

Název v angličtině: A study of the properties of tablets from the mixture of directly compressible xylitol and microcrystalline cellulose.

Summary:

The thesis deals with the study of properties of tablets from a mixture of directly compressible xylitol, namely Xylitab® 300, and microcrystalline cellulose, namely Microcel® MC-12, in the ratio of 1:1. (This ratio was arrived at after preceding experiments concerning the strength of tablets made only from Xylitab® 300, and from a mixture of Xylitab® 300 and Microcel® MC-12 in the ratio of 3:1. The strength was insufficient in these cases.) The focus of the study was the dependence of the tensile strength and disintegration time of the tablets on the compression force, the addition of lubricants, namely magnesium stearate and sodium stearyl fumarate (Pruv®), with concentrations of 0.5% and 1%, and a 50% addition of model active ingredients, namely acetylsalicylic acid and ascorbic acid. The compression forces used were 10, 12.5, and 15 kN; tablets containing the drugs were only compressed with a force of 15 kN. Tablets with a weight of 0.5 g and a diameter of 13 mm were compressed using material testing machine T1-FRO 50 TH.A1K Zwick/Roell and they were further subjected to a strength test using Schleuniger Tablet Tester 8M and to a disintegration time test using Erweka ZT 301.

The strength of tablets from the mixture of dry binders increased with increasing compression force. The addition of lubricants caused a decrease in the strength. A more significant decrease was caused by magnesium stearate, there being a direct relationship between the decrease and increasing concentration. When Pruv was used, the strength was higher for the 1% concentration. The longest disintegration time was found for the mixture without lubricants, followed by the mixture containing 1% of Pruv®. In these cases, the disintegration time increased with increasing force. When the other mixtures with lubricants were used, the disintegration time of tablets was shorter, there being only a slow increase in the time with increasing compression force, and the values for individual compression forces showed no regular pattern. In the case of mixtures with drugs, the strength of tablets was higher when acetylsalicylic acid was used. Increasing the concentration of lubricants led to a decrease in the strength, the decrease being more significant in the case of magnesium stearate. The disintegration time was longer when acetylsalicylic acid was used. A higher concentration of magnesium stearate led to a longer disintegration time of tablets; when Pruv® was used, the reverse was the case. As far as tablets with ascorbic acid are concerned, the disintegration time was longer when the tablets contained 0.5% concentrations of lubricants and when they contained magnesium stearate.