

Accepted Manuscript

Physico-chemical characterization of drug–bio-surfactant micellar system: A road for developing better pharmaceutical formulations

S. Chauhan, Kuldeep Singh, C.N. Sundaresan



PII: S0167-7322(18)31738-0
DOI: doi:[10.1016/j.molliq.2018.07.008](https://doi.org/10.1016/j.molliq.2018.07.008)
Reference: MOLLIQ 9329
To appear in: *Journal of Molecular Liquids*
Received date: 2 April 2018
Revised date: 15 June 2018
Accepted date: 2 July 2018

Please cite this article as: S. Chauhan, Kuldeep Singh, C.N. Sundaresan , Physico-chemical characterization of drug–bio-surfactant micellar system: A road for developing better pharmaceutical formulations. Molliq (2018), doi:[10.1016/j.molliq.2018.07.008](https://doi.org/10.1016/j.molliq.2018.07.008)

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.

Physico-Chemical Characterization of Drug–Bio-surfactant Micellar System: A Road for Developing Better Pharmaceutical Formulations

S. Chauhan^{1*} Kuldeep Singh¹ and C.N. Sundaresan²

¹Department of Chemistry, Himachal Pradesh University, Summer Hill, Shimla–171005

²Department of Chemistry, Sri Sathya Sai Institute of Higher Learning, Brindavan Campus, Bangalore-560067, India

*Corresponding author: E-mail address: scschauhan19@gmail.com (S. Chauhan)

Tel.: +91 177 2830803; fax: +91 177 2830775

Abstract

The knowledge about the characteristics of drug – bio-surfactants systems is crucial in pharmacology which helps to design better pharmaceutical formulations. The descriptions of the modulation in drug (metformin hydrochloride) – bio-surfactants (sodium cholate and sodium deoxycholate) mixture, in solution micellar phase has been accessed by means of critical micelle concentration (*CMC*) determination and thermodynamic approach through conductometric and spectroscopic techniques. The conductivity, κ data have been employed to determine critical micelle concentration, *CMC* i.e. point of aggregation and results have been discussed in terms of hydrophobic and electrostatic interactions present in the system. The obtained *CMC* values reveal the fact that the micellization tendency of studied bio-surfactant increases in the presence of drug. The conductivity study (*CMC* determination) has also been found to corroborate the results obtained from UV-visible (absorption spectra) and fluorescence (emission spectra) studies. Moreover, the temperature dependence of *CMC* values (typical U-shaped profile) has been explained in terms of various interactions present around the hydrophobic part of bile salts. Furthermore, charged pseudo-phase separation model of micellization has also been applied to grasp information on the intermolecular interactions existing in the present ternary system. The work may be considered a step towards making use of bile salts as a promising approach in drug delivery and increasing their bioavailability.

Keywords: Bio-surfactant; Aggregation; critical micelle concentration; micellization; charged pseudo-phase separation model.

Download English Version:

<https://daneshyari.com/en/article/7841948>

Download Persian Version:

<https://daneshyari.com/article/7841948>

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