

Comparative Study on Physicochemical Properties of Novel CO₂ Absorbents

송호준, 박상원, 박진원*, 장경룡¹, 심재구¹, 이지현¹
연세대학교 화공생명공학과;
¹한전 전력연구원 녹색성장연구소
(jwpark@yonsei.ac.kr*)

Wet amine scrubbing using alkanolamine has been thought to be the most feasible method for the capture of CO₂ from coal-fired power plant flue gases. Korea Electric Power Research Institute (KEPRI) has developed highly efficient CO₂ absorbent solution named KoSol. It was proven that the recently formulated solution, KoSol-3, has superior performance in solvent regeneration energy, metal corrosivity, and thermochemical degradation than does 30 mass % monoethanolamine (MEA). The 2 ton CO₂/day (0.1 MW)-scale pilot plant has been installed at Boryeong Power Plant and the field tests are ongoing using KoSol-3 as CO₂ absorbent.

In the present study, the characterization experiments were conducted on the candidates for the novel CO₂ absorbents. Physical properties, such as density, viscosity, gas diffusivity, surface tension, heat capacity, and gas solubility, were measured. Overall reaction kinetic constant (k_{ov}), under the pseudo-first order reaction regime, was measured using stirred-cell reactor. From the measured data, the performances of the candidates were comparatively discussed. The data will be utilized for the design and optimization of the CO₂ capture pilot plant.