Abstract

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Title of Thesis	Energy evaluation of compression process of tablets from the new type of silicified microcrystalline cellulose

This thesis studied the energy evaluation of compaction process from co-processed dry binder Prosolv EASYtab and the results were compared with Prosolv SMCC 90 and the physical mixtures of Prosolv SMCC 90 with Explotab (in concentration 1% or 1,5%) and Pruv (in concentration 0,5% or 1%). The mixtures with the active ingredients were evaluated too, specifically with ascorbic acid and acetylsalicylic acid. Tablets were compressed using material tableting machine T1-FRO 50 Th.A1K Zwick/Roell and used compression forces were 3, 3,5 and 4 kN, in the case of mixtures with drugs 4 kN. Computer program testXpert V 9.01 shown and drawn during the compression graphical records of „force-displacement“ and quantified individual types of energy and plasticity.

From comparison of substances results, that Prosolv EASYtab had the lowest total energy of compression (E_{max}) and the plasticity in all compression forces. The values of the total energy of compression were due to the values of energy accumulated by the tablet after the compression (E_2). Energy of friction E_1 was the lowest at Prosolv EASYtab using compression force of 3,5 kN. No signifiant differences were found between the values of energy of decompression (E_3) at studied mixtures. The values of energy rised with the growing compression forces, the values of plasticity decreased. In the case of mixtures with drugs the values of the total energy E_{max} for Prosolv EASYtab were equaled with the values of mixtures for Prosolv SMCC 90 with Explotab and Pruv. In the comparison of drugs higher values of the total energy for acetylsalicylic acid were detected. The values of plasticity were higher for mixtures with ascorbic acid.