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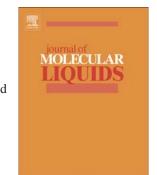
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## ACCEPTED MANUSCRIPT

# Solid-liquid phase equilibrium and thermodynamic properties of vanillic acid in different pure solvents

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#### **ABSTRACT**

Dissolution thermodynamics of vanillic acid (VA) in eight pure solvents, namely, ethanol, methanol, 2-butanol, ethylene glycol, ethyl acetate, triethyl orthoformate, 1,4 dioxane and cyclohexanone were studied. The solubility of vanillic acid in the above solvents was measured over the temperature range from (293.15 to 318.15) K at atmosphere pressure using a thermostatted reactor and UV/vis spectrophotometer analysis. It is observed that the solubility increases with the increase of temperature. All these data were regressed by van't Hoff model, the modified Apelblat equation and  $\lambda h$  equation. The results show that three equations may well correlate the measured information. Moreover, thermodynamic studies obtained the dissolution process for vanillic acid in the selected solvents is endergonic, not spontaneous. Therefore, the experimental figures and typical parameters would provide essential support for industrial design and further theoretical studies.

*Keywords*: Vanillic Acid; Solubility; Organic solvents; Solid–liquid equilibrium; Modeling; Thermodynamic properties; Excess enthalpy of solution.

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