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## Comparison of the Dielectric Thermal Properties and Dynamic Mechanical Thermal Properties of Natural Rubber-Based Composites Comprising Multiwall Carbon Nanotubes and Graphene Nanoplatelets

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### FULLERENES NANOTUBES AND CARBON NANOSTRUCTURES

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### Abstract

The aim of the present study is to obtain natural rubber-based composites with optimal conductivity at a lowest possible filler amount. For this reason, two different conductive nanoparticles-multiwall carbon nanotubes and graphene-have been used at different amounts. The dynamic and dielectric properties of the rubber composites have been investigated and compared. The results reveal improvement in the dielectric permittivity of the composites with the increasing amount of MWCNTs. The percolation threshold is reached and surpassed when MWCNTs concentration is over 6 phr. The dielectric permittivity of the composites comprising GNP does not change considerably as dependent on the filler amount. At the concentrations chosen those samples are considered to be dielectrics. The data from the mechanical thermal analysis show that polymer-filler interaction in the composites comprising MWCNTs is stronger than that in composites filled with GNP. That fact is an evidence of the better reinforcing effect produced by MWCNTs.

### Keywords

**Author Keywords:** Natural rubber; Multiwall carbon nanotubes; Graphene; Dielectric properties; Dynamic properties

**KeyWords Plus:** ATOMIC-FORCE MICROSCOPY; PROBE TIPS; REINFORCEMENT; SILICA; POLY(DIMETHYLSILOXANE); CONDUCTIVITY; FABRICATION; ELASTOMERS; NETWORKS; FILLER

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