

Pt-Zr (Platinum-Zirconium)

H. Okamoto

The Pt-Zr phase diagram in [Massalski2] showed three intermetallic compounds, Pt₃Zr, PtZr (dimorphic, but the transition temperature is unknown), and Pt₃Zr₅. [2000Fai] discovered a new phase Pt₄Zr by means of XRD and SEM. In addition, [2007Sta] discovered Pt₁₀Zr₇, Pt₄Zr₃, and βPtZr by means of XRD, neutron diffraction, electron microscopy, and metallography. Figure 1 shows the Pt-Zr phase diagram proposed by [2007Sta].

Table 1 shows Pt-Zr crystal structure data summarized from [Massalski2] and [2007Sta].

References

- 2000Fai:** G.B. Fairbank, C.J. Humphreys, A. Kelly, and C.N. Jones, Ultra-high Temperature Intermetallics for the Third Millennium, *Intermetallics*, 2000, **8**, p 1091-1100
2007Sta: J.K. Stalick and R.M. Waterstrat, The Zirconium-Platinum Phase Diagram, *J. Alloys Compds.*, 2007, p 123-131

Table 1 Pt-Zr crystal structure data

Phase	Composition, at.% Zr	Pearson symbol	Space group	Strukturbericht designation	Prototype
(Pt)	0-13	<i>cF4</i>	<i>Fm$\bar{3}m$</i>	<i>A1</i>	Cu
Pt ₄ Zr	17-21	<i>hP16</i>	<i>P6₃/mmc</i>	<i>D0₂₄</i>	Ni ₃ Ti
Pt ₃ Zr	22-31	<i>cP4</i>	<i>Pm$\bar{3}m$</i>	<i>L1₂</i>	AuCu ₃
Pt ₁₀ Zr ₇	40-42	<i>oC68</i>	<i>Cmca</i>	...	Ni ₁₀ Zr ₇
Pt ₄ Zr ₃	42.5-46	<i>hR42</i>	<i>R$\bar{3}$</i>
βPtZr	47-54	<i>cP2</i>	<i>Pm$\bar{3}m$</i>	<i>B2</i>	CsCl
αPtZr	48-53	<i>oC8</i>	<i>Cmcm</i>	<i>B_f</i>	CrB
Pt ₃ Zr ₅	62-65	<i>hP16</i>	<i>P6₃/mcm</i>	<i>D8₈</i>	Mn ₅ Si ₃
(βZr)	94-100	<i>cI2</i>	<i>Im$\bar{3}m$</i>	<i>A2</i>	W
(αZr)	98.5-100	<i>hP2</i>	<i>P6₃/mmc</i>	<i>A3</i>	Mg

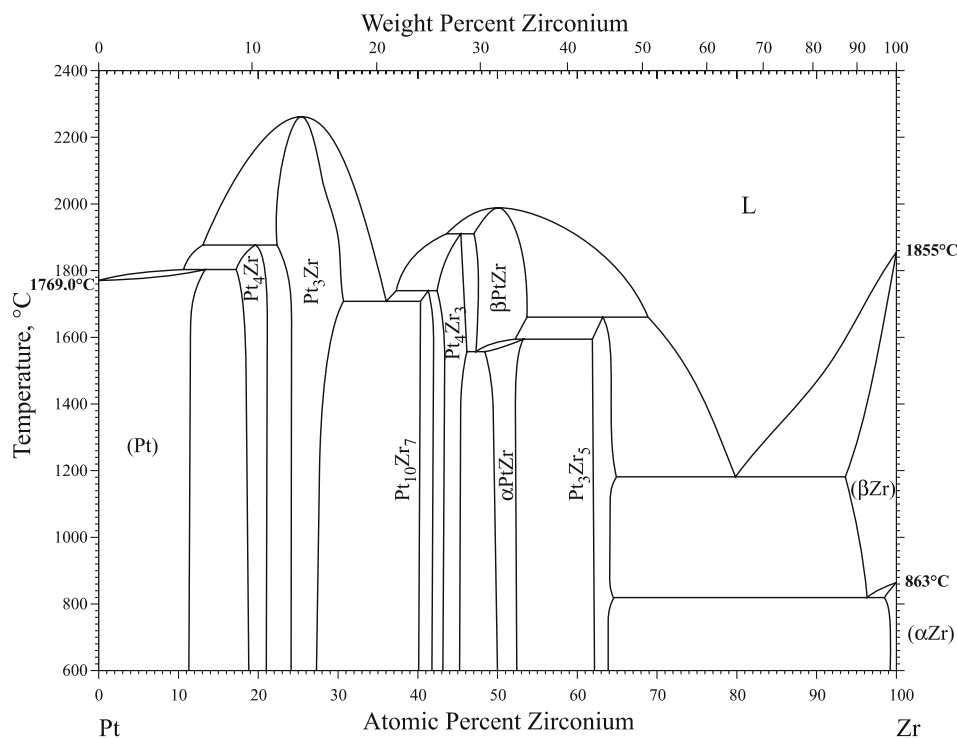


Fig. 1 Pt-Zr phase diagram