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Characterisation of Ionic Liquids Nanoemulsion Loaded with Piroxicam for Drug Delivery System.

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Abstract

In this study, ionic liquid-in-oil nanoemulsions (IL/o NEs) system were formulated by using two types of ionic liquids, 1-hexyl-3-methylimidazolium chloride [Hmim][Cl] and 1-butyl-3-methylimidazolium hexafluorophosphate [Bmim][PF₆] in differences mass ratio with Tween-80/Span-20 1:1, 1:2, 2:1 and 2:3. They were tested for stability study before undergo characterisation, rheology behaviour and released study in order to get the best result of NEs system. The high concentration of Tween-80 in the formulation of NEs show high stability from separation, creaming, sedimentation and flocculation. The droplet sizes, zeta potential, drug encapsulation efficiency (%) and pH value for all formulations were considered in the range of 100 to 500 nm, -37.3 to -55.3 mV, 60.02% to 98.76% and 4.72 to 5.50 respectively. Spherical droplets were seen in the transmission electron microscopy (TEM) images of the nanoemulsions. Rheological studies showed non-Newtonian shear thinning behaviour at low shear rate up to 14 S⁻¹ of NE for both ionic liquids. Nanoemulsions insertion of Piroxicam was used to investigate the *in vitro* drug releases via dialysis bag method. The permeation of drug demonstrated the optimised surfactant ratio is 2:1 and ionic liquid is [Hmim][Cl] with 93% of drug released. It is concluded that the NEs prepared from ionic liquids offered a good potential as a carrier for drug delivery of Piroxicam.

Keywords

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