

Abstract

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Title of Thesis: The influence of the dwell time on the parameters of the stress relaxation test for microcrystalline cellulose and starch.

This thesis is focused on the viscoelastic properties of pharmaceutical excipients and the tensile strength of tablets. The theoretical part describes used materials. Microcrystalline cellulose and starch were used as fillers and magnesium stearate at concentration of 1% was used as lubricant. The stress relaxation test and its evaluation and utilization not only in pharmacy is described as well as the tensile strength of tablets.

The experimental part deals with the viscoelastic properties of used materials and their mixtures with lubricant. These properties were evaluated using the stress relaxation test. At maximum compression force of 10 kN the length of dwell time was changed (60 s, 120 s, 180 s, 240 s, 300 s, 360 s, 420 s, 480 s, 540 s, 600 s). For derived parameters of elasticity A_{1-3} and plasticity P_{1-3} the dependence on the length of dwell time was evaluated. Parameter A_1 increases with increasing dwell time for all substances. For parameters A_2, A_3 , the dependence on the dwell time is different for individual compounds and mixtures. Parameters of plasticity P increase with increasing dwell time for all used materials. Dependence of the tensile strength on the length of dwell time has similar characteristics to the dependence of the parameters of elasticity A .