

Analysis of the shielding effectiveness in the X - Band frequency of polymer composite based on graphite in flakes

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Radiation absorbent materials of the microwave frequency range have attracted great attention in the military and civil applications. Due to the increasing of electromagnetic interference, that causes serious problems such as malfunction of electronic devices and detrimental effects on human bodies exposed to this radiation [1]. In order to contribute to the development of the technology of radiation absorbent materials in the aeronautical and aerospace environment, this work has synthesized a polymer composite of silicone rubber and natural graphite in flakes. Where the silicone rubber acts as the dielectric material with the ability to absorb an electromagnetic field while dissipating minimal energy in the form of heat, and the graphite as the conductor [2]. The morphological and structural characterization of the graphite are given by the techniques of X-ray Diffraction, Raman Spectroscopy and Field Emission Gun, and the electromagnetic characterization of the composite is given by the technique of Vector Network Analyzer with the frequency range of the X-Band (8.2 - 12.4 GHz). Results show that the imaginary permittivity of the composite, points to the absorption bands that are analyzed in function of the physical concepts of the relaxation time, that basically it is the time it takes a charge placed in the interior of a material to drop to percent of its initial value, where it is short for good conductors and long for good dielectrics [3].

Reference:

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