

New Approach in Hybrid Separation Process: Heat Integration of Hybrid Distillation with Vapor Permeation for Isopropanol Dehydration

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Due to azeotropes in mixture of isopropanol and water, a new technology approach for dehydration of isopropanol has been proposed. A combination of distillation column and vapor permeation unit is proposed to overcome these thermodynamic limitations. It also offers the advantage of being a cost-effective unit process using simple configuration without entrainers. This work proposed hollow fiber membranes to replace flat sheet membranes. This membrane is used in this work due to its wide applications and large membrane area packed in a small volume. Process simulations and modelling in the design of this hybrid were performed by using combination of Aspen Plus as powerful simulator and Aspen Custom Modeler as modelling software to develop the membrane. Furthermore, hollow fiber module can successfully be applied in this hybrid configuration.

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