RADAR ABSORPTION MATERIAL BY POROUS CARBON PARTICULATE IN POLYMERIC MATRIX

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1. Introduction

Radar absorption materials are very common on aerospace industry because they are responsible to protect internal components on the satellites from external interferences. There are many studies that use carbon materials in polymeric matrix to additive electromagnetic properties for electromagnetic shielding application [1]. The aim of this work is an electromagnetic characterization, by waveguide method, of a porous carbon particulate (PCP) synthesized by chemical polymerization of crude black liquor in alkaline medium [2].

2. Experimental

The materials will be prepared via chemical synthesis by modifying the methodology described in the literature [2] aiming at the integral use of the pulp and paper industry waste with a "polymerized resin". The acrylic polymer PMMA will be used in the medium in different granulometries for the development of porosity. The materials produced will be crushed and the electric characterize will be performed through the network vector analysis combined with a waveguide in the microwaves range.

3. Results and Discussions

Through reflectivity measurement it was possible to observe that the granulometry of the samples not influence in attenuation of the incident wave, but smaller porosities show a inconsiderable improvement.. According to the Figures 1 and 2, with the increase of the PCP concentration it was possible to observe that there was an increase in the attenuation. Similarly for all granulometry and porosity, the attenuations for samples with 1% PCP were attenuated by approximately 10.4% over the whole frequency range, whereas the samples with 5% and 10% showed a non-linear behavior. The sample with 5% PCP presented a minimum attenuation of 9.7% in 8.2GHz and a maximum of 24.2% in 11.38GHz, while the 10% PCP showed a maximum attenuation of 30.1% in 8.2GHz and a minimum attenuation of 18.2% in 11.85 GHz.

Fig. 1. *Reflectivity of the samples of 1%, 5% and 10% PCP with Granulometry less than 250 µm and pore less than 420µm*

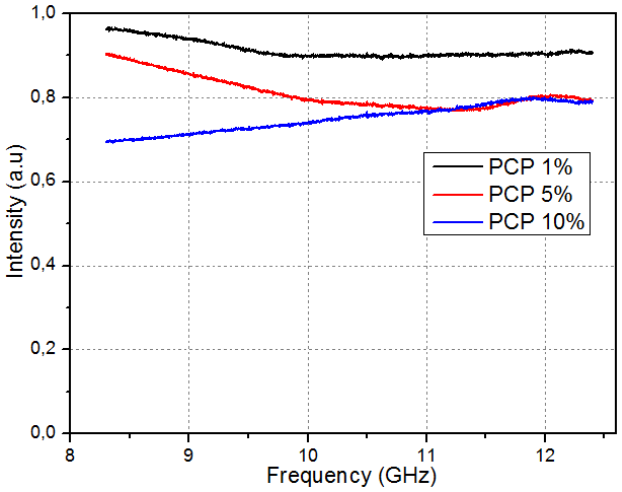
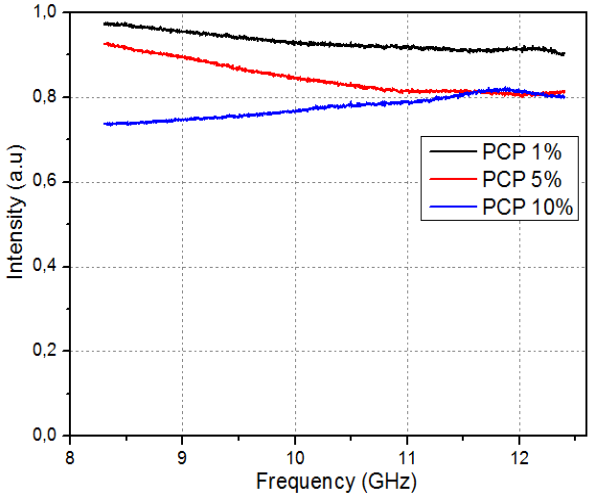


Fig. 2. *Reflectivity of the samples of 1%, 5% and 10% PCP with Granulometry less than 250 µm and pore greater than 420 µm*



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4. References

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