

INVESTIGATIONS ON STRUCTURAL AND ELECTRICAL PROPERTIES OF SOL-GEL GROWN NANOCOMPOSITES

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ABSTRACT

In the present communication, structural and electrical properties of sol-gel grown ZnO:LaMnO₃ nanocomposites have been studied. To understand the structural properties and modifications due to addition of LaMnO₃ (0, 5, 10 and 15 wt%) within ZnO, θ -2 θ X-ray diffraction (XRD) measurement was carried out for all samples at room temperature. Frequency-dependent dielectric constant (ϵ'), loss tangent ($\tan \delta$), real and imaginary part of electric modulus (M' and M'') and A.C. conductivity have been carried out for all the samples using Agilent E4980A precision LCR meter in the range of 10 kHz to 2 MHz frequency at room temperature. Dielectric behavior has been understood in the context of relaxation formula and universal dielectric relaxation (UDR) model fits very well throughout the frequency range studied. A.C. conductivity has been understood on the basis of Jonscher's universal power law. Power law fits suggest that charge conduction is possible in the through correlated barrier hopping (CBH) mechanism.

