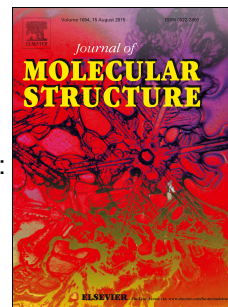


Accepted Manuscript

Structural and luminescent properties of a new 1D Cadmium(II) coordination polymer:
A combined effort with experiment & theory

Abhranil De, Anita Sahu, Suvendu Paul, Mayank Joshi, Angshuman Roy Choudhury,
Bhaskar Biswas



PII: S0022-2860(18)30531-3

DOI: [10.1016/j.molstruc.2018.04.081](https://doi.org/10.1016/j.molstruc.2018.04.081)

Reference: MOLSTR 25154

To appear in: *Journal of Molecular Structure*

Received Date: 10 February 2018

Revised Date: 18 April 2018

Accepted Date: 24 April 2018

Please cite this article as: A. De, A. Sahu, S. Paul, M. Joshi, A.R. Choudhury, B. Biswas, Structural and luminescent properties of a new 1D Cadmium(II) coordination polymer: A combined effort with experiment & theory, *Journal of Molecular Structure* (2018), doi: 10.1016/j.molstruc.2018.04.081.

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.

Structural and Luminescent Properties of a New 1D Cadmium(II) Coordination Polymer: A Combined Effort with Experiment & Theory

Abhranil De,^a Anita Sahu,^a Suvendu Paul,^c Mayank Joshi,^b Angshuman Roy Choudhury,^b Bhaskar Biswas^{a,*†}

^aDepartment of Chemistry, Raghunathpur College, Raghunathpur, Purulia-723133, India

^bDepartment of Chemical Sciences, Indian Institute of Science Education and Research, Mohali, Mohali-140306, India

^cDepartment of Chemistry, University of Kalyani, Kalyani-741235, India

[†]Present address: ^aDepartment of Chemistry, Surendranath College, Kolkata-700009, India

Abstract

In this work, we have developed a new one-dimensional cadmium (II) coordination polymer, $[\text{Cd}(\text{phen})(\text{NO}_3)_2(\text{H}_2\text{O})]_n$ (**1**) (phen = 1,10-phenanthroline) and structurally characterized by different spectroscopic techniques including single crystal X-ray diffraction analysis. Single crystal X-ray structural analysis of **1** indicates that Cd(II) ion in the coordination polymer crystallizes in a monoclinic system with $P2_1$ space group and adopts a distorted pentagonal bipyramidal coordination geometry. This will be the first citation of a 1D Cd(II) polymer till date where nitrate ions exhibit diverse coordination motifs. Solid state emission suggests good luminescence behavior of the polymer. Spectroscopic studies reveal that the polymer is unstable in polar solvents and dominates in monomeric form. Molar conductivity and electrospray ionization mass spectral analysis in methanolic solution confirm the instability of the polymer at room temperature and authenticates the decomposition of the polymer into monomer in solution. In addition, all the structural parameters and spectroscopic behaviors have been well corroborated with the theoretical findings.

Keywords: Cd(II); X-ray structure; 1D coordination polymer; Supramolecular architecture; Spectroscopic study; DFT study

*Corresponding author. Tel.: +91 3251 255235; Fax: +91 3251 255235.

E-mail: mr.bbiswas@rediffmail.com / icbbiswas@gmail.com

Download English Version:

<https://daneshyari.com/en/article/7807072>

Download Persian Version:

<https://daneshyari.com/article/7807072>

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