Influence of Adjuvances on the Drug Release from Hydrogels

J. OREMUSOVÁ 1, Z. VITKOVÁ 2, P. HERDOVÁ 2

1 Department of Physical Chemistry of Drugs, Faculty of Pharmacy, Commenius University, Bratislava, Slovakia
2 Department of Galenic Pharmacy, Faculty of Pharmacy, Commenius University, Bratislava, Slovakia
E-mail: herdova@fpharm.uniba.sk (P. Herdová)


The drugs in a dosage form is rarely alone. Usually the dosage form is a system of several adjuvances and these more or less influence physico-chemical properties and the drug effect.

From the reason of increasing drug solubility many drugs and adjuvances have amphiphilic structure and are able to create associates. Since the drug is effective exclusively in monomeric form for formulation of a dosage form we need to know concentration at which the associates are created – so called critical micellar concentration (CMC).

The objective of this study is to observe the effect of adjuvances on hydrogel – surfactant 1-ethoxy-N,N,N-trimethyl-1-oxohexadecan-2-aminium bromide (Septonex – concentration 0.01% w/w) and polymer – Chitosan (2.5% w/w) on the release of chlorhexidine – member of group of antisepsics (CHH – 0.01% w/w).

Both substances – the drug and surfactant have amphiphilic structures, thus create micelles. CMC of the both was evaluated from conductivity and spectrophotometric dependences [Septonex at the temperature 25–50 °C, CMC increases non linearly in interval (8.07–9.59) \( \times \) \( 10^{-4} \) mol dm\(^{-3} \) and CHH at 25 °C – CMC = 7.25 \( \times \) \( 10^{-5} \) mol dm\(^{-3} \)].

The partition coefficients in system octanol / water were determined for both substances at the temperature 25 °C. Release profiles were evaluated at the temperature 25 °C. The released amount of drug was determined spectrophotometrically at \( \lambda = 281 \) nm.

The presence the Septonex as an adjuvance in the prepared hydrogel increased the amount of released drug (after 180 minutes 98.79 %) as compared with hydrogel containing polymer and drug only (51.9 %).

Conclusion: Surfactant used in prepared hydrogels positive effected the drug release.

This work was supported by the Grant VEGA No. 1/ 0320/ 08