THE MEASUREMENT OF TABLET SURFACE AREA BY PERMEAMETRY

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During compaction of powders the significance of particle fragmentation has been discussed. It seems that the effect of particle properties as well as the effect of additives for the tablet strength could be correlated to the degree of particle fragmentation. Consequently, interest has been directed towards the study of methods estimating the fragmentation propensity of a material (Duberg & Nyström 1982). In this context it could be desirable to measure the tablet surface area, e.g. by using a gas adsorption method. However, some drawbacks limit the use of this method and it could therefore be of interest to use a permeametry technique for measuring the tablet surface area (Gupte 1976). The intention of this study was to evaluate a tablet permeametry method for the estimation of the fragmentation propensity of a material.

A problem with permeametry measurements of tablets is to adapt the specimen in the permeametry apparatus, in this case a Blaine-apparatus. This was solved by compacting the powder in a specially constructed die and then directly fixing this to the Blaine-apparatus with the aid of a special connection. The compaction was performed by hand in an instrumented single punch press. The tablet surface area was calculated using an additive function with terms for both viscous and molecular flow (Carman & Malherbe 1950).

Firstly, it was shown that the reproducibility of the method was acceptable and the influence of experimental parameters (e.g. compact height and dwell time) were small. Secondly, a number of substances, in the size range 212-250 um, with different fragmentation propensity was studied. The test substances were compacted at a series of pressures and the calculated specific surface areas of the tablets were plotted vs. the compaction pressures (Fig. 1). The method discriminated well between the materials and they were rank ordered in agreement with earlier experiences of their fragmentation properties (Duberg & Nyström 1982).

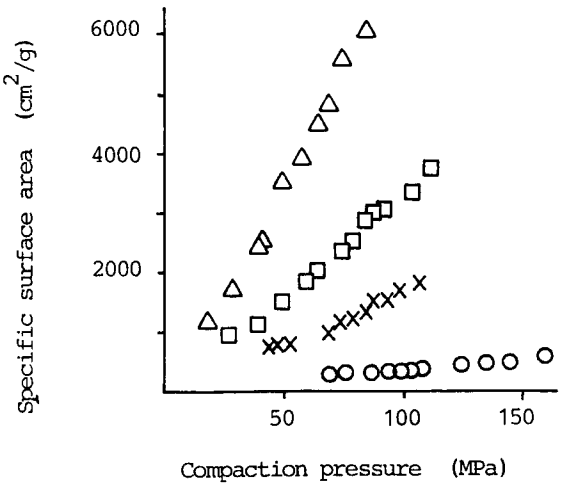

Fig. 1. Specific surface areas of tablets vs. compaction pressures.
Emcompress △
Lactose □
Saccharose ×
Sodium chloride ○

Duberg,M., Nyström,C.(1982) Acta Pharm. Suec. in press
Gupte,A.R.(1976) Acta Pharm. Technol. 22: 153-168
Carman,P.C., Malherbe,P.le R.(1950) J.Soc.Chem.Ind. 69: 134-143

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