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GRANULE FORMATION AND STRUCTURE FROM SINGLE DROP IMPACT ON HETEROGENEOUS POWDER BEDS

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ABSTRACT

Single drop impact of liquid on a static powder bed was studied to investigate the granule formation mechanism, droplet penetration time, as well as the characterization of granules (morphology, surface structure and internal structure). Water was used as the liquid and two pharmaceutical powders, microcrystalline cellulose (MCC) and acetaminophen (APAP), were mixed to make heterogeneous powder beds. The complete drop impact and penetration was recorded by a high speed camera. Two granule formation mechanisms that have been identified previously occurred: Spreading and Tunneling. Spreading occurred for mixtures with an APAP amount of less than 20%, while Tunneling started to occur when the APAP amount increased above 20%. With an increase of APAP concentration, the mean particle size decreased,

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