

عنوان مقاله:

Comparison of vapor recompression and modified vapor recompression methods in separation of close boiling mixtures

محل انتشار:

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خلاصه مقاله:

Distillation is the most widely used separation method in chemical processes. Huge amounts of energy consumed in separating close boiling mixtures cause an increase in the process costs. Consequently, energy optimization and heat integration of distillation columns seems necessary for separating close boiling mixtures. This study investigated separation of the toluene-benzene mixture, which consume huge amounts of energy because of close boiling of these two compounds. Vapor recompression distillation (VRC) is an energy integrated distillation configuration which works on the principle of a heat pump. The vapor recompression and modified vapor recompression (MVRC) methods were used to for energy optimization of the separation process. According to the results, the vapor recompression and modified vapor recompression methods respectively reduced energy consumption by ۶۶.۷۸% and ۷۰.۰۴% relative to the conventional separation process. Moreover, the modified vapor recompression consumed the least amount of energy due to reduced duty of the compressor, and thus was selected as the best separation process.

کلمات کلیدی:

,Distillation, Close boiling, Energy optimization, VRC, Modified VRC

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