



Investigation of the morphological, optical and antimicrobial properties of Nd doped ZnO nanoparticles using *Hemidesmus indicus* (L.) R. Br. Root extracts

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Abstract:

In the current study, we present a low-cost, novel, and straightforward method for the biopreparation of zinc oxide nanoparticles (ZnO NPs) and neodymium (Nd³⁺) incorporated into the ZnO NPs using extracts of *Hemidesmus indicus* (*H. indicus*) (L.) R. Br. root like a sustainable reducing as well as coating agent. Rietveld's analysis of the XRD data showed that ZnO and Nd³⁺ doped ZnO NPs have a hexagonal wurtzite crystalline level. The morphological representation of synthesized NPs was analyzed by FESEM and chemical composition by EDAX. The different vibrational frequencies were assigned for the FT-IR spectra. The Optical behaviour of the prepared NPs be present studies by UV-visible spectroscopy. Moreover, this study concludes the antimicrobial efficiency of the synthesized NPs opposed to standard and clinical strains of *Staphylococcus aureus* (gram-positive) and *Klebsiella pneumoniae* (gram-negative) bacterial strains using the well diffusion method.

Keywords: ZnO, *Hemidesmus indicus*, antimicrobial activity.