

## Heat of Mixing of the Lead-based Binary Liquid Alloys of Alkali Metals

S. K. CHAKRABARTI<sup>1\*</sup>, I. S. JHA<sup>1</sup>, R. N. YADAV<sup>2</sup> and B. P. SINGH<sup>3</sup>

<sup>1</sup>Department of Physics, M. M. A. M. Campus, Tribhuvan University, Biratnagar, Nepal

<sup>2</sup>Department of Mathematics, M. M. A. M. Campus, Tribhuvan University, Biratnagar, Nepal

<sup>3</sup>Department of Physics, T. M. Bhagalpur University, Bhagalpur, Bihar, India

\*E-mail: skc\_2007@yahoo.com

*Received : 9.6.2015 ; Accepted : 11.6.2015*

**Abstract :** Binary alloys, especially the complex-forming ones, are often found to exhibit anomalous behaviour as regards their thermodynamic properties. In this theoretical work we have considered three lead-based binary alloys—lithium-lead, sodium-lead and potassium-lead—all in molten state near their respective melting points. We have tried to calculate their heat of mixing for different concentrations of the alkali metals. All these alloys forming strongly interacting systems, we have used Flory's model. It is a statistical mechanical model based on the size factor of the constituent species of a binary liquid alloy. Our results explain the observed asymmetry in the heat of mixing of the present binary liquid alloys around equi-atomic composition.

**Keywords:** Binary liquid alloy, Free energy of mixing, Interchange energy, Entropy of mixing, Heat of mixing.

[\[ Full Paper \]](#)