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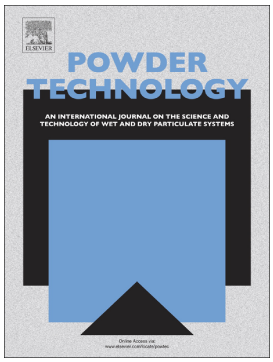

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Enhanced low-frequency microwave absorbing property of SCFs@TiO_2 composite

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Abstract It has been rarely reported that the microwave absorption materials can exhibit excellent low-frequency EM wave absorbing properties. In this paper, we synthesized steady short carbon fibers (SCFs)@TiO_2 composites by using simple one-pot hydrothermal process. The conductive short carbon fibers could be separated by TiO_2 nanoparticles from each other and reduced the conductivity of composite materials as a whole, meeting the requirements of impedance matching. With the introduction of SCFs content, SCFs@TiO_2 composites showed improved tanδ_E values at low frequencies, implying the enhanced microwave attenuation ability at low and medium frequency. We unexpectedly found that the SCFs@TiO_2 composites exhibited very strong absorbing peaks (*i.e.*, -46.3 dB) at low frequencies with relatively thin matching thickness. Interestingly, when the thickness of the SCFs@TiO_2 composite was only 1.0 mm, the absorbing bandwidth with a RL value less than -10 dB was over 14.3-16.7 GHz (*i.e.*, absorbing frequency bandwidth is 2.4 GHz).