

INVESTIGATION OF PHYSICAL AND ELECTRICAL PROPERTIES OF ZINC OXIDE AND SILVER DOPED ZINC OXIDE NANOPARTICLES

Introduction:

Nanotechnology is expected to have tremendous impact in future with many useful applications across various field. In the development of nanoscience, the emerging new physical and electrical properties plays an important role. Various research field such as physics, chemists, material scientists and engineer's of electrical and mechanical are involved in this research.

Literature review:

Silver doped zinc oxide nanoparticles exhibit enhanced optical absorption, conductivity, antimicrobial activity, thermal stability and modified band gap and making them more effective. In future its plays a important role in investigating toxicity, bio compatibility and exploring new application in energy, environment and medicine.

Research Design and methods:

1. To synthesize Ag-ZnO nanoparticles by following methods:

- a) Co-precipitation
- b) Hydrothermal synthesis
- c) Sol-gel method

2. Dope ZnO with varying concentrations of silver

3. Characterize Ag-ZnO nanoparticles using:

X-ray diffraction (XRD), Transmission electron microscope (TEM), Scanning electron microscopy (SEM), Energy-dispersive spectroscopy (EDS). UV-Vis spectroscopy, Fourier transform infrared spectroscopy (FTIR)

4. To investigate the effect of silver doping on ZnO's structural, optical, electrical, physical and antimicrobial properties.

Implications and contribution:

Silver doped zinc oxide (Ag-ZnO) nanoparticles have various contribution and applications such as:

1. Optoelectronic,
2. Biomedical,
3. Environmental,
4. Economical

5. Cosmetic and Skincare,
6. Textile and coating applications
7. Increased investment in nanotechnology research,
8. Investigating toxicity and biocompatibility
9. Exploring new applications,
10. Increased demand for Ag-ZnO-based products,
11. Job creation and economic growth,
12. Potential reduction in healthcare costs,
13. Increased investment in nanotechnology research.

References:

1.R.Sudhaperiathai,A.amutha,T.Mohanapriya,S.Rufinevangalin-March April 2023.

2.(Rajesh et al., 2018; Wang et al., 2019; Li et al., 2020; Kumar et al., 2020; Saha et al., 2019; Raghupathy et al., 2019)