

## Synthesis of Macroporous Titania/Silica alloy Particles for Host Materials of CO<sub>2</sub> Capture

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Macroporous Titania/Silica alloy particles were prepared by emulsion-assisted colloidal templating, in which non-aqueous emulsions have been used for dealing with reactive sol-gel precursors such as titanium butoxide(TBT) and tetraethyl orthosilicate(TEOS). Submicron-sized crosslinked polystyrene (PS) beads were used as template for macropore. The toluene-in-formamide emulsions including PS beads, sol-gel precursors were prepared using high-speed homogenizer. Then, PS-Titania/Silica composite particles were produced by evaporation of toluene using heat treatment. Finally, macroporous Titania/Silica alloy particles were obtained by heat treatment which developed macropores inside particles. Macroporous particles were further functionalized with various amine compounds, in which CO<sub>2</sub> adsorption and desorption capacities and rates were compared. Amine compounds were reacted with hydroxyl group on the host material surface. So CO<sub>2</sub> capacity was concerned with number of hydroxyl group on the surface. Titania was provided more high number of hydroxyl group than silica. This results, CO<sub>2</sub> capacity was increased, when the Titania/silica alloy materials were used.