

Inclusion Complexes of New Ibuprofen Thiazolidin-4-Ones with β -Cyclodextrin [†]

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Abstract: (1) **Background:** Cyclodextrins are used in various areas due to their ability to form inclusion complexes and to modify some properties of the guest molecule. The characteristics that can be improved are related to the solubility of poorly water-soluble drugs, the stabilization of labile guests against the degradative effects of the environment (oxidation, light and heat), bioavailability, decreasing side effects, taste modification or odour elimination and controlling of drug release. Additionally, ibuprofen is a widely used nonsteroidal anti-inflammatory drug in treating pain and inflammation, but the long-term use of this drug has been associated with gastrointestinal side effects and nephrotoxicity. This led to the introduction of new compounds of ibuprofen with an improved profile. **Aim.** The research project combines two actual topics in the pharmaceutical area: developing new safer drugs and improving the pharmacokinetic and pharmacotoxicological profile through complexation with cyclodextrins. The main objective was to develop drug delivery systems based on cyclodextrins and new ibuprofen thiazolidin-4-ones as potential analgesic and anti-inflammatory drugs. (2) **Methods:** Thiazolidin-4-one derivatives of ibuprofen were included in β -cyclodextrin complexes by co-precipitation (1:1M) and lyophilization methods. The inclusion complexes were characterized using spectral methods such as infrared analysis (FTIR), NMR spectroscopy and phase solubility studies. The surface morphology was studied using scanning electron microscopy (SEM). (3) **Results and Conclusions:** Four inclusion complexes with β -cyclodextrin and new ibuprofen derivatives with a thiazolidin-4-one structure were obtained and characterized. These can confirm the theoretical premises for an improved pharmacological and safety toxicological profile and can continue with future studies (in vivo biological evaluation of pharmacokinetic, analgesic and anti-inflammatory profile).

Keywords: ibuprofen; thiazolidin-4-one; β -cyclodextrin

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