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Abstract

The modern advances in portable and flexible electronic devices require integration of flexibility into future electromagnetic interference shielding nanocomposites. Light weight and flexible acrylonitrile butadiene rubber/graphene nanosheets (NBR/GN) nanocomposites were fabricated using conventional rubber - roll milling technique. The surface morphology of as prepared GN and NBR/GN nanocomposites were examined by scanning and high resolution electron microscopy. The incorporation of GN nanosheets into NBR matrix has significantly enhanced the mechanical properties and electrical conductivity of nanocomposites. The dielectric properties of (NBR/GN) in the frequency range from 1 GHz to 12 GHz were studied. The electromagnetic interference shielding effectiveness (SE) of conducting NBR/GN nanocomposites was studied as a function of GN content, frequency and thickness of absorber and their interrelation was explored. We found an excellent agreement among theoretically predicted shielding effectiveness and the experimental data. The obtained results revealed that NBR/GN nanocomposites can be used as very effective, lightweight microwave shielding materials for spacecraft, aircraft, microelectronic and structural applications.

Keywords: A. Polymer-matrix composites (PMCs), B. Electrical properties
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