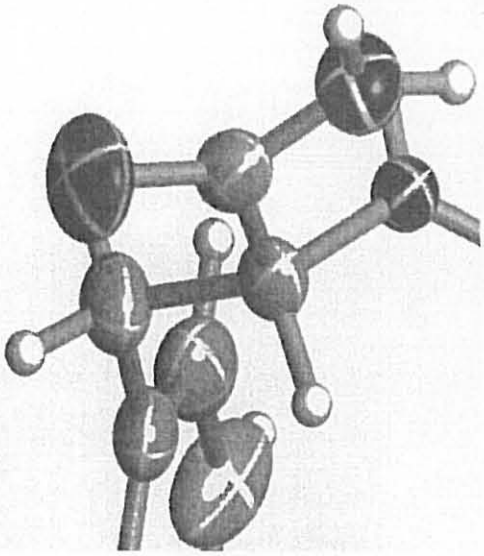

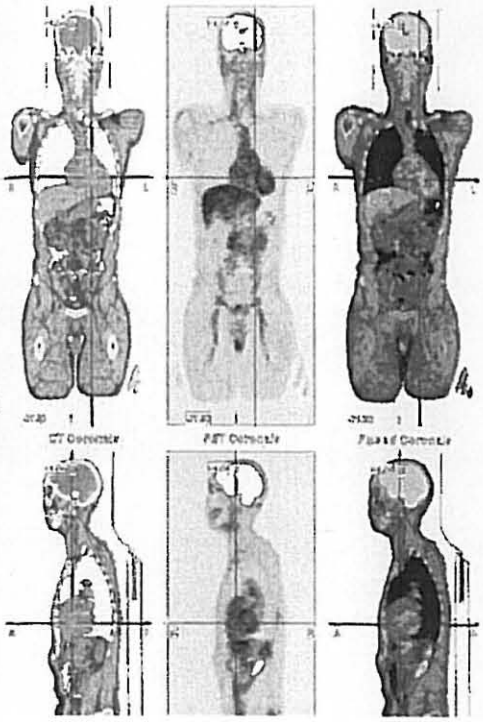

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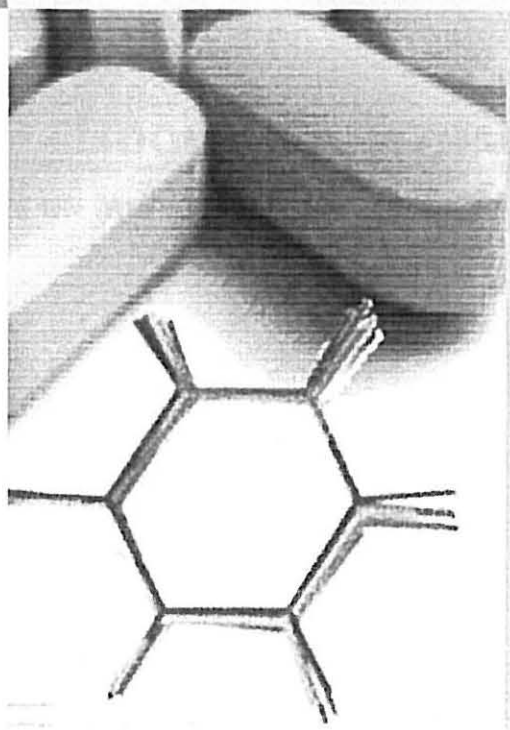

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Development of ketoprofen delivery systems based on aqueous polyurethane dispersions

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Ketoprofen (2-(3-benzoylphenyl) propionic acid) is a non-steroidal anti-inflammatory drug (NSAID) used to treat a wide range of acute and chronic inflammatory diseases, e.g., rheumatoid arthritis, osteoarthritis and ankylosing spondylitis. Its prolonged oral administration is associated with several gastrointestinal reactions such as irritation and ulceration. In this context, ketoprofen is a good candidate for controlled release administration systems.

This work aims to test the suitability of using aqueous polyurethane dispersions (PUDs) as the base vehicle for producing ketoprofen controlled release systems. In a first step, polyester (polycaprolactone, PCL) and polyether (polypropylene glycol, PPG) based PUDs have been synthesized by using a modified pre-polymer method. Two chain extenders have been assayed (ethylenediamina (EDA) and hydrazine monohydrate (HYD)). The obtained dispersions have been characterized in terms of pH, viscosity, solid content and particle size. In a second step, incorporation of ketoprofen in the produced PDUs was studied following two main strategies to enhance ketoprofen solubility in water, namely the use of a co-solvent (acetone, DMSO and HYD) and the use of a nonionic surfactant (Tween 80). For this last case an intermediate step comprising the preparation of a ketoprofen suspension was needed. Ketoprofen incorporation was tested at contents of 5% and 10% (drug/polymer ratio, w/w). When solubilization was achieved films prepared by solution casting method were produced.

In conclusion, ketoprofen was successfully incorporated in the produced PUDs being the best results obtained when Tween 80 was used. The films obtained by this methodologywere completely homogeneous, transparent and flexible.The next steps in this work in progress will concentrate on the evaluation of ketoprofen release profiles that will support the design of the appropriate drug delivery system. Different typologies can be envisaged (patches, or implants) depending on a compromise between film properties and release behavior.

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