

Structural and photocatalytic study of La, Ce co-doped ZnO nanoparticles

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Abstract: Synthesis and study of materials at nano scale has become a major fascinating area of interdisciplinary research over the past few decades. Lately rare earth ion doped II-IV semiconductor nano materials have revolutionized the research world because of their much improved optical properties. [1-4]. Luminescent nanoparticles: ZnO nanoparticles with Lanthanum (La) and Cerium (Ce) co doping concentration have been prepared via co precipitation route. Characterization of the sample has been done by, SEM, TEM and EDX analysis. Photo catalytic study is done using uv lamp. The effect of lanthanum and Cerium incorporation on the morphology was examined by, Scanning Electron Microscope (SEM), and Transmission electron microscopy (TEM). The average particle size of the synthesized co doped ZnO nanoparticles is calculated to be less than 50 nm.

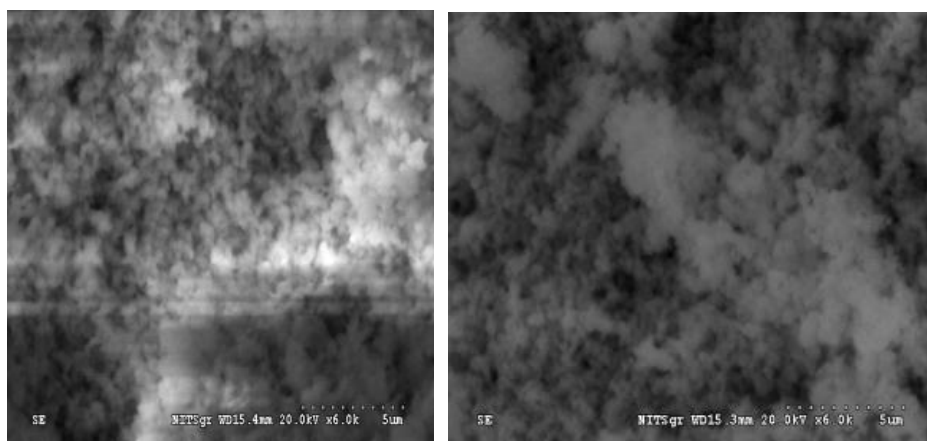


Figure 1: SEM photomicrographs of La, Ce co-doped ZnO nanoparticles.

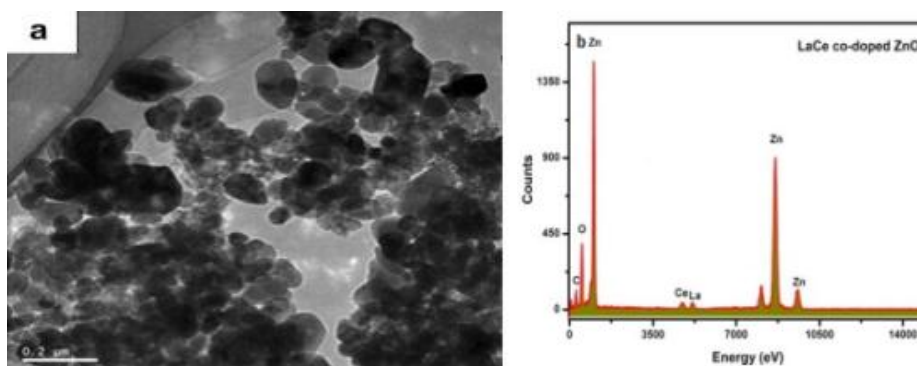


Figure 2: TEM and EDX images of La, Ce co-doped ZnO.

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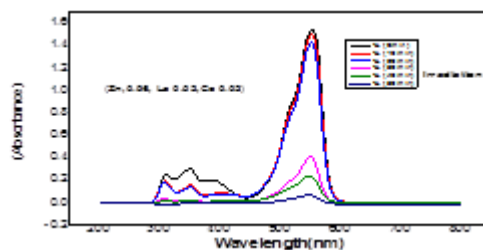


Figure 3: UV–Vis absorbance Spectral changes of Rhodamine B dye solution during the photocatalytic degradation by La, Ce co-doped ZnO nanoparticles.

Conclusion: The particles crystallized in Hexagonal structure. The morphology of the ZnO particles was obtained from SEM. The investigation of the photocatalytic activity showed that all the La Ce co-doped ZnO nanoparticles exhibit excellent photocatalytic degradation activity of Rhodamine B dye solution as visible light irradiation.

References:

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