ABSTRACT

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Title of Thesis: A comparison of viscoelastic properties of mixtures of lactose and different lubricants using the stress relaxation test

This diploma thesis deals with viscoelastic properties of pharmaceutical excipients and tensile strength of tablets made of these excipients. Theoretical part is dedicated to description of lactose and lubricants, further the tablets compressibility and compression energy profile are described. The end of theoretical part deals with the stress relaxation test, with evaluation methods and the stress relaxation test influence on lactose tablets with different types of lubricants as well.

The experimental part deals with the evaluation of the viscoelastic properties of two types of lactose and their mixtures with different types of lubricants at concentration of 1%. These characteristics were evaluated by stress relaxation test. All tablets were compressed by compression forces of 13 kN and 15 kN with dwell time 180 seconds.

The study was about differences between two types of lactose, effect of lubricants and effect of two different compression forces on parameters of elasticity A_1 –A_3 and plasticity P_1-P_3. Parameter´s values of lactose mixtures were always higher for those compressed by higher compression force. Parameter´s values decreased due to lubricant mixtures in most cases, parameters A_1 and P_1 increased in both lactoses. When comparing both lactoses, the A and P values are similar. The radial strength in both lactoses increased at higher compression force. The strength of tablets decreased by adding lubricants.