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CuO:Fe nanoparticles: preparation, characterization and antibacterial properties

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Abstract:

Cu_{1-x} Fe_xO (x=0,0.05,0.10, 0.15) nano particles with average diameter of about 37 nm were prepared by sol-gel method at 400°C. The obtained nanoparticles were characterized by X-Ray Diffraction (XRD), Transmission Electron Microscopy (TEM), an Ultraviolet-Visible (UV-vis) spectroscopy. Optical studies show that Optical band gap of products increase with doping. The observed shift in the absorption edge from 360 to 356 nm with the increase of dopant concentration from 0 to 15%, clearly reflects the incorporation of Fe in the CuO lattice. And also Band gap energy increase from 1.85 eV (pure CuO) to 2.23 eV (CuO:Fe 10%). X-ray diffraction patterns of samples confirm the presence of cupric oxide (CuO) phase. The antimicrobial properties of CuO:Fe nanoparticles with different Fe concentration were investigated using Escherichia coli (*E. Coli*) bacteria.

KEYWORDS : CuO nanoparticle, Antibacterial properties, sol-gel method