

Investigating effective parameters on the growth and optical properties of MnS nanoparticles

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Abstract

In this research, hydrothermal-microwave process was used for synthesis of manganese sulfide (MnS) nanoparticles (NPs). The effects of growth parameters such as concentration, solution type, and power were investigated. After synthesis, different thermo-radiations of microwave were applied and optical properties were studied. Different characterization methods for study of NPs properties such as X-ray diffraction (XRD), transmission and scanning electron microscopy (TEM and SEM), energy dispersive X-ray, and UV-Visible spectroscopy were used. XRD patterns and EDX spectra represent formation of polycrystalline MnS phase and the existence of desired elements, respectively. Electron microscopy images showed the composition of NPs in the form of adherent spherical particles. With increasing synthesis temperature, optical energy band gap increased and relative absorbance intensity decreased.

Keywords: Hydrothermal-microwave, MnS nanoparticles, Optical properties

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