

Accepted Manuscript

Photophysics of a coumarin based Schiff base in solvents of varying polarities

Saptarshi Ghosh, Nayan Roy, T. Sanjoy Singh, Nitin Chattopadhyay



PII: S1386-1425(17)30563-2
DOI: doi: [10.1016/j.saa.2017.07.006](https://doi.org/10.1016/j.saa.2017.07.006)
Reference: SAA 15293

To appear in: *Spectrochimica Acta Part A: Molecular and Biomolecular Spectroscopy*

Received date: 25 May 2017
Revised date: 5 July 2017
Accepted date: 11 July 2017

Please cite this article as: Saptarshi Ghosh, Nayan Roy, T. Sanjoy Singh, Nitin Chattopadhyay, Photophysics of a coumarin based Schiff base in solvents of varying polarities, *Spectrochimica Acta Part A: Molecular and Biomolecular Spectroscopy* (2017), doi: [10.1016/j.saa.2017.07.006](https://doi.org/10.1016/j.saa.2017.07.006)

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.

Photophysics of a coumarin based Schiff base in solvents of varying polarities

Saptarshi Ghosh¹, Nayan Roy², T. Sanjoy Singh² and Nitin Chattopadhyay^{1,*}

¹Department of Chemistry, Jadavpur University, Jadavpur, Kolkata – 700032, India.

²Department of Chemistry, Assam University, Silchar, Assam – 788011, India.

*Corresponding author: Fax: 91-33-2414-6584

E-mail: nitin.chattopadhyay@yahoo.com

Abstract

The present work reports detailed photophysics of a coumarin based Schiff base, namely, (E)-7-(((8-hydroxyquinolin-2-yl)methylene)amino)-4-methyl-2H-chromen-2-one (HMC) in different solvents of varying polarity exploiting steady state absorption, fluorescence and time resolved fluorescence spectroscopy. The dominant photophysical features of HMC are discussed in terms of emission from an intramolecular charge transfer (ICT) excited state. Molecular orbital (MO) diagrams as obtained from DFT based computational analysis confirms the occurrence of charge transfer from 8'-hydroxy quinoline moiety of the molecule to the coumarin part. The notable difference in the photophysical response of HMC from its analogous coumarin (C480) lies in a lower magnitude of fluorescence quantum yield of the former, particularly in the solvents of low polarity, which is rationalized by considering the higher rate of non-radiative decay of HMC in apolar solvents. Phosphorescence emission as well as phosphorescence lifetime of HMC has also been reported in 77 K frozen matrix.

Keywords: Schiff base, Photophysics, Intramolecular charge transfer, Fluorescence, Molecular orbital.

Download English Version:

<https://daneshyari.com/en/article/5139464>

Download Persian Version:

<https://daneshyari.com/article/5139464>

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