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Some Thermodynamic Studies on Paracetamol -Ascorbic Acid Binary Drug System

H. Shekhar and Raj Laxmi

Department of Chemistry, V.K.S. University, Agra – 802301, **INDIA**

Email: hshe2503@rediffmail.com

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ABSTRACT

The solid-liquid equilibrium study of binary drug system has been taken for providing the significant enhanced pharmaceutical properties as compared to the parent drug. The present communication aims at some thermodynamic and interfacial investigation of Paracetamol (PCM) and Ascorbic Acid (AA) binary drug dispersion. Partial and Integral thermodynamic quantities such as, excess Gibbs energy (g^E), excess enthalpy (h^E), excess entropy (s^E) of eutectic and non-eutectic mixtures were also calculated using activity coefficient data. The value of excess Gibbs free energy indicates positive deviation from ideal behaviour which refers stronger association between like molecules during formation of binary mix. However, the negative value of mixing function, Gibbs free energy of mixing (ΔG^M) suggests the mixing for eutectic and non-eutectic is spontaneous. The interfacial properties such as entropy of fusion per unit volume (ΔSv), interfacial energy (σ), roughness parameter (α), grain boundary energy of parent components, eutectics and non-eutectics have been studied using enthalpy of fusion data. The size of critical nucleus at different undercooling in nanoscale may be a big challenge for pharmaceutical world.

Keywords: Binary drug, Excess thermodynamic, mixing functions, Critical radius and Interfacial Energy.