

IMPACT OF CU ON AUXILIARY, OPTICAL AND ELECTRICAL CHARACTERISTICS OF SnO_2 NANOPARTICLES

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ABSTRACT

Unadulterated and Cu doped SnO_2 nanopowders have been blended by concoction precipitation technique utilizing $\text{SnCl}_4 \cdot 5\text{H}_2\text{O}$, $\text{NH}_3 \cdot \text{H}_2\text{O}$ and $\text{CuSO}_4 \cdot 5\text{H}_2\text{O}$ as crude materials. The items have been tempered at 600°C for 5 hours under encompassing condition so as to enhance the crystallinity. Powder XRD results demonstrate that the specimens solidify in tetragonal rutile sort SnO_2 stage. The normal crystalline size of unadulterated SnO_2 is observed to associate with 10 nm. The precious stone structure of the SnO_2 does not change with the presentation of Cu, but rather the crystalline size declines to 8 nm and 6.5 nm for Cu doping of 10 and 20 wt. % individually. These outcomes have been affirmed by the transmission electron microscopy (TEM) thinks about. UV-VIS dissemination reflectance spectroscopy (DRS) uncovered the band hole energies to be 3.56, 3.31, 3.28 eV for immaculate and Cu (10 and 20 wt. %) doped SnO_2 separately. Temperature subordinate resistivity estimation demonstrated that both the immaculate and Cu doped specimens are appropriate for gas detecting applications. The electrochemical way of the examples has been concentrated on utilizing cyclic voltammetric strategy.

KEYWORDS: SnO_2 , Copper Doping, UV-VIS DRS, TEM, Cyclic Voltammetry