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INFLUENCE OF HYDROXYPROPYL-BETA-CYCLODEXTRIN ON THE PHYSICOCHEMICAL AND BIOLOGICAL CHARACTERISTICS OF A FLAVONE WITH IMPORTANT PHARMACOLOGICAL PROPERTIES

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Abstract

The purpose of this study was to investigate the influence of hydroxypropyl- β -cyclodextrin on diosmin, substance from the flavones category with important pharmacological properties. We carried out solubility studies, calculating the solubility constant of the complex formed between diosmin and hydroxypropyl-cyclodextrin at various temperatures (20, 25 and 37 °C) and in the presence of increasing cyclodextrin concentrations. A_L type curves were obtained which suggest the formation of an inclusion compound on a 1:1 molar ratio and the solubility constants had values between 370 and 453 M^{-1} . Knowing that between diosmin, hydroxypropyl-cyclodextrin and the used solvent, thermodynamic interactions occur, we investigated the influence of these interactions on several thermodynamic parameters such as Gibbs free energy change, free energy change, enthalpy change and entropy change. The calculated values showed that the reaction is positively influenced by the cyclodextrin's concentration increment and the temperature, the process being spontaneously. Next, inclusion compounds were obtained by co-evaporation and co-precipitation, and their structures were confirmed by FTIR and MS analysis. The complexes were tested *in vitro* compared with the parent substances, the results indicating improved antioxidant and antimicrobial activities. Moreover, the dissolution of diosmin increased in mediums similar to physiological conditions (simulated gastric and intestinal).

Key words: antimicrobial, antioxidant, beta-cyclodextrin, diosmin, dissolution

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