

## 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 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]

## ORIGINAL MEASUREMENTS:

Girich, T.E.; Guljamov, Yu.M.  
*Vopr. Khim. Khim. Tekhnol.* 1979, 57, 54-7.

## EXPERIMENTAL VALUES cont'd:

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.

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				
24	0.00	38.43	373.1	B + E
25	5.59	40.89	318.0	"
26	11.35	41.33	291.7	"
temp. = 348 K				
27	100.00	95.31	373.4	A + C
28	85.49	94.68	302.1	"
29	74.33	94.36	271.4	"
30	64.73	94.37	227.0	"
31	55.08	94.30	193.5	"
32	46.39	94.17	165.3	"
33	47.01	100.0	149.0	A + B
34	46.13	96.73	148.0	"
35	44.62	94.04	147.4	A + B + C
36	42.98	92.94	156.2	B + C
37	40.83	90.53	178.0	"
38	36.91	85.19	192.5	"
39	34.44	82.00	201.4	"
40	31.00	75.19	206.2	"
41	25.11	64.30	211.7	"
42	21.83	55.68	219.8	"
43	20.91	47.29	226.3	"
44	29.06	40.92	234.0	B + C + D
45	20.05	38.47	243.5	C + D
46	21.31	29.19	258.7	"
47	21.28	19.44	266.0	"
48	21.70	11.09	276.4	"
49	20.52	0.00	289.1	"
50	0.00	51.14	267.2	B + D
51	5.31	50.00	256.0	"
52	11.15	45.96	247.3	"
53	15.31	44.96	239.5	"
temp. = 373 K				
54	100.00	97.08	245.0	A + C
55	99.68	97.08	213.2	"
56	83.91	96.83	191.7	"
57	70.53	95.35	176.3	"
58	60.85	95.18	142.8	"
59	52.95	95.03	113.5	"
60	51.90	100.0	95.7	A + B
61	51.32	97.75	93.0	"
62	50.35	94.97	92.4	A + B + C
63	49.02	91.24	94.6	B + C
64	47.52	82.85	112.5	"
65	45.01	74.71	117.8	"
66	42.46	63.76	130.0	"
67	36.87	54.88	139.5	"
68	33.82	47.00	147.0	"
69	31.22	44.73	156.3	"
70	29.53	42.27	161.5	B + C + D
71	29.01	38.09	164.0	C + D
72	28.03	34.04	176.2	"
73	25.78	28.26	181.4	"
74	23.45	18.88	189.0	"
75	25.43	5.30	196.1	"
76	25.44	0.00	205.0	"

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(1) Sodium dihydrogenphosphate; $\text{NaH}_2\text{PO}_4$ ; [7558-80-7]					Girich, T.E.; Guljamov, Yu.M. <i>Vopr. Khim. Khim. Tekhnol.</i> 1979, 57, 54-7.			
(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]								
EXPERIMENTAL VALUES cont'd:								
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.								
		$\text{K}^+$	$\text{NO}_3^-$	$\text{H}_2\text{O}$	solid			
soln. no.	ion%	ion%	conc. <sup>a</sup>	phases <sup>b</sup>				
temp. = 373 K								
77	0.00	55.26	229.8	B + D				
78	2.66	54.97	225.6	"				
79	10.00	50.22	201.3	"				
80	18.36	45.95	190.0	"				
<sup>a</sup> The concentration units are: mol $\text{H}_2\text{O}$ /100 g equiv of dry salts.								
<sup>b</sup> The solid phases are: A = $\text{KNO}_3$ ; B = $\text{NaNO}_3$ ; C = $\text{KH}_2\text{PO}_4$ ; D = $\text{NaH}_2\text{PO}_4$ ; E = $\text{NaH}_2\text{PO}_4 \cdot 2\text{H}_2\text{O}$ .								
The compiler has calculated the following values from the data given above.								
	conc. of $\text{K}^+$		conc. of $\text{Na}^+$		conc. of $\text{NO}_3^-$		conc. of $\text{H}_2\text{PO}_4^-$	
soln. no.	mass%	mol/kg	mass%	mol/kg	mass%	mol/kg	mass%	mol/kg
temp. = 323 K								
1	16.47	8.03	0.89	0.74	25.59	7.87	4.60	0.90
2	16.04	8.43	2.19	1.96	28.30	9.38	4.79	1.01
3	14.46	8.14	4.14	3.96	30.76	10.92	5.22	1.18
4	15.60	7.82	4.99	4.88	31.70	11.49	5.22	1.21
5	13.12	7.99	6.00	6.21	33.62	12.92	5.28	1.29
6	13.82	10.18	7.40	9.27	38.07	17.68	5.98	1.77
7	12.54	9.16	8.28	10.29	38.91	17.91	5.22	1.53
8	11.80	9.10	9.32	12.23	40.54	19.72	5.18	1.61
9	11.58	9.29	9.84	13.43	41.79	21.13	4.90	1.58
10	11.52	10.04	10.48	15.54	42.91	23.57	5.72	2.01
11	11.33	10.68	11.29	18.11	45.26	26.90	4.98	1.89
12	11.82	10.39	10.90	16.29	48.16	26.68	0.00	0.00
13	11.72	10.88	11.26	17.77	48.12	28.16	1.34	0.50
14	11.61	10.88	11.23	17.90	46.78	27.63	3.05	1.15
15	3.43	2.51	10.17	12.66	0.00	0.00	51.45	15.18
16	3.34	2.80	11.80	16.82	6.69	3.53	47.64	16.09
17	3.28	2.63	11.99	16.36	10.51	5.31	42.32	13.68
18	3.65	2.95	12.25	16.86	14.70	7.50	37.77	12.31
19	4.19	3.39	12.14	16.72	16.91	8.63	35.17	11.48
20	4.41	3.83	12.69	18.75	19.63	10.75	33.80	11.83
21	5.55	4.82	12.54	18.52	25.30	13.84	27.13	9.49
22	7.20	6.37	12.56	18.90	34.64	19.32	16.68	5.95
23	10.04	8.98	11.63	17.69	43.01	24.26	6.71	2.42
24	0.00	0.00	13.23	14.89	34.38	5.72	38.66	9.16
25	1.33	0.97	13.24	16.49	34.99	7.14	34.93	10.32
26	2.77	2.16	12.74	16.88	35.59	7.87	32.84	11.17
temp. = 348 K								
27	23.00	14.87	0.00	0.00	34.77	14.18	2.67	0.69
28	21.56	15.72	2.15	2.66	37.87	17.41	3.32	0.97
29	19.66	15.21	3.99	5.25	39.59	19.31	3.70	1.15
30	18.30	15.84	5.86	8.63	42.32	23.09	3.94	1.37
31	16.47	15.81	7.90	12.89	44.74	27.07	4.23	1.63
32	14.59	15.59	9.91	18.01	46.99	31.64	4.55	1.95
33	15.39	17.52	10.20	19.74	51.94	37.28	0.00	0.00
34	15.00	17.31	10.30	20.22	49.89	36.31	2.63	1.22
35	14.44	16.81	10.53	20.87	48.27	35.44	4.78	2.24
36	13.71	15.28	10.69	20.28	47.04	33.05	5.58	2.51
37	12.57	12.74	10.71	18.46	44.23	28.25	7.23	2.95
38	11.03	10.65	11.09	18.20	40.39	24.58	10.98	4.27
39	10.11	9.50	11.32	18.08	38.20	22.61	13.11	4.96
40	8.92	8.35	11.68	18.59	34.33	20.25	17.72	6.68

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(2) Potassium dihydrogenphosphate; $\text{KH}_2\text{PO}_4$ ; [7778-70-0]	<i>Vopr. Khim. Khim. Tekhnol.</i> 1979, 57, 54-7.
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(5) Water; $\text{H}_2\text{O}$ ; [7732-18-5]	

## EXPERIMENTAL VALUES cont'd:

The compiler has calculated the following values from the data given above.

soln. no.	conc. of $\text{K}^+$		conc. of $\text{Na}^+$		conc. of $\text{NO}_3^-$		conc. of $\text{H}_2\text{PO}_4^-$	
	mass%	mol/kg	mass%	mol/kg	mass%	mol/kg	mass%	mol/kg
temp. 348 K								
41	7.03	6.58	12.32	19.65	28.55	16.87	24.79	9.36
42	5.94	5.51	12.51	19.75	24.04	14.07	29.93	11.20
43	5.54	5.13	12.32	19.41	19.87	11.60	34.65	12.94
44	7.45	6.89	10.69	16.84	16.64	9.71	37.58	14.02
45	5.10	4.57	11.96	18.24	15.53	8.77	38.85	14.03
46	5.21	4.57	11.32	16.89	11.33	6.26	42.98	15.20
47	5.05	4.44	11.00	16.44	7.32	4.06	47.50	16.82
48	5.00	4.36	10.62	15.73	4.06	2.22	50.92	17.87
49	4.57	3.94	10.42	15.27	0.00	0.00	55.32	19.21
50	0.00	0.00	15.30	20.79	21.11	10.63	31.55	10.15
51	1.38	1.15	14.56	20.54	20.75	10.85	32.45	10.85
52	2.90	2.50	13.59	19.96	18.97	10.32	34.89	12.14
53	3.99	3.55	12.99	19.64	18.60	10.42	35.63	12.76
temp. = 373 K								
54	26.73	22.67	0.00	0.00	41.17	22.01	1.93	0.66
55	27.74	25.97	0.05	0.08	42.86	25.29	2.01	0.76
56	24.45	24.31	2.75	4.66	44.76	28.06	2.29	0.91
57	21.25	22.22	5.22	9.28	45.58	30.04	3.47	1.46
58	19.46	23.67	7.36	15.23	48.30	37.02	3.82	1.87
59	17.89	25.91	9.34	23.02	50.93	46.51	4.16	2.43
60	18.34	30.12	9.99	27.92	56.07	58.05	0.00	0.00
61	18.10	30.65	10.10	29.08	54.71	58.39	1.96	1.34
62	17.65	30.27	10.23	29.85	52.81	57.10	4.37	3.02
63	16.96	28.78	10.37	29.93	50.07	53.58	7.51	5.14
64	15.62	23.46	10.14	25.91	43.21	40.91	13.98	8.46
65	14.38	21.22	10.33	25.93	37.88	35.23	20.05	11.92
66	12.97	18.14	10.34	24.58	30.91	27.24	27.47	15.48
67	10.93	14.68	11.00	25.14	25.81	21.85	33.19	17.96
68	9.76	12.78	11.23	25.01	21.51	17.76	37.95	20.03
69	8.87	11.09	11.49	24.44	20.17	15.89	38.98	19.64
70	8.30	10.15	11.65	24.24	18.85	14.54	40.27	19.85
71	8.05	9.82	11.58	24.04	16.77	12.90	42.63	20.97
72	7.59	8.83	11.46	22.69	14.62	10.73	44.33	20.79
73	6.86	7.89	11.61	22.73	11.93	8.65	47.36	21.97
74	6.06	6.89	11.64	22.50	7.74	5.54	52.05	23.84
75	6.31	7.20	10.88	21.12	2.08	1.50	58.31	26.82
76	6.17	6.89	10.64	20.20	0.00	0.00	60.25	27.10
77	0.00	0.00	16.18	24.17	24.13	13.35	30.55	10.81
78	0.73	0.65	15.78	23.96	24.04	13.53	30.80	11.08
79	2.78	2.75	14.75	24.83	22.20	13.85	34.42	13.73
80	5.08	5.36	13.30	23.87	20.20	13.43	37.16	15.80