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Short communication

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Lin Liu, Na He, Tong Wu, Panbing Hu, Guoxiu Tong

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Co/C/Fe/C Hierarchical Flowers with Strawberry-like Surface as Surface Plasmon for Enhanced Permittivity, Permeability, and Microwave Absorption Properties

Lin Liu, Na He, Tong Wu, Panbing Hu, Guoxiu Tong*

College of Chemistry and Life Sciences, Zhejiang Key Laboratory for Reactive Chemistry on Solid Surface, Zhejiang Normal University, Jinhua 321004, China.

ABSTRACT: Co/C/Fe/C core–shell hierarchical flowers (CSHFs) with various compositions and surface morphologies were fabricated by hydrothermal–chemical vapor decomposition. Surface-dependent electromagnetic properties were investigated at 2–18 GHz. Due to the localized surface plasmon resonance and coupling, Co/C/Fe/C CSHFs with strawberry-like surface exhibit significantly enhanced permittivity, permeability, exchange resonances, and attenuation compared with Co HFs and Co/C/Fe/C CSHFs with compact particle film. Such performances enable Co/C/Fe/C CSHFs to become excellent absorbers with strong absorption, broad bandwidth, and light weight. This finding demonstrates that the surface and interface designs of plasmonic heterostructures are critical to improve microwave absorption properties for future application.

Keywords: Co/C/Fe/C core–shell hierarchical flowers; electromagnetic characteristics; the localized surface plasmon resonance; microwave absorption

Serious electromagnetic (EM) interference problems originating from the rapid development of EM wave technology have been given priority in research on highly effective microwave absorption materials (MAMs)[1–4]. Magnetic metal powders (i.e., Fe, Co, Ni, and alloys) are

*Corresponding author. E-mail: tonggx@zjnu.cn

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