

# Pd-Ta (Palladium-Tantalum)

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The Pd-Ta phase diagram in [Massalski2] was redrawn from [1990Cha], which was primarily based on [1978Wat]. The peritectic formation temperature of PdTa<sub>3</sub> was shown at 2550 °C. [2003Wat] re-measured this temperature by observing a rapidly cooled 75 at.% Ta alloy after annealing at 2030 and 1990 °C. The signs of liquification indicated that a peritectic temperature at 2010 °C.

Figure 1 shows the Pd-Ta phase diagram of [1990Cha] with modification based on [2003Wat]. The problem of the liquidus and solidus of (Ta) in [1990Cha] (they would cross one another when extrapolated) was solved in Fig. 1.

There is an unlikely feature remaining in Fig. 1. The liquidus and solidus of (Pd) are expected to be continuous with those of the β phase. Unless unusual bends are introduced, the liquidus and solidus of (Pd) would be extrapolated into the liquid phase at around 28 at.% Ta.

It suggests that (Pd) is stabilized around here. Therefore, the L = Pd<sub>3</sub>Ta + Pd<sub>2</sub>Ta eutectic temperature must be higher or a stable Cu-type fcc phase must exist around 28 at.% Ta.

## References

- 1978Wat:** R.M. Waterstrat, B.C. Giessen, R. Koch, and R.C. Manuszewski, The Tantalum-Palladium Constitutional Diagram, *Metall. Trans.*, 1978, **9A**, p 643-648
- 1990Cha:** M.S. Chandrasekharaiah and S.R. Bharadwaj, The Pd-Ta (Palladium-Tantalum) System, *J. Alloy Phase Diagrams*, 1990, **6(2)**, p 103-110
- 2003Wat:** R.M. Waterstrat, Re-Measurement of the Peritectic Temperature of the Sigma Phase in the Ta-Pd System, *J. Phase Equilibria*, 2003, **24(4)**, p 328-359

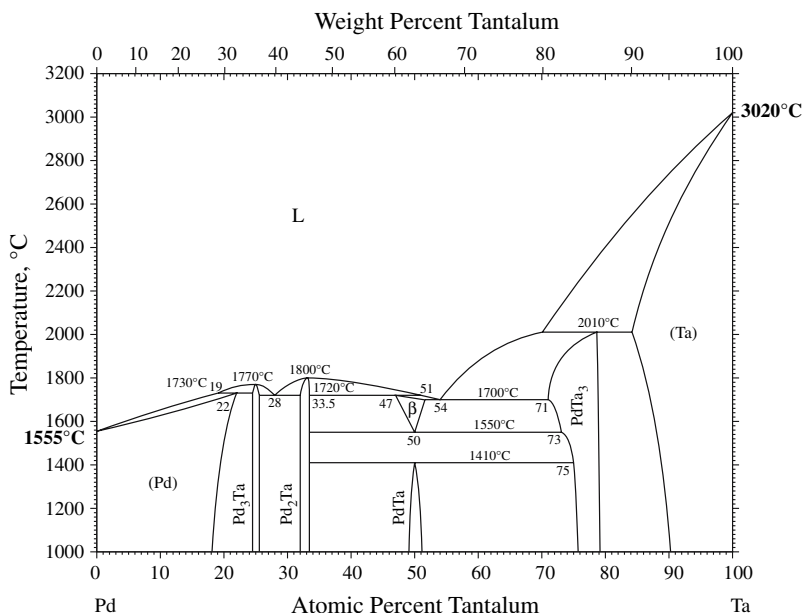


Fig. 1 Pd-Ta phase diagram