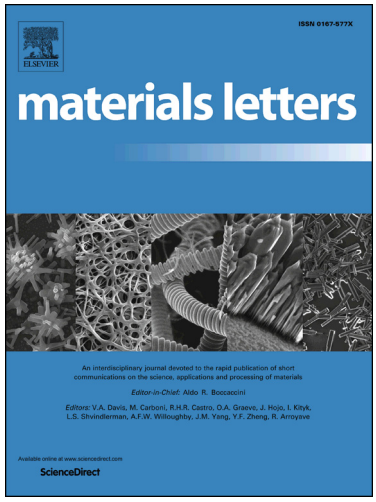

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Preparation of flower-like $CoFe_2O_4$@graphene composites and their microwave absorbing properties

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ABSTRACT: Novel flower-like $CoFe_2O_4$@graphene composites were prepared using a spray drying technique in combination with a solvothermal method, followed by calcination. Hundreds of uniform $CoFe_2O_4$ microspheres are encapsulated with gauzy graphene to form large flower-like composites. This unique structure effectively reduces agglomeration of graphene and enhances microwave absorption performances. The minimum reflection loss of as-obtained flower-like $CoFe_2O_4$@graphene composites reaches -42 dB at 12.9 GHz with a thickness of 2 mm, and the effective absorption frequency (RL < -10 dB) is 4.59 GHz from 11.2 to 15.79 GHz. Flower-like $CoFe_2O_4$@graphene composites show better microwave absorbing performance than pure $CoFe_2O_4$ microspheres. These $CoFe_2O_4$@graphene composites are promising as light weight, broad frequency bandwidth and strong absorption microwave absorbers.

Keywords: Composite materials, Structural, Graphene, Cobalt ferrite, Spray drying, Absorbing performance

1. Introduction

With the rapid development of electronic technology, more attention has been paid to microwave absorbing materials for preventing the electromagnetic radiation pollution. It is urgently necessary to develop microwave absorbing materials with powerful absorption, thin thickness, low density and wide frequency bandwidth due to the increasing demands of information safety and human health [1].