World Academy of Science, Engineering and Technology
International Journal of Mathematical and Computational Sciences
Vol:14, No:12, 2020

# Modulated Bioavailability of an Anti HIV Drug through a Self-Nanoemulsifying Drug Delivery System

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**Abstract :** The main drawback to design drug delivery systems with BCS class II drugs is their low bioavailabilty due to their inherent low permeability characteristics. So the present investigation aspire to develop a self-nanoemulsifying drug delivery system (SNEDDS) of BCS class II anti HIV drug efavirenz (EFZ) using mixtures of non-ionic surfactant mixtures with the main objective to improve the oral bioavailability of said drug. Results obtained from solubility studies of EFZ in various expients utilized for construction of the pseudo ternary phase diagram containing surfactant mixtures. Surfactants in 1:1 combination are used with different co-surfactants in different ratio to delineate the area of monophasic region of the pseudo ternary phase diagram. The formulations which offered positive results in different thermodynamic stability studies were considered for percentage transmittance and turbidity analysis. The various characterization studies like the TEM analysis of post diluted SNEDDS formulations r confirmed the size in nanometric range (below 50 nm) and FT-IR studies confirmed the intactness of the drug the in the preconcentrate. The in vitro dissolution profile of SNEDDS showed that 80% drug was released within 30 min in case of optimized SNEDDS while it was approximately 18.3 % in the case of plain drug powder.. The Pharmacokinetic study using rat model revealed a 2.63 fold increase in AUC (0-∞) in comparison to plain EFZ suspension. The designed delivery system illustrated the confidence in creating a formulation of EFZ with enhanced bioavailability for better HIV treatment.

**Keywords :** efavirenz, self-nanoemulsifying, surfactant mixture, bioavailability
**Conference Title :** ICSRD 2020 : International Conference on Scientific Research and Development
**Conference Location :** Chicago, United States
**Conference Dates :** December 12-13, 2020