Copper-Dopped Zinc Oxide Nanoparticles Synthesis by a Fast Polymer Precursor Based Method

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Zinc oxide is a versatile semiconductor material and have shown many applications as UV detector, varistor, photocatalysis and gas sensors. When doped with many transition metals as Ni, Mn and Co, ZnO exhibit ferromagnetic ordering at room temperature. In the present work, nanostructured Cu doped-ZnO was synthesized by a modified fast polymeric precursor method based on soluble polymer. This method involved a water-based complexation of Zn and Cu, with concentration from 0.1 to 5.0%-mol of copper, by water soluble polyacrylate [1]. The solution was dried and calcined by 120 minutes at 400, 450, 500 and 550 °C. The temperatures or thermal decomposition were determined using Differential Scanning Calorimetry (DSC). A Fourier-Transform Infra-Red Spectroscopy (FTIR) was proceeded to determine how were the structure of calcined product. X-Ray Diffraction (XRD) was performed, showing very crystalline pattern, specially the powders thermally decomposed at 550 °C. Using Scherrer inference calculated from diffractogram peaks, nanoparticles under 50 nm are present. Scanning Electron Microscopy was also employed to study the morphology of the particles. This process yielded the synthesis of nanoparticles in very short time of about six hours, faster than conventional polymeric precursor methods as Pechini and sol-gel, and no ageing step was needed

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