the elimination of all peaks and agglutination of the suspensions. On extrapolation to the appropriate cell densities these concentrations approximate to those that would be expected to partially inhibit the growth of cultures of this organism and it seems possible that inhibition of bacterial growth by low concentrations of these membrane active agents results from the reversible uncoupling of the terminal cytochrome from the electron transport chain without any gross membrane damage or penetration of agent into the cells.

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Preliminary compaction studies using a device to simulate a rotary tabletting machine

E. T. COLE, J. E. REES AND J. A. HERSEY*
Pharmaceutical Research and Development, Sandoz Ltd., CH-4002 Basle, Switzerland

Rotary compressing machines commonly used for the manufacture of pharmaceutical tablets compress powders in a die between two moving punches. However, preliminary compaction studies are often made using hydraulic presses or eccentric compressing machines, in which one moving punch compresses the material against a second stationary punch. Since the frictional conditions at the die wall, and the stress distribution within the compact differ between these two types of compression it is often difficult to relate the results of preliminary studies to the subsequent behaviour of the material on a rotary machine. Nevertheless it is inadvisable to use precision equipment such as a rotary tabletting machine for initial compression studies with unlubricated powders or with formulations having ill-defined compaction properties.

A device has therefore been developed to simulate the compression conditions on a rotary machine. We have used the apparatus in conjunction with a universal testing instrument ("Instron") but the principle could also be applied to a hydraulic press or an eccentric tabletting machine. The lower punch is supported by a load cell located on the fixed platten of the universal testing instrument and the upper punch is attached to the movable crosshead. As the upper punch compresses the powder, the movement of the crosshead is translated to the die which also begins to move downwards but at a slower rate than the upper punch. The relative rate of movement of the die and the upper punch is adjustable, and the instant at which the die begins to move can be controlled.

Using this system with plane-faced punches of 33 mm diameter, the compaction properties of 40–60 mesh fractions (250–420 μm) of crystalline sodium chloride, potassium chloride, potassium citrate and lactose were investigated. Deformation of the material was measured at a range of applied loads up to 49·0 kN. For a range of maximum loads, when samples of each material had been compressed the upper punch movement was stopped. Decay in the load on the compact at constant strain, due to continuing deformation of the material, was studied. The effect of load on ejection force and compact strength was determined.

Differences in the compaction behaviour and the properties of the compacts of the four materials studied indicate differences in the mechanism of consolidation. Evidence of plastic deformation of sodium chloride and potassium chloride is shown by large stress relaxations, high ejection forces and high strength values. This effect is most apparent with potassium chloride. Conversely, lactose and potassium citrate exhibit much less stress relaxation and produce far weaker compacts. Differences between potassium citrate and lactose are explained by more extensive size reduction of lactose by fragmentation during compaction.

* Present address: The Victorian College of Pharmacy, 381, Royal Parade, Parkville, Victoria 3052, Australia.