

Abstract

This thesis is focused on characterization of a process of compression through finding viscoelastic properties of a pressed material.

The theoretical part describes applied substances, i.e. microcrystalline cellulose and stearic acid. Also elastic recovery measurement methods as well as factors which influence elastic recovery are described.

The aim of the thesis was to determine viscoelastic properties of microcrystalline cellulose and mixture of microcrystalline cellulose and lubricant, stearic acid in diverse concentrations. To learn this, a force-displacement diagram and a calculation of a tablet relaxation was used. A machine T1 – FRO 50 pressed tablets by eleven various pressures within the range from 1,9 to 113,0 MPa. The tablets were composed by a mixture of microcrystalline cellulose and lubricant stearic acid in a diverse concentration of lubricant within the range from 0% to 2,5%. After the tablets had been compressed, their height and their diameter were measured and 24 hours later this process of measurement was repeated. From this measurement we gained viscoelastic parameters E1, E2, E3, Elis, PI and tablet volumes in various time period (from 0 to 24 hours).

In the research we found the influence of a pressed pressure and a concentration of lubricant upon the energy of compression and upon the relaxation of tablets. The parameters E1, E2, E3, Elis increase with a growing pressed pressure. The PI parameter and the tablet relaxation at first increase with a growing pressure, after reaching their maximum they decrease. The E1, E2 and Elis parameters decrease with a growing concentration of a lubricant. On the contrary the E3 parameter increases at the beginning, then it is constant and the PI parameter decreases at first and it is constant afterwards. The tablet relaxation increases with a growing concentration of a lubricant and it is constant only by a higher concentration of a lubricant.