

Synthesis and characterization of flower-shaped ZnO nanostructures by solution process

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Among various semiconductor nanostructures, II-VI semiconductor ZnO exhibits a variety of nanostructures and hence, it is the richest family of nanostructures. With a wurtzite hexagonal phase. A variety of methods have been applied to grow various types of ZnO nanostructures such as thermal evaporation method, hydrothermal process, cyclic feeding chemical vapor deposition, CVD and MOCVD process etc. In addition of these processes, the sol-gel method presents a simple approach to obtain the products with good crystal quality at very low temperature. In this regard we synthesized flower-shaped ZnO nanostructures composed of hexagonal ZnO nanorods by a chemical solution process containing $Zn(CH_3COO)_2 \cdot 2H_2O$ and NaOH at very low temperature at about 90°C in 12 hours refluxing time. The obtained products were characterized in terms of their structural and optical properties. The FESEM studies revealed that the synthesized flower-shaped structures. The typical diameters of the obtained nanorods are in the range of 300–350 nm with the length of 2–4 μm while the full array of one flower-shaped structure is in the range of 5–6 μm .