

Synthesis, Characterization and Cytotoxic Effect of Eu₂O₃-doped ZnO Nanostructures

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Abstract : In this work ZnO nanostructures (nanopowders and nanostars) have been synthesized via a simple sol-gel method. The used methods for synthesizing the nanostructures involve two steps as follows: (1) precipitation of zinc acetate precursor for the synthesis of ZnO nanopowders and zinc chloride precursor for the synthesis of ZnO nanostars and (2) addition of Eu₂O₃ in different concentrations (1%, 3%, and 5%) using europium acetate as precursor. Detailed crystalline parameters for each of the synthesized species were analysed using X-ray diffraction. Structural transitions were also discussed. The structure and morphology of the as-prepared ZnO nanopowders and nanostars were investigated by electron microscopy. TEM investigations have shown an average particle size range from 23 to 29 nm and polyhedral and spherical morphology with tendency to form aggregates for nanopowders. For nanostars structures, a star-like morphology could be observed. Cytotoxicity tests on MG-63 cell lines were also performed. Photocatalytic activity of ZnO nanopowders have reached higher values compared to ZnO nanostars.

Keywords : cytotoxicity, photocatalytic activity, TEM, ZnO

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