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PROCESSING OF RADAR ABSORBING STRUCTURE BASED ON POLYANILINE-CARBON NANOTUBE IMPREGNATED IN TEXTILE MATERIAL

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Nanomaterials have attracted more and more attention because of their particular properties that have allowed new applications in different areas. This potencial of application increases when the nanostructures are combined with other materials and the resulted material improves its performance. In this context, it can be cited the adequate combination of conducting polymers, for example the polyaniline, with carbon nanotubes. Conducting polymers have shown desirable properties, such as thermal and chemical stability, and adjustable conductivity for using in the microwave frequencies. Carbon nanotube represents the form of carbon having a high degree of constitutional organization and high respect ratio. This both characterisitics are responsible for unique electric, magnetic and mechanical properties of these nanostructures. The combination of polyaniline with carbon nanotubes may create a new functional material which enhances the final electromagnetic properties of the material. These tailored materials combine the desired properties of the two components, i.e. the electrical conductivity of polyaniline with the physical and mechanical properties of the nanotubes. In this context, the objective of this work is to show a study involving the processing of radar absorbing structures (RAS) based on composite of fiberglass fabric and epoxy/fiberglass prepreg impregnated with different formulations of polyaniline and carbon nanotubes. Multilayers RAS are obtained by the impregnation of woven fiberglass layers with different formulations of polyaniline/carbon nanotubes (multilayer structure composite). The processed RAS were characterized by scanning electron microscopy and reflectivity measurements with the NRL arch technique (frequency of 8 to 12 GHz). The morphological analyses show that the processed materials present a homogeneous impregnation and the reflectivity results, around 80%, indicate that the material presents a good performance as microwave absorber.