



Synthesis and Characterization of PVA/PEO/ In_2S_3 Polymer Nanocomposite Films and Study of their Optical, Electrical and Thermal Properties

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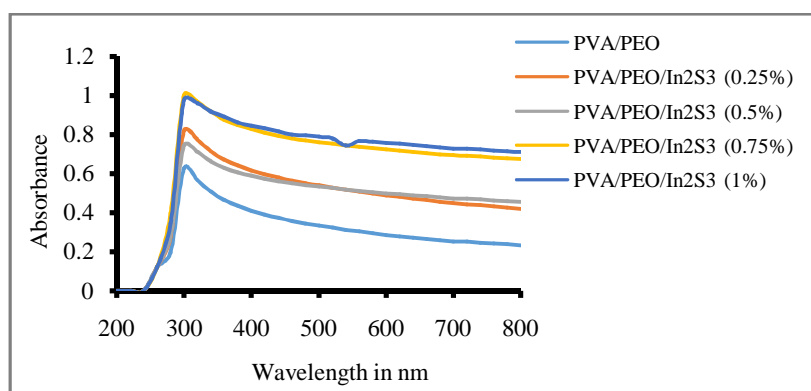
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ABSTRACT

In this study, polymer nanocomposite films consisting of poly vinyl alcohol (PVA) and poly ethylene oxide (PEO) blend matrix dispersed with nanosize particles of Indium sulphide (In_2S_3) have been prepared by well known solution casting method. The structural, optical and thermal studies were performed using X-ray diffraction (XRD), Fourier transform infrared (FT-IR), Ultra violet- visible spectra (UV-Vis), Scanning electron microscope (SEM) and Thermogravimetric analysis (TGA). The structural properties of polymer nanocomposite films characterized by XRD measurements confirm the semi-crystalline structures of these materials. The IR absorption spectra indicate that the PVA/PEO undoped blend and doped with In_2S_3 are immiscible. The XRD and DSC showed that the incorporation of nano In_2S_3 into the polymeric system causes decrease in the crystallinity of samples. The thermal stability and mechanical strength of the blended samples increased with increase in In_2S_3 when compared to pure PVA/PEO blend films. The SEM analysis indicate that the change of the surface morphology of PVA/PEO/ In_2S_3 nanoparticle system as phase segregation.

Graphical Abstract



UV-Visible spectra of PVA/PEO/ In_2S_3 polymer nanocomposite films.

Keywords: Polyvinyl alcohol, polyethylene oxide, In_2S_3 , PVA/PEO/ In_2S_3 films.