

Title **CO₂ ABSORPTION/REGENERATION PERFORMANCE
ENHANCEMENT BY NANOABSORBENTS**

Speaker **Prof. Yong Tae Kang**
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Date & Time **Friday, September 29, 2017 4:00 p.m.**

Place **I2CNER hall, I2CNER Bldg.1, Ito campus, Kyushu University**

Abstract

Global warming has triggered a worldwide concern about the CO₂ emission to the atmosphere. In this regard, technologies such as the integrated gasification combined cycle (IGCC) have gained interest due to the rich reserves of coal around the world and the possibility to store CO₂ straight from the CO₂ capture process. The acid gases removal process in IGCC usually is performed with a physical solvent, which has a smaller absorption rate compared to the chemical solvents under atmospheric condition. In this study, the objective is to estimate the performance of CO₂ gas absorption and regeneration by using SiO₂/DI water and Al₂O₃/DI water nanofluids. The key parameters are the concentrations of SiO₂ and Al₂O₃ nanoparticles and the system pressure during the regeneration process. It is found that the maximum CO₂ absorption and regeneration performance enhancements are 23.5% and 11.8% at 0.01 vol% of SiO₂ nanoparticles, respectively. However, in the case of Al₂O₃ nanoparticles, the regeneration performance decreases 11.2% at 0.01 vol%.

KEYWORDS: Al₂O₃ nanoparticles , CO₂ Absorption, Nanoabsorbents, Regeneration, SiO₂ nanoparticles,

About the Speaker

Professor Kang received his BS and MS at Department of Mechanical Eng., Seoul National University in 1987 and 1989, respectively, and PhD at Department of Mechanical Eng, The Ohio State University in 1994. After spending two years at the OSU as a postdoctoral researcher, he joined JST as a special researcher and TUAT, Tokyo, Japan as a visiting professor in 1997. After spending three years at JST and TUAT, he joined the faculty at Kyung Hee University, Korea in 2000, and moved to Korea University in 2014. His research focuses on thermal energy systems including absorption heat pumps, heat exchanger design, refrigeration systems, nanofluids and CO₂ capture using nanoabsorbents. He published more than 150 international and domestic journals and more than 200 conference papers. He is now a member of ASHRAE (American Society of Heating, Refrigeration, and Air-Conditioning Engineers), KSME (Korean Society of Mechanical Engineers), IIR (International Institute of Refrigeration), JSHRAE (Japanese Society of Heating, Refrigeration, and Air-Conditioning Engineers) and SAREK (Society of Air-Conditioning and Refrigeration Engineers of Korea). In 2010, his lab was designated as a National Research Lab. by the Ministry of Science and Technology. In 2012, he served as a vice president of graduate school, Kyung Hee University. In 2015, he received the Asian Academic Award jointly from SAREK/CAR/JSRAE. In 2017, He received the best research award from Korea University. Now, he serves as a director of Brain Korea plus (BK plus), School of Mechanical Engineering, Korea University.

Host: Professor Bidyut Saha

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