

Accepted Manuscript

Title: The one-step synthesis of polymer-based magnetic $\gamma\text{-Fe}_2\text{O}_3$ /carboxymethyl cellulose nanocomposites

Authors: V.V. Spiridonov, I.G. Panova, L.A. Makarova, M.I. Afanasov, S.B. Zezin, A.V. Sybachin, A.A. Yaroslavov



PII: S0144-8617(17)31010-X
DOI: <http://dx.doi.org/10.1016/j.carbpol.2017.08.126>
Reference: CARP 12733

To appear in:

Received date: 5-6-2017
Revised date: 26-8-2017
Accepted date: 30-8-2017

Please cite this article as: Spiridonov, VV., Panova, IG., Makarova, LA., Afanasov, MI., Zezin, SB., Sybachin, AV., & Yaroslavov, A.A., The one-step synthesis of polymer-based magnetic $\gamma\text{-Fe}_2\text{O}_3$ /carboxymethyl cellulose nanocomposites. *Carbohydrate Polymers* <http://dx.doi.org/10.1016/j.carbpol.2017.08.126>

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.

The one-step synthesis of polymer-based magnetic γ -Fe₂O₃/carboxymethyl cellulose nanocomposites

V.V. Spiridonov*, I.G. Panova, L.A. Makarova, M.I. Afanasov,
S.B. Zezin, A.V. Sybachin, A.A. Yaroslavov

Department of Chemistry, Lomonosov Moscow State University,
Leninskie gory, 1-3, Moscow 119991, Russia

*Corresponding author

E-mail address: vasya_spiridonov@mail.ru (V.V.S.)

Highlights

- Original one-step procedure was designed for preparation of biocompatible composites from γ -Fe₂O₃ maghemite nanoparticles and carboxymethyl cellulose under mild conditions.
- The nanocomposites form stable dispersions when dissolved in water, sensitive to an external magnetic field.
- The biocompatible maghemite-CMC nanocomposites seem to be promising for encapsulation and delivery of biologically active compounds.

ABSTRACT

A novel one-step procedure is described for synthesizing water soluble biocompatible nanocomposites from maghemite nanoparticles and carboxymethyl cellulose (CMC). The procedure allows the magneto-sensitive nanocomposites with a controlled content of the inorganic phase. The maghemite formation has been proved by X-ray diffraction analysis and Mossbauer spectroscopy. An average diameter of the maghemite nanoparticles is equal to 11 nm according to transmission electron microscopy. As shown by FTIR spectroscopy, the nanoparticles bind to the polymer matrix via electrostatic and coordination

Download English Version:

<https://daneshyari.com/en/article/5156504>

Download Persian Version:

<https://daneshyari.com/article/5156504>

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