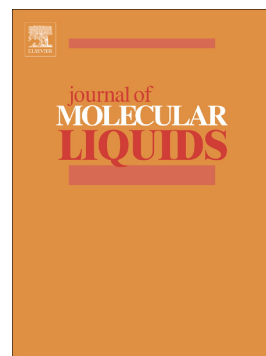


Accepted Manuscript

Synthesis of graphene quantum dots from corn powder and their application in reduce charge recombination and increase free charge carriers

Hakimeh Teymourinia, Masoud Salavati-Niasari, Omid Amiri, Hossein Safardoust-Hojaghan



PII: S0167-7322(17)32695-8
DOI: doi: [10.1016/j.molliq.2017.07.052](https://doi.org/10.1016/j.molliq.2017.07.052)
Reference: MOLLIQ 7630

To appear in: *Journal of Molecular Liquids*

Received date: 19 June 2017

Revised date: 11 July 2017

Accepted date: 14 July 2017

Please cite this article as: Hakimeh Teymourinia, Masoud Salavati-Niasari, Omid Amiri, Hossein Safardoust-Hojaghan, Synthesis of graphene quantum dots from corn powder and their application in reduce charge recombination and increase free charge carriers, *Journal of Molecular Liquids* (2017), doi: [10.1016/j.molliq.2017.07.052](https://doi.org/10.1016/j.molliq.2017.07.052)

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.

Synthesis of graphene quantum dots from corn powder and their application in reduce charge recombination and increase free charge carriers

Hakimeh Teymourinia¹, Masoud Salavati-Niasari^{1,*}, Omid Amiri^{1,2}, Hossein Safardoust-Hojaghan¹

¹*Institute of Nano Science and Nano Technology, University of Kashan, Kashan, P. O. Box. 87317-51167, I. R. Iran.*

²*Department of Electrical Engineering and Computer Science, University of Michigan, Ann Arbor, USA.*

* Corresponding author. Tel.: +98 31 55912383; Fax: +98 31 55913201;

E-mail address: salavati@kashanu.ac.ir (M. Salavati-Niasari)

Abstract

GQDs have been synthesized by using a novel and green precursor (corn powder). Furthermore, GQDs/TiO₂ composite has been prepared by using graphene quantum dots as capping agent. Incorporation of graphene quantum dots in TiO₂ nanoparticles reduce charge recombination, extend the absorption spectrum of TiO₂ to the visible region, and increases the accessible surface area of TiO₂ nanoparticles. Therefore, the significant enhancement of photocatalytic activity for degrading the Rhodamin B has been achieved. Characterization of the samples was carried out by Fourier transformed infrared (FT-IR) spectroscopy, UV-Vis spectroscopy, Field-emission scanning electron microscopy (FE-SEM), X-ray diffraction (XRD), Transmission electron microscopy (TEM), and Photoluminescence (PL).

Keywords: Graphene quantum dots; Charge recombination; Nanocomposite; Photocatalysis; Nanostructures.

Download English Version:

<https://daneshyari.com/en/article/5408443>

Download Persian Version:

<https://daneshyari.com/article/5408443>

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