

Synthesis and optical characterization of needle-shaped ZnO nanorods via sonochemical method

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The semiconductor ZnO, with a direct wide band gap (3.37 eV) and high exciton binding energy (60 MeV) at room-temperature, presenting itself as a promising material for the wide range of well-know technological as well as an important functional material for the future research and applications. In this connection we synthesized needle shaped zinc oxide nanorods at room temperature by the sonochemical method using zinc acetate dihydrate and sodium hydroxide. Morphological observations done by field Emission scanning electron microscopy (FESEM) and transmission electron microscopy (TEM) reveals that the obtained products have hexagonal morphology with typical diameter and length varies from 120–160nm and 3–5 μm , respectively. Sonication time appears to be a critical parameter for the shape determination. As grown powders composition was analyzed by the FTIR spectra. It shows a characteristic peak of zinc oxide at 520 cm^{-1} . The optical properties of zinc oxide were measured by the UV-visible and room temperature photoluminescence.