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Fe₃O₄@SiO₂ nanoparticles wrapped with polypyrrole (PPy) aerogel: a highly performance material as excellent electromagnetic absorber

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ABSTRACT

Massive efforts have been focused on effective electromagnetic absorbing materials, which have promising applications in suppressing or eliminating the electromagnetic radiation. In this study, Fe₃O₄@SiO₂@PPy composites were prepared *via* a facile one-pot polyreaction. The results demonstrate that the composites loaded with 30 wt% possess an excellent electromagnetic absorbing property. Specifically, the minimum reflection loss value is -56.90 dB at 10.41 GHz at an absorber thickness of 3.7 mm. The broadest effective frequency bandwidth (reflection loss less than -10 dB) is 6.38 GHz at an absorber thickness of 3 mm. The outstanding performance implies that the Fe₃O₄@SiO₂@PPy composites have a huge potential for application as advanced electromagnetic absorber with the advantages of strong absorption, wide bandwidth

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