

Rheological Evaluation of a Mucoadhesive Precursor of Based-Poloxamer 407 or Polyethylenimine Liquid Crystal System for Buccal Administration

Authors : Jéssica Bernegossi, Lívia Nordi Dovigo, Marlus Chorilli

Abstract : Mucoadhesive liquid crystalline systems are emerging how delivery systems for oral cavity. These systems are interesting since they facilitate the targeting of medicines and change the release enabling a reduction in the number of applications made by the patient. The buccal mucosa is permeable besides present a great blood supply and absence of first pass metabolism, it is a good route of administration. It was developed two systems liquid crystals utilizing as surfactant the ethyl alcohol ethoxylated and propoxylated (30%) as oil phase the oleic acid (60%), and the aqueous phase (10%) dispersion of polymer polyethylenimine (0.5%) or dispersion of polymer poloxamer 407 (16%), with the intention of applying the buccal mucosa. Initially, was performed for characterization of systems the conference by polarized light microscopy and rheological analysis. For the preparation of the systems the components described was added above in glass vials and shaken. Then, 30 and 100% artificial saliva were added to each prepared formulation so as to simulate the environment of the oral cavity. For the verification of the system structure, aliquots of the formulations were observed in glass slide and covered with a coverslip, examined in polarized light microscope (PLM) Axioskop - Zeiss® in 40x magnifier. The formulations were also evaluated for their rheological profile Rheometer TA Instruments®, which were obtained rheograms the selected systems employing fluency mode (flow) in temperature of 37°C (98.6°F). In PLM, it was observed that in formulations containing polyethylenimine and poloxamer 407 without the addition of artificial saliva was observed dark-field being indicative of microemulsion, this was also observed with the formulation that was increased with 30% of the artificial saliva. In the formulation that was increased with 100% simulated saliva was shown to be a system structure since it presented anisotropy with the presence of striae being indicative of hexagonal liquid crystalline mesophase system. Upon observation of rheograms, both systems without the addition of artificial saliva showed a Newtonian profile, after addition of 30% artificial saliva have been given a non-Newtonian behavior of the pseudoplastic-thixotropic type and after adding 100% of the saliva artificial proved plastic-thixotropic. Furthermore, it is clearly seen that the formulations containing poloxamer 407 have significantly larger (15-800 Pa) shear stress compared to those containing polyethyleneimine (5-50 Pa), indicating a greater plasticity of these. Thus, it is possible to observe that the addition of saliva was of interest to the system structure, starting from a microemulsion for a liquid crystal system, thereby also changing thereby its rheological behavior. The systems have promising characteristics as controlled release systems to the oral cavity, as it features good fluidity during its possible application and greater structuring of the system when it comes into contact with environmental saliva.

Keywords : liquid crystal system, poloxamer 407, polyethylenimine, rheology

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