ABSTRACT

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Title of the diploma thesis: Automation of liberation tests for clotrimazole released from differently saturated polymer nanofibers

This diploma thesis deals with the liberation profiles of clotrimazole released from a nanofiber carrier using an automated non-separation flow technique, sequential injection analysis. Polymer nanofibers polydioxanone and polycaprolactone were chosen as membranes. Nanofiber membranes were manufactured by the Technical University of Liberec.

Two nanofiber saturation procedures were successively tested. First, membranes were used which were saturated during production in different ratios of polymer and clotrimazole content. These fiberes were analysed in the laboratory. In the second part, the fiberes without the active substance were tested, it means they originally did not contain clotrimazole. The nanofiber membranes thus prepared were saturated with ethanolic solutions of various concentrations and for a certain period of time in laboratory conditions. These analyses helped to find ideal conditions for nanofiber saturation.

Liberation tests were performed under conditions that simulated the condition of intact healthy human skin. A buffer solution of pH 4.5 and a temperature of 32 ° C was used. Under these conditions, the release of clotrimazole was measured in three Franz cells connected in parallel. A nanofiber carrier with bound clotrimazole was placed in these cells. The measurement was performed for 135 minutes, when the substance was released into the medium. Every 15 minutes, a sample was taken from this medium for sequential injection analysis. A UV-VIS spectrophotometer was used as a detector. The individual liberation profiles were compared. The main parameters monitored were the release profile, release rate and concentration of clotrimazole released in the respective time.