

Hydrothermal Growth of Undoped and Zn-Doped SnO Nanocrystals: A Frequency Dependence of AC Conductivity and Dielectric Response Studies

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The aim of this work is to investigate the dielectric properties of undoped and Zn-doped Tin monoxide (SnO) nanocrystals synthesized by the hydrothermal technique. The prepared nanocrystals were made as pellet and characterized by using the LCR meter at various temperatures range from 313 to 373 K for undoped samples and at room temperature for Zn-doped samples in the frequency ranging from 50 Hz to 20 KHz and 50 Hz to 1 MHz respectively. The increase in measurement temperatures of undoped samples reveals the increase in dielectric constant in accordance with the frequency. The activation energy of 0.58 meV has calculated using the Arrhenius plot of DC conductivity at various temperatures. The dielectric loss and dielectric constant values were decreased with the increasing Zn doping concentration but the ac electrical conductivity increases as a function of frequency and also decreases with respect to dopant concentration.

Keywords: SnO, nanomaterials, powder technology, Hydrothermal synthesis, dielectric properties.

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