

عنوان مقاله:

The Effect of Tin Concentration on Microstructural, Optical and Electrical Properties of ITO Nanoparticles Synthesized Using Green Method

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خلاصه مقاله:

Indium tin oxide (ITO) nanoparticles were synthesized by green combustion method using indium (In) and tin (Sn) as precursors, and Carica papaya seed extract as novel fuel. This paper highlights effect of tin concentration (5%, 10% and 50%) on microstructural, optical and electrical properties of ITO nanoparticles (NPs). The indium nitrate and tin nitrate solution along with the fuel were heated at 600 °C for 1 h in muffle furnace and obtained powder was calcinated at 650 °C for 3 h to produce ITO NPs. The above properties were investigated using XRD, FTIR, UV-Vis spectroscopy, SEM, TEM and computer controlled impedance analyser. The XRD, SEM and TEM investigations reveals the synthesized NPs were spherical in shape with an increase in average grain size (17.66 to 35 nm) as Sn concentration increases. FTIR investigations confirms the In-O bonding. The optical properties results revealed that the ITO NPs band gap decreased from 3.21 to 2.98 eV with increase in Sn concentration. The ac conductivity of ITO NPs was found to increase with increase in Sn concentration. These synthesised ITO NPs showed the excellent properties for .emerging sensor and optical device application

کلمات کلیدی:

Indium Tin Oxide, Green synthesis, Crystallite size, Band gap, Grain Boundary, AC conductivity

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