



Thermodynamic Assessment of the Copper-Lutetium Binary System



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Submission: June 20, 2018; Published: June 26, 2018

Opinion

On the basis of lattice stabilities cited from Dinsdale [1], the optimization of the Copper-Lutetium binary system is carried out using the Thermo-calc software [2,3]. Thermo-calc software for evaluating the thermodynamic, kinetic and thermo-physical model parameters from experimental or theoretically calculated data by solving the weighted least squares problem. The phase diagram and thermochemical data were used as input to the program for the optimization. Each piece of selected information was given a certain weight by personal judgment and verified by trial and error method during the assessment until most of the selected experimental information was reproduced.

Up to 1988, no equilibrium diagram is available for Copper-Lutetium binary system then Subramanian & Laughlin [4] determined the Copper-Lutetium equilibrium diagram from the extrapolated invariant temperatures of corresponding data for Copper-Lanthanide systems for which experimental phase diagrams are already known using the systematic methods described by Gschneidner & Calderwood [5] in conjunction with thermodynamic considerations. At present the number of publications that represent original experimental information on the thermodynamic properties of Copper-Lutetium melts is close to 6. The studied properties include the partial and integral mixing enthalpies of components [6-9] activity [10] of components and enthalpy of formation from [11,12].

This work deals with an assessment of the thermodynamic description of the Copper-Lutetium binary system by means of the CALPHAD method. A set of self-consistent thermodynamic parameters of the Copper-Lutetium binary system was obtained.

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