

## Hafnium Doped ZnO Nanostructures: An Eco-Friendly Synthesis for Optoelectronic Applications

**Authors :** Mohamed Achehboune, Mohammed Khenfouch, Issam Boukhoubza, Bakang Mothudi, Izeddine Zorkani, Anouar Jorio

**Abstract :** Zinc Oxide (ZnO) nanostructures have been attracting growing interest in recent years; their optical and electrical properties make them useful as attractive and promising materials for optoelectronic applications. In this study, pure and Hafnium doped ZnO nanostructures were synthesized using a green processing method. The structural, optical and electrical properties of samples were investigated structural and optical spectroscopies and electrical measurements. The synthesis and chemical composition of pure and Hafnium doped ZnO were confirmed by SEM observation. The XRD studies of Hafnium doped ZnO demonstrate the formation of wurtzite structure with preferred c-axis orientation. Moreover, the optical and electrical properties of doped material have improved after the doping process. The experimental results obtained for our material show that Hf doped ZnO nanostructures could be a promising material in optoelectronic applications such as photovoltaic cell and light emitting diode devices.

**Keywords :** green synthesis, hafnium-doped-zinc oxide, nanostructures, optoelectronic

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