「米国National carbon capture center (NCCC)における分離膜の実証試験」

Frank Morton
Southern Company Services, Inc.
Director, Technology Development

Abstract

The U.S. National Carbon Capture Center (NCCC) is a key component of the U.S. Department of Energy's strategy in promoting the United States' economic, environmental, and energy security through reliable, clean, and affordable power produced from coal. The NCCC provides state-of-the-art facilities and support for technology developers to evaluate and advance the most promising post- and pre-combustion CO2 capture and gasification technologies for future commercial deployment. Since CO2 emission reduction is a global issue with only global solutions, the NCCC encourages international participation in the technology development at the center.

The NCCC facilities include the Post-Combustion Carbon Capture Center (PC4), located at Alabama Power's E.C. Gaston power plant, and a pilot coal gasification plant which includes pre-combustion CO2 capture processes. Evaluation of developing technologies using coal-derived gas under industrial conditions provides critical information on material and process suitability for scale-up to commercial applications. Because of the ability to operate under a wide range of flow rates and process conditions, research at the NCCC can simultaneously evaluate a number of technologies at various levels of maturity, thereby accelerating the pace of development.

Operations at the PC4 have included more than 31,000 hours of bench- and pilot-scale technology evaluations with coal-derived flue gas, with more than 2,500 hours under simulated natural gas flue gas conditions. Technologies tested at the center include independent solvent processes, membranes, enzymes, and sorbents.

For gasification and pre-combustion CO2 capture technologies, the center has accommodated more than 32,000 hours combined of developer technology testing since 2009. These technologies include water-gas shift, carbonyl sulfide hydrolysis, and Fischer-Tropsch.