

DISCRETE ELEMENT METHOD (DEM) SIMULATIONS OF PHARMACEUTICAL PROCESSES

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ABSTRACT

Modeling pharmaceutical processes poses significant challenges due to the complexity and diverse nature of the involved steps. Creating something as seemingly simple as a tablet consists of many processing stages, including wet or dry granulation, drying, blending, tableting, and tablet coating, with the additional complexity of batch or continuous forms. The complexity further intensifies when considering different forms of drug delivery. Consequently, pharmaceutical applications of DEM simulations are often scattered across various sessions, addressing specific aspects such as granular flow, fundamentals, feeding and blending, and coupled problems.

This mini-symposium aims to overcome this fragmentation and consolidate the pharmaceutical applications of DEM simulations into one integrated session. By bringing together researchers from diverse groups working in the pharmaceutical field, the event seeks to facilitate collaboration and knowledge exchange. All applications utilizing pure or coupled DEM simulations to model pharmaceutical processes are welcome, encompassing many scenarios beyond the earlier examples.

Emphasis will be placed on presentations that link DEM results to critical quality attributes of intermediate and final products. The session will explore how DEM simulations can provide insights into cohesive pharmaceutical powders, complex particle shapes, granulation, drying, blending, and tablet coating, as well as their impact on the quality of pharmaceutical products.

This mini-symposium aims to foster a comprehensive understanding of the latest advancements in modelling pharmaceutical processes using DEM simulations by uniting these disparate applications under one session. Attendees will gain valuable insights into the challenges, opportunities, and potential improvements in drug manufacturing, ensuring the production of high-quality pharmaceutical products that meet stringent industry standards.