Biocompatible Nanoemulsion : phase behavior ,Formulation, Characterization and some application

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Abstract

Isotretinoin is 13-cis-retinoic acid and is related to both retinoic acid and Retinol (Vitamin A). It has been commonly used for the treatment of severe acne and the other dermatological diseases , isotretinoin has some deficiencies, such as poor solubility in water and in most organic solvents and poor stability, being easily oxidized when heated or exposed to light .

Because water insoluble drugs often show low absorption and weak bioavailability, improvement in solubility is important for development of drug preparations .

Drugs can be solubilized and formulated in nanoemulsions . nanoemulsions are excellent candidates as potential drug delivery systems because of their improved drug solublization , long shelf life and ease of preparation .

Recently, Tetronic surfactants have been studied as possible vehicles for drug delivery; hence, studies on their behavior under a variety of conditions will be an important part of the formulation in delivery agents.

Tetronic 1107 is a tetrafunctional block copolymer surfactant terminating in primary hydroxyl groups see figure (1) . A nonionic surfactant that is 100% active and nontoxic

This study aims to investigate the phase behavior of Tetronics 1107 with Propylene Glycol as a model oil and cationic surfactant tetra butyl ammonium bromide at different temperature (25,37,and 45 C), and then investigate the phase behavior of Tetronics 1107 with R (+)-Limonene oil at different temperature (25,37C) to form nanoemulsion in order to improve solubility of isotretinoin

Visual inspection , cross polarizers and polarized microscopy were used to detect anisotropy . A cubic phase and micelle were detected in the corresponding ternary phase diagram. each of them will be used to formulate of isotretinoin in a second stage .

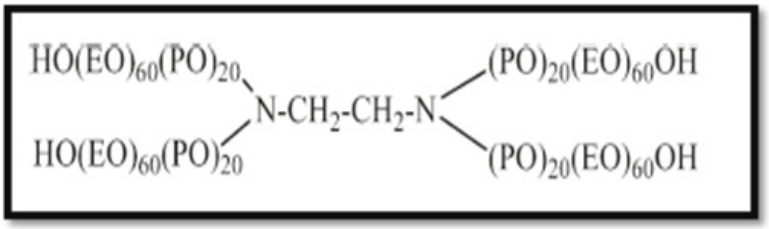

Figure (1) : chemical structure of tetronics 1107