

## Abstract

Charles University in Prague, Faculty of Pharmacy in Hradci Králové

Department of: Pharmaceutical technology

Consultant: PharmDr. Pavel Ondrejček, Ph.D.

Student: Natálie Havlíková

Title of Thesis: The effect of particle size on lactose compressibility

It is known that the particle size of the compressed material plays an important role in the manufacture of tablets. It affects the properties of intermediate and final products. In this thesis the properties of tablets made of two lactose types, which were used as model fillers, were studied. These were Tablettose<sup>®</sup> 80 and Lactopress<sup>®</sup> Anhydrous. In both lactose types, five sieved size fractions of the particle size ranging from 9 to 346 $\mu$ m and their original unsieved mixture were used. The compaction forces ranging from 2 to 10kN were used for tablet preparation. Magnesium stearate was used for external lubrication.

The evaluation of the prepared tablets was done mainly by using the pharmacopoeial methods. The evaluated parameters were friability, disintegration time and hardness. Furthermore, the elasticity of the tablets and the evaluation using the force-displacement method parameters were assessed. From the results of this work, it is not possible to unambiguously determine the advantage of one particular fraction size in the comparison to the unsieved raw material. The optimal fraction size of the used lactose varied for the individual evaluated parameters and the used compression forces. The particle size was statistically significant e.g. for tablet friability, their hardness, or some energy parameters of force-displacement method. Overall, tablets compressed of Lactopress<sup>®</sup> Anhydrous showed better properties.