

КОЛОКВИУМ
НА СЕКЦИЯ “ПОВЪРХНОСТИ И КОЛОИДИ”
ИНСТИТУТ ПО ФИЗИКОХИМИЯ НА БАН

С Ъ О Б Щ Е Н И Е

На **11 май 2018 г. (петък)** от **11:00 часа** в зала **“Болцман”** на **ИФХ-БАН**, ще се проведе заседание на Колоквиума със следния дневен ред:

1. Доклад на **Dr. Marcel Krzan** (Jerzy Haber Institute of Catalysis and Surface Chemistry, Polish Academy of Sciences, Cracow, Poland) на тема:

**“SURFACE PROPERTIES OF SAPONIN SOLUTIONS AND ITS MIXTURES WITH
VARIOUS BIOPOLYMERS IN RELATION TO THEIR FOAMABILITY”**

Mixture of natural surfactants at fluid interfaces are widely investigated as stabilizers of emulsions and foams for many applied fields where it is important to have bio-compatible and biodegradable products, such as body-care and bio-medical fields.

Aim of this work is to contribute to the development of new formulations of biodegradable and biocompatible foams for industrial application, able also to reduce the use of synthetic surfactants in commercial products.

I would like to present two independent series of research in which we studied the interactions between saponin and other bio-polymers. Saponin (one of mostly known green surfactant) is a group of compounds produced from various plant species and some marine organisms. They are composed of amphipathic glycosides having one or more hydrophilic glycoside moieties combined with a lipophilic triterpene derivative.

In first series of experiments we studied the saponin interaction with chitosan, which is natural preservative with antibacterial and antifungal properties. In second series of research we observed the variation of surface and foaming properties in mixtures of saponin with Egg White (clear liquid of eggs - the primary purpose of egg white is to protect the yolk and provide additional nutrition for the growing embryo. Egg white consists mostly of water into which about 10% proteins are dissolved) and Persian Gum (a water-soluble exudate polysaccharide from the trunk and branches of wild or mountain almond trees).

In the case of saponin/chitosan mixtures the results show that saponin is a very effective surfactant since, even at very low concentration, leads to an important decrease of the surface tension and to high values of the dilational viscoelasticity. This latter peculiarity being relevant for its utilization as foam stabilizer. On the other hand, the presence of chitosan, seems to be very important because tends increase the viscoelastic modulus of the Saponin adsorption layer and to enhance the foamability of the system, under defined conditions.

In second approach, where we studied saponin interactions with Egg White and Persian Gum, results confirmed that also egg white protein acts like classical synthetic surface active agents. The variations of pH had a great influence only on the egg white adsorption properties. Egg white shows a much stronger surface activity in pH 7 than in pH 9 solutions. In contrast, the saponin molecules were almost not affected by pH variations. It should be noticed that natural pH of egg white varies from 8.5-10 according to the season, egg age and other environmental and genetical factors. Thus, egg white proteins have their original structure at alkaline pH values and their conformation does not change under these conditions..