

## Reduction of Energy Consumption of Distillation Process by Recovering the Heat from Exit Streams

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**Abstract :** Distillation consumes enormous quantity of energy. This work proposed a process to recover the energy from exit streams during the distillation process of three consecutive columns. There are several novel techniques to recover the heat with the distillation system; however, a complex control system is required. This work proposed a simpler technique by exchanging the heat between streams without interrupting the internal distillation process that might cause a serious control problem. The proposed process is executed by using heat exchanger network with pinch analysis to maximize the process heat recovery. The test model is the distillation of butane, pentane, hexane, and heptanes, which is a common mixture in the petroleum refinery. This proposed process saved the energy consumption for hot and cold utilities of 29 and 27%, which is considered significant. Therefore, the recovery of heat from exit streams from distillation process is proved to be effective for energy saving.

**Keywords :** distillation, heat exchanger, network pinch analysis, chemical engineering

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