Design of Extraction Column Methanol Recovery System for the TAME Reactive Distillation Process

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Abstract
This paper studies the synthesis and the design of methanol recovery system for TAME reactive distillation process using extraction column with water as a solvent. The design of the extraction column system has not been studied in the literature. The effect of operating conditions such as solvent flowrate, extraction column temperature, and number of equilibrium trays are studied. It is found that methanol could be recovered completely from the hydrocarbon when 5 equilibrium trays in the extraction column are used. The column is operated isothermally at an optimum temperature of 40°C and the optimum solvent to process ratio is found to be close to one. The recovery system consists of a methanol distillation column which was optimized to recover methanol and recycle water to the extraction column. Other auxiliary units are designed to complement the overall process flowsheet.

Keywords: TAME, liquid extraction, methanol recovery

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