World Academy of Science, Engineering and Technology
International Journal of Chemical and Molecular Engineering
Vol:9, No:08, 2015

Development and in vitro Characterization of Loteprednol Etabonate-Loaded Polymeric Nanoparticles for Ocular Delivery

Authors : Abhishek Kumar Sah, Preeti K. Suresh

Abstract : Effective drug delivery to the eye is a massive challenge, due to complicated physiological ocular barriers, rapid washout by tear and nasolachrymal drainage. Thus, most of the conventional ophthalmic formulations face the problem of low ocular bioavailability. Ophthalmic drug therapy can be improved by enhancing the precorneal drug retention along with improved drug penetration. The aim of the present investigation was to develop and evaluate a biodegradable polymer poly (D, L-lactide-co-glycolide) (PLGA) coated nanoparticulate carrier of loteprednol etabonate. PLGA nanoparticles were prepared by modified emulsification/solvent diffusion method using high-speed homogenizer followed by sonication. The nanoparticles were characterized for various parameters such as particle size, zeta potential, polydispersity index, X-ray powder diffraction (XRD), Transmission electron microscopy (TEM), in vitro drug release profile and stability. The prepared nanocarriers displayed mean particle size in the range of 271.7 to 424.4 nm, with zeta potential less than –10 mV. In vitro release in simulated tear fluid (STF) nanocarrier showed an extended release profile of loteprednol etabonate. TEM confirmed the spherical morphology and smooth surface of the particles. All the prepared formulations were found to be stable at varying temperatures.

Keywords : drug delivery, ocular delivery,polymeric nanoparticles,loteprednol etabonate
Conference Title : ICPCE 2015 : International Conference on Pharmacy and Chemical Engineering
Conference Location : Kuala Lumpur, Malaysia
Conference Dates : August 24-25, 2015

Open Science Index, Chemical and Molecular Engineering Vol:9, No:08, 2015 publications.waset.org/abstracts/22757.pdf