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Characterization of chitosan/xanthan polyelectrolyte complex carriers: Influence of drug encapsulation procedure on *in vitro* release kinetics

Ana Ćirić, Ljiljana Đekić

Department of Pharmaceutical Technology and Cosmetology, University of Belgrade - Faculty of Pharmacy, Vojvode Stepe 450, 11221 Belgrade, Serbia

Chitosan/xanthan polyelectrolyte complexes (PECs) are considered promising oral drug delivery carriers due to nontoxicity, biodegradability and can be investigated as potential carriers for extended drug release [1,2]. Ibuprofen has short half-life ($t_{1/2}$~2 h) and requires frequent administration of immediate release dosage forms [3]. The aim of this study was to investigate the influence of the ibuprofen encapsulation procedure on its *in vitro* release kinetics. Dried PECs, prepared with chitosan solutions adjusted to pH 4.6 using acetic acid, and ibuprofen dispersed in the xanthan solution before (4.6B) or added after (4.6A) the complexation of polymer aqueous solutions, comprising 100 mg of ibuprofen, were filled into size 0 capsules. *In vitro* release profiles in the paddle apparatus (50 rpm) (Erweka DT70, Germany) were obtained using 900 ml of phosphate buffer pH 7.2 at 37 ± 1 °C. Both samples showed extended ibuprofen release during 12 h. From 4.6B 100% of ibuprofen was released after 12 h. From 4.6A 66.41 ± 2.14% of substance was released after the same time. Ibuprofen release from the samples followed the *Korsmeyer-Peppas* kinetics and the release mechanism was a combination of swelling, erosion and diffusion ($0.5<n<1$). PEC 4.6B showed better control of ibuprofen release and its preparation conditions are considered optimal for controlled extended drug release.

References

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Supervisor(s): Dr. Ljiljana Đekić, Associate Professor