Mo-U (Molybdenum-Uranium)

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The Mo-U phase diagram in [Massalski2] was redrawn from [1980Bre] with additional controversial information from [1989Lun] that MoU₂ may be stable up to at least 1252 °C. This problem has not been solved since then.

Figure 1 shows the Mo-U phase diagram calculated by [2011Ber]. The question of high-temperature stability of MoU₂ was not taken into account. Therefore, experimental work is needed to verify this phase diagram.

Table 1 shows Mo-U crystal structure data.

References

1980Bre: L. Brewer, Molybdenum: Physico-Chemical Properties of Its Compounds and Alloys, *Atomic Energy Review*, Special Issue No. 7, O. Kubaschewski, Ed., International Atomic Energy Agency, Vienna, 1980, p 341-343

1989Lun: L.B. Lundberg, High-Temperature Interdiffusion and Phase Equilibria in U-Mo, *J. Nucl. Mater.*, 1989, **167**, p 64-75

2011Ber: A. Berche, N. Dupin, C. Guénau, C. Rado, B. Sundman, and J.C. Dumas, Calphad Thermodynamic Description of Some Binary Systems Involving U, *J. Nucl. Mater.*, 2011, **411**, p 131-143

Table 1 Mo-U crystal structure data

Phase	Composition, at.% U	Pearson symbol	Space group	Strukturbericht designation	Prototype
(Mo)	0-2	<i>cI2</i>	<i>Im</i> $\bar{3}m$	<i>A2</i>	W
MoU ₂	66.7	<i>tI6</i>	<i>I4/mmm</i>	<i>C11_b</i>	MoSi ₂
(γ U)	56.3-100	<i>cI2</i>	<i>Im</i> $\bar{3}m$	<i>A2</i>	W
(β U)	98.7-100	<i>tP30</i>	<i>P4₂/mnm</i>	<i>A_b</i>	β U
(α U)	99.9-100	<i>oC4</i>	<i>Cmcm</i>	<i>A20</i>	α U

Fig. 1 Mo-U phase diagram