

Abstract

The theoretical part of this work deals with chitosan polymer and its derivatives. A polymer molecule is described in more detail, its solubility and chemical modifications are described separately. In the next part biocompatibility and biodegradability of chitosan are dealt with. Parameters of the electrospinning of chitosan end this chapter.

The experimental part is first dedicated to the determination of aquosity in the samples of 3 different nanofiber membranes and to their gravimetric changes by keeping in the desiccator. The samples of membranes absorb water at the most up to 1,5% (m/m) and there is not a big difference among them.

The second part quantifies changes in the composition of the saturated excipients which were used for the impregnation of the samples of nanomembranes. The highest amount of caffeine was absorbed by the membrane 3, namely in case of both saturating media.

The evaluation of the amount of caffeine which the tested membranes are able to release from their surface in vitro follows. In case of the saturation of membranes by the aqueous solution of caffeine and by the caffeine suspension is the maximum of the subsequent liberation into the acceptor phase reached from the 120th minute. In case of the ethanolic and chloroform saturated solution is the maximal concentration of the released caffeine already reached within 40 minutes.

The evaluation of the releasable amount of caffeine incorporated into the polymer of nanomembranes before the electrospinning processing is the subject of the next chapter. The period necessary for reaching the maximum concentration is 180 minutes, the same for all samples. The amount of the really released caffeine reaches maximally 2,2% of the total amount of the caffeine in membranes.

The last part of the work brings the global view on the release of the impregnated and incorporated caffeine.