

Structure Evolution of Highly Porous/Hollow ZnO Nanoparticles in Sonochemical Process

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Recent advances in nanostructured materials have been led by the development of new synthetic methods which can control the morphologies of nanostructures. The utilization of high intensity ultrasound offers a facile, versatile synthetic tool for nanostructured materials that are often unavailable by conventional methods. In our research, ZnO porous/hollow spheres with diameter of 300 nm consisting of numerous ZnO nanoparticles with a diameter of approximately 15 nm have been successfully prepared through sonochemical process. It is believed that ultrasonic irradiation significantly enhances the hydrolysis rate and the shock waves can induce a typical morphology of material. The ZnO spheres were synthesized for various process variables and were characterized systematically by XRD, SEM, TEM measurements in order to elucidate the particle growth mechanism in sonochemical reactor.