

# An Energy-Efficient Dimethyl Ether Catalytic Distillation Process

**Wei-Bin Su<sup>\*a</sup>, Karl T. Chuang<sup>b</sup>, Chung-Chen Lai<sup>a</sup>, Cheng-Tsung Hong<sup>a</sup>**

<sup>a</sup> C Refining and Manufacturing Research Institute, CPC Corp., Taiwan, No.217, Min-Sheng S. Road, Chia-Yi 60051, Taiwan

<sup>b</sup> D Department of Chemical and Materials Engineering, University of Alberta, Edmonton, Alberta, Canada T6G 2G6

\*Email: 078221@cpc.com.tw

A dimethyl ether (DME) catalytic distillation (CD) tower model was developed and carefully validated with both VLE data and pilot test data, and the modeling results were comparable to those published by An et al. The solid foundation work completed with experimental data and theoretical calculation makes the design of the CD tower valuable for DME process development. The process modeling results indicated that the energy consumption can be lowered by more than 50% if the methanol dehydration was performed in a CD tower, not as done in a traditional DME process. Also, the methanol conversion could reach almost 100% thus there is no need to recycle the unreacted methanol.

Keywords: Dimethyl ether, Catalytic distillation, Energy saving.

報告型式：☐口頭 ☐海報 ☒皆可

是否參加學生壁報論文競賽：☐是 ☐否

(註：參加口頭報告者亦可參加學生壁報論文競賽，但須準備海報、全文及簡報等相關資料，依**學生壁報論文競賽獎評選辦法**中所規定之方式辦理。)