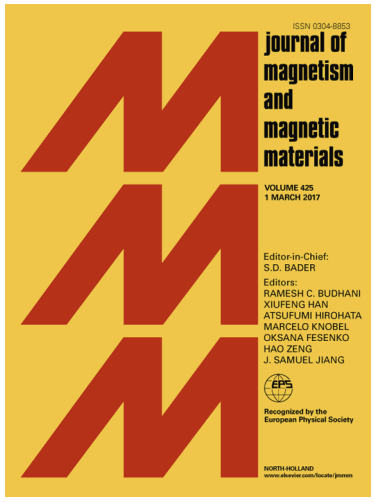

Enhanced impedance matching and microwave absorption properties of the MAMs by using ball-milled flaky carbonyl iron-$BaFe_{12}O_{19}$ as compound absorbent

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Enhanced impedance matching and microwave absorption properties of the MAMs by using ball-milled flaky carbonyl iron-$BaFe_{12}O_{19}$ as compound absorbent

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ABSTRACT

The electromagnetic (EM) and microwave absorption properties of microwave absorbing materials (MAMs) with ball-milled flaky carbonyl iron-$BaFe_{12}O_{19}$ (FCI-$BaFe_{12}O_{19}$) as compound absorbents and silicon resin as matrix were investigated in the frequency range of 2.6-18.0GHz. Results indicate that efficiently enhanced impedance matching and microwave absorption of the FCI-$BaFe_{12}O_{19}$/silicon resin composites were obtained due to the microstructure and synergism of FCI-$BaFe_{12}O_{19}$ particles as well as the inherent electromagnetic properties. And the values and frequency dependencies of EM and microwave absorption properties of the MAMs can be simply adjusted by filling FCI-$BaFe_{12}O_{19}$ absorbents with different mass ratios. When the mass ratio was 6:1, the reflective loss (RL) values below -5dB were obtained in the frequency range of 5.4-18GHz, 4.9-18GHz and 4.5-18GHz with the thicknesses of 1.0mm, 1.1mm and 1.2mm, respectively. Moreover, RL values are all below -8dB in military X band, meaning that 85% EM wave can be absorbed. The advantages demonstrate that this FCI-$BaFe_{12}O_{19}$ compound absorbent can be acted as