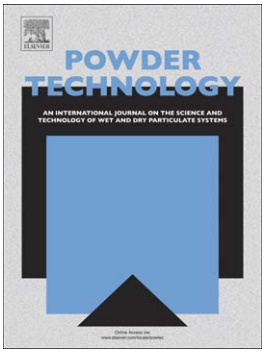

Impact of amorphous and semicrystalline polymers on the dissolution and crystallization inhibition of pioglitazone solid dispersions

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Impact of amorphous and semicrystalline polymers on the dissolution and crystallization inhibition of pioglitazone solid dispersions

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Abstract

Solid dispersions are used as a useful approach to improve the dissolution rate and bioavailability of poorly water-soluble active pharmaceutical ingredients (APIs). The present study investigated the impact of amorphous polymers (polyvinylpolypyrrolidone K30 and polyvinylpolypyrrolidone K90) and semicrystalline polymers (polyethyleneglycol 6000 and polyethylene-polypropylene glycol 188) on the dissolution profile of pioglitazone solid dispersions and crystallization behavior from a supersaturable state. Generated solid dispersions by these polymers resulted in significant dissolution enhancements compared with the crystalline API, whereas the dissolution differences of solid dispersions prepared by amorphous and semicrystalline polymers were not notable. Amorphous polymers themselves are superior to semicrystalline polymers for the dissolution enhancement of the crystalline API in a medium containing pre-dissolved polymers. For maintaining a supersaturated state, all