

Phase Equilibria for Reactive Distillation of Diethyl Succinate

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Diethyl succinate is an excellent solvent and also can serve as a feedstock for PBS polymers or other four-carbon derivatives. The ester can be produced by isolation of succinic acid from fermentation streams and subsequent esterification with ethanol. However, most fermentations coproduce other acids such as acetic acid. In this work, we examine phase behavior of succinate-related species and consider the impact of acetic acid on the subsequent phase behavior. We consider solubility behavior of the succinic acid in aqueous and alcoholic solutions, liquid-liquid equilibria of sets for the components ethanol + diethyl succinate + water + acetic acid + ethyl acetate, and vapor-liquid equilibria of the solutions including monoethyl succinate. In addition, we provide preliminary results of the reactive distillation using an ion exchange resin catalyst.