# New Regenerable MgO-Based Sorbents Promoted with $K_2CO_3$ for $CO_2$ Capture at Low Temperatures

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To improve the $CO_2$ absorption capacity of alkali-based sorbents, $CO_2$ capture capacities and regeneration properties of sorbents, prepared by impregnation and wet mixing method of potassium carbonate on supports such as activated carbon and MgO (KACI30, KACP30, KMgI30, and KMgP30), were investigated in a fixed bed reactor ($CO_2$ absorption at 50-100℃ and regeneration at 150-400℃). Total $CO_2$ capture capacities of KMgI30-500 and KMgP30-500 were 178.6 and 197.6 mg $CO_2$/g sorbent, respectively, in the presence of 11 vol.% $H_2O$ even at 50oC. The large amount of $CO_2$ capture capacity of KMgP30-500 and KMgI30-500 could be explained by the fact that MgO itself, as well as $K_2CO_3$, could absorb $CO_2$ in the presence of water vapor even at low temperatures. In particular, water vapor plays an important role in the $CO_2$ absorption of MgO and KMgI30-500 even at low temperatures below 60℃, in marked contrast to MgO and CaO which can absorb $CO_2$ at high temperatures. KMgI sorbents showed excellent characteristics in that it could satisfy a large amount of $CO_2$ absorption at low temperatures, a high $CO_2$ absorption rate, and fast and complete regeneration.