

**EFFECT OF SILICA DOPED ZINC OXIDE BASED VARISTOR ON
STRUCTURAL AND ELECTRICAL PROPERTIES**

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ABSTRACT

EFFECT OF SILICA DOPED ZINC OXIDE BASED VARISTOR ON MICROSTRUCTURAL AND ELECTRICAL PROPERTIES

Zinc Oxide (ZnO) based varistor are widely used as circuit protective devices by literally absorbs the dangerous surge and spikes or grounding this unwanted magnitude. In this research, the effect of silica (SiO_2) doping on the microstructure and electrical properties of ZnO base varistor has been investigated. The sample undoped ZnO and 1 wt.%, 3 wt.%, 5 wt.% and 7 wt.% SiO_2 doped ZnO were prepared by using solid state method. The sample have been characterized via X-Ray Diffraction (XRD), Scanning Electron Microscopy (SEM), densification and electrical measurement. All the XRD diffraction peak was shows the presence of dominant ZnO phase with hexagonal wurtzite structure. The SEM results show that the average grain size of undoped ZnO was low compared to SiO_2 doped ZnO. The average grain size increased with the increases of SiO_2 dopant and the structural of 5 wt.% of SiO_2 was more homogeneous and uniformly distributed. The value of nonlinear coefficient (α) was obtained from the analysis of I-V curve. The α value of undoped ZnO sample is low compared to SiO_2 doped ZnO. The α value is increased as the content of SiO_2 increases. The maximum value of α is at 5 wt.% of SiO_2 doped ZnO which is 2.040 and might be enhanced the performance of varistor.

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