Polyaniline electrossynthesis on composite surface carbon fiber-epoxy Aeronautic application

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This work aims to obtain polyaniline (PAni) by electro synthesis, as thin layers on carbon fiber/epoxy composite surface, to attenuate microwave amplitude and so decrease radar cross section (RCS) on drone surfaces. In order to it, two procedures were used to obtain polyaniline on surface from aniline 0,5 mol L^{-1} and H_2SO_4 1,0 mol L^{-1}, using cyclic voltammetry, from -0,50 up to 1,05 V x Ag/AgCl, using auxiliary electrode of Pt, by potentiostat-galvanostat Autolab PGSTAT 302. The first used 26 cycles to a sample and 53 cycles to another sample, at 25mVs^{-1}. The second differs to the first in to use 3 beginning cycles at 5mVs^{-1} and remaining cycles at 100 mVs^{-1}, obtaining two samples, similar to first treatment, with 26 and 53 cycles, at end. Processes temperature was 0°C. These procedures resulted in two different materials of PAni, evaluated in function of scanning velocity and variation on cycle numbers used. Resulting new composites were characterized scanning electronic microscopy (SEM), X-ray diffraction (XRD), electrochemical impedance spectroscopy (EIS), electromagnetic measures in waveguide of intrinsic properties, scattering parameters and reflectivity on frequency range from 8,0 up to 12,0 GHz To verify applicability on aeronautics electromagnetic shields, computing sources were used, through numeric simulations to determine RCS of objects, overlapping concepts of geometric interactions with material properties applied on their surfaces, added with interception of microwaves emitted by hypothetic radars. To this end, software Computer Simulation Technology-(CST) was used, through which efficacy of composite PAni@carbon fiber@epoxy was indicated to aeronautic application in Stealth technology.