

Hybrid nanofillers loaded epoxy resin; Synthesis, characterizations and dielectric spectroscopy

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present work outlines, synthesis; structural and dielectric characterization of nano fillers doped epoxy composites. Bisphenol A-(epichlorhydrin): epoxy and hardener N(3-dimethylaminopropyl)-1,3-propylenediamine were used to prepare epoxy composite and nano epoxy composite. $\text{CoFe}_2\text{O}_4 + \text{Fe}_3\text{O}_4$, and $\text{NiFe}_2\text{O}_4 + \text{CoFe}_2\text{O}_4$ hybrid nano fillers were used as a nano filler. The structural information of neat epoxy and nano-epoxy composites was obtained by XRD. In order to understand the actual chemical changes, the nature of bonding and interaction mechanism between the nano-particle and the neat epoxy; the structural chemistry and surface functionality of nano- epoxy composites were examined through Fourier transform infrared Spectroscopy. Moreover, VSM measurement were done in order to gain additive information about the magnetic properties of nanoparticle loaded epoxy composites. Dielectric spectroscopy measurement of nano epoxy composite was carried out using precision LCR meter in the frequency range of 1 kHz to 2 MHz Influence of nano-fillers on the dielectric properties of neat epoxy composite is discussed thoroughly.