

Study on Formation Mechanism of Magnetite Porous Spheres through a Facile Template-Free Solvothermal Process

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We utilized a facile template-free solvothermal process for the synthesis of monodispersed Fe_3O_4 nanospheres with hollow interior structures. The changes of morphology, crystal structure and magnetic properties of the Fe_3O_4 nanoparticles were systematically characterized by using SEM, TEM, XRD and VSM methods. The hollow structure was formed based on the aggregation of many primary particles, followed by Oswald ripening process. Because of the energy difference between the outer and interior particles in the aggregates, the inner particles migrated to the outer shell, resulted in the formation of the empty space inside nanostructures.