

As – Pd (Arsenic – Palladium)

Phase diagram

Okamoto [90 Oka], [92 Oka] has published an assessed phase diagram, which was the basis of Fig. 1. For a short discussion of the phase equilibria the reader is referred to [92 Oka].

Crystal structure

In addition to the crystallographic properties collected in [Massalski], lattice parameters are given in Table 1.

Table 1. As–Pd. Lattice constants of intermediate phases taken from [Massalski] and [Pearson].

Phase	Structure	Prototype	Lattice parameters [nm]		
			<i>a</i>	<i>b</i>	<i>c</i>
As ₂ Pd					
β-AsPd ₂ L	hex	Fe ₂ P	0.662		0.360
α-AsPd ₂ H	mon		0.9241	0.847 β = 94°	1.045
As ₂ Pd ₅	hex		0.732		9.62
As ₃ Pd ₈	hex		0.7399		1.0311
AsPd ₃	tet	Ni ₃ P	0.9974		0.4822
AsPd ₅	mon	AsPd ₅	0.5514	0.7725 β = 99.08°	0.8427
Metastable phase					
AsPd ₅	cub	CsCl	0.3093		

L = Low temperature modification

H = High temperature modification

Using an isopiestic method, Ipser et al. [91 Ips1] have determined thermodynamic activities of As in liquid As-Pd alloys.

Thermodynamics

It should be mentioned that Ipser et al. [91 Ips2] have investigated very precisely the phase diagram of this system between 30 and 70 at% As. The thermodynamic activities of As in liquid alloys above 50 at% Pd have been used to draw Fig. 2. Furtheron, the authors have calculated for this range of concentration integral the enthalpies of mixing (Fig. 3) and the integral entropies of mixing (Fig. 4). Standard states are liquid Pd and solid As.

Figures

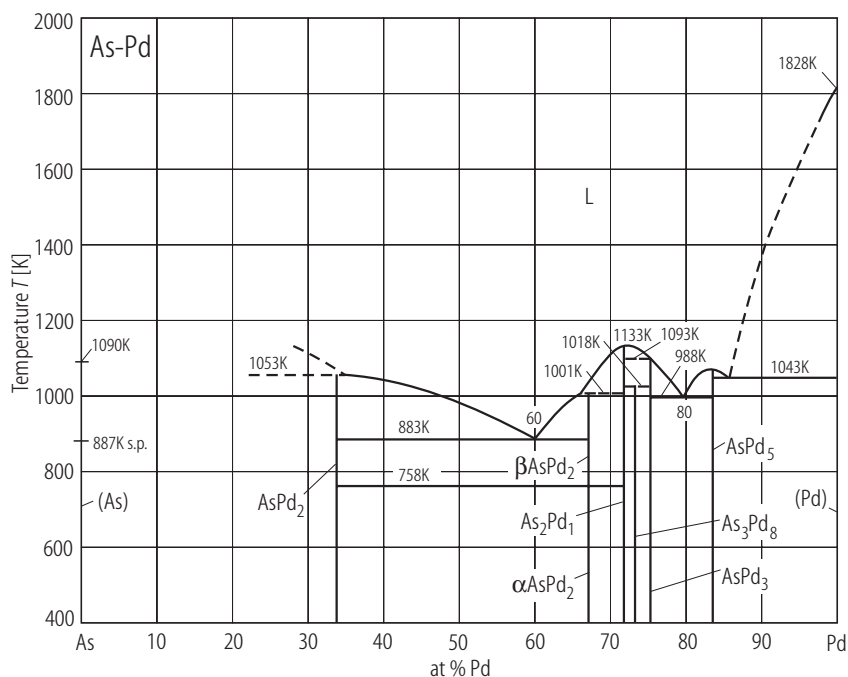


Fig. 1. As-Pd. Assessed partial phase diagram [92 Oka].

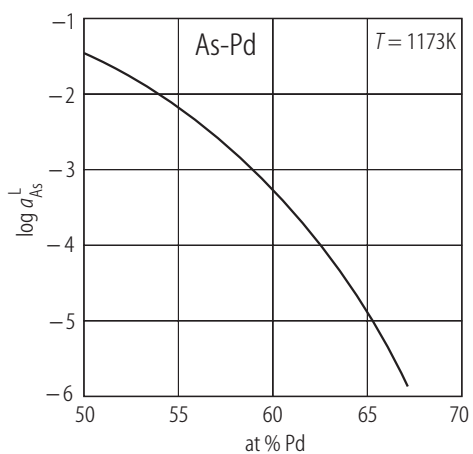


Fig. 2. As-Pd. $\log a^L_{\text{As}}$ in liquid alloys [91 Ips2].

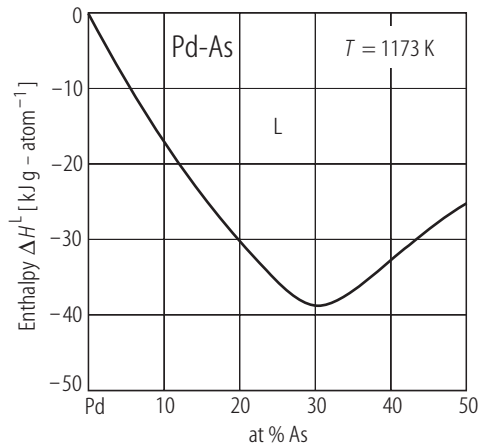


Fig. 3. As-Pd. Enthalpies of mixing of liquid alloys [91 Ips2].

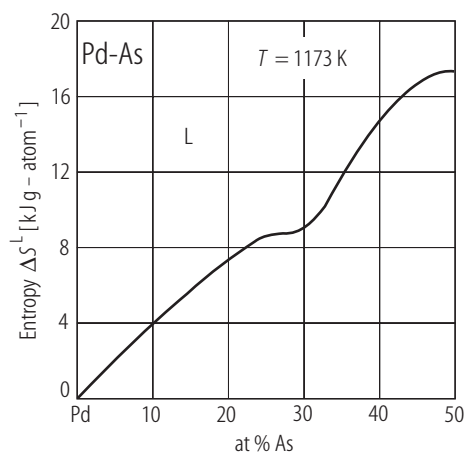


Fig. 4. As–Pd. Entropies of mixing of liquid alloys [91 Ips2].

References

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