Economy Evaluation of CO_2 Absorption Process using Monoethanolamine

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The CO2 absorption process using amine solvents has been considered as the powerful candidate among CO2 capture options. While many research groups have been studying the novel configurations of CO2 absorption process to reduce the energy required to regenerate solvents, no study groups estimate equipment costs of CO2 absorption process precisely. In this study, the method of columns & heat exchangers design was described. The sensitivities of column design factors were also analyzed and column design was optimized based on analysis. With optimization results, equipment costs of base case of CO2 absorption process were evaluated. The portion of equipment costs and operating costs were analyzed and new process configuration which reduces total heat transfer area so that equipment costs are decreased was proposed. Monoethanolamine(MEA) was used as solvent of base case of CO2 absorption process, the packing types of absorber and stripper were MELLAPAK 250X, and Aspen PlusTM was used to simulate the processes.