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Solubility enhancement of Furosemide and its fabrication into dosage form

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Bioavailability is defined as the rate and extent of the drug concentration in the systemic circulation after oral administration. The BCS is a scientific framework for classifying drug substances based on their aqueous solubility and intestinal permeability. Furosemide is a class IV drug. Present experimental work was aimed to prepare optimized, stable solid self emulsifying drug delivery system containing Furosemide. The combination of the various solubilizers and hydrophilic surfactants like Poloxamer 188, Polysorbate 80 and medium chain triglycrides were used in the present study. PEG-40 Hydrogenated castor oil was used as solvent cum cosurfactant on the basis of solubility of Furosemide. The formulations were so designed that they form nano dispersion in contact with water or GI fluids which increases the permeability through GI membrane. All the prototype formulation tested for *in vitro* dissolution formed nano emulsion in 15 minutes. Trend of drug dissolution of prototype A and B remain constant or increase marginally as the time increases, dissolution rate of drug remains constant or increases marginally until 60 minutes in case of prototypes A and B. This indicates that upon contact with dissolution media, formulations A1 to A3 and B1 to B3 form emulsions which have poor thermodynamic stability and eventually drug particle size in dispersion increases. This was not observed in the case of the prototype C3 formulation where the drug dissolution enhances with time indicating good thermodynamic stability of nanoemulsion produced on contact with aqueous fluids. Thus prototype C3 is optimized formulation and this optimized batch was evaluated for average weight of tablet, hardness, friability, disintegration time, dissolution and stability study was carried out.

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