

Process optimization of gas separation process using hollow-fiber membrane for carbon dioxide capture from coal power plant

이성훈, Michael John Binns, 이정현¹, 문종호¹, 여정구¹,
여영구, 김진국[†]
한양대학교; ¹한국에너지기술원
(jinkukkim@hanyang.ac.kr[†])

We develop the superstructure for carbon capture using hollow-fiber membrane, which has advantages as compact module and low energy usage, compared to conventional absorption or adsorption processes. The performance of membrane process is determined by feed and permeate pressure, configuration of membrane network and their area. The optimization solver, GA (Genetic Algorithms) is used to determine the cost-effective configuration and optimized amount of utility usages, based on minimized TAC (Total Annualized Cost) per ton of CO₂ which is subject to target purity and minimum recovery of CO₂. The mathematical model of membrane process and optimization are carried out in an MATLAB[®] environment.

Acknowledgment: This research was supported by the Korea Carbon Capture & Sequestration R&D Center (KCRC) through the National Research Foundation of Korea (NRF) funded by the Ministry of Science, ICT and Future Planning(2014M1A8A1049305).