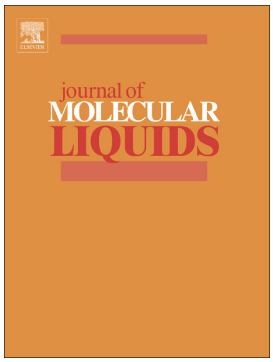

Solubility of taurine and its application for the crystallization process improvement

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Solubility of Taurine and Its Application for the Crystallization Process Improvement

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ABSTRACT

The solubility of taurine in the binary water + acetone solvent mixture at temperatures from 278.15K to 323.15K was measured using the laser monitoring technique, and the experimental data were well correlated by the Jouyban−Acree model. The solubility decreased quickly when the mole fraction of acetone increased in the binary solvent mixture and also the metastable zone width got narrowed at the same time. Then the nucleation mechanism was investigated based on the induction time. The results showed that the homogeneous dominated at higher supersaturation while the heterogeneous nucleation dominated at lower supersaturation. Finally, a combined cooling and anti-solvent crystallization process was put forward. The product yield was raised to 96% from 73%, compared with the original cooling crystallization process in aqueous solution. What's more, the caking of taurine crystals was reduced and the fluidity of the product obtained was improved.

KEYWORDS:

Taurine; Solubility; Combined cooling and anti-solvent crystallization process; Nucleation mechanism; Metastable zone width.

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