TWO LEVEL FACTORIAL DESIGN USING RSM FOR SCREENING FACTORS OF IPA DEHYDRATION BY PERVAPORATION PROCESS USING PA HOLLOW FIBERS

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ABSTRACT

Purifiying the IPA from the aqueous solutions in the industry by PV is a well-established in the membrane separation technologies. PV has progressively become a prospective separation technique because of the benefits in term of energy efficiency, environment friendly and simple operation. To ensure an effective pervaporation process, the related factors and their contributions need to be identified intensively. As one of the features in RSM, FFD were used to identify an approximating function for predicting future response for further analysis to determine factor values that optimize the response function for IPA pervaporation. The factorial models have been obtained from experimental design to study all interactions among the considered parameters which were IPA concentration (70 - 95 wt %), feed temperature (60 - 90 °C), feed flow rate (30 - 100 L/hr) and permeate pressure (0.1 – 5 kPa). The results obtained from the analysis of variance (ANOVA) of permeate flux and selectivity, showed that the impacts of IPA concentration and feed temperature are much more important than feed flow rate and permeate pressure and the regression equation obtained to show the relationship between the responses.

Keywords: Analysis of Variance (ANOVA); Isopropanol (IPA); Pervaporation (PV); Polyamide (PA); Response Surface Methodology (RSM); Two Level Factorial Design (FFD).