

Application of deep eutectic solvent to break azeotropic mixtures containing ethanol

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Bioethanol is spotlighted as a clean alternative energy in the energy industry and the economic production of bioethanol is very important. During the production of bioethanol, it is frequently found that the azeotropic mixtures containing ethanol should be processed. Extraction process is usually considered as an alternative process of distillation for azeotropic mixtures. Liquid-liquid extraction processes are energy efficient and eco-friendly. Recently, it has been found that deep eutectic solvents (DESs), as an extract agent, can solve the azeotropic mixture separation problem on the distillation process. DESs are formed by the combination of quaternary ammonium salt and hydrogen bond donor (HBD), which have properties similar to those of ionic liquids. The present study experimentally evaluated the potentiality of extracting ethanol from azeotropic mixtures using DES based on choline chloride. Also, the ethanol distribution between the two phases was modeled by COSMO-SAC.

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