CHOLIN IBUPROFENATE STABILIZED IN SBA-15 AIMING PRODUCING A DRUG DELIVERY SYSTEM

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To stabilize instable phase of pharmaceuticals two strategies were combined: the intrinsic combination of the active pharmaceutical ingredient (API) with an ionic liquid (LI), producing an IL_API, and the subsequent confinement in a nanoporous silica matrix. Cholin ibuprofenate: Ibu/Col was selected as IL/API. The work was preceded by the study of Ibu/Col in its natural state, since its physico-chemical properties are not described in literature. Given that Ibu/Col easily absorbs water, its effect on phase transformations as glass transition, crystallization and fusion was evaluated by differential scanning calorimetry (DSC). It was observed that the glass transition temperature shifts towards higher temperatures with the decrease of adsorbed water and crystallization emerges for relatively dried samples.

The transport properties as diffusion coefficient and mobility of charge carriers were estimated from frequency dependent conductivity measurements. The estimated transport properties significantly decrease (approximately two orders of magnitude) from hydrated sample to dehydrated one.

Ibu/Col was impregnated in SBA-15 matrixes synthesised with 4.5 and 5.6 nm pore diameter. FTIR and DSC confirmed the efficiency of the impregnation. DSC showed that the retained material when impregnated in SBA-15 with both pore sizes, remains in the supercooled liquid state, with no crystallization when submitted to the same thermal treatment that Ibu/Col on its natural state. The respective transport properties were estimated also for the impregnated guest with no discontinuity as observed for systems that undergo crystallization. Thus, impregnation on nano-porous silica matrix proved to be and efficient strategy to suppress crystallization in Ibu/Col being encouraging its application as controllable drug delivery systems.

Acknowledgements

Financial support for this work was provided by Fundação para a Ciência e Tecnologia through the projects PTDC/CTM/098979/2008 and PTDC/EQU-EPR/104554/2008. M. T. Viciosa acknowledges financial support from SFRH/BPD/39691/2007.