9. Abstract

The theoretical part deals, in the introduction, with the questions of the transdermal administration of medicines and also with the current overview of the transdermal preparations registered by the FDA Agency (U.S. Food and Drug Administration). The basic principles of the non-woven fabric production technology focused on the electrospinning method, which is used in the production of nanofiber membranes and evaluated further in the experiment, are described. The next part is dedicated to the characteristics and production of polymers which compose the tested membranes. Some physical tests which were used for the continued characterization of the nanofiber membranes are shown.

The first chapter of the experimental part gives the results of the three physical and technical characteristics of the nanofiber membranes produced by electrospinning, from chitosan, polyamide 6 and polyurethane. A piece of the samples from these polymeric non-woven nanomembranes was radiosterilized. From the tensile strength point of view the nanofiber membrane made of polyurethane fibres was the most stable. The radiation sterilization process caused the lessening of the strength of the nanomembrane made of chitosan, of the other two membranes the sterilization process had no significant influence. The membranes made of polyamide 6 had probably increased strength in the longitudinal direction than in the cross direction, contrary to the other two tested membranes. Hydrous buffer absorption tests at the usual temperature surprisingly showed the inability of all the three membranes to absorb the hydrous phase. Also the random experiment to evaluate the equilibrium dihedral angle on the membranes did not show any markedly different results on the tested samples.

The nanofiber membranes retarded the hydrophilic permeant release from the lipophilic excipient used for the tested membranes impregnation in the permeant test. This tendency is least noticeable by the membrane made of chitosan, most noticeable by the membrane made of polyurethane.