

## Am – Pu (Americium – Plutonium)

### Phase diagram

By calculation, using Brewer's valence bond model, Ogawa [93 Oga] has obtained an optimized phase diagram. After some discussion Okamoto [99 Oka] has drawn an assessed phase diagram, from where information has been obtained to construct Fig. 1.

It should be mentioned that this phase diagram is in discrepancy to that one known [Landolt-Börnstein].

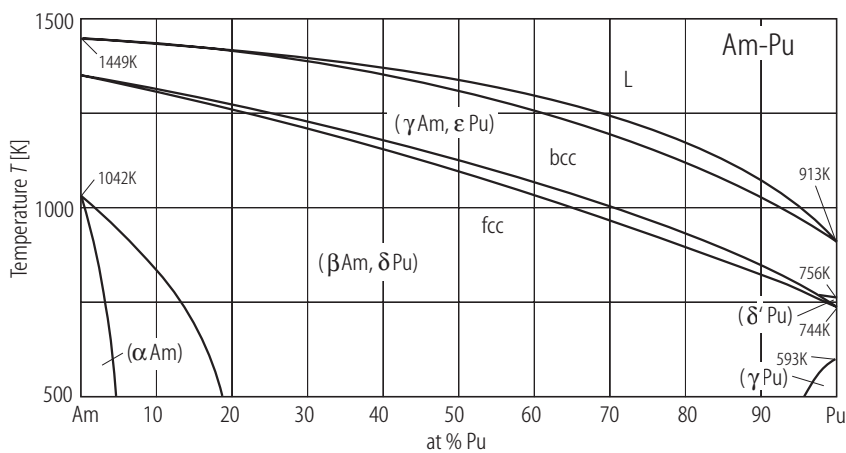
Using the regular solution model [93 Oga] has calculated equilibria concerning the phases  $\gamma$ -Am -  $\epsilon$ -Pu,  $\beta$ -Am -  $\delta$ -Pu and the liquidus. The interactions between the atoms of the components were taken from valence bond theory of [80 Bre]. The modifications  $\alpha$ -Am,  $\gamma$ -Pu,  $\beta$ -Pu and  $\alpha$ -Pu have not been regarded at by [93 Oga]. The equilibria concerning phases including these modifications are taken from [66 Ell] (solid lines). The results obtained with added  $\delta'$  - Pu are published by Okamoto [99 Oka].

### Crystal structure

Crystallographic data of solid phases are given in Table 1 (taken from [99 Oka])

**Table 1.**

Phase	Composition at-% Pu	Structure	Prototype
$\alpha$ - Pu	100	mon	$\alpha$ - Pu
$\beta$ - Pu	100	mon	$\beta$ - Pu
$\gamma$ - Pu	100	cub	$\gamma$ - Pu
$\delta'$ - Pu	? – 100	tet	In
$\alpha$ - Am	0 – 5	hex	$\alpha$ -La
$\beta$ - Am, $\delta$ -Pu	0 - 100	cub	Cu
$\gamma$ - Am, $\epsilon$ - Pu	0 - 100	cub	W

**Figure****Fig. 1. Am–Pu.** Phase diagram of the Am-Pu system [99 Oka].**References**

- [66 Ell] Ellinger, F.H., K.A. Johnson, and V.O. Struebing, J. Nucl. Mater. **20** (1966) 83  
 [80 Bre] Brewer, L., and R.H. Lamoreaux, At. Energy Rev., Spec. Issue **7** (1980) 11  
 [93 Oga] Ogawa, T.: J. Alloys and Comp. **194** (1993) 1  
 [99 Oka] Okamoto, H.: J. Phase Equilibria **20** (1999) 451  
 [Landolt-Börnstein] New Series, Group IV, Vol. 5, Subvolume a to j, Predel, B., Madelung, O. (ed.), Springer-Verlag (1991) to (1998)