Magnesia rich supports for enhanced CO_2 capture promoted by Eutectic mixture

Hiremath Vishwanath, 이한영, 서정길†
명지대학교
(jgseo@mju.ac.kr†)

Magnesia based adsorbents with Al_2O_3 and SiO_2 (Mg/Al, Mg/Si molar ratio 3-5) supports further impregnated with (K, Li)NO_3 eutectic mixture were synthesized for high temperature CO_2 capture. The adsorbents are characterized by XRD, BET, SEM-EDX, TEM and thermogravimetric analysis. It was observed that, the excess of MgO present activated at the eutectic point and the carbonation was initiated. The effect of adsorption temperature, effective carbonation conversion and the optimum Mg/Al molar ratio to stabilize MgO for the effective regenarabilty during the high temperature CO_2 adsorption-desorption were investigated in detail. Also, it was observed that with increasing molar ratio the adsorption performance was increased due to the excess of MgO present. Moreover, due to the presence of the basic $MgAl_2O_4$ and Mg_2SiO_4 phases, the enrichment of MgO towards CO_2 attraction was observed. This work was supported by KCRC through the NRF funded by Ministry of Science, ICT, and Future Planning (NRF-2014M1A8A1049258)