ABSTRACT

Charles University, Faculty of Pharmacy in Hradec Králové

Department of:	Department of Pharmaceutical Technology
Consultant:	PharmDr. Petra Svačinová. Ph.D.
Student:	Chrzová Iryna
Title of Thesis:	Evaluation of compressibility of tableting mixtures containing different amount of sodium stearyl fumarate

This thesis deals with the evaluation of the compressibility of tablets with different content of sodium stearyl fumarate (SSF). A mixture of microcrystalline cellulose and lactose in a 1:1 ratio was used as a model substance. The glidant sodium stearyl fumarate was added at concentrations of 0.5%, 1%, 1.5% and 2%. Subsequently, the tablets were pressed at a compression force of 5 kN, 7 kN and 10 kN using force-displacement record. The energy profile of the compression process was recorded, and the ejection force was also evaluated. Then crushing force, disintegration time, friability and true density were measured. The values of tensile strength, porosity, axial and volume relaxation characterizing the properties of prepared tablets were calculated from the obtained results.

During the evaluation of the energy profile, it emerged that E1, E2, E3, Elis and Emax increase with increasing pressing force. The addition of SSF has minimal effect on the energy profile. At a concentration of 0.5% and 1% of SSF, the highest axial relaxation was measured, concentrations of 1.5% and 2% had no effect on the relaxation of the tablets. A decrease in volume relaxation occurred at all compression forces and concentrations of SSF. The most significant decrease was at 0.5% of SSF. As expected, it was confirmed that as the concentration of the lubricant increases, there is a significant decrease in the ejection force. According to the measurements, mixtures with 2% SSF content show the lowest ejection force, while mixtures with 0.5% of this lubricant have the highest ejection force. Tensile strength was not affected at 0.5%, 1%, and 1.5% SSF concentrations, but decreased at 2% SSF concentration. Tablet disintegration time increased with increasing compression force and with increasing SSF concentration. Friability decreased with increasing compression force and increased with increasing SSF concentration. The porosity decreased with increasing compression force and was almost unaffected by the glidant concentration.

Keywords: compression process, microcrystalline cellulose, lactose, sodium stearyl fumarate, energy profile, tablet properties.