

عنوان مقاله:

Investigation on magnetic and microwave behavior of magnetite nanoparticles coated carbon fibers composite

محل انتشار:

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خلاصه مقاله:

Radar absorbing materials, i.e. magnetite (Fe_3O_4) coated carbon fibers (MCCFs) were fabricated by electro-deposition (ED) technique. Single spinel phase Fe_3O_4 nanoparticles were easily synthesized by hydrothermal method through the reduction of Fe (III) - Triethanolamine complex in an aqueous alkaline solution at 60-80°C. Uniform and compact Fe_3O_4 films were fabricated on nitric acid treated carbon fibers. A correlation between the magnetic and absorption properties of the specimens was made. It was found that the deposition time, and the sequences of the coating process have a significant effect on the reflection loss characteristics of the MCCFs. On the other hand, the temperature of the coating process strongly affected the composition of the thin film. MCCFs prepared at 80°C possesses a much higher loss factor than the one prepared at 60°C. The morphology, phases in the coating layer, magnetic properties and absorption behaviors of the MCCFs were examined using FE-SEM, XRD and permagraph, vector network analyzer (VNA), respectively. The highest reflection loss (-10 dB at 12.27 GHz) was observed for the sample deposited for four minutes. It was also found that a uniform deposition layer can be observed, when the sample deposited in three steps in which each step takes four minutes

کلمات کلیدی:

Fe₃O₄ nanoparticles, coated carbon fiber, Electro-deposition, Radar absorbing materials

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