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TITLE

Hot Melt Extrusion: Processing Solid Solutions

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With the advent of high throughput screening and combinatorial chemistry, there are now many drug compounds that exhibit poor bioavailability due to limited intestinal fluid solubility. Improving the solubility of these compounds is one of the major challenges facing the pharmaceutical industry. Numerous methods have been employed to increase the solubility of these drugs, one of which is the use of solid drug dispersions. Typically, solid dispersions are prepared using organic solvents, but this is problematic because of environmental and toxicological issues. Additionally, process scale-up is often difficult. Over the last decade hot-melt extrusion (HME) has been actively adapted for pharmaceutical purposes resulting in a renewed interest in use of solid dispersions as a way to improve the solubility of poorly water-soluble drugs. HME is a continuous process offering several manufacturing advantages. Successful commercial applications of solid dispersions produced by hot-melt extrusion, such as Kaletra®, show the potential of this technology in bringing new drugs to market. This presentation provides a background on solid dispersions and HME, and subsequently evaluates the research being conducted in this area for the purpose of enhancing the solubility of poorly water-soluble drugs. Much of the research thus far has focused on assessing the performance of various hydrophilic polymers as carrier platforms. However, more recently the effects of process/formulation factors have been investigated. It is anticipated that over the next five years the full potential of HME will be realised with more drugs being successfully formulated as solid dispersions and subsequently marketed.

Biography

Dr Andrews is a Senior Lecturer in Pharmaceuticals and holds a Royal Society Industrial Fellowship. His research interests are in solid dosage forms, biomaterials and semisolid drug delivery platforms. Dr Andrews has secured external funding from a variety of sources including highly competitive awards from EPSRC, EU, The Wellcome Trust, The Royal Society and major multinational pharmaceutical companies. Dr Andrews sits on the editorial advisory board of Drug Development and Industrial Pharmacy and the Journal of Pharmacy and Pharmacology. Dr Andrews has published his research in internationally peer-reviewed pharmaceuticals journals and has been invited to present his work at both national and international conferences.