Solid-liquid equilibria of ternary systems containing succinic acid for drowning-out crystallization

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Succinic acid is widely used as a building block chemical that has many applications such as pharmaceuticals, foods, and polymers. Recently, the drowning-out crystallization has been studied to separate the succinic acid from a fermentation broth. It is important to choose the most effective combination of solvent/anti-solvent to generate solubility changes in the solution. Moreover, phase diagram for a multicomponent system of mixed dibasic acids including solvent and anti-solvent is necessary to determine crystallization process. In this work, the combination of solvent and anti-solvent effective in drowning-out crystallization for succinic acid was screened using the density functional theory with COnductor-like Screening MOdel. Dimethyl sulfoxide (DMSO) and water were chosen as the solvent and anti-solvent, respectively. Solid-liquid equilibrium of succinic acid + adipic acid + DMSO or water were determined using high-performance liquid chromatography. These results would be helpful in drowning-out crystallization for succinic acid from dibasic acid mixtures.