

As – Na (Arsenic – Sodium)

Phase diagram

A short review of this system is given by Sangster et al. [93 San].

Crystal structure

Four intermediate phases have been detected and investigated [Massalski]. They are collected in Table 1.

Table 1. As–Na. Crystal structure of intermediate phases taken from [Massalski] and [Pearson].

Phase	Structure	Prototype	Lattice parameters [nm]		
			<i>a</i>	<i>b</i>	<i>c</i>
As ₅ Na					
As ₇ Na ₃					
AsNa	ort	NaP	0.6240	0.5910	1.0510
AsNa ₃	hex	AsNa ₃	0.5088		0.8982

Thermodynamics

From results of electrochemical measurements [72 Blu] have calculated thermodynamic properties of intermediate phases. The results are given in Table 2.

Table 2. As–Na. Standard enthalpies and entropies of formation of intermediate phases due to the reaction $x \text{ Na (liquid)} + (1-x) \text{ As (solid)} \rightarrow \text{Na}_x\text{As}_{1-x} \text{ (solid)}$ [72 Blu].

Phase	ΔH^S [kJ g-atom ⁻¹]	ΔS^S [J g-atom ⁻¹ ·K]
AsNa ₃	- 55.6	- 20.5
AsNa	- 49.8	- 15.1
As ₇ Na ₃	- 34.3	- 8.4

References

- [72 Blu] Bludova, L.N., Voronin, G.F., Gerasimov, Ya.I.: Russ. J. Phys. Chem. **46** (1972) 1279
 [93 San] Sangster, J., Pelton, A.D.: J. Phase Equilibria **14** (1993) 240
 [Massalski] Massalski, T.B., (ed.): “Binary Alloy Phase Diagrams”, Second Edition, The Materials Information Society, ASM International, Materials Park, Ohio (1992)
 [Pearson] Pearson, W.B.: “Handbook of Lattice Spacings and Structure of Metals and Alloys”, Pergamon Press, New York, (1958), Vol. 1; (1967) Vol. 2