DSC STUDIES OF SOLID COMPLEXES BETWEEN CYCLODEXTRINS AND FLAVONOIDS

Palecz B.[1], Belica S.[1], Buczkowski A.[1], Zavodnik L.B.[2], Zavodnik I.B.[3]

[1] – Department of Physical Chemistry, University of Lodz, Poland

[2] – Department of Pharmacology and Physiology Agricultural University of Grodno, Belarus

[3] – Department of Biochemistry, Yanka Kupala Grodno State University, Belarus

Cyclodextrins (CDs) – a cyclic oligosaccharides contain mostly six (□ CD), seven (□CD) or eight (□CD) glucose residues – have a relatively nonpolar cylindrical cavity, which can bind and solublize a wide variety of hydrophobic molecules like flavonoids for example quercetin and rutin. Quercetin is a flavonoid widely distributed in nature. It is a naturally-occurring polar auxin transport inhibitor, a plant-derived flavonoid found in fruits, vegetables, leaves and grains. It also may be used as an ingredient in supplements, beverages or foods. Rutin, also called rutoside is the glycoside

between the flavonol quercetin and the disaccharide rutinose. Rutin inhibits platelet aggregation as well as decreases capillary permeability, making the blood thinner and improving circulation what makes it useful in medicine and veterinary medicine. Quercetin and rutin are flavonoids with low solubility in water. To increase the bioavailability of those oral-taken drugs it is worth to check influence of the cyclodextrins on those substance. Cyclodextrins are able to improve solubility of the guest drug inserted into their cavities and make the drug absorption in the gastrointestinal tract more effective.

One of the methods to examine the complex formation between drugs and cyclodextrins is differential scanning calorimetry (DSC111). The set of parameters of interaction given by these experimental method brings information about the strength and the energetic aspects of complex formation between guest and host molecules. In this work the stability parameters from DSC111 measurements like enthalpy of melting and descomposition of β-cyclodextrin with quercetin and rutin are presented. The parameters are compared with each other and with available literature and the conclusions are made.