

ABSTRACT

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Title of Dissertation: Validation of a new method for the evaluation of stress relaxation of tablets

Keywords: tablets, stress relaxation test, elastic and plastic deformation

The theoretical part of this thesis deals with the elastic relaxation of tablets. It describes various methods used in the evaluation of elastic recovery of tablets. The present work explores the factors affecting the elastic relaxation of tablets.

The experimental part is focused on the stress relaxation test. Until present only one delay was studied. This work studies the stress relaxation after relieving tablet. The parameters A_2 , T_2 and P_2 were reviewed. The relationship between the parameters P_2 and compression force relief were studied. For experiments microcrystalline cellulose Avicel PH 102 (MCC) was used. Tablets were compressed in a device used for testing the strength of the material in pressure and tension T1-FRO 50. For the determination of the stress relaxation test, the tablets were compressed with 180 sec first delay. The second delay was always 60 sec but it was measured from certain decrease of pressure (7 kN, 6 kN, 5 kN, 4 kN, 3 kN, 2 kN, 1 kN and 0.1 kN). To evaluate the stress relaxation test one-parameter equation was used. The following conclusions were made. The loss of elastic energy A_2 increases with the decrease of compression force and the process accelerates and the loss of plasticity increases. Between parameters P_2 and compression force strain linear relationship was found.