

Abstract

Charles University, Faculty of Pharmacy in Hradec Králové

Department of: Pharmaceutical technology
Supervisor: doc. PharmDr. Zdeňka Šklubalová, Ph.D.
Consultant: Ing. Hana Hurychová
Student: Eliška Dostálová
Title of Thesis: Study of bulk and consolidation properties
 of size fractions of anhydrous lactose

The bulk and consolidation behaviour of pharmaceutical excipients belong to their important properties. Properties of five size fractions of anhydrous lactose having the particle size in the range of 1–400 µm were studied in this thesis. The measurement was carried out by using static and dynamic pharmacopoeial methods. The bulk density and the tapped density, the angle of repose were evaluated as well as the true density of particles by using the gas pycnometry. The mass flow rate through the orifice of a model conical hopper by the force of gravity was estimated for the individual size fractions. The discharge rate through the orifice having the diameter in a range of 0.6–1.5 cm was modelled with the Beverloo et al and Jones & Pilpel power regression equations; the precision of the flow rate prediction was about 3 %. The best bulk properties were detected for the particle size fraction 246 µm. The results of the evaluation of the consolidation dynamic during the tapping of powder bed permitted the prediction of the angle of internal friction from the porosity factor with the highest value of 45.5° for the particle size fraction 9 µm.