

### Engineering the structure of mesoporous zinc/magnesium silicate particles

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Silica-based mesoporous materials have been extensively studied for practical applications in many fields due to their low toxicity, high chemical and mechanical stability, and versatile surface functionalization. In this study, we fabricated various structure of silica-based mixed oxide particles. We developed a novel one-pot method to engineer nanostructure of zinc and magnesium silicate particles. In this method, we simply reacted a mixture of tetraethoxysilane, zinc acetate, magnesium acetate and cetyltrimethylammonium chloride in water. The product was mesoporous magnesium and zinc silicate particles with a core-shell structure. We found that formation of mixed oxide was different with silica, which was responsible for the core-shell structure. Based on these understanding, we could engineer nanostructure of the synthesized particles. Using nitrogen sorption method, average pore size of mesoporous zinc silicate particles was found to be 3.4 nm which is consistent with the diameter of spherical CTAC micelles.