Latin American Journal of Pharmacy
(formerly *Acta Farmacéutica Bonaerense)*
Lat. Am. J. Pharm. **31** (9): 1261-9 (2012)

Regular Article
Received: May 10, 2012
Revised version: October 9, 2012
Accepted: October 11, 2012

Physicochemical Aspects of the Solubilization of Ibuprofen in Biorelevant Media: Modified and Classical FaSSIF Systems

Sandra M. GÓMEZ, Diana M. CRISTANCHO & Fleming MARTÍNEZ*

Grupo de Investigaciones Farmacéutico-Fisicoquímicas, Departamento de Farmacia, Facultad de Ciencias, Universidad Nacional de Colombia, A.A. 14490, Bogotá, D.C., Colombia.

***SUMMARY*. In this work some thermodynamic information related to the transfer of ibuprofen (IBP) between aqueous systems and micellar systems, in some biorelevant media, is reported. For this purpose, the apparent solubility of IBP at different temperatures, in the modified and classical Fasted State Simulated Intestinal Fluid (FaSSIF) biorelevant media, at different concentrations of sodium taurocholate and phosphatidylcholine, was studied. It is observed that temperature and surfactant concentration affected the apparent solubility of this drug in these media. The solubility results were used to determine the micelle partition coefficients ($K_{m/w}$) in both media. For modified FaSSIF, $K_{m/w}$ values varied from 820 at 293.15 to 1471 at 313.15 K, whereas for classical FaSSIF, this property varied from 1147 to 1861, considering the same temperatures. The temperature dependence of solubility and micelle partition coefficient allowed the calculation of the respective thermodynamic quantities of transfer of IBP from the aqueous media to the micellar pseudo-phases. Gibbs energies were negative, but enthalpies and entropies were positive, indicating spontaneous transfer processes in both media, and driven by entropy. The results were interpreted in terms of solute-micellar interactions, especially hydrogen bonding and electrostatics interactions. Also, the critical micelle concentrations (CMC) of surfactants in each medium were determined, obtaining values near to 8.0 and 4.0 mmol/L, for modified and classical FaSSIF, respectively.**

KEY WORDS: Biorelevant media, ibuprofen, phosphatidylcholine, sodium taurocholate, solubilization thermodynamics.

* Author to whom correspondence should be addressed. *E-mail:* fmartinezr@unal.edu.co