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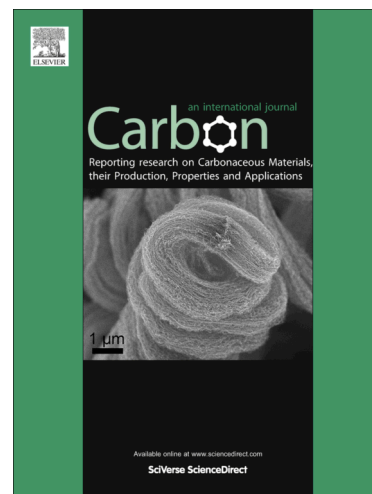
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**Fabrication and microwave absorption properties of magnetite nanoparticle-carbon  
nanotube-hollow carbon fiber composites**

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**ABSTRACT**

Absorbents with “tree-like” structures, which were composed of hollow porous carbon fibers (HPCFs) acting as “trunk” structures, carbon nanotubes (CNTs) as “branch” structures and magnetite ( $\text{Fe}_3\text{O}_4$ ) nanoparticles playing the role of “fruit” structures were prepared by chemical vapor deposition technique and chemical reaction. Microwave reflection loss, permittivity and permeability of  $\text{Fe}_3\text{O}_4$ -CNTs-HPCFs composites were investigated in the frequency range of 2-18 GHz. It was proven that prepared absorbents possessed the excellent electromagnetic wave absorbing performances. The bandwidth with a reflection loss less than -15 dB covers a wide frequency range from 10.2 to 18 GHz with the thickness of 1.5-3.0mm, and the minimum reflection loss is -50.9 dB at 14.03 GHz with a 2.5 mm thick sample layer. Microwave absorbing mechanism of the  $\text{Fe}_3\text{O}_4$ -CNTs-HPCFs composites is concluded as dielectric polarization and the synergetic interactions exist between  $\text{Fe}_3\text{O}_4$  and CNTs-HPCFs.

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