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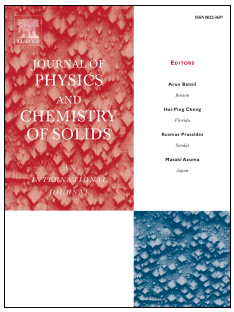

Electrical conductivity behavior of Gum Arabic biopolymer-Fe_3O_4 nanocomposites

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Electrical conductivity behavior of Gum Arabic biopolymer-Fe_3O_4 nanocomposites

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ABSTRACT

Present work reports a study on the electrical conduction properties of some composites of Gum Arabic biopolymer and magnetite nanoparticles as host and guest, respectively, synthesized in different weight percentages. The nanocomposites are found to be non-extrinsic type of semiconductors with guest content dependent trap distribution of charge carriers. Conductivity of these materials increases with increasing guest content along with a concomitant decrease in the activation energy. Percolation theory has been employed for the analysis of the electrical conductivity results to explore the effect of the guest on the electrical conductivity of the host.

Keywords: Biopolymer; Magnetite; Nanocomposites; Electrical conduction; Percolation