Abstract

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Title of Thesis: The evaluation of compressibility of the mixtures pellets and microcrystalline cellulose

This thesis is focused on the evaluation of powdered microcrystalline cellulose, pellets and mixtures thereof. Comprcel 102 was used as powdered microcrystalline cellulose. The used pellets were commercially available pellets Cellets 100 made of microcrystalline cellulose. The flow properties of used materials and their mixtures were evaluated by using the angle of repose, flow through orifice and Hausner ratio methods. Further the compressibility was evaluated using the force-displacement record. For the evaluation of compaction process the three exponential compaction was used. Finally the radial tablet strength and tablet friability was tested.

The results showed, that the flow properties improved with an increasing amount of pellets in mixture. It is due to higher bulk and tapped density and also narrower particle size distribution, smoother surface and the regular shape of used pellets. The parameters of the force-displacement method showed different compressibility of used tabletting mixtures. The evaluation of compaction process of used tabletting mixtures was done using the parameters of the three exponential compaction equation. The found differences are probably caused by different behavior of microcrystalline cellulose and pellets during compaction. Further the influence of tabletting mixture composition on the tablet radial strength and friability was described. With the growing amount of pellets in the mixture the tablet radial strength decreased and conversely the friability increased. Under the used experimental conditions the mixture containing 40 % of microcrystalline cellulose and 60 % of pellets seems to be optimal in terms of flow properties, compressibility, radial strength and friability of tablets.