

Design of Pre-reactor Distillation Column with external side reactor for ethyl benzene synthesis

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A new configuration based on pre-reactor coupled to distillation column with external side reactors is proposed for both selectivity and energy intensification of multiple reaction systems. Simulation of ethyl benzene process based on available reaction kinetic data was carried out in Aspen Plus. Compared to the base case, the results show that this configuration can save up to 25% in terms of reboiler duty and improved selectivity towards desired product. This study was supported by the Basic Science Research Program through the National Research Foundation of Korea (NRF) funded by the Ministry of Education (2015R1D1A3A01015621). This study was also supported by Priority Research Centers Program through the National Research Foundation of Korea (NRF) funded by the Ministry of Education (2014R1A6A1031189).