

Effects of adding an organic acid to reduce energy requirement for MEA solvent recovery of the stripping process in the CO₂ capture system

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Chemical absorption is the most popular technology in CO₂ capture system. This technology is more mature than other CO₂ capture technologies and proper for large scale plants. MEA (Mono-ethanolamine) has been used as an absorbent to capture CO₂ because it has high reactivity and low solvent cost. However, CO₂ absorption process using MEA has disadvantages and one of those is that the regeneration energy of MEA solvent is higher than those of other amine based solvents in the general stripping process.

This work focuses on effects of adding an aqueous organic acid, such as benzoic acid, to decrease MEA recovery energy in the stripper. The acid can reduce CO₂ solubility in aqueous MEA solution and the energy to separate MEA and CO₂ would be lower. To confirm effects of adding the acid in the stripping process, CO₂ solubility in aqueous MEA solution and in a mixture of aqueous MEA and benzoic acid solutions were measured at different weight percent ratio of MEA and the benzoic acid. Through the solubility data, effects of adding the acid in the stripping process could be estimated.