

Ag – Ca (Silver – Calcium)

Crystal structure

Calvert et al. [64 Cal] reported the existence of the intermediate phase Ag_8Ca_3 . Snyder et al. [94 Sny] stated, that this compound actually is a nitride with the stoichiometry $\text{Ag}_{16}\text{Ca}_6\text{N}$. The Ag_8Ca_3 compound is not existing [95 Sny].

Snyder et al. [95 Sny] have investigated extensively single crystals of Ag_7Ca_2 . They found that this compound is orthorhombic with lattice constants

$$a = 0.9478 \text{ nm}$$

$$b = 0.5525 \text{ nm and}$$

$$c = 1.4079 \text{ nm.}$$

Thermodynamics

Using the EMF technique employing CaF_2 as a solid electrolyte Delcet et al. [78 Del] have determined thermodynamic activities of Ca in liquid alloys at 1073 K. The results are given in Table 1.

Table 1. Ag-Ca. Thermodynamic activities of Ca in liquid alloys at 1073 K.

x_{Ca}	a_{Ca}^{L}
0.1	$1.145 \cdot 10^{-5}$
0.2	$1.66 \cdot 10^{-4}$
0.3	$1.98 \cdot 10^{-3}$
0.4	$1.286 \cdot 10^{-2}$
0.5	$5.33 \cdot 10^{-2}$
0.6	0.1325
0.7	0.2873
0.8*	0.5267
0.9*	0.7456

* calculated from the phase diagram.

By a galvanic method, Notin et al. [82 Not] have determined some thermodynamic data for intermediate phases. The results obtained at 830 K are compiled in Table 2.

Table 2. Ag-Ca. Thermodynamic data of intermediate phases.

Compound	ΔH^s [kJ mol ⁻¹]	ΔS^s [J mol ⁻¹]	ΔG [kJ mol ⁻¹]
Ag ₉ Ca ₂	- 15.7	0	- 15.7
Ag ₇ Ca ₂	- 19.6	- 0.8	-18.9
Ag ₂ Ca	- 23.0	- 0.6	- 22.5
AgCa			- 25.0
Ag _{0.5} Ca _{0.5} (liquid)	- 25.0	-	-

References

- [64 Cal] Calvert, L.D., Rand, C.: Acta Crystallogr. **17** (1964) 1175
[78 Del] Delcet, J., Egan, J.J.: J. Less-Common Met. **59** (1978) 229
[82 Not] Notin, M.: Calphad **6** (1982) 49
[94 Sny] Snyder, G.J., Simon, A.: Angew. Chem. **106** (1994) 173
[95 Sny] Snyder, G.J., Simon, A.: J. Alloys and Comp. **223** (1995) 65