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OPTIMIZATION / AIR SEPARATION UNIT / ASPEN PLUS / DISTILLATION

CHAKKRIT WISESJUNG : OPTIMIZATION OF THE AIR SEPARATION UNIT

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Nowadays, the production lines of petrochemical plants have to operate continuously. They are not available for development or improvement any capability at that time, so a simulation model is needed to represent the actual plant. This research presents the Simulation Model of Air Separation Unit written in ASPEN PLUS. The main objective of this study is to find out optimal operating conditions which can produce the highest purity of Nitrogen, Oxygen and Argon gas with respect to parameters (feeding temperature, reflux ratio and differential pressure per tray). In addition the sensitivities of the process have been studied for the change in flow rate, temperature and pressure of feed stream independently and simultaneously.

This Optimization has separated into 3 conditions: Maximization of nitrogen, oxygen and argon. Simulation results have shown that the appropriate condition is to maximize Nitrogen; simulation result has shown that purity of nitrogen for the Nitrogen's optimal condition is 99.994%, which is higher than the normal operating condition while the purities of oxygen and argon almost the same. For the sensitivity analysis, it has found the flow rate of feed stream is the most sensitive to the purity of the product gas whereas temperature and pressure of stream feed stream are insensitive to the purity of the product gas.

This simulation model can represent the real processing production which is useful for developing or improving its capability. The value-added products can make more reliability to customers

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