2 Abstract

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Title of Thesis:	Fractal aspects of flow and consolidation behaviour of microcrystalline cellulose

The object of this diploma thesis was to study the flow and consolidation characteristics of three types of microcrystalline cellulose. The granulometric characteristics, including the linear fractal dimension, were estimated using the optical microscopy. The bulk and tapped density, the angle of repose and the flow rate through an orifice of the hopper were evaluated. True density of the materials and the porosity of a loose powder bed were determined by helium pyknometry. The changes of density by the gravity consolidation were studied; the relationship of Hausner ratio on the number of taps describes best the differences in the consolidation behaviour of the substances. Modelling the consolidation kinetic by the exponential law allowed to determine the parameter $N_{1/2,}$ which shows the number of taps needed to reach one half of the powder volume reduction. The values of $N_{1/2}$ within a range of 6,9-18 correlated well with the particle size of the used types of microcrystalline cellulose.