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Preparation and Characterization of Diclofenac Sodium Loaded Solid Lipid Nanoparticle

Authors : Oktavia Eka Puspita

Abstract : The possibility of using Solid Lipid Nanoparticles (SLN) for topical use is an interesting feature concerning this system has occlusive properties on the skin surface therefore enhance the penetration of drugs through the stratum corneum by increased hydration. This advantage can be used to enhance the drug penetration of topical delivery such as Diclofenac sodium for the relief of signs and symptoms of osteoarthritis, rheumatoid arthritis and ankylosing spondylitis. The purpose of this study was focused on the preparation and physical characterization of Diclofenac sodium loaded SLN (D-SLN). D loaded SLN were prepared by hot homogenization followed by ultrasonication technique. Since the occlusion factor of SLN is related to its particle size the formulation of D-SLN in present study two formulations different in its surfactant contents were prepared to investigate the difference of the particle size resulted. Surfactants selected for preparation of formulation A (FA) were lecithin soya and Tween 80 whereas formulation B (FB) were lecithin soya, Tween 80, and Sodium Lauryl Sulphate. D-SLN were characterized for particle size and distribution, polydispersity index (PI), zeta potential using Beckman-Coulter Delsa™ Nano. Overall, the particle size obtained from FA was larger than FB. FA has 90% of the particles were above 1000 nm, while FB has 90% were below 100 nm.

Keywords : solid lipid nanoparticles, hot homogenization technique, particle size analysis, topical administration
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