## STUDY OF THE THERMODYNAMICS OF SORPTION OF VOLATILE ORGANIC COMPOUNDS IN "IONIC LIQUID-MACROCYCLE" SYSTEMS BY INVERSE GAS CHROMATOGRAPHY

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In gas chromatography, ionic liquids (ILs) are successfully used as stationary phases in capillary columns, mainly due to a number of properties such as high thermal stability, high melting temperatures, vapor pressure from low to negligible even at high temperatures, viscosity from moderate to high, as well as tunable selectivity. Recently, many papers have been published related to the combination of cyclodextrin and ILs. It has been recognized as a universal tool in analytical methods, for example, in separation studies, since the functional group of the ionic liquid is able to improve the efficiency of cyclodextrin extraction.

The aim of the work was to study the thermodynamics of sorption from the gas phase of organic compounds of different classes by fixed phases based on the ionic liquid 1-butyl-3-methylimidazolium bromide with macrocyclic addition, as well as to establish the possibility of the formation of "sorbate-macrocycle" complexes. *heptacys*(2,6-di-*O*-methyl)-β-cyclodextrin and β-cyclodextrin were used as macrocyclic additives.

The temperature dependences of the retention of different classes of waste by stationary phases were constructed and studied. It is shown that the introduction of a macrocyclic component into an ionic liquid can lead to a decrease or increase in retention, depending on both the nature of the organic matter and the structure of the macrocycle. Based on the experimental data obtained, the thermodynamic characteristics of sorption (changes in internal energy and entropy), as well as the activity coefficient at infinite dilution, were calculated. The Hansen solubility parameters were determined to evaluate the interactions of organic compounds in mixed "ionic liquid-macrocycle" systems. It was found that the contribution of various types of intermolecular interactions, estimated using Hansen solubility parameters, correlates with the enthalpy and energy characteristics of the sorption process.

It is proved that "ILs-macrocycle" systems exhibit structural and enantioselectivity under gas chromatography conditions.