PREPARATION AND CHARACTERIZATION OF THE INCLUSION COMPLEXES OF SALICIN WITH α- CYCLODEXTRIN AND γ-CYCLODEXTRIN

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Abstract

Cyclodextrins are α-1,4-linked cyclic oligosaccharides with a three-dimensional shape like a truncated cone acting as "host" for bioactive molecules, with the complete or partial inclusion in their cavity [1]. Due to their particular structures, cyclodextrins can encapsulate guest molecules leading to the formation of inclusion complexes [2]. Cyclodextrins are used as complexing agents to improve the solubility, stability and bioavailability of the bioactive molecules [3]. In addition, many bioactive compounds such as salicin are astringent or present an unpleasant flavour and encapsulation in cyclodextrins could effectively reduce or suppress these deficiencies. Salicin is a white bitter-tasting powder and was first obtained in pure crystalline form in 1829 from willow bark and was then used for the treatment of rheumatism. Salicin is the metabolic precursor of salicylic acid and has a similar action in the human body [4].

In this paper, salicin/α-cyclodextrin and salicin/γ-cyclodextrin inclusion complexes in a molar ratio of 1:1 were prepared by wet trituration and characterized by Fourier transform infrared spectroscopy (FT-IR), Raman spectroscopy, scanning electron microscopy (SEM), X-ray diffraction (XRD), and UV-Vis-NIR spectroscopy. The obtained results were compared with those corresponding to the host components (α- and γ-cyclodextrin), the guest (salicin) and their physical mixture in order to demonstrate the formation of the inclusion complexes.

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