Evaluation of granules made using a high-shear mixer granulator in comparison to large model granules

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Abstract:

The majority of prescriptions dispensed in pharmacies are for oral solid dosage forms such as tablets, capsules or sachets. These are manufactured on an industrial scale using highly specialised machinery and processes. Several scientists have tried in the past to simplify these processes by incorporating new techniques. The main objective of this study was to evaluate the granules made using a high shear mixer granulator in comparison with larger model granules, tablets and beams. While tablets are solid preparations each containing a single dose of one or more active substances and usually obtained by compressing uniform volumes of particles, beams are geometrically simple specimens that are made from powders or granules by compaction (the typical length of the beams is at least ten times their cross-sectional dimension). Beams and tablets were produced using the same granulation mixture (excipients used: lactose and microcrystalline cellulose in a ratio 1:1 and polyvinylpyrrolidone in concentrations of 0.6% solution) and their fracture mechanics were compared. The resistance to crushing or otherwise the tensile strength is the force that is required to fracture the specimen; along its thickness when referring to a beam or the diameter if the specimen is circular. Therefore, the mechanical properties of compacts were evaluated using three-point beam bending experiments and diametric compression tablet tests. The results suggested that the fracture mechanics of the beams were similar to those of the tablets. Therefore, a prediction of the fracture mechanics of the tablets could be easily estimated prior to their manufacturing, only by knowing the fracture mechanics of the corresponding beams. This research was carried out under the guidance of Prof Fridrun Podczeck at the University of Sunderland.

Biography:

Angeliki Siamidi, MPharm, MSc, PhD, is a postdoctoral researcher in the Department of Pharmaceutical Technology, University of Athens, Greece. She completed her doctoral dissertation in 2017 at the Department of Pharmacy of the University of Athens. Her research focuses on developing and evaluating modified release pharmaceutical forms. She has published more than 30 scientific papers in international peer-reviewed journals and 4 chapters in scientific books. She has presented more than 25 poster presentations at national and international conferences.

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