><td>283.0</td><td>"</td></tr> <tr><td>17</td><td>13.88</td><td>27.98</td><td>292.4</td><td>"</td></tr> <tr><td>18</td><td>14.93</td><td>37.85</td><td>280.3</td><td>"</td></tr> <tr><td>19</td><td>16.88</td><td>42.92</td><td>276.1</td><td>B + C + E</td></tr> <tr><td>20</td><td>16.99</td><td>47.60</td><td>245.9</td><td>B + C</td></tr> <tr><td>21</td><td>20.66</td><td>59.33</td><td>238.0</td><td>"</td></tr> <tr><td>22</td><td>25.22</td><td>76.45</td><td>219.8</td><td>"</td></tr> <tr><td>23</td><td>33.67</td><td>90.92</td><td>208.2</td><td>"</td></tr> </tbody> </table> <p style="text-align: right;">(continued next page)</p>		soln. no.	$\text{K}^+$ ion%	$\text{NO}_3^-$ ion%	$\text{H}_2\text{O}$ conc. <sup>a</sup>	solid phases <sup>b</sup>	temp. = 323 K					1	91.54	89.68	633.0	A + C	2	81.09	90.22	534.2	"	3	67.25	90.20	458.7	"	4	61.59	90.47	437.2	"	5	56.26	90.87	390.7	"	6	52.33	90.87	285.5	"	7	47.09	92.09	285.5	"	8	42.68	92.44	260.3	"	9	40.89	93.02	244.5	"	10	39.25	92.14	217.1	"	11	37.10	93.42	192.9	A + B + C	12	38.95	100.0	208.2	A + B	13	37.98	98.25	193.8	"	14	37.81	95.99	193.0	"	15	16.57	0.00	365.9	C + E	16	14.29	18.01	283.0	"	17	13.88	27.98	292.4	"	18	14.93	37.85	280.3	"	19	16.88	42.92	276.1	B + C + E	20	16.99	47.60	245.9	B + C	21	20.66	59.33	238.0	"	22	25.22	76.45	219.8	"	23	33.67	90.92	208.2	"
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<b>METHOD/APPARATUS/PROCEDURE:</b> The isothermal method was used. Equilibrium was ascertained by repeated analysis of the solid and liquid phases. The dihydrogenphosphate ion content was determined photocolometrically, the sodium and potassium ion content was determined by flame photometry, and the nitrate ion content was determined by a titration with $\text{FeSO}_4$ .	<b>SOURCE AND PURITY OF MATERIALS:</b> The solids were chemically pure and were recrystallized twice before being used.  <b>ESTIMATED ERROR:</b> No details are given.  <b>REFERENCES:</b>																																																																																																																													