

Synthesis and characterization of WO₃ for solar cell application

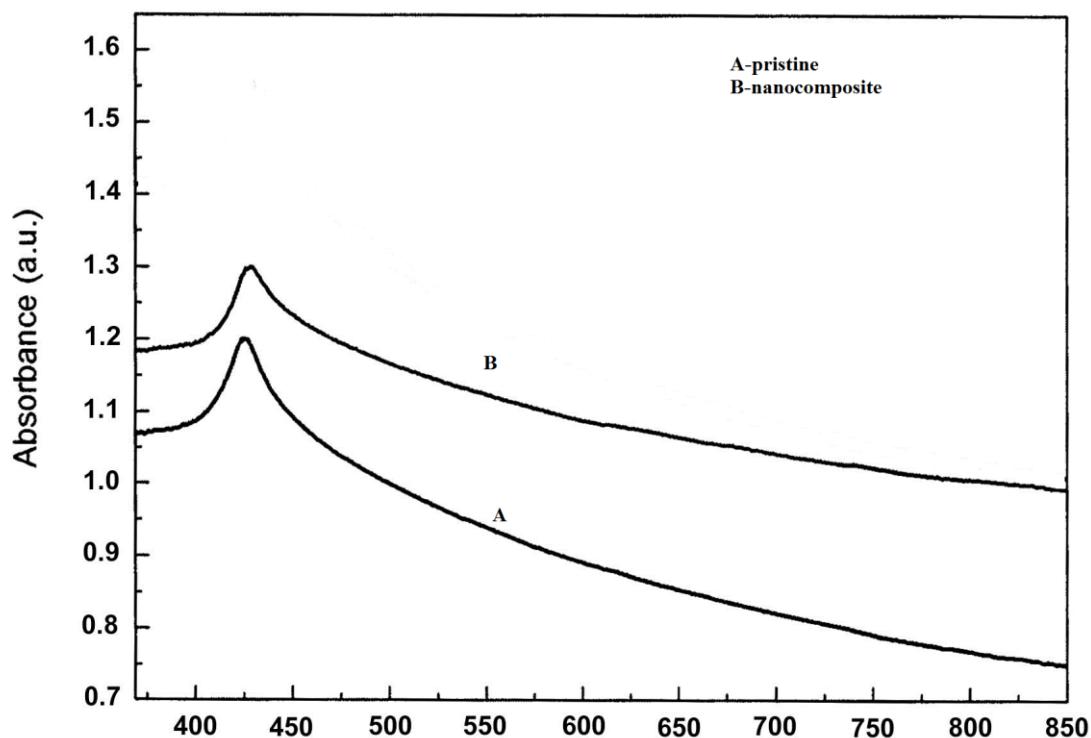
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Abstract

The present study reports a convenient ion irradiated template method for the synthesis of WO₃ nanowire arrays. The structural, morphological and optical properties of the nanowires hetero-junctions are studied using absorption and transmittance spectra . The results indicate that WO₃ nanowires having mean diameter 10 nm which are uniform. Earlier many experimental as well as theoretical studies are discussed for application semiconductor nanocopposite for solar cells. To the best of our knowledge no efforts has been made to synthesize WO₃ semiconductor in-line with work reported earlier. The optical band gap energy of WO₃ sample was found to be 2.6 eV. The dispersion in this value may originate in quantum confinement inside the nano crystalline material. The particle size is further confirmed by XRD while surface morphology is determined by SEM. The photovoltaic performances of the resulting WO₃ nanowire arrays have also been accessed using electrochemical analyser. The power efficiency of this solar cell is found to be 7.59% [1-9].

Keywords: Nanowire arrays, quantum confinement, absorbance, transmittance, cyclic voltagrams and nuclear magnetic resonance.



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