creasing as the temperature increases. However, the solubility of Sb must decrease at higher temperature [91Oka], because the phase in equilibrium with liquid B is not liquid but gas. A modified phase diagram is shown in Fig. 1. The boiling point of B is 4002 °C [Massalski2].

Cited References

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Hf-Ni (Hafnium-Nickel)

H. Okamoto

[90Zen] "updated" the Ni-Hf phase diagram proposed by [83Nas] by optimization of the thermodynamic parameters of the system using the experimental data of [67Sve] and lattice stability parameters of [75Kau]. However, the calculated diagram of [90Zen] is not acceptable. For example, the Gibbs energies of formation of $NiHf_2$ and NiHf are given to be $G(NiHf_2) = -111245.8 + 61.665T$ and $G(NiHf) = -289.5 - 15.317T$ J/mol, respectively. The Gibbs energy of $NiHf_2$ becomes too low at low temperatures and NiHf (actually all the other compounds of the Ni-Hf system) becomes unstable (see [91Oka]). [90Zen] also obtained extremely unrealistic temperature dependence in the interaction parameters of the liquid and (Ni) phases. Unfortunately, the initial slope of the (βHf) liquidus in [83Nas] is not conformable to the van't Hoff relationship (too steep, see [91Oka]). Therefore, the diagram of [83Nas] is also subject to further modification. The crystal structure data [83Nas] are revised in Table 1.

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Table 1 Ni-Hf Crystal Structure Data

Phase	Composition, at.% Hf	Pearson symbol	Space group	Strukturbericht designation	Prototype
(Ni)	0 to 1	*cF*4	$Fm\bar{3}m$	*A*1	Cu
Ni_5Hf	16.7	*cF*24	$F\bar{4}3m$	$C15_b$	$AuBe_5$
Ni_7Hf_2	22.2	*m***	...	...	...
βNi_3Hf	25	*hP*40	$P6_3/mmc$	...	...
αNi_3Hf	25	*hR*12	$R\bar{3}m$	...	...
$Ni_{21}Hf_6$	27.6	*aP*29	$P\bar{1}$	...	...
Ni_7Hf_3	30	*aP*20	$P\bar{1}$	...	...
$Ni_{10}Hf_7$	41.2	*oC*68	*C*2*ca*	...	...
$Ni_{11}Hf_9$	45	*tI**	*I*4/*m*	...	...
NiHf	50	*oC*8	*Cmcm*	B_f	CrB
$NiHf_2$	66.7	*tI*12	*I*4/*mcm*	*C*16	Al_2Cu
(βHf)	98 to 100	*cI*2	$Im\bar{3}m$	*A*2	W
(αHf)	99 to 100	*hP*2	$P6_3/mmc$	*A*3	Mg

Lu-Sb (Lutetium-Antimony)

H. Okamoto

[90Abd] determined the Lu-Sb phase diagram by means of thermal and metallographic analyses. LuSb is bimorphic with a transformation temperature at 1870 °C [90Abd]. The melting point of LuSb was reported earlier by [74Sam] (same author) to be 2200 °C.

Crystal structure and lattice parameter data are given in Tables 1 and 2, respectively. Lu_5Sb_3 is Mn_5Si_3 type [90Abd]. The NaCl-type crystal structure of LuSb [63Prz] is most likely be for the low-temperature modification, because [90Abd] measured microhardness of NaCl-type crystal. [71Joh] determined the