2 ABSTRACT

Charles University, Faculty of Pharmacy in Hradec Králové

Department of: Pharmaceutical Technology

Consultant: PharmDr. Petra Svačinová, Ph.D.

Student: Eva Bartoňová

Title of Thesis: Spray drying of a suspension of the drug in a solution of chitosan

During spray drying a liquid solution, suspension, or emulsion is converted to solid particles by means of a hot drying medium. The set drying parameters can affect the properties of the resulting particles. This work deals with the preparation of particles from a suspension of meloxicam in a solution of chitosan and the influence of the drying parameters and the concentration of this solution on the properties of the particles. The concentration of the solution was 0,5 %, 1 %, 1,5 % and 2 %. The inlet temperature was set at 170, 190 and 210 °C. The 2% sample was not dried due to high viscosity and nozzle clogging.

The particles were evaluated by optical microscopy, scanning electron microscopy (SEM), differential scanning calorimetry (DSC) and a dissolution test was used to evaluate the drug release from the particles. Two measurements were performed by DSC, the first M1 after drying the particles and the second M2 after 6 months.

The resulting particles were spherical and irregular in shape and formed clumps. The particle shape was not affected by the solution concentration or the drying temperature. Peaks of chitosan dehydration (70.5–92.6 °C), melting points of meloxicam (248.6–251.4 °C) and decomposition of meloxicam (250.8–253.8 °C) were visible on DSC thermograms. After the second measurement, temperature changes were observed, especially in the dehydration of chitosan by up to 17.8 °C. The changes in meloxicam samples were minimal, so meloxicam is in a stable form in the particles. After the dissolution test, a higher drug release was found compared to meloxicam and

at 0.5% and 1% concentrations also, compared to the physical mixture. No direct dependence of concentration and inlet temperature on drug release was observed. With increasing amounts of chitosan, the release of the drug from the physical mixture increased.