

عنوان مقاله:

Modeling of esterification in a batch reactor coupled with pervaporation for production of ethyl acetate catalyzed by ionexchange resins

محل انتشار:

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خلاصه مقاله:

In the chemical industry, process intensification is needed to meet important goals such as sustainable and eco-friendly processes. For esterification reaction the produce more with less pollution objective can be achieved by coupling reaction and separation in a so called integrated process. In this work a model for describing the esterification reaction of ethyl acetate in pervaporation membrane reactor using Amberlyst 15 as a heterogeneous catalyst and polydimethylsiloxane (PDMS) membrane was developed. The validity of the model was tested by comparing the calculated results with experimental data reported in the literature. It was shown rate of conversion increased by removing ethyl acetate from the reaction mixture. A parametric study was carried out to evaluate the effects of operating conditions on the performance of the pervaporation membrane reactor. Conversion increased by increasing the temperature, molar ratios of reactants and catalyst concentration. According to the calculation the best conditions for the operation of the reactor in the event of temperature ~ 343 K, catalyst concentration 10 g, excess amount of acetic acid relative to ethanol 50% were shown

کلمات کلیدی:

Membrane reactor.Pervaporation.Esterification.Ethyl acetate.Modeling.Green chemistry

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