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Advancements in Manufacturing of Amorphous Solid Dispersions: Exploring Cutting-Edge Techniques and Strategies

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Abstract:

The therapeutic potential of drugs in BCS Class II and IV is limited by their severe solubility and bioavailability issues. Numerous approaches have been explored for the solubility enhancement and dissolution rate enhancement of such drugs, each with their own disadvantages. One such approach is the development of Amorphous Solid Dispersions (ASDs), which is an industrially feasible technique for bioavailability enhancement. The success of this approach depends on the manufacturing methods employed for the development of ASDs. This review examines a range of ASD manufacturing processes, including conventional approaches such as spray-drying and hot melt extrusion, as well as cutting-edge technologies like kinetisol, 3D printing and supercritical fluid processing. The review elaborates on the characteristics and merits of each method with the inclusion of a few relevant case-studies.

Keywords: Amorphous Solid Dispersions, Solubility Enhancement, Hot-Melt Extrusion, Spray Drying, Supercritical Fluid Technology

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