

PP17. NEW SUPRAMOLECULAR COMPLEXES WITH SPECIFIED PROPERTIES BASED ON PHYTOECDYSTEROIDS

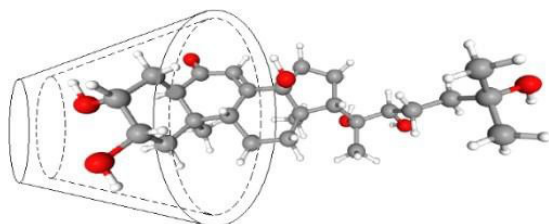
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Supramolecules (cyclodextrins, polysaccharides, water-soluble natural polymers, etc.) are widely used for intermolecular encapsulation of a medicinal substance in terms of stabilization and improvement of hydrophilic properties.

Taking into account the unique properties of organic supramolecules, we synthesized and obtained a number of supramolecular ensembles based on α -, β -, γ - and 2-hydroxypropyl- β -cyclodextrins, disodium salt of glycyrrhizic acid (Na₂GA), and polyvinylpyrrolidone with 20-hydroxyecdysone (20E), 2-deoxyecdysone, 2-deoxy-20-hydroxyecdysone, 3-epi-2-deoxyecdysone, as well as tri and tetracetate, hydrazone, oxime and enamine derivatives 20E used as clathrates [1]. When using 2-hydroxypropyl- β -cyclodextrin (2-GP- β -CD) as a



component of intermolecular self-assembly, it is more hydrophilic compared to analogues of α - and β -CDs, due to the presence of additional 2-hydroxypropyl fragments in the macroheterocycle molecule, where proton changes both in the outer shell and and they are the same internally, which contributes to the formation of a mixed ligand supramolecular composite (Fig.1). The fine structure of the new water-soluble supramolecular ensembles of phytoecdysons and synthesized synthon compounds is confirmed by the data of two-dimensional correlation of ¹H-¹H, TOCSY, ¹H-¹H ROESY, ¹H-¹³C HMQC and ¹H-¹³C HMBC NMR spectra. When studying the water solubility of supramolecular complexes based on 20E with 2-GP- β -CD and Na₂GA, the moment of dissolution of the substance was determined using high-performance liquid chromatography and a potentiometric value in time intervals. The experimental results demonstrated a 3-fold improved solubility of 20E in combination with 2-GP- β -CD and 2.7-fold with Na₂GA, respectively. As a result of bioscreening, substances with pronounced anti-inflammatory and analgesic activity were found among the synthesized compounds, surpassing the comparison drug "Sodium diclofenac".

REFERENCES

[1] Tuleuov BI, Temirgaziev BS, Kozhanova AM, *et al.* Supramolecular Complex of 20-Hydroxyecdysone-3-acetate with β -Cyclodextrin and Its Biological Activity. *Russ J Gen Chem.* 2020; 90, 2258–2263.