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# Synthesis and characterization of nanosized zinc stannate for thermal application

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Nano sized bimetallic oxide materials have been extensively studied worldwide because of their unique properties and applications. One of the methods studied is the facial approach to preparing well dispersed nanocrystals of zinc stanate ($ZnSnO_3$) using Zn and Sn oxalate as precursors. Self-propagating high temperature synthesis method has been adopted using polymer fuel. Combustion processed $ZnSnO_3$ nanomaterials have been confirmed by various characterization tools. X-ray diffraction (XRD) tool is used to study the structure of the prepared bimetallic oxide nanomaterials sample. Morphological study of prepared sample is carried out by scanning electron microscope (SEM) analysis. Bonding nature of the sample has been studied by Fourier transform infrared (FT-IR) tool and presence of the Zn and Sn in the prepared sample has been identified by EDX analysis respectively. Absorption study of the prepared sample has been characterized by UV-Vis spectroscopy. Thermal behaviour of the bimetallic oxide sample has been analyzed by thermo gravimetric analysis (TGA), Raman spectroscopic (RS) study has been undertaken to view its structural organization. Dynamic light scattering (DLS) study has been implemented to know the size of the sample. Cyclic voltammetry (CV) study has also been used to know the electrolytic behaviour of the zinc stannate sample.

**Keywords**: Bimet¯allic oxide, $ZnSnO_3$ XRD, SEM, FT-IR, UV-Vis, DLS, RS, TGA