COMPONENTS:	ORIGINAL MEASUREMENTS:
(1) Lithium phosphate; Li_3PO_4; [10377-52-3] (2) Phosphoric acid; H_3PO_4; [7664-38-2] (3) Lithium oxide; Li_2O; [12057-24-8] (4) Water; H_2O; [7732-18-5]	Rollet, A.P.; Lauffenburger, R. *Bull. Soc. Chim. France* 1934, 146-52.
VARIABLES:	**PREPARED BY:**
Temperature and Composition	J. Eysseltová

EXPERIMENTAL VALUES:

Composition of saturated solutions of Li_3PO_4 at 20°C.

Li_2O	P_2O_5	H_3PO_4 [a]		Li_3PO_4 [a]		Solid [b]
mass %	mass %	mass %	mol/kg H_2O	mass %	mol/kg H_2O	phase
7.05	0.017	----	----	0.0277	0.0026 (D)	A + B
0.077	0.016	----	----	0.0261	0.0023	B
0.0134	0.021	----	----	0.0343	0.0030	"
0.0165	0.0272	0.00152	0.00015	0.0426	0.0037	"
0.0197	0.0345	0.00456	0.00047	0.0509	0.0044	"
0.0203	0.0360	0.00538	0.00054	0.0524	0.0045	"
0.050	0.116	0.0508	0.00521	0.129	0.0111	"
0.096	0.242	0.123	0.0126	0.249	0.0216	"
0.118	0.305	0.163	0.0167	0.305	0.0264	"
0.150	0.409	0.236	0.0243	0.388	0.0337	"
0.205	0.620	0.407	0.0420	0.530	0.0461	"
0.262	0.875	0.635	0.0657	0.677	0.0593	"
5.73	27.5	25.4	4.34	14.8	2.14	"
7.63	37.1	34.5	7.70	19.7	3.72	"
7.95	38.8	36.2	8.53	20.5	4.10	"
8.45	41.6	38.9	10.14	21.8	4.81 (E)	B + C
7.73	41.7	40.7	10.55	20.0	4.38	C
6.62	43.5	45.5	12.4	17.1	3.96	"

[a] All these values were calculated by the compiler.

[b] The solid phases are: A = $LiOH \cdot H_2O$; B = Li_3PO_4; C = LiH_2PO_4.

(continued next page)

AUXILIARY INFORMATION

METHOD/APPARATUS/PROCEDURE:

Phosphoric acid, lithia and water were placed in glass tubes and sealed with a Hg stirrer. The tubes, equipped with Pt electrodes for conductivity measurements, were placed in a thermostat and stirred for at least 8 h. The attainment of equil was ascertained by the constancy in the conductivity. P_2O_5 was detd in a few cases by titrn with NaOH soln; usually P_2O_5 was detd gravimetrically by ppting as $(NH_4)_3PMo_{12}O_{40}$, re-pptd as $NH_4MgPO_4 \cdot 6H_2O$, calcined and weighed as $Mg_2P_2O_7$. Additional gravimetric analyses were performed when the P_2O_5/Li_2O ratio corresponded to the formulas Li_3PO_4 and LiH_2PO_4. In this case the soln was evaporated and the residue calcined. The total weight of the calcined residue is the sum of P_2O_5 and Li_2O. No other details given.

SOURCE AND PURITY OF MATERIALS:

Nothing specified.

ESTIMATED ERROR:

Temp control at best is ± 0.1 K
Soly: exptl error not specified. For binary system Li_3PO_4-H_2O extrapolations give errors of ± 4.5% at 0° and ± 6.7% at 20°C (authors)

REFERENCES:

COMPONENTS:	ORIGINAL MEASUREMENTS:
(1) Lithium phosphate; Li_3PO_4; [10377-52-3]	Rollet, A.P.; Lauffenburger, R.
(2) Phosphoric acid; H_3PO_4; [7664-38-2]	*Bull. Soc. Chim. France* 1934, 146-52.
(3) Lithium oxide; Li_2O, [12057-24-8]	
(4) Water, H_2O; [7732-18-5]	

EXPERIMENTAL VALUES, cont'd:

Composition of saturated solutions of Li_3PO_4 at 0°C.

Li_2O mass %	P_2O_5 mass %	H_3PO_4 mass %	H_3PO_4 [a] mol/kg H_2O	Li_3PO_4 mass %	Li_3PO_4 [a] mol/kg H_2O	Solid phase [b]
6.70	0.00	----	----	0.00	0.00	A
6.72	0.015	----	----	0.024	0.0023 (A)	A + B
5.88	0.020	----	----	0.033	0.0030	B
2.40	0.016	----	----	0.026	0.0023	"
0.49	0.020	----	----	0.033	0.0028	"
0.0088	0.0148	0.0012	0.0001	0.0227	0.0020	"
0.0098	0.0163	0.0011	0.0001	0.0253	0.0021	"
0.0185	0.0375	0.0113	0.0012	0.0478	0.0041	"
0.025	0.058	0.0248	0.0026	0.0646	0.0056	"
0.149	0.388	0.210	0.0216	0.385	0.0334	"
0.167	0.414	0.207	0.0212	0.432	0.0375	"
0.174	0.452	0.240	0.0250	0.450	0.0399	"
0.2285	0.635	0.377	0.0389	0.590	0.0515	"
0.266	0.785	0.502	0.0519	0.687	0.0601	"
0.270	0.80	0.513	0.0531	0.698	0.0610	"
0.330	0.96	0.603	0.0626	0.863	0.0747	"
0.403	1.355	0.989	0.1031	1.04	0.0928	"
0.520	1.88	1.46	0.153	1.34	0.119	"
0.740	2.74	2.17	0.230	1.91	0.172	"
2.55	11.03	9.65	1.18	6.59	0.679	"
3.90	17.2	15.3	2.08	10.1	1.165	"
4.58	20.26	18.0	2.61	11.8	1.46	"
4.97	22.16	19.7	2.99	12.8	1.64	"
5.42	24.30	21.7	3.44	14.0	1.88	"
6.88	31.13	28.0	5.26	17.7	2.82	"
7.55 [c]	34.43 [c]	31.0	6.40	19.5	3.41	"
8.30 [c]	38.0 [c]	34.2	7.92	21.4	4.19 (B)	B + C
8.19	37.95	34.5	7.94	21.2	4.12	C
8.08	38.10	34.9	8.07	20.9	4.08	"
7.68	38.20	35.9	8.30	19.8	3.88	"
7.54	38.45	36.6	8.50	19.5	3.83	"
7.18	38.85	37.9	8.90	18.6	3.68	"
4.62	47.5	55.5	17.6	11.9	2.86	"
3.21	53.05	66.2	26.5	8.30	2.81	"
2.74	55.65	70.4	32.8	7.60	2.80	"
2.22	58.8	76.3	43.4	5.74	2.76 (C)	"

[a] All these values were calculated by the compiler.

[b] The solid phases are: A = $LiOH \cdot H_2O$; B = Li_3PO_4; C = LiH_2PO_4.

[c] Read from the intersection of branch lines. For discussion of points A, B, C, D, E see the discussion of the phase diagram in the Critical Evaluation.

By interpolation of the isotherms, the authors report the solubilites of Li_3PO_4 at 0° and 20° in the binary system to be 0.022 ± 0.001 mass % and 0.030 ± 0.002 mass %, respectively. The compiler has calculated these solubility values to be 0.0019 mol kg^{-1} at 0°C and 0.0026 mol kg^{-1} at 20°C.

From the data in the region rich in H_3PO_4 the solubility of LiH_2PO_4 [13453-80-0] was determined to be 55.8 ± 0.1 mass % or 12.15 ± 0.02 mol kg^{-1} (compiler's calculation) at 0°C.