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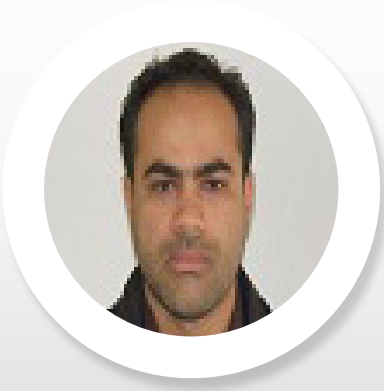
Downstream optimization of manufactured spray dried amorphous solid dispersion (ASD) powders



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Spray drying (SD) is often used as a continuous processing technique to isolate, purify and to enhance the biopharmaceutical properties and processability of many active pharmaceutical ingredients (APIs). One of the main applications of SD is to manufacture amorphous solid dispersion (ASD) formulations of poorly water-soluble crystalline drugs. The amorphous state, with a higher energy than the equivalent crystalline form, typically confers significantly higher solubility on the API, resulting in enhanced dissolution and bioavailability characteristics, which can reflect in a higher therapeutic efficacy of the drug product. One of the limitations of SD is that it usually produces fine spherical solid particles that exhibit poor powder flow characteristics, which requires further processing before they can be presented in a final dosage form such as a tablet. Materials selection and processing conditions are critical parameters for the success of the SD technique in the manufacture of ASDs. Furthermore, addition of excipients and further downstream processing will influence the performance of manufactured ASDs. In our research, the SD technique was employed as a continuous processing technique to manufacture ASD formulations of model poorly water-soluble drugs; namely: Indomethacin and Glibenclamide. The effect of polymeric carrier selection, solvent mixtures used, and different SD processing conditions were all investigated. ASDs of the candidate API were successfully manufactured and different process critical parameters were monitored and identified. This study provides deeper insights on the effect of different SD process related parameters, as well as material selection, on the nature and performance of the manufactured formulations.

Biography

Atif M Madi is a Postdoctoral Research Fellow and PI with a demonstrated history of working in the higher education sector. He is currently undertaking an Industrial Research Fellowship with APC Ltd (Science Foundation Ireland Award). He is skilled in Pharmaceutics and Pharmaceutical Technologies. He holds a Master of Science (MSc) degree in Pharmaceutical Analysis and Doctor of Philosophy (PhD) focused on Oral Drug Delivery. He works under the direction of Professor Anne-Marie Healy of Trinity College Dublin, Dublin, Ireland since February 2016.

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