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Ni-P (Nickel-Phosphorus)

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The Ni-P phase diagram in [2000Oka] was constructed based on thermodynamic modeling by [1999Shi] (0 to 33.3 at.% P) and assessment by [1991Lee] (33.3 to 100 at.% P). All phases were assumed to be line compounds in [1999Shi].

[2009Sch] investigated the Ni-P phase diagram based on XRD and EMPA. The result is shown in Fig. 1 (0 to 66.7 at.% P). βNi_5P_2, $\beta Ni_{12}P_5$, and Ni_2P have measurable width (enlarged in Fig. 2). The rest of the phase diagram in Fig. 1 has been redrawn from [1991Lee].

Ni-P crystal structure data are given in Table 1.

Table 1 Ni-P crystal structure data

Phase	Composition, at.% P	Pearson symbol	Space group	Strukturbericht designation	Prototype
(Ni)	0	*cF*4	$Fm\bar{3}m$	*A*1	Cu
Ni_3P	25	*tI*32	$I\bar{4}$	$D0_e$	Ni_3P
βNi_5P_2	28.7-29.2	...	...	...	...
αNi_5P_2	28.6	*hP*168	$P\bar{3}$	...	...
$\beta Ni_{12}P_5$	29.4-30.7	...	...	...	...
$\alpha Ni_{12}P_5$	29.4	*tI*34	*I*4/*m*	...	...
Ni_2P	33.3-34	*hP*9	$P\bar{6}2m$	*C*22	Fe_2P
Ni_5P_4	44.4	*hP*36	$P6_3mc$	...	...
NiP	50	*aP*16	*Pcba*	...	...
NiP_2	66.7	*mC*12	*C*2/*c*	...	...
NiP_3	75	*cI*32	$Im\bar{3}$	$D0_2$	$CoAs_3$
P(red)	100	...	...	...	...

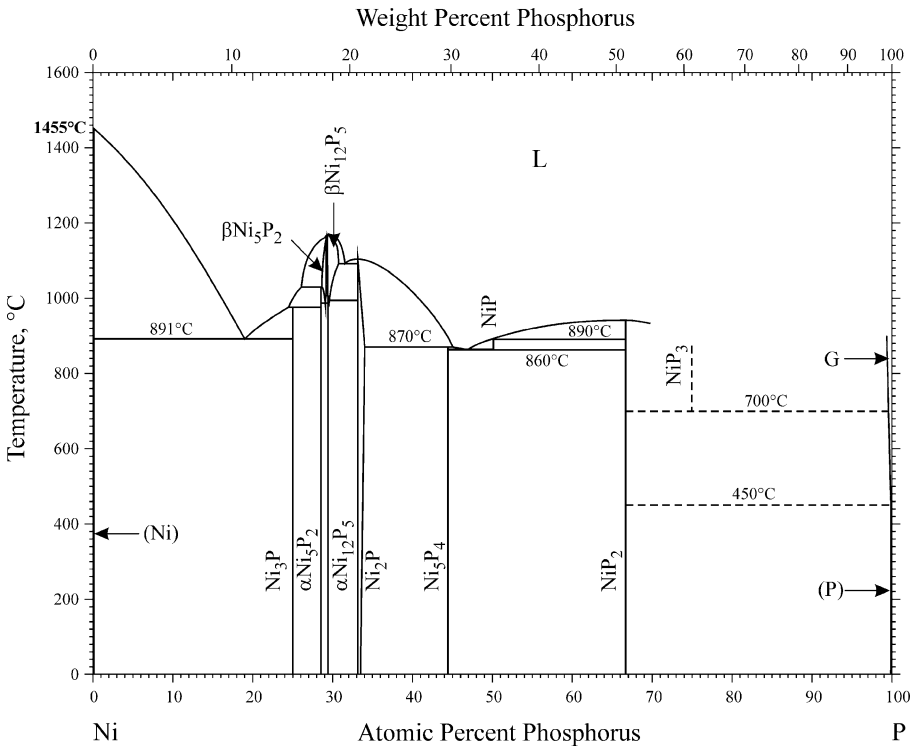

Fig. 1 Ni-P phase diagram

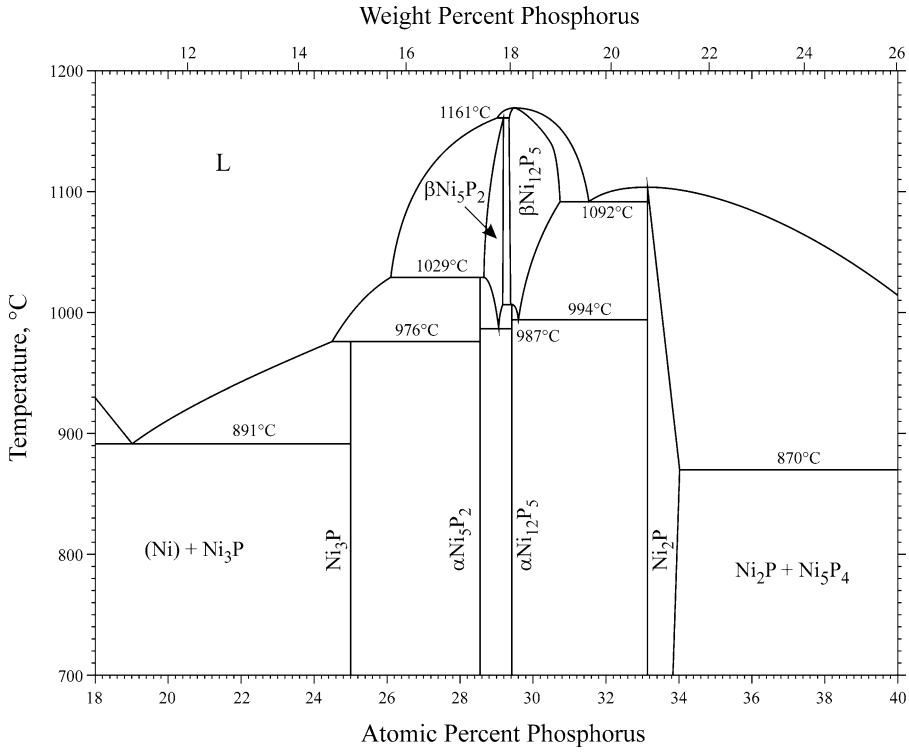

Fig. 2 Enlarged Ni-P phase diagram (18 to 40 at.% P)

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