

Al – Cu (Aluminum – Copper)

Phase diagram

Liu et al. [98 Liu] have investigated phase equilibria in the composition range between 40 and 85 at% Cu and at temperatures between 773 K and 1273 K. Following results have been found:

- The α - β equilibria are in agreement with findings of earlier work
- The ε_1 (ε_2)/ liquid phase equilibria are in agreement with results from earlier investigations.

A second order transformation has been found between 61 at% and 68 at% Cu, but not a first order reaction – as supposed before. The reaction temperature is about 150 K higher.

Fig. 1 shows the temperature-concentration part of interest.

Thermodynamics

Stolz et al. [93 Sto] have determined, using high-temperature calorimetry, enthalpies of mixing of liquid alloys. The results obtained are plotted in Fig. 2. They agree with results published by Heyer [89 Hey] and Sandakov et al. [71 San].

The dependence of ΔH^L from concentration can be expressed using an association model. It should be mentioned, that the ΔH^L values given by Hultgren et al. [Hultgren] on the one hand and values in Fig. 1 on the other hand disagree by about a factor 2.

Thermodynamic activities of liquid alloys have been calculated by Stolz et al. [93 Sto] applying an association model. The results are plotted in Fig. 3. These calculated activities are in good agreement with experimental data present in the literature (see [93 Sto]).

Figures

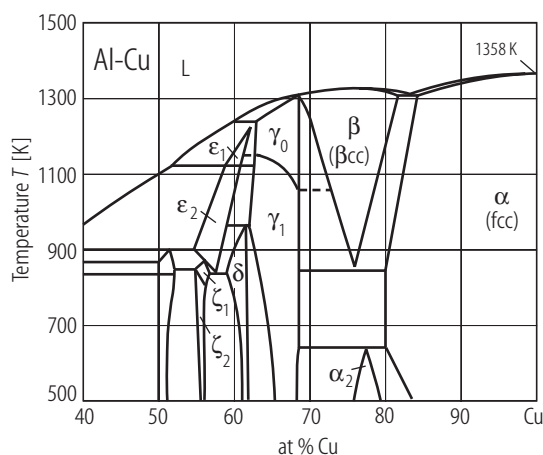


Fig. 1. Al-Cu. Temperature-concentration part of interest.

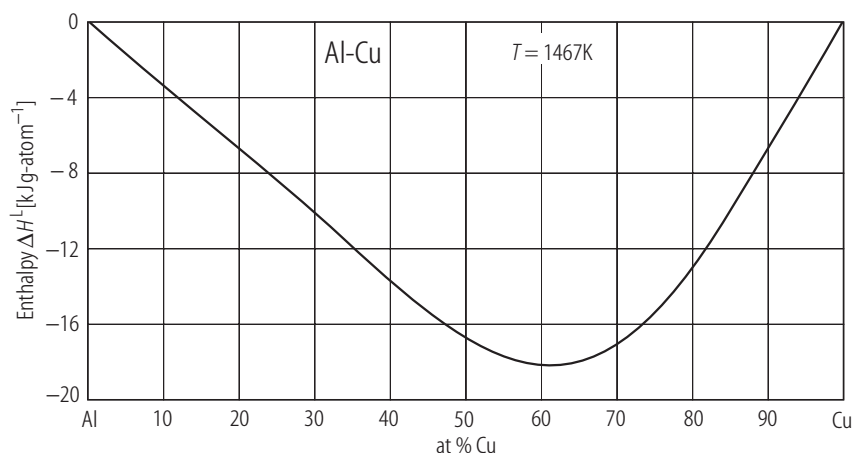


Fig. 2. Al–Cu. Experimentally determined enthalpies of mixing of liquid alloys [93 Sto].

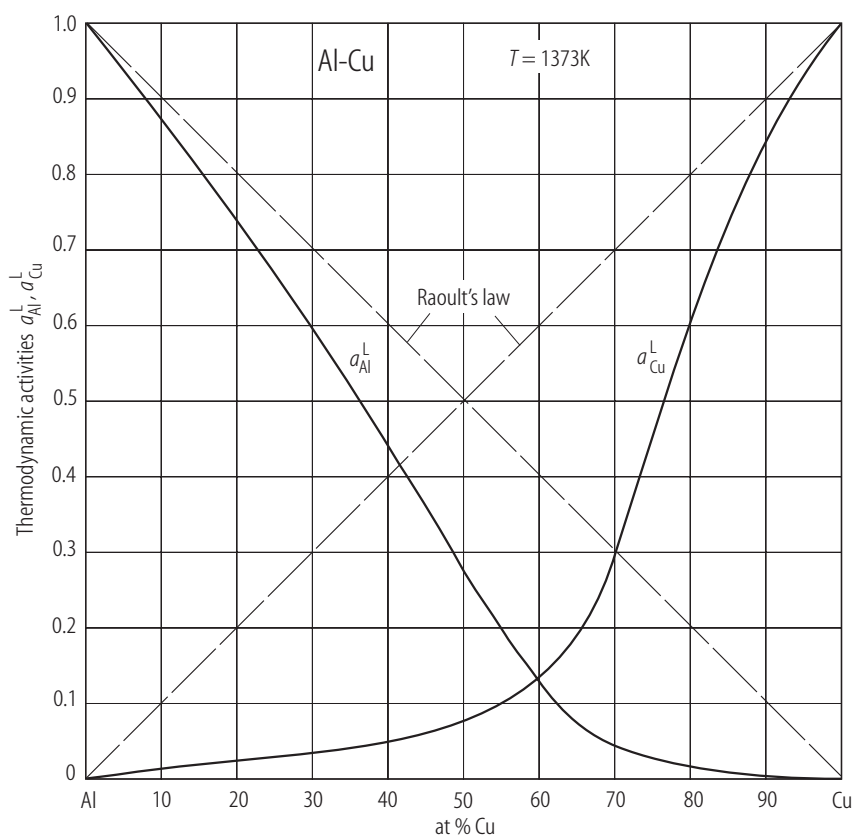


Fig. 3. Al–Cu. Calculated thermodynamic activities of liquid alloys at 1373 K [93 Sto].

References

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