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**Stability of new electrostatic discharge protection and electromagnetic wave shielding effectiveness from poly(vinyl chloride)/graphite/nickel nanoconducting composites**

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**Abstract**

Poly(vinyl Chloride)/graphite nanosheet/nickel (PVC/GN) nanocomposites are new alternative candidates for electrostatic charge dissipation and electromagnetic interference shielding applications due to their lightweight, ease processing and tunable conductivities. The structures of the nanocomposites were examined by means of scanning electron microscopy (SEM) and X-ray analysis. The mechanical properties such as hardness, modulus of elasticity and elongation at break as a function of GN content were examined. The applicability of the nanocomposites as electrostatic charge dissipation was tested in terms of displaying the variation of decay voltage with time. In addition, the dielectric properties such as real and imaginary permittivity of composites as functions of frequency were investigated. Finally, the electromagnetic properties were measured in the frequency range from 1 to 12 GHz and compared with theoretical modeling. The highest shielding effectiveness at microwave frequency of these nanocomposites was 47 dB which is realistic for defense applications like radar evasion. © 2009 Elsevier Ltd. All rights reserved.

**Author Keywords**

Conducting graphite - nickel nanocomposites; Dielectric properties; Electromagnetic shielding; Electrostatic discharge protection; Microstructure

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