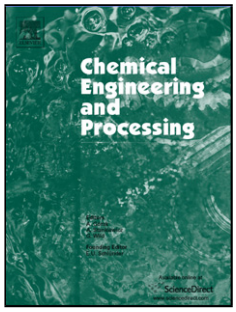

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Tuneable Extraction Systems based on Hyperbranched Polymers

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Abstract

By the use of hyperbranched polymers as tunable solvent in extraction processes, the solubility of the polymers is important. If the solubility limit is gone below, there is a crystallization of the polymer hindering the extraction process. On the other hand, the liquid-liquid equilibrium has an impact on the crystallization. For this reason, the superposition of liquid-liquid and solid-liquid equilibria of binary solutions of hyperbranched polymers was investigated theoretically. As model systems hyperbranched polyesters Boltorn W3000 dissolved in methanol, ethanol and propan-1-ol were considered, which form a demixing system. For the calculation of the phase equilibria the lattice-cluster theory (LCT) was combined with the extended chemical association lattice model (ECALM). The developed thermodynamic model is able to simultaneously model the liquid-liquid equilibrium and the solid-liquid equilibrium with the same model parameters, whereas the model results are in good agreement with experimental data taken from the literature.