EFFECT OF BISMUTH OXIDE ON ZINC OXIDE PROPERTIES FOR VARISTOR APPLICATIONS

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ABSTRACT

EFFECT OF BISMUTH OXIDE ON ZINC OXIDE PROPERTIES FOR VARISTOR APPLICATIONS

The effect of bismuth oxide properties for varistor applications have been investigated. The Bi_2O_3 doped ZnO with composition [(100-X)%ZnO)+(X%Bi_2O_3)]mol% have been prepared using solid state method. The structural and morphological properties of synthesized Bi_2O_3-doped ZnO structures have examined. Four different composition of Bi_2O_3 and ZnO have been applied to the samples. All the samples were characterized using Scanning Electron Microscope (SEM), X-ray Diffraction (XRD), Fourier Transform Infrared (FTIR) and UV-visible spectroscopy. The increasing of Bi_2O_3 concentration has led to decrease in the average grain size and crystallite size. Therefore, by varying the concentration of the dopant will influence the structural and morphological properties of Bi_2O_3 doped ZnO varistor and will increase the performance of varistor application. The Bi_2O_3 doped ZnO based varistor that have been sintered at 1050°C with 1.0mol% of Bi_2O_3 has obtained the smallest grain size and exhibited the most excellent varistor characteristics.