

Solvothermal Synthesis of Porous Shell and Hollow Core Metal Oxide Nanostructures

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Metal oxide nanoparticles such as Fe_3O_4 and TiO_2 with porous shell and hollow core structure have been synthesized through a one-pot and template-free solvothermal process. It was suggested that the porous structure was formed by spherical assembly of numerous small grains and the hollow core was generated by chemical conversion simultaneously coupled with Ostwald ripening process within these spherical assemblies. The chemical conversion might cause the non-uniformities of tiny grains and the empty spaces within the spherical assemblies and thus enhanced the outward migration and relocation of the core grains toward the outer layer, resulting in the formation and expansion of the porous/hollow structure.