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DETERMINATION OF PHYSICOCHEMICAL PARAMETERS OF [CIPROFLOXACINATE CITRATE ZINC (II)] COMPLEX THAT COULD BE USED IN ARTIFITIAL TEARS

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Abstract content

The ciprofloxacin (1-cyclopropyl-6-fluoro-1,4-dihydro-4-oxo-7-(1-piperacinyl)-3-quinolinecarboxylic acid), is a wide spectrum antimicrobian from the second generation quinolones, due to its pharmacokinetic properties, it is considered as a good option for the treatment of multiple infections. Zinc (Zn) is an essential trace element for all lifestyles and it is the most abundant intercellular element. In addition, it is associated to multiple functions in the body such as wound healing for his role in collagen synthesis and cell proliferation. Therefore, there is an interest to synthesize zinc ciprofloxacin complexes of to study the role of such complex in both healing capacity and antimicrobial effect. The formation of zinc ciprofloxacin complexes in a rate 1:2 has been reported previously. Houever, a highly insoluble product was obtained, and its biological activity could be reduced, so in this work it is proposed the addition of a citrate group in the zinc complex to make it more soluble. In order to study the complexes synthesized, X-ray absorption spectroscopy (XAS) was used to elucidate the structure of both complexes since they were obtained as an amorphous form. The X-ray absorption spectra was obtained using the Beam line 7.3 at the Stanford Synchrotron Radiation Lightsource (SSRL). Afterwards, the XANES part of the spectra was extracted. Finally, a comparison among model compounds and sample spectra showed some difference between the chemical environment of 1 and 2 ciprofloxacine complexes. Moreover, it was observed that the spectra show more similarities to the Zn oxide model compound that the Zn nitrate spectra used as a reagent in the synthesis. Therefore, it is possible that ligands may be coordinated to the metal through deprotonated oxygens of the respective carboxylic acids from the citrate and ciprofloxacine. It is recommended the EXAFS spectra analysis to obtain the coordination number of the metal and additional structural information.

Summary

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