

Accepted Manuscript

Nanofibrous membrane constructed magnetic materials for high-efficiency electromagnetic wave absorption

Ibrahim Abdalla, Jianyong Yu, Zhaoling Li, Bin Ding



PII: S1359-8368(18)31986-3

DOI: [10.1016/j.compositesb.2018.09.026](https://doi.org/10.1016/j.compositesb.2018.09.026)

Reference: JCOMB 5996

To appear in: *Composites Part B*

Received Date: 21 June 2018

Revised Date: 27 July 2018

Accepted Date: 11 September 2018

Please cite this article as: Abdalla I, Yu J, Li Z, Ding B, Nanofibrous membrane constructed magnetic materials for high-efficiency electromagnetic wave absorption, *Composites Part B* (2018), doi: <https://doi.org/10.1016/j.compositesb.2018.09.026>.

This is a PDF file of an unedited manuscript that has been accepted for publication. As a service to our customers we are providing this early version of the manuscript. The manuscript will undergo copyediting, typesetting, and review of the resulting proof before it is published in its final form. Please note that during the production process errors may be discovered which could affect the content, and all legal disclaimers that apply to the journal pertain.

DOI: 10.1002/((please add manuscript number))

Article type: Full length article

Nanofibrous Membrane Constructed Magnetic Materials for High-efficiency Electromagnetic Wave Absorption

Ibrahim Abdalla ^a, Jianyong Yu ^c, Zhaoling Li ^{b,c,*}, Bin Ding ^{a,b,c,*}

^a State Key Laboratory for Modification of Chemical Fibers and Polymer Materials, College of Materials Science and Engineering, Donghua University, Shanghai 201620, China

^b Key Laboratory of Textile Science and Technology, Ministry of Education, College of Textiles, Donghua University, Shanghai 201620, China

^c Innovation Center for Textile Science and Technology, Donghua University, Shanghai 200051, China

*Correspondence to: zli@dhu.edu.cn (Prof. Z. Li), binding@dhu.edu.cn (Prof. B. Ding)

ABSTRACT

With the rapid advancement of modern technology, electromagnetic (EM) wave absorption materials become more and more indispensable to daily life and even national strategic areas. However, how to fabricate such materials in a manner of high-efficiency and broad frequency range remains a challenge and highly desired. Here, we proposed a new route to produce high performance EM wave membranes by combined techniques of electrospinning, stabilization and carbonization processes. NiFe₂O₄ nanoparticles and multiwall carbon nanotubes (MWCNTs) were respectively selected as the effective magnetic material and dielectric material to construct the highly flexible NiFe₂O₄/MWCNTs doped carbon nanofibers (CNFs). The fabricated composite membrane exhibits superior EM wave absorption behavior in a wide frequency range. For the EM wave absorption performance in C-band (4-8 GHz), X-band (8-12 GHz) and Ku-band (12-18 GHz), the reflection loss (R_L) exceeding -20 dB are obtained in the frequency range of 5.36-18 GHz at a sample thickness of 2-5 mm. Similarly, the R_L value of 45.60 dB can be realized for NiFe₂O₄/MWCNTs CNFs with a bandwidth of 12.96 GHz at a thickness of 2.5 mm. The as-synthesized NiFe₂O₄/MWCNTs CNFs nanofibrous membrane can be a promising

Download English Version:

<https://daneshyari.com/en/article/11004188>

Download Persian Version:

<https://daneshyari.com/article/11004188>

[Daneshyari.com](https://daneshyari.com)