COMPONENTS:	ORIGINAL MEASUREMENTS:
(1) Potassium dihydrogenphosphate; KH_2PO_4; [7778-77-0] (2) Potassium chloride; KCl; [7747-40-7] (3) Ammonium dihydrogenphosphate; $NH_4H_2PO_4$; [7722-76-1] (4) Ammonium chloride; NH_4Cl; [12125-02-9] (5) Water; H_2O; [7732-18-5]	Askenasy, F.; Nessler, F. *Z. Anorg. Chem.* 1930, 189, 305-28.
VARIABLES: Composition at 0°C.	**PREPARED BY:** 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.

	mol/100 mol solute					
d/g cm^{-3}	$H_2PO_4^-$	Cl^-	K^+	NH_4^+	H_2O	solid phases[a]
1.1100	7.6	92.4	8.0	92.0	925	"NH_4Cl" + "$NH_4H_2PO_4$"
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"

[a] A 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; [7778-77-0]
(2) Potassium chloride; KCl; [7747-40-7]
(3) Ammonium dihydrogenphosphate; $NH_4H_2PO_4$; [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 $(K,NH_4)H_2PO_4$ system.

liquid phase mol/100 mol of solute					solid phase mol%	
$H_2PO_4^-$	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]
mass%	mol/kg	mass%	mol/kg	mass%	mol/kg	mass%	mol/kg	mass%	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

[a] The solid phases are: A = "NH_4Cl"; B = "$NH_4H_2PO_4$"; C = ternary eutectic point; D = "KCl"; E = "KH_2PO_4"; F = "NH_4Cl". 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	"

[b] The solid phase, G. here refers to a precipitate designated as $(K,NH_4)H_2PO_4$.

COMPONENTS:	ORIGINAL MEASUREMENTS:
(1) Potassium dihydrogenphosphate; KH_2PO_4; [7778-77-0] (2) Calcium dihydrogenphosphate; $Ca(H_2PO_4)_2$; [10103-46-5] (3) Phosphoric acid; H_3PO_4; [7664-38-2] (4) Water; H_2O; [7732-18-5]	Flatt, R.; Brunisholz, G.; Bourgeois, J. *Helv. Chim. Acta* 1956, 39, 841-53.
VARIABLES: Composition at 25°C.	**PREPARED BY:** J. Eysseltová

EXPERIMENTAL VALUES:

Part 1. Composition of saturated solutions in the KH_2PO_4-$Ca(H_2PO_4)_2$ - H_3PO_4-H_2O system at 25°C.

soln. no.	eq% Ca^{2+}	eq% K^+	eq% H^+	mol H_2O/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; $Ca(H_2PO_4)_2$; [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-$Ca(H_2PO_4)_2$ - H_3PO_4-H_2O system at 25°C.

soln. no.	eq% Ca^{2+}	eq% K^+	eq% H^+	mol H_2O/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	"

[a]The solid phases are: A = $Ca(H_2PO_4)_2$; B = KH_2PO_4; C = $KH_5(PO_4)_2$;
D = $Ca_9K_4H_{32}(PO_4)_{18}\cdot 10H_2O$; E = $CaHPO_4$.

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

soln. no.	$Ca(H_2PO_4)_2$ mass%	$Ca(H_2PO_4)_2$ mol/kg	KH_2PO_4 mass%	KH_2PO_4 mol/kg	H_3PO_4 mass%	H_3PO_4 mol/kg	H_2O mass%
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:
(1) Potassium dihydrogenphosphate; KH_2PO_4; [7778-77-0]
(2) Calcium dihydrogenphosphate; $Ca(H_2PO_4)_2$; [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 2. The compiler has calculated the following values from the data given in Part 1 above.

	$Ca(H_2PO_4)_2$		KH_2PO_4		H_3PO_4		H_2O
soln. no.	mass%	mol/kg	mass%	mol/kg	mass%	mol/kg	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] (2) Potassium chloride; KCl; [7747-40-7] (3) Ammonium dihydrogenphosphate; $NH_4H_2PO_4$; [7722-76-1] (4) Ammonium chloride; NH_4Cl; [12125-02-9] (5) Water; H_2O; [7732-18-5]	Iovi, A.; Haiduc, C. *Rev. Roum. Chim.* 1971, *16*, 1743-7.
VARIABLES: Temperature. Equimolar mixtures of KCl + $NH_4H_2PO_4$ or NH_4Cl and KH_2PO_4 are used.	**PREPARED BY:** J. Eysseltová

EXPERIMENTAL VALUES:

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

		(A) KCl + $NH_4H_2PO_4$				(B) NH_4Cl + KH_2PO_4				
Nr.	t/°C.	$H_2PO_4^-$	Cl^-	K^+	NH_4^+	$H_2PO_4^-$	Cl^-	K^+	NH_4^+	d/g cm^{-3}
1	20	0.60	4.77	2.18	3.19	0.60	4.77	2.18	3.19	1.1585
2	25	0.70	4.76	2.18	3.28	0.70	4.72	2.18	3.24	1.1640
3	40	1.00	4.49	2.31	3.18	1.00	4.39	2.31	3.08	1.1690
4	60	1.50	4.36	2.44	3.42	1.50	4.36	2.44	3.42	1.1880
5	75	2.20	4.36	2.82	3.74	2.20	4.26	2.82	3.64	1.2360
6	80	2.50	4.23	2.95	3.78	2.50	4.22	2.95	3.77	1.2479

The compiler has recalculated these values as follows:

	$H_2PO_4^-$		chloride		potassium		ammonium	
Nr	mass%	mol/kg	mass%	mol/kg	mass%	mol/kg	mass%	mol/kg
1(A,B)	5.02	0.76	14.60	6.04	7.35	2.76	4.95	4.03
2(A)	5.83	0.89	14.50	6.07	7.32	2.78	5.07	4.18
2(B)	5.83	0.89	14.38	6.01	7.32	2.77	5.01	4.11
3(A)	8.29	1.30	13.62	5.86	7.72	3.01	4.89	4.14
3(B)	8.29	1.29	13.32	5.69	7.72	2.99	4.74	3.99
4(A,B)	12.24	2.05	13.01	5.96	8.03	3.33	5.18	4.67
5(A)	17.26	3.18	12.51	6.31	8.92	4.08	5.44	5.40
5(B)	17.26	3.16	12.22	6.12	8.92	4.05	5.30	5.22
6(A)	19.43	3.72	12.02	6.29	9.24	4.39	5.45	5.61
6(B)	19.43	3.71	11.99	6.27	9.24	4.38	5.43	5.59

(continued next page)

AUXILIARY INFORMATION

METHOD/APPARATUS/PROCEDURE:

The samples were equilibrated by stirring for 10 hours in a thermostat. The potassium content was determined with the use of a type C Zeiss Jena Model III flame photometer and gravimetrically as $KClO_4$, phosphate ion was determined by a complexiometric titration with $MgCl_2$ using Eriochrome Black T as indicator (1), chloride was determined by potentiometric titration with $AgNO_3$, and NH_3 was determined by the Kjeldahl method.

SOURCE AND PURITY OF MATERIALS:

No information is given.

ESTIMATED ERROR:

No information is given.

REFERENCES:

1. Liteanu, C. *Chimie Analitica Cantitativa*, Ed. didactica si pedagogica, Bucuresti, 1964, p. 508.

COMPONENTS:	ORIGINAL MEASUREMENTS:
(1) Potassium dihydrogenphosphate; KH_2PO_4; [7778-77-0] (2) Potassium chloride; KCl; [7747-40-7] (3) Ammonium dihydrogenphosphate; $NH_4H_2PO_4$; [7722-76-1] (4) Ammonium chloride; NH_4Cl; [12125-02-9] (5) Water; H_2O; [7732-18-5]	Iovi, A.; Haiduc, C. *Rev. Roum. Chim.* 1971, *16*, 1743-7.

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:

(1) Potassium oxide; K_2O; [12136-45-7]
(2) Ammonia; NH_3; [7664-42-7]
(3) Phosphoric acid; H_3PO_4; [7664-38-2]
(4) Diphosphoric acid: $H_4P_2O_7$; [2466-09-3]
(5) Water; H_2O; [7732-18-5]

ORIGINAL MEASUREMENTS:

Frazier, A.W.; Dillard, E.F.; Thrasher, R.D.; Waerstad, K.R.

J. Agr. Food Chem. 1973, *21*, 700-4

VARIABLES:

Composition at 298 K.

PREPARED BY:

J. Eysseltová

EXPERIMENTAL VALUES:

Solubility in the NH_3-K_2O-H_3PO_4-$H_4P_2O_7$-H_2O system at 25°C.

Soln. no.	pH	$(NH_4)_2O$ mass%	K_2O mass%	total P_2O_5 mass%	ortho P_2O_5 mass%	pyro P_2O_5 % of total	solid [a] phases
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_2PO_4, $NH_4H_2PO_4$, KOH, and NH_4OH were used. The $K_2H_2P_2O_7$ and $(NH_4)_3P_2O_7 \cdot H_2O$ were recrystallized.

ESTIMATED ERROR:

No information is given.

REFERENCES:

COMPONENTS:

(1) Potassium oxide; K_2O; [12136-45-7]
(2) Ammonia; NH_3; [7664-42-7]
(3) Phosphoric acid; H_3PO_4; [7664-38-2]
(4) Diphosphoric acid; $H_4P_2O_7$; [2466-09-3]
(5) Water; H_2O; [7732-18-5]

ORIGINAL MEASUREMENTS:

Frazier, A.W.; Dillard, E.F.; Thrasher, R.D.; Waerstad, K.R.

J. Agr. Food Chem. 1973, *21*, 700-4

EXPERIMENTAL VALUES cont'd:

Solubility in the NH_3-K_2O-H_3PO_4-$H_4P_2O_7$-H_2O system at 25°C.

Soln no.	pH	$(NH_4)_2O$ mass%	K_2O mass%	total P_2O_5 mass%	ortho P_2O_5 mass%	pyro P_2O_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

[a] The solid phases are: A = $(NH_4)_4P_2O_7$; B = $(NH_4)_3HP_2O_7 \cdot H_2O$; C = $(NH_4,K)_3HP_2O_7 \cdot H_2O$, mole ratio N/P 1.0 to 2.8; D = $(NH_4)_2H_2P_2O_7$; E = $(NH_4,K)_2H_2P_2O_7$, mole ratio N/P is 1.9 to 3.0; F = $(NH_4,K)_2H_2P_2O_7 \cdot 0.5H_2O$, mole ratio N/P is 0.61 to 0.74; G = $K_2H_2P_2O_7$; J = $K_3HP_2O_7 \cdot 3H_2O$; L = $(NH_4)_2HPO_4$; M = $(NH_4,K)H_2PO_4$; N = $K_2HPO_4 \cdot 3H_2O$.

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	$(NH_4)_2O$ mol/kg	K_2O mol/kg	total P_2O_5 mol/kg	ortho P_2O_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:

(1) Potassium dihydrogenphosphate; KH_2PO_4; [7778-77-0]
(2) Potassium chloride; KCl; [7447-40-7]
(3) Calcium dihydrogenphosphate; $Ca(H_2PO_4)_2$; [10103-46-5]
(4) Calcium chloride; $CaCl_2$ [10043-52-4]
(5) Water; H_2O; [7732-18-5]

ORIGINAL MEASUREMENTS:

Timoshenko, Yu.M.; Gilyazova, G.N.
Zh. Neorg. Khim. 1981, *26*, 1104-6.

VARIABLES:

Composition at 25°C.

PREPARED BY:

J. Eysseltová

EXPERIMENTAL VALUES:

Composition of saturated solutions at 25°C.

d / g cm^{-3}	η/cP	$Ca(H_2PO_4)_2$ mass%	$CaCl_2$ mass%	KH_2PO_4 mass%	KCl mass%	mol/100 mol solute Ca^{2+}	$2H_2PO_4^-$	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

[a] The solid phases are: A = $Ca(H_2PO_4)_2 \cdot H_2O$; B = KH_2PO_4; C = KCl; D = $CaCl_2 \cdot 6H_2O$.

COMMENT: The authors emphasize that in the $Ca(H_2PO_4)_2$-KH_2PO_4-H_2O and $Ca(H_2PO_4)_2$-$CaCl_2$-H_2O systems the solubility of each salt component is not influenced appreciably by the presence of the other one.

AUXILIARY INFORMATION

METHOD/APPARATUS/PROCEDURE:

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 complexometric titration. Where the amount of phosphate ion was small, it was determined gravimetrically as ammonium phosphomolybdate.

SOURCE AND PURITY OF MATERIALS:

No information is given.

ESTIMATED ERROR:

No information is given.

REFERENCES: