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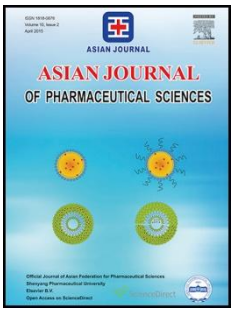

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Compaction of coated multi-particulates

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There has been a strong interest for controlled release solid dosage forms and to achieve controlled release, coating of particulates is often attempted to modify drug release. Due to the disadvantages of coated single-unit dosage forms, such as occurrences of dose dumping and local irritation, coated multi-particulates are often preferred. However, coated multi-particulates are often filled into capsules. Compressed tablet dosage form is more desirable than capsules as the unit production costs of tablets are lower and tablet presses are more common. The avoidance of gelatin is another impetus. Compaction of multi-particulates into tablets can also allow dosing flexibility as tablets may be scored. However, compaction forces can result in structural damage to coatings, affecting their function. Hence, it is important to understand the factors that can affect coat damage during compression, requiring research into the various aspects of compacting coated multi-particulates, from the coating process, coat quality, nature of cores, accompanying ingredients, tooling type, and process of force application among others. The structural damage during compression may be reduced by using smaller particles [1] but coating small particles is challenging [2]. Thus, judicious selection and optimization ofthe fluid bed coating process are important. It is also necessary to examine the impact of compacting coated particles with commonly used excipients, often necessitate the design of sacrificial granules to mitigate the harsh conditions required for the formation of compacts in a die of the tablet press [3, 4]. Excipients with smaller mean particle size could reduce the coat damage of multi-particulates during compression [5]. However, even with the usage of the finest grade of lactose, the drug release was about 3 times faster than the uncompressed coated particles. Besides excipient properties, the size of the coated particles could have also contributed to the failure of coat function after compression. It is also of interest to explore the use of smaller coated particles for compression. Nevertheless, the coating of small particles has always been a challenge due to the propensity of small particles to agglomerate [6].

In order to reduce the amount of agglomeration, the spray rate of the coating media needed to be reduced. However, reducing spray rate increased the level of spray drying, resulting in significant loss of coating material. In addition, coat quality could be affected when coating is applied in very dry coating conditions. Thus, understanding and optimizing of the coating process to determine the ideal coating parameters for coating small particles is very important. Application of a side spray onto a swirling flow of particulates is very successful for coating small particles [7], and a high spray rate with minimal agglomeration can be achieved

for pellets in the low few hundred microns size range. Careful application of the compaction force onto coated multi-particulates could also help to mitigatethe extent of coat damage during the compaction. This can be achieved by the use of air compensator to limited the applied force and extend compaction dwell time. This presentation will examine the various factors involved in the preparation and compaction of coated multi-particulates, highlighting the various research studies carried out in this area.

Keywords: Coated multi-particulates; Controlled release solid dosage forms

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