

Accepted Manuscript

Study of chemical physics on energy transfer phenomenon between quantum dots and a designed diporphyrin in solution

Anamika Ray, Ajay Bauri, Sumanta Bhattacharya



PII: S0167-7322(18)31030-4
DOI: [doi:10.1016/j.molliq.2018.04.035](https://doi.org/10.1016/j.molliq.2018.04.035)
Reference: MOLLIQ 8938
To appear in: *Journal of Molecular Liquids*
Received date: 27 February 2018
Revised date: 24 March 2018
Accepted date: 8 April 2018

Please cite this article as: Anamika Ray, Ajay Bauri, Sumanta Bhattacharya , Study of chemical physics on energy transfer phenomenon between quantum dots and a designed diporphyrin in solution. The address for the corresponding author was captured as affiliation for all authors. Please check if appropriate. Molliq(2017), doi:[10.1016/j.molliq.2018.04.035](https://doi.org/10.1016/j.molliq.2018.04.035)

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.

Study of chemical physics on energy transfer phenomenon between quantum dots and a designed diporphyrin in solution

Anamika Ray^(a), Ajay Bauri,^(b) and Sumanta Bhattacharya^{(a)*}

(a) Department of Chemistry, The University of Burdwan, Golapbag, Burdwan – 713 104, India.

(b) Bio-Organic Division, Bhabha Atomic Research Centre, Trombay, Mumbai – 400 085, India.

Abstract

The present paper reports a case study of energy transfer (ET) phenomenon from the excited CdS/ZnS core-shell type quantum dots (QDs) having particle size of ~2 nm to a designed diporphyrin (**1**) molecule in solution. Photoluminescence intensity measurements and lifetime quenching experiments establish the process of Förster resonance energy transfer (FRET) from QDs to **1** in toluene. Magnitude of bimolecular quenching constant of QDs/**1** system ($2.185 \times 10^{13} \text{ sec}^{-1}$) rules out the possibility of diffusion controlled mechanism in present work. It is proposed that QDs/**1** system may be employed as an efficient energy transfer unit for possible application in photosensitization.

Key words: Quantum dots; diporphyrin; FRET; bimolecular quenching constant; charge-separation.

*Author for correspondence; Email: sbhattacharya@chem.buruniv.ac.in

Download English Version:

<https://daneshyari.com/en/article/7842105>

Download Persian Version:

<https://daneshyari.com/article/7842105>

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