

S. BELMOUJOU¹, M. EL MOUDANE², A. GHANIMI², A. SABBAR¹

Modeling and Simulation of Thermophysical Properties of Lead-Free Ag-Bi-Sn liquid solder materials

¹ *Equipe de Physico-chimie des matériaux et nanomatériaux: Dépollution, environnement et développement durable, Université Mohammed V-Agdal, Faculté des Sciences, Av. Ibn Batouta, B.P. 1014, Rabat, Morocco*

² *Laboratoire de Matériaux, Nanotechnologies et Environnement, Université Mohammed V-Agdal, Faculté des Sciences, Av. Ibn Batouta, B.P. 1014, Rabat, Morocco*

E-mail: asabbar2001@yahoo.fr

Abstract

The surface tensions, viscosities and molar volumes of liquid Cu-Ag-In alloys were simulated and presented in this paper. These physical properties have been estimated using the Kohler's and Buttler's models for surface tension and molar volume and Seetharaman's model for viscosity. The results show that up to 40 at. % Ag, no influence of the surface tension and no significant dependence on temperature has been noted. With increasing temperature the viscosity decreases smoothly. Both surface tension and viscosity increase significantly at high Ag-concentrations. The molar volume decreases linearly with increasing Ag-compositions.

Keywords: Pb-free solders; Surface tension; Viscosity; Molar volume, Cu-Ag-In ternary system