

Lu-Pd (Lutetium-Palladium)

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The Lu-Pd phase diagram was unknown in [Massalski2]. [1993Tak] reported a partial phase diagram (73-100 at.% Pd, 300-600 °C) to show the peritectoid formation of LuPd₇ from LuPd₃ and (Lu). [1999Bur] reported another partial phase diagram for higher temperatures (75-100 at.% Pd, >1000 °C).

Figure 1 was created by combining the results of [1993Tak] and [1999Bur]. [1999Bur] reported two sets of

phase boundaries for the LuPd₃ + (Pd) two-phase field based on X-ray measurements and DTA measurements. The boundaries shown in Fig. 1 were drawn by assuming smooth connection to the results of [1993Tak].

Table 1 shows Lu-Pd crystal structure data. The existence of three more phases is known, but the phase relationships among them have not been reported.

Table 1 Lu-Pd crystal structure data

Phase	Composition, at.% Pd	Pearson symbol	Space group	Strukturbericht designation	Prototype
(Lu)*	0	<i>hP2</i>	<i>P6₃/mmc</i>	<i>A3</i>	Mg
LuPd*	50	<i>cP2</i>	<i>Pm$\bar{3}$m</i>	<i>B2</i>	CsCl
Lu ₃ Pd ₄ *	57.1	<i>hR14</i>	<i>R$\bar{3}$</i>
Lu ₂ Pd ₅ *	71.4	<i>cF144</i>	<i>Fd$\bar{3}$m</i>
LuPd ₃	75-80	<i>cP4</i>	<i>Pm$\bar{3}$m</i>	<i>L1₂</i>	AuCu ₃
LuPd ₇	87-88
(Pd)	83-100	<i>cF4</i>	<i>Fm$\bar{3}$m</i>	<i>A1</i>	Cu

* Not shown in Fig. 1

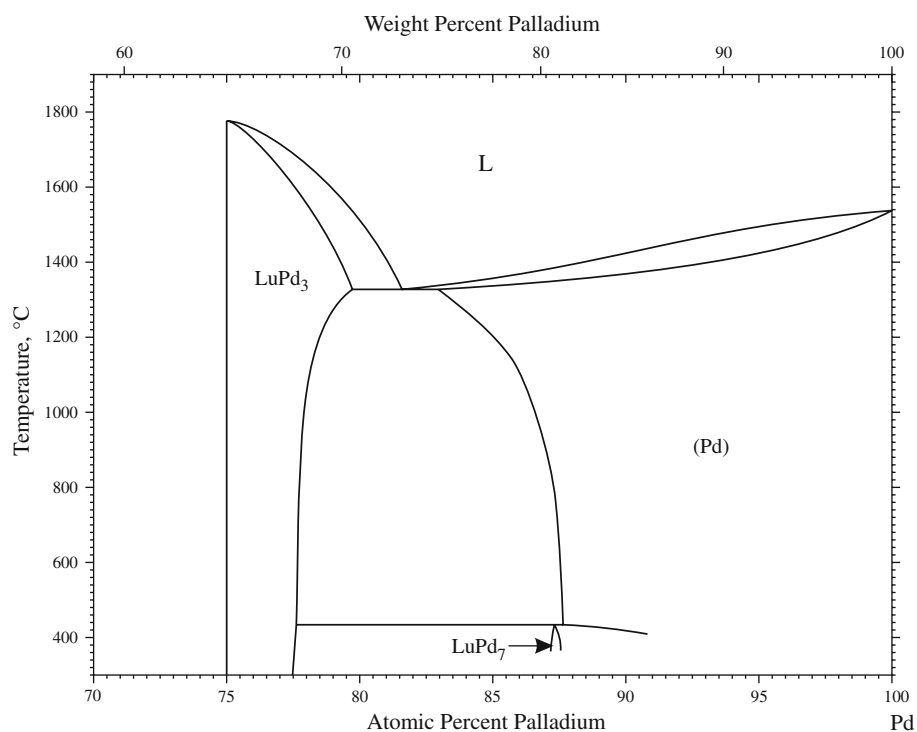


Fig. 1 Lu-Pd phase diagram

Section III: Supplemental Literature Review

References

- 1993Tak:** K. Takao, Y. Sakamoto, T. Araki, and H. Kohzuma, Observations of Ordered Pd₇RE (RE = Tb, Tm, Yb, Lu) Phases in Pd-RE Alloys, *J. Alloys Compds.*, 1993, **193**, p 41-43
- 1999Bur:** G.S. Burkhanov, A.S. Ilyushin, N.B. Kol'chugina, N.A. Khatanova, O.D. Chistyakov, and O. Tsetsgeeglin, *Phase Diagram of Lu-Pd System in the 0-25 at.% Lu Region*, *Russ. Metall.*, 1999, (6), p 132-136