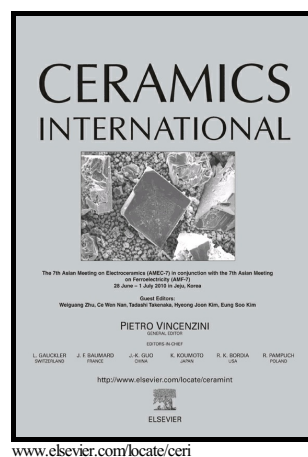


Green facile synthesis of low-toxic superparamagnetic iron oxide nanoparticles (SPIONs) and their cytotoxicity effects toward Neuro2A and HUVEC cell lines

Leila Gholami, Reza Kazemi Oskuee, Mohsen Tafaghodi, Abouzar Ramezani Farkhani, Majid Darroudi



PII: S0272-8842(18)30447-4
DOI: <https://doi.org/10.1016/j.ceramint.2018.02.137>
Reference: CER117539

To appear in: *Ceramics International*

Received date: 31 December 2017
Revised date: 9 February 2018
Accepted date: 15 February 2018

Cite this article as: Leila Gholami, Reza Kazemi Oskuee, Mohsen Tafaghodi, Abouzar Ramezani Farkhani and Majid Darroudi, Green facile synthesis of low-toxic superparamagnetic iron oxide nanoparticles (SPIONs) and their cytotoxicity effects toward Neuro2A and HUVEC cell lines, *Ceramics International*, <https://doi.org/10.1016/j.ceramint.2018.02.137>

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 galley proof before it is published in its final citable 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.

Green facile synthesis of low-toxic superparamagnetic iron oxide nanoparticles (SPIONs) and their cytotoxicity effects toward Neuro2A and HUVEC cell lines

Leila Gholami^a, Reza Kazemi Oskuee^b, Mohsen Tafaghodi^c, Abouzar Ramezani Farkhani^c, Majid Darroudi^{d,e,*}

^aNeurogenic Inflammation Research Center, Mashhad University of Medical Sciences, Mashhad 9177948564, Iran

^bTargeted Drug Delivery Research Center, Mashhad University of Medical Sciences, Mashhad, Iran

^cNanotechnology Research Center, Pharmaceutical Technology Institute, Mashhad University of Medical Sciences, Mashhad, Iran

^dNuclear Medicine Research Center, Mashhad University of Medical Sciences, Mashhad, Iran

^eDepartment of Modern Sciences and Technologies, Mashhad University of Medical Sciences, Mashhad, Iran

Abstract

Superparamagnetic iron oxide (Fe_3O_4) nanoparticles (SPIONs) were synthesized by co-precipitation using polyvinyl alcohol (PVA) as a capping agent under alkaline condition. The produced X-ray diffraction (XRD) pattern evidenced the presence of peaks corresponding to the inverse spinel structure of the prepared SPIONs. Debye-Scherrer and field emission scanning microscopy (FESEM) showed the prepared SPIONs to be well-defined with about < 50 nm size. Likewise, the superparamagnetic properties of the SPIONs measured by Vibrating Sample Magnetometer (VSM) showed high saturation magnetization (~ 65.36 emu/g). The *in vitro* cytotoxicity studies on Neuro2A and HUVEC cells have mentioned low toxic and non-toxic SPIONs, respectively in a range of concentrations (1.17-150 $\mu\text{g/ml}$), thus, we reckon that the synthesized SPIONs will have persistent utilization in different fields of medical applications.

Keywords:

Iron oxide nanoparticles, superparamagnetic, co-precipitation, cytotoxicity, XRD

***Corresponding author:**

M. Darroudi (E-mail: darroudim@mums.ac.ir & Tel.: +98-513-8002286 & Fax: +98-513-8002287)

Download English Version:

<https://daneshyari.com/en/article/7887718>

Download Persian Version:

<https://daneshyari.com/article/7887718>

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