

As-Te (Arsenic-Tellurium)

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The As-Te phase diagram in [Massalski2] showed that As_2Te_3 melts congruently at 381 °C. [1990Rou] supported this result (see [1993Oka]).

Based on DTA data, however, [2001Che] concluded that As_2Te_3 melts peritectically. When the result of [1990Rou] is reviewed again, their data points appear to support [2001Che] more consistently. The As-Te phase diagram in [Massalski2] was revised in Fig. 1 accordingly.

In addition, [2001Che] proposed an As-Te phase diagram at 1 atm. pressure. (The sublimation point of As is 614 °C. Figure 1 is for condensed phases.) However, this phase diagram cannot be accepted because the initial opening angle of the two-phase field $G + L$ at 100% Te is shown to be much smaller than the $L + (\text{Te})$ opening angle. As reviewed in [1990Oka], the van't Hoff relationship requires that the $G + L$ opening angle must be very much larger than that of $L + (\text{Te})$ in view of the magnitude of the heat of

transformation of Te (heat of vaporization = 114.1 kJ/mol, heat of fusion = 17.47 kJ/mol).

References

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- 1993Oka:** H. Okamoto, As-Te (Arsenic-Tellurium), *J. Phase Equilib.*, 1993, **14**(6), p 764-765
- 2001Che:** C. Chen, S. Chen, and J. Wang, Properties of As-Te Alloys and Their Reactions with Zn Substrate, *Mater. Chem. Phys.*, 2001, **76**, p 316-325

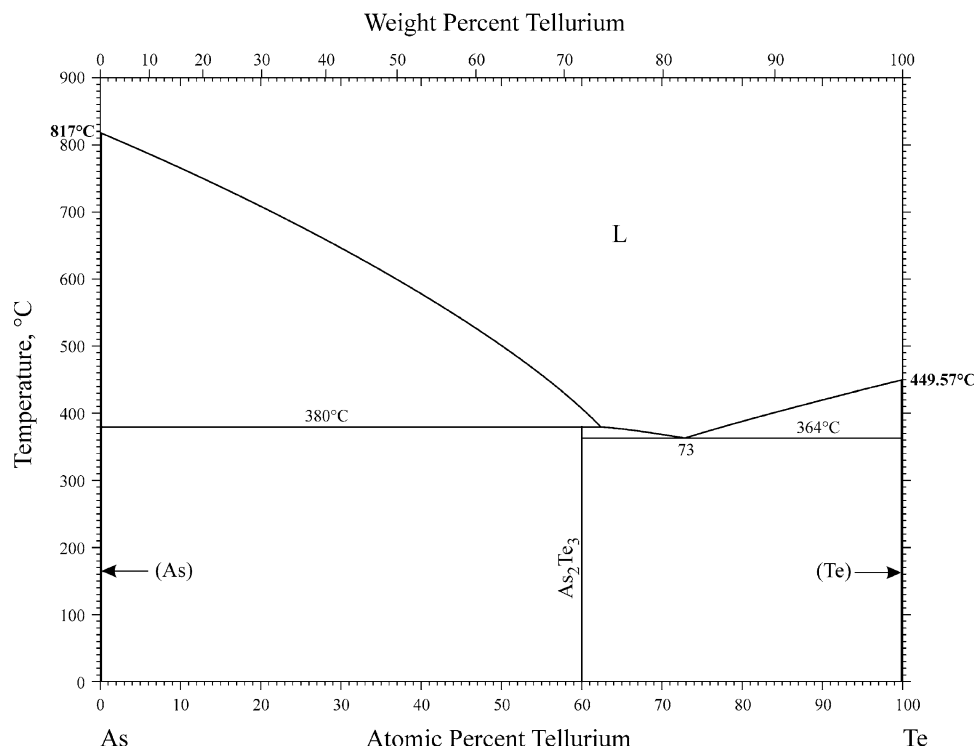


Fig. 1 As-Te phase diagram