

Separation succinic acid from dibasic acid mixture using drowning-out crystallization

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Succinic acid is a valuable material which has broad applications in the food, pesticides, and medical industries. Recently, the enzyme fermentation has been used to produce the succinic acid. However, it was hard to separate succinic acid from the fermentation broth (i.e., dibasic acid mixture) with high purity because of their similar physicochemical characteristics. In this study, a drowning-out crystallization was employed to separate succinic acid from a ternary mixture: succinic acid + adipic acid + solvent or anti-solvent. The quantum mechanics calculation (COSMO-CONductor-like Screening MOdel) was performed to find an effective solvent and anti-solvent pair. Dimethyl sulfoxide (DMSO) and water were chosen as the solvent and anti-solvent, respectively. Solid-Liquid Equilibrium (SLE) of succinic acid + adipic acid + DMSO or water were determined using high-performance liquid chromatography. Based on the phase diagram, the drowning-out crystallization was performed and evaluated regarding yield and product purity of succinic acid. These results would be helpful in drowning-out crystallization for succinic acid from dibasic acid mixtures.