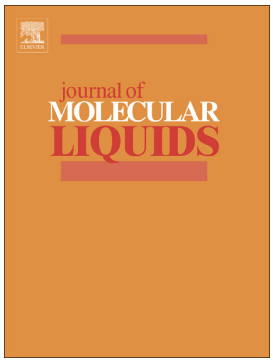

An insight into effect of micelle-forming surfactants on aqueous solubilization and octanol/water partition coefficient of the drugs gemfibrozil and ibuprofen

Morteza Jabbari, Farzaneh Teymoori

PII: S0167-7322(17)36237-2
DOI: doi:10.1016/j.molliq.2018.04.054
Reference: MOLLIQ 8957

To appear in: *Journal of Molecular Liquids*

Received date: 29 December 2017
Revised date: 19 March 2018
Accepted date: 9 April 2018

Please cite this article as: Morteza Jabbari, Farzaneh Teymoori , An insight into effect of micelle-forming surfactants on aqueous solubilization and octanol/water partition coefficient of the drugs gemfibrozil and ibuprofen. The address for the corresponding author was captured as affiliation for all authors. Please check if appropriate. Molliq(2017), doi:10.1016/j.molliq.2018.04.054

An insight into effect of micelle-forming surfactants on aqueous solubilization and octanol/water partition coefficient of the drugs gemfibrozil and ibuprofen

Morteza Jabbari*, Farzaneh Teymoori

School of Chemistry, Damghan University, 36716-41167 Damghan, Iran

ABSTRACT

Aqueous micellar solubilization of ibuprofen and gemfibrozil drugs was investigated at constant temperature (25.0 ± 0.1) ^{o}C and atmospheric pressure using shake-flask and UV-Vis spectrophotometric techniques. The solubility measurement was done in presence of three surfactants possessing different head groups, namely sodium dodecylsulfate (anionic SDS), cethyltrimethylammonium bromide (cationic CTAB) and polyethylene glycol dodecyl ether (non-ionic Brij 35) as well as their binary mixtures. The micellar solubility descriptors of χ (molar solubilization capacity), K (micelle–water partition coefficient), and ΔG_s° (standard free energy of solubilization) were obtained to estimate quantitatively the solubilization efficiency of the surfactant systems. Moreover, the octanol-water partition coefficient of these drugs was also evaluated in the micellar solutions. The results obtained in the aqueous micellar system demonstrate that, irrespective of the surfactant type, the solubility of drugs increases with increasing the concentration of micelles. It was found that the solubility of ibuprofen and gemfibrozil in Brij 35 and CTAB solutions, respectively are higher compared to that in the other surfactants. However, the partition coefficients of these drugs show an inverse trend with solubility data. Finally, the effect of the surfactant type on solubility enhancement of the drugs is explained in terms of possible interactions between the drug and the micelle.

Keywords: Ibuprofen, Gemfibrozil, Aqueous solubility, Partition coefficient, Micelle effect

1. Introduction

* Corresponding author (*E-mail address*: m_jabari@du.ac.ir)