Thesis Title	Performance of a Pilot - Pervaporation System and the Economic Analysis
Thesis Credits	12
Candidate	Miss Wannee Arethsakul
Supervisors	Assoc. Prof. Dr. Ratana Jirarattananon
	Asst. Prof. Dr. Dusadee Uttapap
Degree of Study	Master of Engineering
Department	Chemical Engineering
Academic Year	1999

Abstract

The objectives of this thesis are to test the performance of the pilot-pervaporation system for dehydration of 95 % (by volume) ethanol and to perform an economic analysis in comparison with azeotropic distillation.

The pervaporation system employed the polyion complex (PIC) composite hollow - fibre membrane with 0.1 m^2 effective area per module. The experiments were carried out in a batch mode for the cases of 1-module and 2-module connected in series and in parallel.

The experimented results showed that the 1-module system gave higher flux but lower separation factor than the 2-module systems. The permeation fluxes of the series and parallel systems were approximately the same but the series system gave higer separation factor. The final concentrations of ethanol solution obtained were 99.52-99.68 %

The economic analysis was performed based on the production rate of 50,000 litre/day using the experimental data and data from the literatures and it was found that the cost of dehydration of ethanol solution from 95 % to 99.5 % by pervaporation was cheaper.

Keywords : Pervaporation / Flux / Separation Factor / Membrane / Ethanol / Azeotrope / Economic Analysis