

Shape-Controlled Synthesis of Flower-like ZnO Nanostructures via Simple Solution Chemistry

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Flowers-shaped ZnO nanostructures have been successfully synthesized by reaction of aqueous solution of zinc nitrate and NaOH at low temperature (90 °C). To examine the morphology and growth process of ZnO nanostructures, time dependent (7, 9 and 11 hrs) experiments were carried out without changing other reaction parameters. Scanning electron microscopy images revealed that the reaction carried out for 7 hrs resulted in formation of ZnO flowers with triangular-shaped leaves and some irregular nanoparticles of ZnO desiminated around flowers. When the reaction time is increased upto 9 hrs ZnO flower in clusters are obtained. Further increasing the reaction time to 11 hrs resulted in monodispersed-flower shaped ZnO nanostructures. XRD and TEM analysis revealed that obtained flower shaped nanostructures are single crystalline with wurtzite hexagonal phase. Finally, growth mechanisms for the formation of these ZnO nanostructures were discussed based on the obtained results.