V-Zn (Vanadium-Zinc)

H. Okamoto

The V-Zn phase diagram with three intermediate phases in [Massalski2] was redrawn from [1989Smi]. Among these phases, V_4Zn_5 and VZn_3 were adopted from [1963Cha]. The third phase VZn_{16} was shown in the phase diagram, but its existence was questioned. Furthermore, another phase V_3Zn had been reported to exist, but [1989Smi] concluded that this is not an equilibrium phase. [2010Cha] confirmed the absence of both VZn_{16} and V_3Zn by means of X-ray diffraction analysis and scanning electron microscopy with energy-dispersive X-ray spectrometry for variously heat treated samples. The V-Zn phase diagram calculated by [2010Cha] (Fig. 1) is in good agreement with experimental data of [1963Cha] ($< 800\text{ }^{\circ}\text{C}$).

V-Zn crystal structure data shown in Table 1 was adopted from [1989Smi].

References

1963Cha: M.G. Chasanov, R. Schablaske, P.D. Hunt, and B. Tani, The Zinc-Vanadium Phase Diagram. *Trans. Metall. Soc. AIME.*, 1963, **227**(4), p 485-488
1989Smi: J.F. Smith, V-Zn (Vanadium-Zinc), *Phase Diagrams of Binary Vanadium Alloys*, J.F. Smith, Ed., ASM International, Metals Park, OH, 1989, p 323-325
2010Cha: K. Chang, Y. Du, W. Sun, H. Xu, and L. Zhou, Thermodynamic Assessment of the V-Zn System Supported by Key Experiments and First-Principles Calculations. *Calphad*, 2010, **34**(1), p 75-80

Table 1 V-Zn crystal structure data

Phase	Composition, at.% Zn	Pearson symbol	Space group	Strukturbericht designation	Prototype
(V)	0	<i>cI2</i>	<i>Im$\bar{3}m$</i>	<i>A2</i>	W
V_4Zn_5	55.6	<i>tI18</i>	<i>I4/mmm</i>	...	...
VZn_3	75	<i>cP4</i>	<i>Pm$\bar{3}m$</i>	<i>L1_2</i>	AuCu ₃
(Zn)	100	<i>hP2</i>	<i>P6₃/mmc</i>	<i>A3</i>	Mg

Fig. 1 V-Zn phase diagram