

Diploma thesis
**«Infrared and terahertz pulsed spectroscopy of structural changes of proteins
and model systems under the interaction with crown-ether»**

Spectroscopy of the biological molecules is a very important task of the modern science. Protein molecules are among interesting biological complexes. They take part in life processes of the organism and it is expedient to study their properties, since their functional activity depends on their molecular structure.

Chymotrypsin is a digestive enzyme, that catalyses hydrolysis of proteins, peptides, amides and complicated amino acid ethers in aqueous environment. It's known that in organic solvents protein can change its properties, for example, protein activity significantly increases in the presence of crown-ethers. One of the possible mechanisms of this effect is formation of complexes of crown-ether with surface amino groups of protein. Conventional methods of protein spectroscopy (IR and Raman spectroscopy) are not convenient in the study of the above interaction because of the strong amid I band in protein spectra. Thus model chemical systems are used to study protein interaction with crown-ether. Tris(hydroxymethyl)aminomethane (tris) ($(HOCH_2)_3C-NH_2$) can be used as such a model system.

In the diploma work, interaction between chymotrypsin and crown-ether, effect of complexes of crown-ether and surface amino groups on protein structure and functional activity are studied using methods of IR and terahertz spectroscopy with the aid of model systems consisting of tris and 18-crown-6. Effect of pH of the tris-crown complexes and molar concentrations of components on their interaction is also studied in this work.

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