



## Enhancement of Solubility, Dissolution and Absorption Rate of Tenofovir by using Solid Dispersion Technique with Different Carriers

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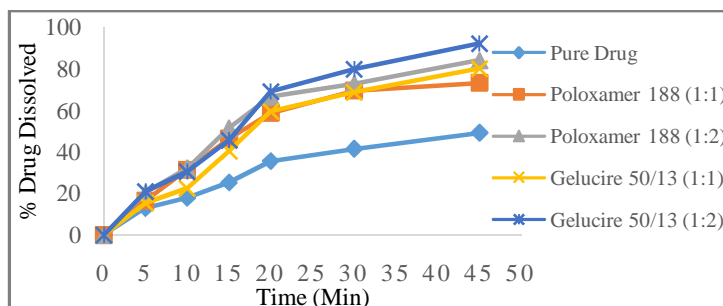
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### ABSTRACT

The solid dispersion has become an established solubilization technology for poorly water-soluble drugs to enhance drug absorption ability. A solid dispersion generally composed of two components- the drug and the polymer matrix. Numerous methods are existing to prepare the solid dispersions such as melting method, solvent evaporation method, fusion method, kneading method etc. A variety of solubility enhancement carriers have been investigated for enhancement of dissolution characteristics and bioavailability of poorly aqueous-soluble drugs. The objective of this investigation was to formulate solid dispersions of poorly water-soluble drug tenofovir using a water-soluble or hydrophilic carriers like Soluplus, Kollidon VA 64 using solvent evaporation method in various ratios of drug and carrier such as 1:1 and 1:2 and carriers like Poloxamer 188 and Gelucire 50/13 using fusion method in various ratios of drug and carrier such as 1:1 and 1:2 to improve the solubility and dissolution rate of tenofovir. The prepared solid dispersions were evaluated for pre-formulation characteristics, drug content, solubility study, and dissolution behavior. Based on the results, all the physical characteristics evaluated were found to be satisfactory and formulation having carrier Gelucire 50/13 with drug to carrier ratio of 1:2 was found to be showing enhanced solubility results when compared to other formulations using fusion method. There is a significant increase in drug release with increase in drug to polymer ratio. Finally, solid dispersion was formulated into controlled release dosage forms such as tablets with rate limiting natural polymers.

### Graphical Abstract



Dissolution comparison of tenofovir solid dispersions using Poloxamer 188 and Gelucire 50/13, 1:1 and 1:2 ratio.

1 **Keywords:** Tenofovir, Soluplus, Kollidon VA 64, Poloxamer P188, Gelucire 50/13, Fusion, Solvent  
2 evaporation, Solubility, Dissolution, Solid Dispersion, Tablets.  
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