

Accepted Manuscript

Title: Novel Ferroferric oxide/Polystyrene/ Silver Core-Shell Magnetic Nanocomposite Microspheres as Regenerable Substrates for Surface-Enhanced Raman Scattering

Author: Bo Liu Chong Bai Dan Zhao Wei-Liang Liu
Man-Man Ren Qin-Ze Liu Zhi-Zhou Yang Xin-Qiang Wang
Xiu-Lan Duan



PII: S0169-4332(15)03191-8
DOI: <http://dx.doi.org/doi:10.1016/j.apsusc.2015.12.186>
Reference: APSUSC 32169

To appear in: *APSUSC*

Received date: 26-10-2015
Revised date: 21-12-2015
Accepted date: 22-12-2015

Please cite this article as: B. Liu, C. Bai, D. Zhao, W.-L. Liu, M.-M. Ren, Q.-Z. Liu, Z.-Z. Yang, X.-Q. Wang, X.-L. Duan, Novel Ferroferric oxide/Polystyrene/ Silver Core-Shell Magnetic Nanocomposite Microspheres as Regenerable Substrates for Surface-Enhanced Raman Scattering, *Applied Surface Science* (2015), <http://dx.doi.org/10.1016/j.apsusc.2015.12.186>

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.

Highlights:

1. The ferroferric oxide/polystyrene/ silver particles with a well-defined core-shell structure have been synthesized.
2. The composite particles provide excellent SERS performance and have a detecting limit of 10^{-10} M R6G.
3. The composite particles show superior stability and reproducibility for SERS application.

Abstract

A novel Ag-coated Fe_3O_4 @Polystyrene core-shell microsphere has been designed *via* fabrication of Fe_3O_4 @Polystyrene core-shell magnetic microsphere through a seed emulsion polymerization, followed by deposition of Ag nanoparticles using in-situ reduction method. Such magnetic microspheres can be utilized as sensitive surface-enhanced Raman scattering (SERS) substrates, using Rhodamine 6G (R6G) as a probe molecule, with both stable and reproducible performances. The SERS detection limit of R6G decreased to 1×10^{-10} M and the enhancement factor of this substrate on the order of 10^6 was obtained. In addition, owing to possessing excellent magnetic properties, the resultant microspheres could be separated rapidly by an external magnetic field and utilized

Download English Version:

<https://daneshyari.com/en/article/5348205>

Download Persian Version:

<https://daneshyari.com/article/5348205>

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