S-Sm (Sulfur-Samarium)

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The Sm-S phase diagram in [Massalski2] was based on [Moffatt] with a minor modification for phase rule consistency.

The S-richest intermediate phase shown in this phase diagram was SmS₂. Its crystal structure could not be well defined.

[2006Vas] discovered that there are three phases Sm₇S₁₃, Sm₉S₁₇ and Sm₁₀S₁₉ instead of SmS₂. The [Massalski2] phase diagram was modified in Fig. 1 to reflect this discovery.

Table 1 shows Sm-S crystal structure data.

Reference

2006Vas: I.G. Vasil'eva, Phase Equilibrium and p_s-T-x Diagrams of the LnS₃-LnS₂ (Ln = La, Pr, Nd, Sm-Er) Systems, *Zh. Fiz. Khim.*, 2006, **80**(11), p 2068-2073, in Russian; TR: *Russ. J. Phys. Chem.*, 2006, **80**(11), p 1842-1847

Table 1 Sm-S crystal structure data

Phase	Composition, at.% S	Pearson symbol	Space group	Strukturbericht designation	Prototype
(γSm)	0	<i>cI2</i>	<i>Im</i> $\bar{3}m$	<i>A2</i>	W
(βSm)	0	<i>hP2</i>	<i>P6</i> ₃ / <i>mmc</i>	<i>A3</i>	Mg
(αSm)	0	<i>hR3</i>	<i>R</i> $\bar{3}m$	...	αSm
SmS	50	<i>cF8</i>	<i>Fm</i> $\bar{3}m$	<i>B1</i>	NaCl
Sm ₃ S ₄	57.1	<i>cI28</i>	<i>I</i> $\bar{4}3d$	<i>D7</i> ₃	Th ₃ P ₄
Sm ₅ S ₇	58.3	<i>tI192</i>	<i>I4</i> ₁ / <i>acd</i>	...	...
Sm ₂ S ₃	60	<i>oP20</i>	<i>Pnma</i>	...	...
Sm ₇ S ₁₃	65	...	...	...	...
Sm ₉ S ₁₇	65.4	...	...	...	...
Sm ₁₀ S ₁₉	65.5	...	...	...	...
(βS)	100	<i>mP48</i>	<i>P2</i> ₁ / <i>a</i>	...	...
(αS)	100	<i>oF128</i>	<i>Fddd</i>	<i>A16</i>	αS

Fig. 1 Sm-S phase diagram