Mn-S (Manganese-Sulfur)

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The partial Mn-S phase diagram (0-50 at.% S) in [Massalski2] was adopted from [1937Vog] with minor changes.

The complete Mn-S phase diagram shown in Fig. 1 was calculated by [2010Kan]. The experimental phase boundary data of [1937Vog] were used in the thermodynamic modeling to reproduce the key features of the phase diagram. The S-rich side of the phase diagram is still speculative due to lack of experimental data.

Table 1 shows the Mn-S crystal structure data.

References

1937Vog: R. Vogel and W. Mahler, Alloys of Manganese with Platinum, Indium, Rhodium, and Ruthenium, *Arch. Eisenhüttenw.*, 1937, **11**, p 41-54, in German

2010Kan: Y.B. Kang, Critical Evaluations and Thermodynamic Optimizations of the Mn-S and the Fe-Mn-S Systems, *Calphad*, 2010, **34**, p 232-244

Table 1 Mn-S crystal structure data

Phase	Composition, at.% S	Pearson symbol	Space group	Strukturbericht designation	Prototype
(δ Mn)	0	<i>cI2</i>	<i>Im</i> $\bar{3}m$	A2	W
(γ Mn)	0	<i>cF4</i>	<i>Fm</i> $\bar{3}m$	A1	Cu
(β Mn)	0	<i>cP20</i>	<i>P4</i> ₁ 32	A13	β Mn
(α Mn)	0	<i>cI58</i>	<i>I</i> $\bar{4}3m$	A12	α Mn
MnS	50	<i>cF8</i>	<i>Fm</i> $\bar{3}m$	B1	NaCl
MnS ₂	66.7	<i>cP12</i>	<i>Pa</i> $\bar{3}$	C2	FeS ₂ (pyrite)
(β S)	100	<i>mP48</i>	<i>P2</i> ₁ / <i>c</i>	...	...
(α S)	100	<i>oF128</i>	<i>Fddd</i>	A16	α S

Fig. 1 Mn-S phase diagram