

## Semi Analytic Method for Determining Optimal Stripper Pressure in CO<sub>2</sub> Capture and Liquefaction Process Using Monoethanolamine (MEA)

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Operation pressure of distillation column is key variable for optimizing required energy in CCS process. It affects the steam drag point in power plant, regeneration energy in capture process and compression energy in liquefaction process. A new analytic method, which is less dependent on simulation, for determining optimal stripper pressure for process using MEA as an absorbent is proposed. Total energy is represented as a function of the pressure based on the equivalent work. The results show that compression work is reduced at high pressure while that for reboiler increases and total energy is represented as a decreasing function with pressure. It is revealed that a general analytic solution for optimal pressure including both capture and liquefaction process cannot be made, using approximation method and Abel–Ruffini theorem, while the expected value of total energy required in the possible range of pressure is estimated with input variables. This research is supported by the Korea Ministry of Trade, Industry and Energy as a grant entitled: Development of standardization/certification technologies and whole chain-integrated modules for CCS commercialization (2012100201687).