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Dielectric properties of bi-based superconductors nanoparticles filled natural rubber/low density polyethelene nanocomposites

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Abstract

A new nano conducting polymer composite containing natural rubber (NR) filled with Bi-based superconductor (BSCCO) nanoparticles was successfully fabricated using a traditional milling rubber technique. The scanning and transmission electron microscopic (SEM, TEM) studies provide information on quality of these samples and the uniform distribution of BSCCO particles within NR matrix. The electric conductivity and dielectric measurements have been carried out in the frequency range of 50 Hz-1 MHz and temperature range of 298-428 K. The measured impedance data were analysed on complex plane and the dc (bulk) as well as ac conductivity were obtained. Studies of dielectric constant as a function of frequency at different temperatures revealed that the compounds do not have any dielectric anomaly in the studied frequency and temperature range. The enhancement of the dielectric properties of nanocomposites makes it feasible as co-fired dielectric component devices. Copyright © 2009 Inderscience Enterprises Ltd.

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