Am-Np (Americium-Neptunium)

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The Am-Np phase diagram was calculated by [1993Oga] using a regular solution model (see [1999Oka]). The phase diagram was incomplete, as low-temperature allotropes of both terminal elements were not taken into account.

Figure 1 shows a complete Am-Np phase diagram calculated by [2010Kur] based on the thermodynamic database created consistently for actinide elements.

Table 1 shows Am-Np crystal structure data. The approximate composition range for each phase was read from the phase diagram.

References

1993Oga: T. Ogawa, Alloying Behaviour among U, Np, Pu, and Am Predicted with the Brewer Bond Model, *J. Alloys Compd.*, 1993, **194**(1), p 1-7

1999Oka: H. Okamoto, Am-Np (Americium-Neptunium), *J. Phase Equilib.*, 1999, **20**(4), p 450

2010Kur: K. Kurata, Thermodynamic Database on U-Pu-Zr-Np-Am-Fe Alloy System II—Evaluation of Np, Am, and Fe Containing Systems, *IOP Conference Series: Materials Science and Engineering*, Vol 9, 2010, 12023, 8 pp

Table 1 Am-Np crystal structure data

Phase	Composition, at.% Np	Pearson symbol	Space group	Strukturbericht designation	Prototype
(γ Am)	0-6	<i>cI2</i>	<i>Im</i> $\bar{3}m$	<i>A2</i>	W
(β Am)	0-2	<i>cF4</i>	<i>Fm</i> $\bar{3}m$	<i>A1</i>	Cu
(α Am)	0-1	<i>hP4</i>	<i>P6</i> ₃ / <i>mmc</i>	<i>A3'</i>	α La
(γ Np)	99-100	<i>cI2</i>	<i>Im</i> $\bar{3}m$	<i>A2</i>	W
(β Np)	100	<i>tP4</i>	<i>P2</i> ₁ 2	<i>A_d</i>	β Np
(α Np)	100	<i>oP8</i>	<i>Pnma</i>	<i>A_c</i>	α Np

Fig. 1 Am-Np phase diagram