Recommendations

In contrast to a physical mixture, the drug and polymer phases in an amorphous solid dispersion are indistinguishable. Individual drug molecules are interspersed between chains of polymer, allowing for interaction between drug and polymer. The latter case, with drug and polymer phases indistinguishable, has been demonstrated to provide kinetic stability to a drug-polymer system. In this situation, the drug and polymer are distinct phases and there will be little, if any, interaction between drug and polymer. In order to provide the most stability to the dispersion, the polymer must mix homogeneously with the drug.

Aqueous solubility studies suggest increased solubility in aqueous systems can be a result of binding interactions between the polymer and drug, with drug molecules bound to polymer. Polymers have been found to increase the solubility of aqueous drug solutions due to molecular interactions such as electrostatic bonding (ionic and dipole interactions). Polymer-drug binding affects the physicochemical properties of the dispersion and the choice of appropriate polymer used to make SDs can have a significant effect on physical stability. For some systems, when polymer concentration increases, polymer-polymer bonds decrease their ability to form drug complexes. Polymer molecules tend to form electrostatic bonds with themselves, limiting their ability to form complexes.

In addition, the results were reproducible with relatively higher percentage yields when incorporated to HPMC AS. Drug content analysis indicated that the drug was uniformly distributed in SDs and the higher yield showed relatively lower process loss.

In spite of the extensive research and the number of scientific papers and patents that were published during the past 50 years, few products relying on solid dispersion technology have reached in the market. A whole array of carriers can be used to stabilize the amorphous form, but it is not completely clear why a certain carrier is suitable where another one fails or why some polymeric carriers maintain the supersaturated state of the API after dissolution, while others do not. Thus the study opens the chances of preparing solid dispersion of poorly water soluble drugs. If chemical stability of the drug remains unaffected to open a new era of more stable economic and safe products in the market can be launched. So further studies must be carried on by researcher to implement new design and development in solid dispersion.