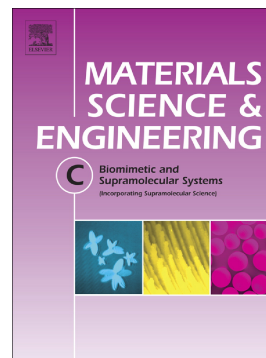


Accepted Manuscript

IRMOF-3: A fluorescent nanoscale metal organic frameworks for selective sensing of glucose and Fe (III) ions without any modification

Amit Kumar, Angshuman Ray Chowdhuri, Archana Kumari, Sumanta Kumar Sahu



PII: S0928-4931(17)33737-2
DOI: doi:[10.1016/j.msec.2018.07.039](https://doi.org/10.1016/j.msec.2018.07.039)
Reference: MSC 8751
To appear in: *Materials Science & Engineering C*
Received date: 16 September 2017
Revised date: 24 May 2018
Accepted date: 16 July 2018

Please cite this article as: Amit Kumar, Angshuman Ray Chowdhuri, Archana Kumari, Sumanta Kumar Sahu , IRMOF-3: A fluorescent nanoscale metal organic frameworks for selective sensing of glucose and Fe (III) ions without any modification. Msc (2018), doi:[10.1016/j.msec.2018.07.039](https://doi.org/10.1016/j.msec.2018.07.039)

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.

IRMOF-3: A fluorescent nanoscale metal organic frameworks for selective sensing of glucose and Fe (III) ions without any modification

Amit Kumar^a, Angshuman Ray Chowdhuri^a, Archana Kumari^b, Sumanta Kumar Sahu^{*a}

a Department of Applied Chemistry, Indian Institute of Technology (ISM) Dhanbad- 826004, Jharkhand, India.

b CSIR-Indian Institute of Petroleum (CSIR-IIP) Dehradun-248005, India.

* Corresponding author. E-mail: sahu.s.ac@ismdhanbad.ac.in, sumantchem@gmail.com; Fax: +91 326-2307772; Tel: +91 326223593

Abstract

The amine functionalized isorecticular metal-organic framework-3 (IRMOF-3) is synthesized by hydrothermal method. Till now, it's widely used in the area of gas separation, adsorption, and catalysis due to large surface area, structural stability, and tunability. Here, we have reported the use of fluorescent nanoscale IRMOF-3 for highly selective detection of glucose as well as Fe³⁺ ions without any modification. This is due to –NH₂ and –COOH groups are present on the surface of IRMOF-3 to bind cis-diols of the glucose molecule via host-guest interaction, and Fe³⁺ ions via ligand to metal charge transfer. The Synthesized IRMOF-3 has average diameter of 160±20 nm and interestingly possess deep blue fluorescent emission spectra at 460 nm with quantum yield 17.3 %. Using fluorometric assay, the limit of detection (LOD) of glucose and Fe³⁺ ions was found to be 0.56 µM and 4.2 nM respectively. More importantly, the synthesized IRMOF-3 is also utilized for detection of glucose and Fe³⁺ ions in bio-environmental samples.

Download English Version:

<https://daneshyari.com/en/article/7866255>

Download Persian Version:

<https://daneshyari.com/article/7866255>

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