Magnetic Thermoplastic Natural Rubber Nanocompositematerials: Preparations and Applications

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Abstract

Magnetic polymer nanocomposites belong to an emerging class of nanocomposites materials that is attracting an increase attention among scientists, engineers and researchers. This is due to its intriguing properties that serve in a wide range of applications including electromagnetic wave absorption and electromagnetic interference (EMI) shielding. This paper will discuss the preparation and potential application of magnetic thermoplastic natural rubber nanocomposite filled with ferrite nanoparticles and carbon nanotube using melt blending method. The effect of different compositions of nanoparticles on morphology, tensile, dynamic mechanical and magnetic properties of the nanocomposites will be highlighted .The paper will also provides a review for fundamentals of the magnetic polymer nanocomposites including; basic concepts, common terms and important mechanisms related to microwave engineering. The processing methods and approaches utilized in the preparation of the magnetic polymer nanocomposite materials will be discussed in details. The absorption of the microwave energy at different frequency bands and EMI shielding application are also addressed.

Keywords: Thermoplastic natural rubber, magnetic polymer nanocomposites, microwave absorbing materials, magnetic nanoparticles, nanocomposite preparation, electromagnetic wave absorption, electromagnetic interference, shielding effectiveness.