

Pt-V (Platinum-Vanadium)

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The Pt-V phase diagram in [Massalski2] was redrawn from [1989Smi].

Figure 1 shows the Pt-V phase diagram calculated by [2008Wan] (excluding Pt₈V). The diagrams of [1989Smi] and [2008Wan] are similar because both are based on [1973Wat], but the diagram of [2008Wan] is naturally more thermodynamically consistent.

The existence of Pt₈V was reported by [1983Sch], but this phase was not shown in the phase diagram of [1989Smi] because its stability was uncertain. [2006Nxu] concluded that Pt₈V is stable below 810 ± 10°C based on

energy dispersive spectroscopy study on variously heat treated specimens. Pt₈V is shown schematically in Fig. 1.

Table 1 shows Pt-V crystal structure data given by [1989Smi] and [2006Nxu].

References

1973Wat: R.M. Waterstrat, The Vanadium-Platinum Constitution Diagram, *Metall. Trans.*, 1973, 4, p 455-466

1983Sch: D. Schryvers, J. Van Landuyt, and S. Amelinckx, Electron Microscopy Study of a New Ordered Phase in the

Table 1 Pt-V crystal structure data

| Phase | Composition, at.% V | Pearson symbol | Space group | Strukturbericht designation | Prototype |
|-------------------|---------------------|----------------|------------------------------|-----------------------------|--------------------|
| (Pt) | 0-56.5 | <i>cF4</i> | <i>Fm</i> $\bar{3}$ <i>m</i> | A1 | Cu |
| Pt ₈ V | 11.1 | <i>tI18</i> | <i>I4/mmm</i> | ... | Pt ₈ Ti |
| Pt ₃ V | 22-25.5 | <i>tI8</i> | <i>I4/mmm</i> | D0 ₂₂ | Al ₃ Ti |
| Pt ₂ V | 31.8-33.5 | <i>oI6</i> | <i>Immm</i> | ... | MoPt ₂ |
| PtV | 50-51.9 | <i>oP4</i> | <i>Pmma</i> | B19 | AuCd |
| PtV ₃ | 67.3-82 | <i>cP8</i> | <i>Pm</i> $\bar{3}$ <i>n</i> | A15 | Cr ₃ Si |
| (V) | 89.4-100 | <i>cI2</i> | <i>Im</i> $\bar{3}$ <i>m</i> | A2 | W |

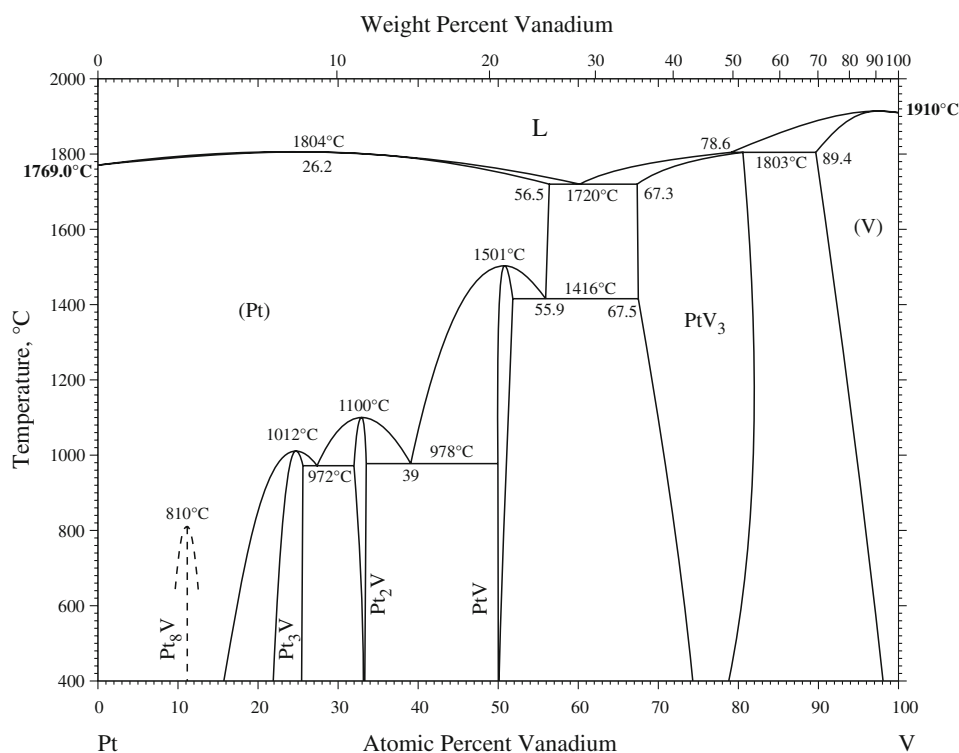


Fig. 1 Pt-V phase diagram

- Platinum-Vanadium (8:1) System, *Mater. Res. Bull.*, 1983, **18**(11), p 1369-1374
- 1989Smi:** J.F. Smith, Pt-V (Platinum-Vanadium), *Phase Diagrams of Binary Vanadium Alloys*, J.F. Smith, Ed., ASM International, Materials Park, OH, 1989, p 223-228
- 2006Nxu:** S. Nxumalo and C.I. Lang, Thermodynamic Stability of Pt₈V, *J. Alloys Compd.*, 2006, **425**, p 181-184
- 2008Wan:** C.P. Wang, A.Q. Zheng, and X.J. Liu, Thermodynamic Assessment of the V-Ge and V-Pt Systems, *Intermetallics*, 2008, **16**, p 544-549