

COMPONENTS: (1) Trisodium phosphate; Na_3PO_4 ; [7601-54-9] (2) 2-Propanone (acetone); $\text{C}_3\text{H}_6\text{O}$; [67-64-1] (3) Water; H_2O , [7732-18-5]	ORIGINAL MEASUREMENTS: Nirenberg, Z.; Solenchyk, B.; Yaron, I. <i>J. Chem. Eng. Data</i> <u>1977</u> , <i>22</i> , 47-8.																																																																																																																																
VARIABLES: Composition and temperature.	PREPARED BY: J. Eysseltová																																																																																																																																
EXPERIMENTAL VALUES: <p style="text-align: center;">I. Ternary solid-liquid equilibrium in the Na_3PO_4-$\text{C}_3\text{H}_6\text{O}$-$\text{H}_2\text{O}$ system.</p> <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th colspan="4"></th> <th colspan="4" style="text-align: center;">Na_3PO_4 $\text{C}_3\text{H}_6\text{O}$ H_2O</th> </tr> <tr> <th></th> <th style="text-align: center;">Na_3PO_4</th> <th style="text-align: center;">$\text{C}_3\text{H}_6\text{O}$</th> <th style="text-align: center;">H_2O</th> <th></th> <th style="text-align: center;">Na_3PO_4</th> <th style="text-align: center;">$\text{C}_3\text{H}_6\text{O}$</th> <th style="text-align: center;">H_2O</th> </tr> <tr> <th style="text-align: center;">$t/^\circ\text{C}$</th> <th style="text-align: center;">mass%</th> <th style="text-align: center;">mass%</th> <th style="text-align: center;">mass%</th> <th style="text-align: center;">$t/^\circ\text{C}$</th> <th style="text-align: center;">mass%</th> <th style="text-align: center;">mass%</th> <th 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H_2O					Na_3PO_4	$\text{C}_3\text{H}_6\text{O}$	H_2O		Na_3PO_4	$\text{C}_3\text{H}_6\text{O}$	H_2O	$t/^\circ\text{C}$	mass%	mass%	mass%	$t/^\circ\text{C}$	mass%	mass%	mass%	10	4.65	----	95.35	20	7.73	----	92.27	10	2.43	8.10	89.47	20	3.20	7.98	88.82	10	1.06	15.75	83.19	20	1.30	16.75	81.95	10	0.50	24.10	75.40	20	0.75	26.40	72.85	10	0.20	33.30	66.50	20	0.17	32.46	67.37									31.5	10.74	----	89.26	40	15.10	----	84.90	31.5	6.00	6.57	87.43	40	8.80	5.95	85.25	31.5	3.00	13.70	83.30	40	4.90	14.10	81.00	31.5	0.62	24.87	74.50	40	2.25	23.50	74.25	31.5	0.34	34.40	65.06	40	0.90	34.10	65.00	31.5	0.19	42.60	57.20	40	0.27	44.50	55.23	31.5	0.07	52.00	47.93	40	0.09	52.00	47.91
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METHOD/APPARATUS/PROCEDURE: Acetone-water mixtures were placed in flasks in a thermostat. In experiments at 31.5°C the phosphate was progressively added to the solvent until saturation was reached. When acetone/water ratios exceeded 2/3, a 9% water solution of $\text{Na}_3\text{PO}_4 \cdot 12\text{H}_2\text{O}$ was added in aliquots of 0.5 ml. At other temperatures an excess of phosphate was always added. Mixtures were equilibrated for 24 hours. Samples were taken, diluted immediately and analyzed for Na, P_2O_5 and acetone. Phosphorus was determined spectrophotometrically at 426 nm using the vanadamolybdate method. Acetone was determined iodometrically. Sodium was determined using a Pye Unicam SP90 spectrometer.	SOURCE AND PURITY OF MATERIALS: Analytical reagent grade materials were used and the purity was rechecked. Doubly distilled water was used in all experiments.																																																																																																																																
	ESTIMATED ERROR: Temperature was controlled to within ± 0.1 K. P_2O_5 : accuracy ± 0.25 ppm at 50 ppm; acetone: accuracy ± 0.048 mg; Na: accuracy ± 2 ppm at 200 ppm.																																																																																																																																
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ORIGINAL MEASUREMENTS:

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J. Chem. Eng. Data 1977, 22, 47-8.

EXPERIMENTAL VALUES cont'd:

II. Solubility isotherms in the Na_3PO_4 - $\text{C}_3\text{H}_6\text{O}$ - H_2O system in various ratios of acetone to 100 ml of solution.

ml/100ml	10°C		20°C		31.5°C	
	Na_3PO_4 g/100 ml	sp. gr.	Na_3PO_4 g/100 ml	sp. gr.	Na_3PO_4 g/.100 ml	sp. gr.
0	4.86	1.04	8.35	1.08	11.50	1.07
10	2.37	0.98	3.30	1.02	6.39	1.05
20	1.05	0.98	1.25	0.98	3.02	1.00
30	0.47	0.97	0.72	0.95	0.61	0.96
40	0.19	0.95	0.16	0.94	0.32	0.93
50	trace	----	trace	----	0.18	0.90
60	0	----	0	----	0.07	0.90
100	0	----	0	----	0	----
40°C						
0	17.05	1.13				
10	9.67	1.10				
20	5.11	1.04				
30	2.25	1.00				
40	0.87	0.97				
50	0.26	0.94				
60	0.08	0.91				
100	0	----				