



Contribution ID: 789

Type: **Poster (+) Presentation**

An investigation of drug release from granules linking structure, process and release performance

Tuesday, 1 June 2021 10:00 (1 hour)

Abstract

An investigation of drug release from granules linking structure, process and release performance

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Granulation is a particle enlargement process where coarse or fine particles are agglomerated into large granules. These large granules are further processed to form tablets for oral solid dosage forms. In a high-shear granulation, the granule structure can be directly influenced by the granulation time and the amount of liquid binder added and this will have a strong influence on the dissolution rate of the granules. However, there is a lack of scientific understanding on the relationship between formulation, process and granule structure and performance. The aim of this work is to develop an experimental understanding of the relationship between granulation process parameters and granule structure and investigate the links between granule structure, granule dissolution and drug release profile.

In this study, microcrystalline cellulose was used as an excipient powder and polyethylene glycol as the binder. Acetyl salicylic acid (aspirin) was used as a model active component drug. When granulated, it was found that increasing of both the liquid to solid ratio (0.8, 1.0 and 1.2) and mixing time (2.5, 5 and 7 minutes) decreased the porosity of the granules. For the dissolution studies, a UV spectrophotometer at 270 nm was used to monitor drug release as a function of time. For the higher porosity granules, i.e. those produced at low granulation time and liquid to solid ratio, dissolution was found to be significantly more rapid. This demonstrates the importance of the granulation process and the resulting granule structure.

Time Block Preference

Time Block B (14:00-17:00 CET)

References

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Student Poster Award

Primary author: Mr SHMAM, Faraj (University of sheffield)

Presenter: Mr SHMAM, Faraj (University of sheffield)

Session Classification: Poster +

Track Classification: (MS4) Swelling and shrinking porous media