

Selected physico-chemical properties of partially carbonated absorbent solutions for CO₂ capture

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Properties of absorbent solutions for CO₂ capture are of great interest among researchers due to the increasing need for the absorbent development. A pilot plant study employing the aqueous mixture of KIER-C3, newly proposed absorbent, and AMP (2-amino-2-methyl-1-propanol) has been conducted to simultaneously remove CO₂ and SO_x in Daejeon, South Korea. The purpose of this work is to investigate the physico-chemical properties of aqueous absorbents sampled from the pilot facility and compare them with the lab-prepared solutions. In this paper, we present experimental results of physico-chemical properties such as the absorption heat, viscosity, and density of partially carbonated absorbent solutions. The physico-chemical properties of each solution varied with the absorbed amount of CO₂ and temperature. The mixture viscosities gradually increased as the amount of absorbed CO₂ increased and decreased as the temperature increased. Compared with the sampled solution from the pilot facility, the viscosities of lab-prepared solution exhibited significantly higher values. It was also found that the other properties of the two kinds of (or categorized or featured) solutions are quite different. Knowing that difference between the two, it should be stressed that the properties of the non-carbonated absorbent solutions as well as those of partially carbonated absorbent solutions be investigated for the design of CO₂ capture facilities.

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