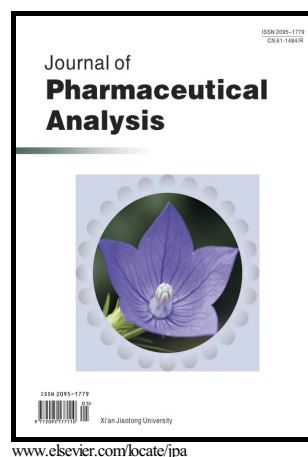


Author's Accepted Manuscript

Bile salt induced solubilization of methylene blue: study on methylene blue fluorescence and molecular mechanics based approach

Susithra Selvam, Ivy Sarkar



PII: S2095-1779(16)30075-2
DOI: <http://dx.doi.org/10.1016/j.jpha.2016.07.006>
Reference: JPHA328

To appear in: *Journal of Pharmaceutical Analysis*

Received date: 6 May 2016
Revised date: 25 June 2016
Accepted date: 20 July 2016

Cite this article as: Susithra Selvam and Ivy Sarkar, Bile salt induced solubilization of methylene blue: study on methylene blue fluorescence and molecular mechanics based approach, *Journal of Pharmaceutical Analysis* <http://dx.doi.org/10.1016/j.jpha.2016.07.006>

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 galley proof before it is published in its final citable 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.

Bile salt induced solubilization of methylene blue: study on methylene blue fluorescence and molecular mechanics based approach

Susithra Selvam^{a*}, Ivy Sarkar^b

^aDepartment of Chemistry, Vel Tech University, Avadi, Chennai 600 062, Tamilnadu, India

^bDepartment of Chemistry, Indian Institute of Technology Madras, Chennai 600 036, Tamilnadu, India

*CORRESPONDING AUTHOR FOOTNOTE: Associate Professor, Department of Chemistry, Vel Tech university, No. 42, Avadi – Vel tech road, Avadi, Chennai - 600 062, Tamilnadu, India, Tel.: +91 44 26841601; fax: +91 44 26840262. E-mail: susithra.selvam@yahoo.com

ABSTRACT

Methylene blue (MB), a hydrophobic drug molecule has versatile importance both as a staining reagent and pharmaceutical agent. The association of MB with organized media such as protein, polymers, surfactants have been studied earlier and mostly by absorption spectroscopy. MB is strongly fluorescent, with an emission peak at 686 nm (λ_{ex} 665 nm). The study on using fluorescence property of MB to probe organized media is attempted here. The possibility of MB as an extrinsic fluorophore to study the micellization behavior of bile salts (BS) is carried out. Since, BSs are well known drug delivery systems, the focus of the study is of pharmaceutical importance, i.e. the solubilization of hydrophobic MB drug molecule by BS is achieved. Hence the aim of the current study is to understand the nature of association of MB with BS media, namely sodium cholate (NaC) and sodium deoxycholate (NaDC). The change in the photophysical properties of MB is monitored and molecular mechanics calculations are carried out to evaluate the MB – BS association. The estimated heat of formation, ΔH_f values, are - 625.19 kcal/mol for MB – NaC and -757.48 kcal/mol for MB – NaDC. The photophysical study also reveals that MB reports the step-wise aggregation pattern of BSs media, as an extrinsic fluorescence probe.

Keywords: Methylene blue; Sodium deoxycholate; Sodium cholate; Absorption; Fluorescence spectroscopy

Download English Version:

<https://daneshyari.com/en/article/8521330>

Download Persian Version:

<https://daneshyari.com/article/8521330>

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