Hybrid membrane and chemical absorption systems for CO_2 capture

Michael John Binns, 김진국*
한양대학교
(jinkukkim@hanyang.ac.kr*)

Amine-based absorption of CO2 is becoming the industry standard technology for capturing CO2 emitted from power plants, refineries and other large chemical plants. More recently, Membranes have more recently been developed for various gas separation processes. In this study we consider the synthesis of hybrid membrane-absorption systems in which the relative benefits of the two technologies are combined.

For a given power plant flue gas we synthesis a CO2 recovery superstructure of membranes and absorption units. In particular we vary the size, pressure difference and recycle ratio of the membranes and the size, flow rate of solvent and feed locations of the absorption and subsequent stripping columns. Optimisation and analysis of these superstructures identifies the optimal designs and checks the feasibility of a hybrid CO2 removal scheme.

Acknowledgements

This research was supported by the International Research & Development Program of the National Research Foundation of Korea (NRF) funded by the Ministry of Education, Science and Technology(No. 2011-0031290).