

Phase Segregating and Complex Forming Pb Based (=X-Pb) Liquid Alloys

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Abstract : We have used a theoretical model based on the assumption of compound formation in binary alloys to study the thermodynamic, microscopic, and surface properties of Bi-Pb and In-Pb liquid alloys. A review of the phase diagrams for these alloys shows that one of the stable complexes for Bi-Pb liquid alloy is BiPb₃; also, that InPb is a stable phase in liquid In-Pb alloys. Using the same interaction parameters that are fitted for the free energy of mixing, we have been able to compute the bulk and thermodynamic properties of the alloys. From our observations, we are able to show that the Bi-Pb liquid alloy exhibits compound formation over the whole concentration range and the In-Pb alloys undergo phase separation. With regards to surface properties, Pb segregates more to the surface in In-Pb alloys than in Bi-Pb alloys. The viscosity isotherms have a positive deviation from ideality for both Bi-Pb and In-Pb alloys.

Keywords : asymmetry, Bi-Pb, deviation, In-Pb, interaction parameters

Conference Title : ICCMPM 2021 : International Conference on Condensed Matter Physics and Materials

Conference Location : Vancouver, Canada

Conference Dates : May 20-21, 2021