

Mo-Si (Molybdenum-Silicon)

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The Mo-Si phase diagram in [Massalski2] was redrawn from [1991Gok]. Three intermediate phases, Mo_3Si , Mo_5Si_3 , and MoSi_2 , exist in this system. MoSi_2 was shown as dimorphic with the transition temperature at 1900°C based on [1971Sve].

However, the investigation of [1998Fra] by means of solidification microstructure analysis and x-ray diffraction revealed that the high-temperature form of MoSi_2 is metastable.

Figure 1 shows the Mo-Si phase diagram thermodynamically calculated by [2010Gen]. The phase boundary data used in this work were essentially the same as those used in the assessment of [1991Gok], but the new finding of [1998Fra] was incorporated in [2010Gen].

Table 1 shows Mo-Si crystal structure data adopted from [1991Gok] with modification for consistency with Fig. 1.

References

- 1971Sve:** V.N. Svechinikov, Yu.A. Kocherzhinskii, and L.M. Yupko, Phases Diagram of the Molybdenum-Silicon System, *Diagrammy Sostoyaniya Metal Syst. Nauka*, 1971, p 116-119, in Russian
- 1991Gok:** A.B. Gokhale and G.D. Abbaschian, The Mo-Si (Molybdenum-Silicon) System, *J. Phase Equilib.*, 1991, **12**(4), p 493-498
- 1998Fra:** P.S. Frankwicz and J.H. Perepezko, Phase Stability of MoSi_2 in the C11_b and C40 Structures at High Temperatures, *Mater. Sci. Eng. A*, 1998, **246**, p 199-206
- 2010Gen:** T. Geng, C. Li, X. Zhao, H. Xu, Z. Du, and C. Guo, Thermodynamic Assessment of the Nb-Si-Mo System, *Calphad*, 2010, **34**, p 363-376

Table 1 Mo-Si crystal structure data

Phase	Composition, at.% Si	Pearson symbol	Space group	Strukturbericht designation	Prototype
(Mo)	0-5	<i>cI2</i>	<i>Im</i> $\bar{3}m$	A2	W
Mo_3Si	25	<i>cP8</i>	<i>Pm</i> $\bar{3}n$	A15	Cr_3Si
Mo_5Si_3	37.4-40	<i>tI32</i>	<i>I4/mcm</i>	$D8_m$	W_5Si_3
MoSi_2	66.7	<i>tI6</i>	<i>I4/mmm</i>	C11 _b	MoSi_2
(Si)	100	<i>cF8</i>	<i>Fd</i> $\bar{3}m$	A4	C (diamond)

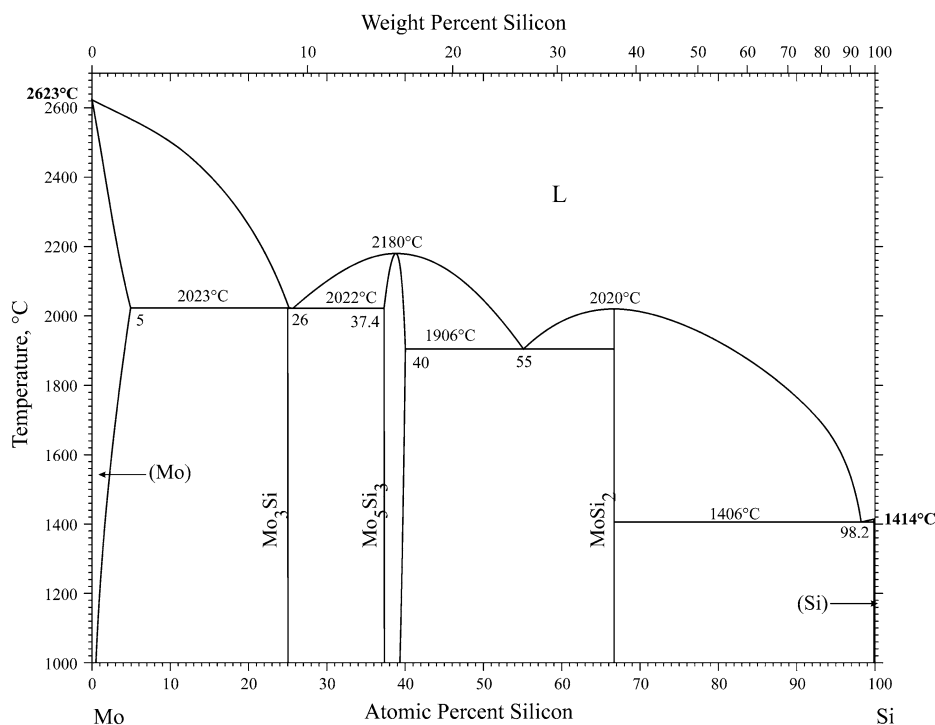


Fig. 1 Mo-Si phase diagram