

CO₂ sorption of mesoporous magnesium oxides at ambient temperature

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Carbon dioxide (CO₂) accumulates in the atmosphere and results in increase in the average global temperature and climatic changes. Therefore, CO₂ capture has attracted the researcher's attention to design potential sorbents recently.

In this work, Mesoporous magnesium oxide (MgO) was synthesized by aero-gel method using magnesium methoxide as precursor, toluene as solvent and distilled water as reactant. Particle morphology was polyhedral sharp and aggregated in SEM images. The type-IV adsorption isotherm with H1 hysteresis obtained by N₂ adsorption/desorption study for MgO.

The performance of as-prepared mesoporous MgO toward CO₂ was analyzed in thermogravimetric analysis (TGA). At room temperature (25°C), the CO₂ sorption capacity was up to 10.6wt%. The sorption capacity decreased with an increase in CO₂ temperature. Finally, the thermal stability of mesoporous MgO was tested by the cyclic test of CO₂ sorption and regeneration in this work.