Carbon dioxide separation from flue gases: a technological review emphasizing reduction in greenhouse gas emissions

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Received 17 August 2013; Accepted 31 October 2013; Published 17 February 2014

Abstract

Increasing concentrations of greenhouse gases (GHGs) such as CO₂ in the atmosphere is a global warming. Human activities are a major cause of increased CO₂ concentration in atmosphere, as in recent decade, two-third of greenhouse effect was caused by human activities. Carbon capture and storage (CCS) is a major strategy that can be used to reduce GHGs emission. There are three methods for CCS: pre-combustion capture, oxy-fuel process, and post-combustion capture. Among them, post-combustion capture is the most important one because it offers flexibility and it can be easily added to the operational units. Various technologies are used for CO₂ capture, some of them include: absorption, adsorption, cryogenic distillation, and membrane separation. In this paper, various technologies for post-combustion are compared and the best condition for using each technology is identified.