ABSTRACT

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Title of Thesis: Spray drying of chitosan suspension with different

                                      content of active substance

In this work, a spray-dried suspension of chitosan with different content of active substance was evaluated. By spray drying, solid particles were formed from the suspensions of various drug concentration, which were further evaluated to assess their properties. The formed suspensions contained, in addition to chitosan, 20, 30, 40 or 50 mg of meloxicam and sodium lauryl sulphate as surfactant and were subsequently dried at 170 °C, 190 °C or 210 °C.

The prepared particles were evaluated using an optical microscope and a scanning electron microscope (SEM). Furthermore, the rate and amount of released active substance were evaluated by dissolution, and the thermal properties of the particles were evaluated by differential scanning calorimetry (DSC).

According to the results from the optical microscope and SEM, it was shown that the particles of the spray-dried samples formed clusters of individual particles and irregular shapes can be seen in the images. Small particles of meloxicam are visible on the surface of the platelet-shaped chitosan particles. No significant influence of drying temperature or change in concentration on the appearance of the particles was demonstrated. After evaluation of the dissolution profiles, the rate of active substance release increased in the spray-dried samples, compared to meloxicam alone and compared to the physical mixture. Peaks of dehydration, melting point, decomposition and degradation products are recorded on DSC thermograms. The melting point of meloxicam was reduced by almost 65 °C in spray-dried samples compared to the melting point of meloxicam alone. After the second measurement with an interval of

6 months, no changes were recorded on the thermograms and the prepared particles can be considered as stable.