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Si-V (Silicon-Vanadium)

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The Si-V phase diagram in [Massalsi2] was redrawn from [1985Smi].

[2007Zha] noticed that the eutectoid decomposition temperature of V_6Si_5 shown at 1160 °C in [1985Smi], which was quoted from [1985Sto], was actually 1160 K (887 °C). A further investigation by [2007Zha] using x-ray powder diffraction indicated that the decomposition temperature of V_6Si_5 is below 500 °C.

Figure 1 shows the Si-V phase diagram calculated by [2008Zha]. The experimental data points used in the modeling were nearly the same as those used by [1985Smi], but a few additional experiments were carried out to clarify ambiguous areas.

Table 1 shows Si-V crystal structure data given by [1985Smi]. The composition range of phases was modified in accordance with Fig. 1.

References

1985Smi: J.F. Smith, The Si-V (Silicon-Vanadium) System: Addendum, *Bull. Alloy Phase Diagr.*, 1985, **6**(3), p 266-271

1985Sto: E.K. Storms and C.E. Myers, Thermodynamics and Phase Equilibria in the Vanadium-Silicon System, *High Temp. Sci.*, 1985, **20**, p 87-96

Table 1 Si-V

Phase	Composition, at.% V	Pearson symbol	Space group	Strukturbericht designation	Prototype
(Si)	0	*cF*8	$Fd\bar{3}m$	*A*4	C (diamond)
Si_2V	33.3	*hP*9	$P6_222$	*C*40	$CrSi_2$
Si_5V_6	55	*oI*44	*Immm*	...	Nb_6Sn_5
Si_3V_5	62.5	*tI*32	*I*4/*mcm*	$D8_m$	W_5Si_3
SiV_3	74.5-80.1	*cP*8	$Pm\bar{3}n$	*A*15	Cr_3Si
(V)	95.2-100	*cI*2	$Im\bar{3}m$	*A*2	W

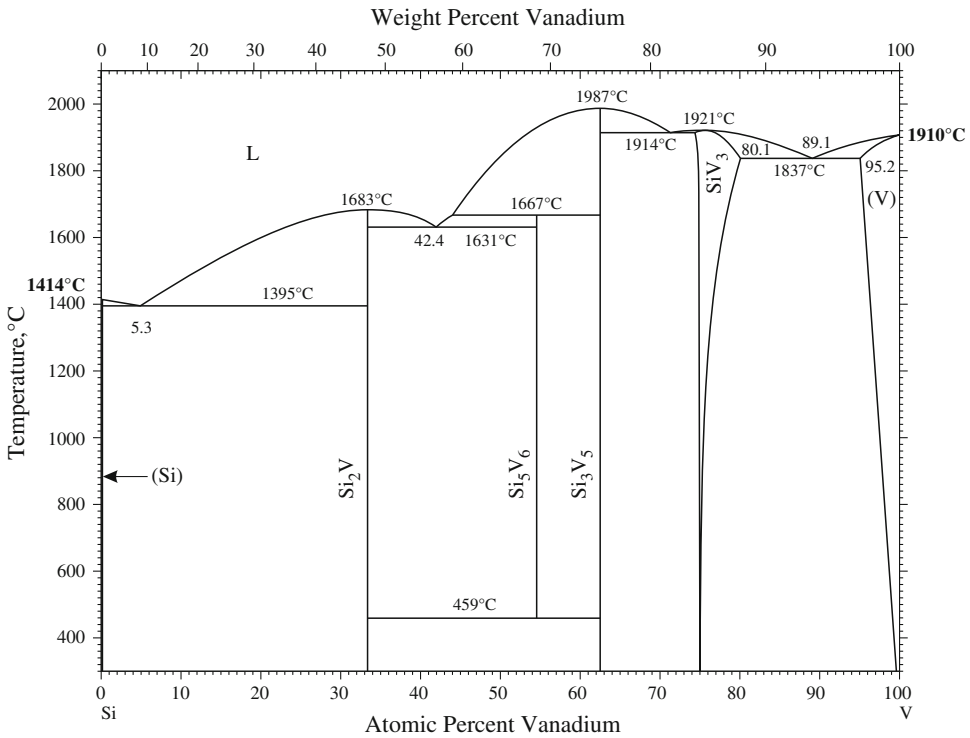

Fig. 1 Si-V phase diagram

Section III: Supplemental Literature Review

2007Zha: C. Zhang, J. Wang, Y. Du, and W. Zhang, An Investigation on the Thermodynamic Stability of V_6Si_5, *J. Mater. Sci*., 2007, **42**, p 7046-7048

2008Zha: C. Zhang, Y. Du, W. Xiong, H. Xu, P. Nash, Y. Ouyang, and R. Hu, Thermodynamic Modeling of the V-Si System Supported by Key Experiments, *Calphad*, 2008, **32**, p 320-325