

Retrofitting a Side Stream Column Using an Intensified Configuration Combining Heat Pump and Dividing Wall Column

Le Quang Minh, 펠리시아, Feng Wei, Pham Ngoc Tram, Le Cao Nhien, Nguyen Van Duc Long, 이문용[†]
영남대학교
(mynlee@yu.ac.kr[†])

Side stream distillation column (SSC), which separates a ternary mixture received much scientific interest associated with a growing industrial demand, is a common energy-intensive process. This study reports the results of a hybrid configuration to retrofit and debottleneck the SSC combining a heat pump and a dividing wall column (DWC). Fractional utilization of the area was used to identify flooding problems in the column as well as how much area is available for vapor flow on an existing stage. The results showed that the proposed sequence can achieve significant operating costs with 83.7% and remove the bottleneck problem. Particularly, a heat pump can improve the performance of DWC, and reversely a DWC can also enhance the energy efficiency of a heat pump and reduce its capital cost. This work was supported by Priority Research Centers Program through the National Research Foundation of Korea (NRF) funded by the Ministry of Education (2014R1A6A1031189). This work was also supported by Basic Science Research Program through the NRF funded by the Ministry of Education, Science and Technology (2012012532).