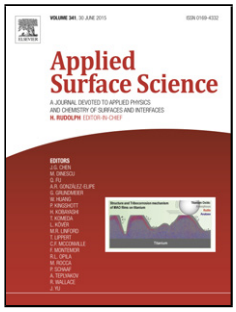
# Accepted Manuscript




Title: Facile synthesis of silver nanoparticles/carbon dots for a charge transfer study and peroxidase-like catalytic monitoring by surface-enhanced Raman scattering

Authors: Hongyue Zhao, Yue Guo, Shoujun Zhu, Yubin Song, Jing Jin, Wei Ji, Wei Song, Bing Zhao, Bai Yang, Yukihiro Ozaki

PII: S0169-4332(17)30700-6
DOI: http://dx.doi.org/doi:10.1016/j.apsusc.2017.03.049
Reference: APSUSC 35425

To appear in: *APSUSC*

Received date: 5-12-2016
Revised date: 20-2-2017
Accepted date: 6-3-2017

Please cite this article as: Hongyue Zhao, Yue Guo, Shoujun Zhu, Yubin Song, Jing Jin, Wei Ji, Wei Song, Bing Zhao, Bai Yang, Yukihiro Ozaki, Facile synthesis of silver nanoparticles/carbon dots for a charge transfer study and peroxidase-like catalytic monitoring by surface-enhanced Raman scattering, Applied Surface Science http://dx.doi.org/10.1016/j.apsusc.2017.03.049

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.

ACCEPTED MANUSCRIPT

<AT>Facile synthesis of silver nanoparticles/carbon dots for a charge transfer study and peroxidase-like catalytic monitoring by surface-enhanced Raman scattering

<AU>Hongyue Zhao[a], Yue Guo[a], Shoujun Zhu[a], Yubin Song[a], Jing Jin[a], Wei Ji[c], Wei Song[a*] ##Email##weisong@jlu.edu.cn##/Email##, Bing Zhao[a], Bai Yang[a], Yukihiro Ozaki[b]
<AU>
<AFF>[a]State Key Laboratory of Supramolecular Structure and Materials, Jilin University, Changchun 130012, PR China
<AFF>[b]School of Science and Technology, Kwansei Gakuin University, 2-1 Gakuen, Sanda, Hyogo 669-1337, Japan
<AFF>[c]School of Chemistry, Dalian University of Technology, Dalian 116023, PR China

<PA>* Corresponding author: Tel.: +86-431-85168473.

<ABS-Head><ABS-HEAD>Graphical abstract
<ABS-P>► Silver nanoparticles/carbon dots have been fabricated via a chemical reaction strategy and used as an efficient SERS substrate for a charge transfer study and peroxidase-like catalysis monitoring.
<ABS-HEAD>Highlights► Silver nanoparticles/carbon dots (Ag NPs/CDs) have been fabricated via a simple chemical reaction strategy. ► Ag NPs/CDs SERS substrate can sensitively detect PATP down to $10^{-9}$ M. ► A charge transfer (CT) effect of PATP molecules on Ag NPs/CDs substrate has been observed. ► Ag NPs/CDs can be used as SERS substrate for peroxidase-like catalysis monitoring.

**<ABS-HEAD>Abstract**

<ABS-P>In this work, carbon dots (CDs) were combined with Ag nanoparticles (NPs) by a chemical reaction to form Ag NPs/CDs hybrid, which was then used as a novel surface-enhanced Raman scattering (SERS) substrate. During the synthetic process, carboxyl groups on the surface of Ag NPs were reacted with amino groups of CDs in an amidation reaction. The D and G bands of CDs in the Ag NPs/CDs hybrid could be easily detected by SERS. By employing *p*-aminothiophenol (PATP) molecules as SERS probes, the Ag NPs/CDs hybrid substrate could detect PATP in diluted solutions of concentration as low as $10^{-9}$ M. The charge transfer (CT) effect on SERS spectra with different excitation wavelengths in the prepared Ag NPs/CDs hybrid and PATP system was also investigated. It was found that addition of CDs changes the degree of CT between Ag NPs and PATP molecules. Since the prepared Ag NPs/CDs hybrid also showed a peroxidase-like activity toward the oxidation of 3,3',5,5'-tetramethylbenzidine using $H_2O_2$, which can provide the sensitive detection of $H_2O_2$ by SERS technique.
<KWD>Keywords: carbon dots; Ag nanoparticles; Surface enhanced Raman scattering; Charge transfer effect

<H1>1. Introduction
Carbon dots (CDs) are novel, environment-friendly carbon materials, that have become a hot topic in research since their discovery in 2004 due to their unique

Download English Version:

https://daneshyari.com/en/article/5347959

Download Persian Version:

https://daneshyari.com/article/5347959

Daneshyari.com