

Al – Mo (Aluminum – Molybdenum)

Phase diagram

The part Al – Al₈Mo₃ has been thoroughly investigated by Schuster et al. [91 Sch] (see Fig. 1). There have been used differential thermal analysis and X-ray diffractography methods.

Two metastable intermediate phases can be prepared:

- 1) with diamond structure (~ 11 at% Mo)
- 2) with hexagonal structure; lattice parameters:
 $a = 0.45 \text{ nm}$
 $c = 0.27 \text{ nm}$
 at 7.7 to 14 at% Mo.

Zdujic et al. [94 Zdu], by mechanical alloying using ball milling, have prepared intermediate phases: Al₁₂Mo, Al₅Mo, Al₄Mo, Al₈Mo₃ and AlMo₃.

Crystal structure

The structure of six intermediate phases has been determined. The structural data of these phases were collected in Table 1.

Table 1. Al–Lu. Crystallographic data of intermediate phases [91 Sch].

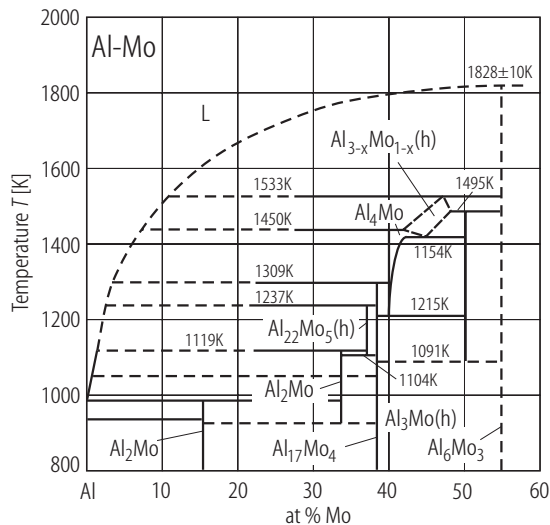
Phase	Structure	Prototype	Lattice parameters in nm			Reference
			<i>a</i>	<i>b</i>	<i>c</i>	
Al ₁₂ Mo	cub	Al ₁₂ W	0.7573			[54 Ada]
Al ₇ Mo	mon		0.512	1.300 $\beta = 95^\circ$	1.350	[60 Cla]
Al ₅ Mo (h)	hex	Al ₅ W	0.489			[55 Ada]
Al ₅ Mo (h')	hex		0.4933		0.4398	[91 Sch]
Al ₅ Mo (r)	hex		0.4937		1.307	[91 Sch]
“Al ₂₂ Mo ₅ ”						[91 Sch]
“Al ₁₇ Mo ₄ ”						[75 Ten]
Al ₄ Mo (h)	mon	Al ₄ W	0.5255	1.7768 $\beta = 100.80^\circ$	0.5525	[64 Lea]
Al _{3+x} Mo _{1-x} (h)	cub	WO ₃	0.4945			[91 Sch]
Al ₃ Mo (h)	mon	Al ₃ Mo	1.6396	0.3594 $\beta = 101.88^\circ$	0.8386	[91 Sch]
Al ₈ Mo ₃	mon	Al ₈ Mo ₃	0.9164	0.3639 $\beta = 100.5^\circ$	1.0040	[62 Pöt]

Thermodynamics

[85 Sud] have determined experimentally enthalpies of mixing of liquid alloys. The results are given in Table 2.

Table 2. Al–Mo. Enthalpies of mixing of liquid alloys taken from [85 Sud].

Composition	ΔH^L [kJ g-atom ⁻¹]
5	- 5.05
10	- 10.04
15	- 18,02
18	- 18.05

Figure**Fig. 1. Al–Mo.** Partial phase diagram [91 Sch].**References**

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