

عنوان مقاله:

Multiple-layered structure of obelisk-shaped crystalline nano-ZnO prepared by sol-gel route

محل انتشار:

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خلاصه مقاله:

Zinc oxide nanopowders were synthesized by the simple sol-gel method from an ethanol solution of zinc nitrate hexahydrate. Structural and surface morphological investigations were carried out using X-ray diffraction (XRD), high-resolution transmission electron microscopy (HRTEM), scanning electron microscopy, Fourier transform infrared spectroscopy (FTIR) and ultraviolet-visible (UV-Vis) spectrophotometry analyses. XRD patterns showed that the zinc oxide nanoparticles exhibited hexagonal wurtzite structure. A multiple-layered structure of obelisk-shaped ZnO nanoparticles was achieved after calcinations. The average particle size of ZnO was around 20 nm as estimated by direct HRTEM observation. The size of sphere-like shaped ZnO nanoparticles was measured in the range of 20–80 nm and the size of pyramid-like shaped annealed samples was achieved in the range of 40–100 nm with less agglomeration. The energy dispersive spectroscopy spectrum showed peaks of zinc and oxygen. The sharp peaks in FTIR spectrum determined the Zn–O stretching and absorbance peak of UV-Vis spectrum showed the wide bandgap energy of 3.35 eV.

کلمات کلیدی:

ZnO nanoparticles Obelisk-shaped Synthesis Sol-gel

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