

Retrofitting Heat Exchanger Network for the Ethyl-benzene Process

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Chemical plants generally consume much energy to convert raw materials into products. Supplying energy needs cost, and the energy cost contributes a significant portion of the total operating cost. Especially for ever-rising energy cost, energy saving is an important issue to chemical industries. This study deals with retrofitting heat exchanger network as an alternative for saving energy.

A target case of this study is a process to manufacture ethyl-benzene. It is manufactured by alkylation between ethylene and benzene, and the ethyl-benzene is used for manufacturing styrene monomer process. Annual energy cost of the ethyl-benzene process is about 7 billion won. If 10% of this cost can be saved, 700 million won is saved. To find possibility for saving, the current heat exchanger network is analyzed using pinch retrofit analysis. Based on this result, improved heat exchanger network is proposed.

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