

COMPONENTS: (1) Disodium hydrogenphosphate; Na_2HPO_4 ; [7558-79-4] (2) Water; H_2O ; [7732-18-5]	ORIGINAL MEASUREMENTS: Shiomi, Ts. <i>Mem. Col. Sci. Emp. (Kyoto)</i> <u>1908</u> , 1, 406-13.
VARIABLES: Composition and temperature.	PREPARED BY: J. Eysseltová

EXPERIMENTAL VALUES:Solubility of Na_2HPO_4 in water.

$t/^\circ\text{C}$	concn ^a	mean	mass% ^b	mol/kg ^b	$t/^\circ\text{C}$	concn ^a	mean	mass% ^b	mol/kg ^b
0.65	1.74		1.71	0.12	30.21	20.80		17.22	1.46
0.65	1.74	1.74	1.71	0.12	30.21	20.76	20.81	17.19	1.46
0.65	1.74		1.71	0.12	30.21	20.88		17.27	1.47
10.26	3.55		3.43	0.25	30.26	21.60		17.76	1.52
10.26	3.54	3.55	3.42	0.25	30.26	21.62		17.78	1.52
10.36	3.58		3.46	0.25	30.26	21.56		17.74	1.52
10.36	3.59		3.46	0.25	30.26	21.55		17.73	1.52
10.36	3.58	3.58	3.46	0.25	30.26	21.56	21.59	17.74	1.52
10.36	3.58		3.46	0.25	30.26	21.61		17.77	1.52
15.11	5.23		4.97	0.37	30.26	21.60		17.76	1.52
15.11	5.22	5.23	4.96	0.37	30.26	21.59		17.76	1.52
20.24	7.88		7.30	0.55	30.26	21.59		17.76	1.52
20.24	7.90	7.89	7.32	0.56	30.76	23.42		18.98	1.65
20.24	7.89		7.31	0.56	30.76	23.40	23.41	18.96	1.65
20.24	7.89		7.31	0.56	30.76	23.41		18.97	1.65
25.15	12.03		10.74	0.85	33.04	30.88		23.59	2.17
25.15	12.01	12.02	10.72	0.84	33.04	30.88	30.88	23.59	2.17
25.15	12.01		10.72	0.84	33.14	31.39		23.89	2.21
25.40	12.32		10.97	0.87	33.14	31.37	31.38	23.88	2.21
25.40	12.34	12.32	10.98	0.87	36.27	45.36		31.20	3.19
25.40	12.31		10.96	0.86	36.27	45.35		31.20	3.19
25.50	12.42		11.05	0.87	36.27	45.34		31.20	3.19
25.50	12.41	12.43	11.04	0.87	36.27	45.38		31.21	3.19
25.50	12.47		11.09	0.88	36.27	45.39	45.37	31.22	3.19

(continued next page)

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

The isothermal method was used. Equilibrium was approached from both supersaturation and undersaturation. Samples of saturated solution were weighed, evaporated to dryness and heated strongly to form the pyrophosphate. The solubility was calculated from the weight of the pyrophosphate formed.

SOURCE AND PURITY OF MATERIALS:

The Na_2HPO_4 was recrystallized twice.

ESTIMATED ERROR:

The temperature was kept constant within 0.1 K (0.6 K above 90°).

REFERENCES:

Disodium Hydrogenphosphate

COMPONENTS:

(1) Disodium hydrogenphosphate; Na_2HPO_4 ;
[7558-79-4](2) Water; H_2O ; [7732-18-5]

ORIGINAL MEASUREMENTS:

Shiomi, Ts.

Mem. Col. Sci. Emp. (Kyoto) 1908, 1, 406-13.

EXPERIMENTAL VALUES cont'd:

Solubility of Na_2HPO_4 in water.

$t/^\circ\text{C}$	concn ^a	mean	mass% ^b	mol/kg ^b	$t/^\circ\text{C}$	concn ^a	mean	mass% ^b	mol/kg ^b
36.27	45.36		31.20	3.19	55.17	81.37		44.86	5.72
36.27	45.41		31.23	3.19	55.17	81.43	81.40	44.88	5.73
36.27	45.36		31.20	3.19	55.27	81.61		44.94	5.74
36.27	45.35		31.20	3.19	55.27	81.66	81.64	44.95	5.74
37.27	47.56		32.23	3.34	60.23	83.01		45.36	5.84
37.27	47.48		32.19	3.34	60.23	83.02	83.00	45.36	5.84
37.27	47.46		32.18	3.34	60.23	82.98		45.35	5.84
37.27	47.53	47.52	32.22	3.34	70.26	88.10		46.84	6.20
37.27	47.56		32.23	3.34	70.26	88.17	88.11	46.86	6.20
37.27	47.48		32.19	3.34	70.26	88.07		46.83	6.20
37.27	47.49		32.20	3.34	80.39	94.74		48.65	6.66
37.27	47.56		32.23	3.34	80.39	94.83	94.78	48.67	6.67
40.29	54.95		35.46	3.86	80.39	94.76		48.65	6.67
40.29	54.86		35.42	3.86	89.74	102.85		50.70	7.23
40.29	54.95		35.46	3.86	89.74	102.89	102.87	50.71	7.24
40.29	54.83	54.88	35.41	3.86	94.75	107.31		51.76	7.55
40.29	54.85		35.42	3.86	94.75	107.37	107.34	51.78	7.55
40.29	54.88		35.43	3.86	94.75	107.34		51.77	7.55
45.14	68.67		40.71	4.83	95.86	107.08		51.71	7.53
45.14	68.68	68.64	40.72	4.83	95.86	107.09	107.09	51.71	7.53
45.14	68.61		40.69	4.83	96.86	104.94		51.20	7.38
45.14	68.58		40.68	4.82	96.86	105.01	104.98	51.22	7.39
47.23	76.60		43.37	5.39	99.57	101.25		50.31	7.12
47.23	76.55	76.58	43.36	5.38	99.57	101.22	101.21	50.30	7.12
48.23	80.03	80.03	44.45	5.63	99.57	101.16		50.29	7.12
48.33	80.12		44.48	5.64	99.77	102.12		50.52	7.18
48.33	80.17	80.15	44.50	5.64	99.77	102.16	102.15	50.53	7.18
50.22	80.40		44.57	5.66	99.77	102.16		50.53	7.18
50.22	80.34	80.35	44.55	5.65					
50.22	80.32		44.54	5.65					
50.22	80.36		44.56	5.65					

^aThe concentration units are: g/100 g H_2O .^bThese values were calculated by the compiler.

COMPONENTS: (1) Disodium hydrogenphosphate; Na_2HPO_4 ; [7558-79-4] (2) Water; H_2O ; [7732-18-5]	ORIGINAL MEASUREMENTS: Hammick, D.L.; Goadby, H.K.; Booth, H. <i>J. Chem. Soc.</i> <u>1920</u> , 67, 1589-92.																																																																											
VARIABLES: Composition and temperature.	PREPARED BY: J. Eysseltová																																																																											
EXPERIMENTAL VALUES: <p style="text-align: center;">Solubility of Na_2HPO_4 in water.</p> <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th rowspan="2">$t/^\circ\text{C}$</th> <th colspan="2">concn Na_2HPO_4</th> <th rowspan="2">H_2O</th> </tr> <tr> <th>g/100 g H_2O</th> <th>mass%^a</th> <th>mol/kg^a</th> </tr> </thead> <tbody> <tr><td>-0.47</td><td>1.45</td><td>1.43</td><td>0.10</td></tr> <tr><td>6.00</td><td>2.73</td><td>2.66</td><td>0.19</td></tr> <tr><td>19.95</td><td>7.26</td><td>6.77</td><td>0.51</td></tr> <tr><td>22.77</td><td>8.93</td><td>8.20</td><td>0.63</td></tr> <tr><td>24.15</td><td>9.53</td><td>8.70</td><td>0.67</td></tr> <tr><td>25.75</td><td>10.90</td><td>9.83</td><td>0.77</td></tr> <tr><td>27.80</td><td>14.16</td><td>12.40</td><td>1.00</td></tr> <tr><td>28.65</td><td>15.87</td><td>13.70</td><td>1.12</td></tr> <tr><td>29.05</td><td>16.04</td><td>13.82</td><td>1.13</td></tr> <tr><td>29.50</td><td>17.18</td><td>14.66</td><td>1.21</td></tr> <tr><td>30.10</td><td>19.45</td><td>16.28</td><td>1.37</td></tr> <tr><td>30.90</td><td>20.08</td><td>16.72</td><td>1.41</td></tr> <tr><td>32.50</td><td>22.57</td><td>18.41</td><td>1.59</td></tr> <tr><td>33.70</td><td>24.63</td><td>19.76</td><td>1.73</td></tr> <tr><td>34.70</td><td>29.75</td><td>22.93</td><td>2.09</td></tr> <tr><td>36.50</td><td>31.15</td><td>23.75</td><td>2.19</td></tr> <tr><td>40.02</td><td>35.56</td><td>26.23</td><td>2.50</td></tr> </tbody> </table> <p>^aThese values were calculated by the compiler.</p>		$t/^\circ\text{C}$	concn Na_2HPO_4		H_2O	g/100 g H_2O	mass% ^a	mol/kg ^a	-0.47	1.45	1.43	0.10	6.00	2.73	2.66	0.19	19.95	7.26	6.77	0.51	22.77	8.93	8.20	0.63	24.15	9.53	8.70	0.67	25.75	10.90	9.83	0.77	27.80	14.16	12.40	1.00	28.65	15.87	13.70	1.12	29.05	16.04	13.82	1.13	29.50	17.18	14.66	1.21	30.10	19.45	16.28	1.37	30.90	20.08	16.72	1.41	32.50	22.57	18.41	1.59	33.70	24.63	19.76	1.73	34.70	29.75	22.93	2.09	36.50	31.15	23.75	2.19	40.02	35.56	26.23	2.50
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METHOD/APPARATUS/PROCEDURE: Saturated solutions were prepared by stirring the solid phase with distilled water in an electrically heated thermostat. The saturated solution was siphoned through a glass-wool filter into a weighed bottle. The composition was determined by converting the dissolved phosphate to $\text{Mg}_2\text{P}_2\text{O}_7$.	SOURCE AND PURITY OF MATERIALS: Arsenic-free $\text{Na}_2\text{HPO}_4 \cdot 12\text{H}_2\text{O}$ was recrystallized and used to prepare the other hydrates. The dihydrate was prepared by boiling finely divided dodecahydrate with ethyl alcohol. The heptahydrate was prepared by fusing together an appropriate mixture of the dihydrate and dodecahydrate and cooling.																																																																											
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EXPERIMENTAL VALUES: <p style="text-align: center;">Solubility of Na_2HPO_4 in water. concentration of Na_2HPO_4</p> <table border="1" style="margin-left: auto; margin-right: auto;"> <thead> <tr> <th rowspan="2">$t/^\circ\text{C}$</th> <th colspan="2">in 1000 ml soln</th> <th colspan="2">in 1000 g soln</th> <th colspan="2">in 1000 g of H_2O</th> </tr> <tr> <th>mol</th> <th>gram</th> <th>mol</th> <th>gram</th> <th>mol</th> <th>gram</th> </tr> </thead> <tbody> <tr> <td>0</td> <td>0.1152</td> <td>16.37</td> <td>0.1130</td> <td>16.05</td> <td>0.1148</td> <td>16.31</td> </tr> <tr> <td>18</td> <td>0.4444</td> <td>63.12</td> <td>0.4212</td> <td>59.85</td> <td>0.4482</td> <td>63.67</td> </tr> <tr> <td>25</td> <td>0.8399</td> <td>119.28</td> <td>0.7625</td> <td>108.29</td> <td>0.8551</td> <td>121.44</td> </tr> <tr> <td>-0.48^a</td> <td></td> <td></td> <td></td> <td></td> <td>0.109</td> <td>15.5</td> </tr> </tbody> </table> <p>The solid phase was $\text{Na}_2\text{HPO}_4 \cdot 12\text{H}_2\text{O}$ [10039-32-4]. ^aThis is the cryohydric point.</p>		$t/^\circ\text{C}$	in 1000 ml soln		in 1000 g soln		in 1000 g of H_2O		mol	gram	mol	gram	mol	gram	0	0.1152	16.37	0.1130	16.05	0.1148	16.31	18	0.4444	63.12	0.4212	59.85	0.4482	63.67	25	0.8399	119.28	0.7625	108.29	0.8551	121.44	-0.48 ^a					0.109	15.5
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METHOD/APPARATUS/PROCEDURE: <p>The apparatus is described elsewhere (1). At 0°C, the equilibrium vessel and sampling pipet were thermostated in an ice-water mixture. Equilibrium was checked by repeated analysis. The Na_2HPO_4 content was determined by titration with 0.1 M HCl using methylorange as indicator (2).</p>	SOURCE AND PURITY OF MATERIALS: Purest Kahlbaum $\text{Na}_2\text{HPO}_4 \cdot 12\text{H}_2\text{O}$ was used.																																									
ESTIMATED ERROR: The temperature was controlled to ± 0.1 K. The accuracy of the cryohydric temperature is ± 0.01 K.																																										
REFERENCES: 1. Menzel, H. <i>Z. Anorg. Allg. Chem.</i> <u>1927</u> , 164, 6. 2. Kolthoff, I. <i>Massanalyse</i> , II, p. 139, Berlin, <u>1928</u> .																																										