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Fe-V (Iron-Vanadium)

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The Fe-V phase diagram in [Massalski2] was redrawn from [1984Smi] (dashed lines in Fig. 1). The asymmetric shape of the σ phase in Fig. 1 was unique among all binary phase diagrams.

[2005Ust1] and [2005Ust2] investigated the Fe-rich part of the σ phase region by means of x-ray diffraction and electron microscopy. They found that the σ phase exists in the temperature range 650 to 1219 °C, and phase separation is observed below 650 °C. They inferred the phase diagram as shown with solid lines in Fig. 1. (Note: Different symbols are used to distinguish different phase fields. However, the same symbol, circle in [2005Ust1] or 45° tilted square in [2005Ust2], is used for both the σ phase and the (αFe,V) + σ two-phase field). In Fig. 1, the (αFe) phase and the (V) phase are connected by forming a narrow strip at about 650 °C. Because there is no positive indication of forming such a continuous phase field at about 650 °C, it is more likely that the σ phase decomposes eutectoidally directly into (αFe) and (V) at about 650 °C, as in the case of the Cr-Fe system ([Massalski2]).

References

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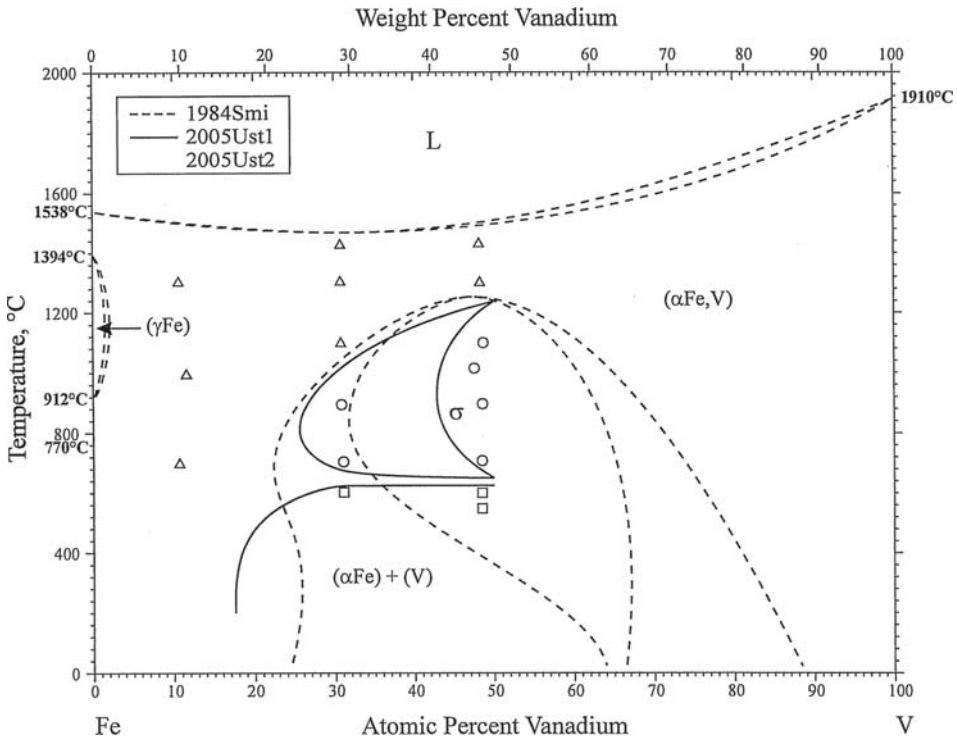

Fig. 1 Fe-V phase diagram. (αFe) + (V) is for the diagram of [2005Ust1] and [2005Ust2]