

DESCRIPTION FOR THE GENERAL PUBLIC

The aim of this project is to obtain basic knowledge on the influence of composition of Deep Eutectic Solvents (DESs) on their basic physiochemical properties and on specific properties allowing its application as selective extractants and sorptive materials. Furthermore, a possibility of “tuning” their properties by specific additives will be also studied.

On the basis of research planned for this project a knowledge relating to several aspects of nature and properties of DESs will be obtained. It is assumed, that it will allow to select an optimal conditions for extraction or sorption processes of selected groups of compounds by DESs making these processes as alternative and more favorable comparing to classic solvents or sorptive materials.

A several number of components will be studied. For synthesizes DESs a number of standard and specific parameters will be determined. Extraction effectiveness and sorption properties will be studied using spectroscopic and chromatographic. The studied range of extraction conditions include hydrophobic DESs used for extraction from aqueous and polar organic matrix as well as hydrophilic DESs for extraction from non-polar and low polarity organic solvents. Different part of research will focus on extraction and sorption of gaseous compounds from the gas phase for selected most promising DESs. The studies will be performed for model compounds and their mixtures. A series of experiments in planned for real feedstocks for further evaluation of DESs properties.

The increasing demands for environmentally friendly processes which deal with the idea of green and sustainable chemistry, and the recognition of outstanding and advantageous properties of deep eutectic solvents (DES) have led, in the past years, to a growing interest in the use of these mixtures as alternatives to conventional organic solvents as well as ionic liquids (IL) in many fields or techniques. Still, DESs where not studied as materials, despite of their valuable properties, in some fields. This project should “fill the gap” providing developments relating to new types of DESs, description of their properties linked with their composition and finally present conditions of extraction and sorptive processes allowing the replacement of classic systems (based mainly on organic solvents or aqueous solutions of acids/bases and salts) by DES-based systems. This along with novel results about application of DES as sorptive materials should results in good basics for further research - in the future it can form a new branch of research in separation techniques.