Self-Heat Recuperative Top Reactive Dividing Wall Column for the Formic Acid Production Process

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A novel self-heat recuperative top reactive dividing wall column for the formic acid production process was proposed in this work. Improving energy efficiency of the formic acid production process is the main purpose of this work. Huang's patented process that was optimized is used as a base case for comparison with other configurations. External heat-integrated and thermal coupling was investigated by adding a side-reboiler onto the reactive distillation column. The proposed configuration can provide preferable conditions for the self-heat recuperation by avoiding the remixing effect and reducing the energy requirements. The proposed self-heat recuperative top reactive dividing wall column configuration can also be applied to other similar reactive distillation processes for improving the energy efficiency. This study was supported by Basic Science Research Program through the National Research Foundation of Korea (NRF) funded by the Ministry of Education (2015R1D1A3A01015621) and by Priority Research Centers Program through the National Research Foundation of Korea (NRF) funded by the Ministry of Education (2014R1A6A1031189).