

Process design of hybrid extraction/distillation process for furfural production

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In this paper, a hybrid purification process combining extraction and distillation for furfural production from lignocellulosic biomass was studied to improve process efficiency. The effective process depends on the choice of the extracting solvent. The promising solvents were proposed through a systematic procedure from solvent screening to process design. Different solvents were first evaluated and promising solvents were selected to separation feasibility. Finally, the processes using three best solvents such as toluene, benzene, and n-butyl chloride were designed and optimized using Aspen Plus. The results show benzene and n-butyl chloride were the most suitable solvents for hybrid furfural process as their processes can achieve energy savings of 79.0 and 44.2%, respectively compared to the toluene process. This work was supported by the National Research Council of Science & Technology (NST) grant by the Korea government (MSIP) (No. CAP-11-04-KIST) and Basic Science Research Program through the National Research Foundation of Korea (NRF) funded by the Ministry of Education (2015R1D1A3A01015621).