Chapter-1 Introduction

Chapter-2 Synthesis of ZnS:М\textsuperscript{n+} nanoparticles using 2-Mercaptoethanol as template, their characterization and applications.

2A. ZnS:Ni\textsuperscript{2+} nanoparticles [37-66]

- Introduction
- Synthesis
- Result discussion
  - X-ray diffraction (XRD)
  - Energy Dispersive X-ray analyses (EDX)
  - Dynamic light scattering (DLS)
  - Inductive coupled plasma atomic emission spectroscopy (ICP-AES)
  - Fourier Transform Infrared Spectroscopy (FT-IR)
  - Transmission Electron Microscopy (TEM)
  - Scanning Electron Microscopy (SEM)
  - Optical Studies and surface charge stabilization
- Thermal Study
- Magnetic study
- Conclusion
- References

2B. ZnS:Fe nanoparticles [67-106]

- Introduction
- Synthesis
- Result discussion
  - X-ray Powder diffraction (XRD)
  - Energy Dispersive X-ray analyses (EDX)
  - Fourier Transform Infrared Spectroscopy (FT-IR)
  - Brunauer-Emmett-Teller (BET) specific surface area (SBET)
Transmission Electron Microscopy (TEM)  
Optical properties  
Mössbauer spectroscopy  
Magnetic properties  
Cyclic voltammetry (CV)  
Mott-Schottky (MS) and electrochemical impedance spectral (EIS) study

- Conclusion  
- References

Chapter-3 Synthesis of ZnS and ZnO nanoparticles using Tartaric acid as template, their characterization and applications.

3.A ZnO/Tartaric acid nanoparticles [107-125]

- Introduction  
- Synthesis  
- Result discussion  
  X-ray diffraction (XRD)  
  Energy Dispersive X-ray (EDX)  
  Morphology analysis  
  Dynamic light scattering (DLS) and zeta potential  
  Fourier Transform Infrared Spectroscopy (FT-IR)  
  Optical study  
  Electrical Study  
  Brunauer-Emmett-Teller (BET) specific surface area (SBET)

- Conclusion  
- References

3.B ZnS/Tartaric acid nanoparticles [126-136]

- Introduction  
- Synthesis  
- Result discussion
X-ray diffraction (XRD)
Energy Dispersive X-ray (EDX)
Transmission Electron Microscopy (TEM)
Optical study
Fourier Transform Infrared Spectroscopy (FT-IR)

• Conclusion
• References

Chapter-4 Synthesis of ZnS and ZnO nanoparticles using surfactants as template, their characterization and applications.

4.1 ZnS/SDS nanoparticles [137-150]

• Introduction
• Synthesis
• Result discussion
  X-ray Diffraction (XRD)
  Transmission Electron Microscopy (TEM)
  Dynamic light scattering (DLS) analysis and zeta potential
  Optical study
  Fourier Transform Infrared Spectroscopy (FT-IR)
• Conclusion
• References

4.2 ZnS/AOT nanoparticles (o/w microemulsion) [151-164]

• Introduction
• Synthesis
• Result discussion
  X-ray Powder diffraction (XRD)
  Transmission Electron Microscopy (TEM)
  Optical study
  Fourier Transform Infrared Spectroscopy (FT-IR)
4.3 ZnS and ZnO nanoparticles using reverse micelle technique. [165-175]

- Introduction
- Synthesis
- Result discussion
  - Transmission Electron Microscopy (TEM)
  - Dynamic light scattering (DLS)
  - Optical study
  - Fourier Transform Infrared Spectroscopy (FT-IR)
- Conclusion
- References

Chapter 5. Synthesis of ZnO nanoparticles using Polymer (PEG) [176-190]

- Introduction
- Synthesis
- Result discussion
  - X-Ray Diffraction (XRD)
  - Energy Dispersive X-ray (EDX)
  - Transmission Electron Microscopy (TEM)
  - Dynamic light scattering (DLS)
  - Optical properties
  - Fourier Transform Infrared Spectroscopy (FT-IR)
  - Vibrating Sample Magnetometer measurements (VSM)
- Conclusion
- References

Conclusion [191]