Abstract

In this work the relationship between the chemical composition and atomic volume in the Ag – x % Zn (x ≤ 20) system was studied. For this purpose, 10 solid solutions were obtained by means of casting and mechanical alloying. The microstructural characterization was carried out by means of X-ray diffraction. The lattice parameter was obtained using the Rietveld’s method, while the chemical composition was determined by dispersive energy X-ray spectroscopy. Based on the results obtained, it can be concluded that there is an inverse lineal relationship between the atomic volume of the solid solution and its Zn concentration, which shows a negative deviation from Vegard’s law (-2.96%). Additionally, it was proposed an equation which relates the Zn concentration with the atomic volume of the solid solution, which showed a prediction error less than 12%.

Keywords

Solid solution, atomic volume, Ag-Zn alloys, X-ray diffraction, chemical composition.