Synthesis of Mesoporous ZnO Nanoclusters Through Dissolution of Polystyrene@ZnO Core-Shells

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Novel mesoporous zinc oxide (ZnO) nanospheres were achieved by dissolution of as-prepared polystyrene@ZnO core-shells nanospheres. In a typical experimental condition, first we prepared 200-300 nm size functionalized polystyrene spheres via polymerization of styrene in aqueous solvent followed by esterification of zinc acetate dihydrate in iso-propyl alcohol under ultrasonication and aged for 24 hours. The structural and morphological investigation of as-grown ZnO mesoporous nanospheres were performed by field emission scanning electron microscope (FESEM) transmission electron microscopy (TEM), x-ray diffraction (XRD) and EDX. The as-synthesized ZnO nanoclusters are composed of spherical shaped, crystalline nanoparticles of 20～40 nm in diameter. Further, the removal of core-polystyrene were investigated by various approach and discussed in detail. However, the polystyrene beads were successfully removed by immersing the as-prepared polystyrene@ZnO in toluene solution.