



2024年中-东欧专家交流活动

2024 China–Eastern European Experts Cooperation and Exchange Activity

基础科学（化学）分论坛

Basic Science Sub-forum (Chemistry)

会议手册

Conference Handbook

化工与化学学院

School of Chemistry and Chemical Engineering

中国 哈尔滨 | 2024年5月17–20日

Harbin, China | 17–20 May, 2024

2024 China-Eastern European Expert Cooperation and Exchange Activity
Basic Science Sub-forum (Chemistry)

Date: May 19, 2024

Location: Multifunctional Hall 1, WandaVista Hotel

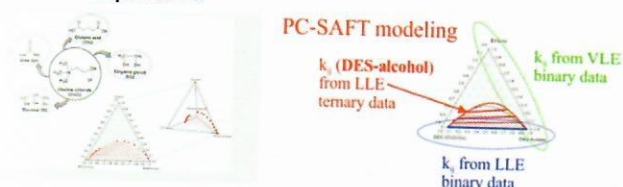
08:30 - 08:35		Welcome Address from Prof. Xiaojun Han		
08:35 - 11:15 Presentations				
Chair	Prof. Elena Alekseeva			
Time	Title	Lecturer	Organization	
08:35 - 08:55	Functional silicone materials	Regina Islamova (Professor)	St. Petersburg State University	
08:55 - 09:15	Phospholipid assembly based artificial cells and their collective behaviors	Xiaojun Han (Professor)	Harbin Institute of Technology	
09:15 - 09:35	The electrochemical performance of vanadium oxide-based cathodes for aqueous zinc-ion batteries	Veniamin Kondratiev (Professor)	St. Petersburg State University	
09:35 - 09:55	Design of catalytic materials for CO ₂ conversion to cyclic carbonate	Jianmin Sun (Professor)	Harbin Institute of Technology	
09:55 - 10:15	Coffee Break			
Chair	Prof. Regina Islamova			
Time	Title	Lecturer	Organization	
10:15 - 10:30	Cobalt environment boosts the oxygen reduction reaction activity of Co, N-doped carbon catalysts derived from polyacrylonitrile	Elena Alekseeva (Senior Researcher)	St. Petersburg State University	
10:30 - 10:45	Electrochemical properties of anode materials based on zinc ferrite for lithium-ion batteries	Svetlana Eliseeva (Researcher)	St. Petersburg State University	
10:45 - 11:00	Perovskite manganese oxide-based intelligent thermal control coatings for smart radiation devices in spacecraft	Xinzhi Wang (Associate Professor)	Harbin Institute of Technology	
11:00 - 11:15	Deep eutectic solvents based on choline chloride as promising extractants for separating alcohol-ester systems	Igor Prikhodko (Associate Professor)	St. Petersburg State University	
Lunch				

Igor Prikhodko

St. Petersburg State University

New experimental liquid-liquid equilibrium data in the systems containing DES based on choline chloride for separation alcohol + ester mixtures, elaboration of thermodynamic models (for instance, PC-SAFT) for description (prediction) of phase behavior in these systems. For more information see ORCID: 0000-0003-0789-3772, Scopus Author ID: 6508122109

Research Areas: Physical Chemistry, Applied Thermodynamics, Phase Equilibria



Deep eutectic solvents based on choline chloride as promising extractants for separating alcohol-ester systems

Abstract

One of new potentially environmentally friendly solvents is deep eutectic solvent (DES). DESs are an emerging class of mixtures consisting of a hydrogen bond donor (HBD) and a hydrogen bond acceptor (HBA), which exhibit significant depressions in melting points compared to those of the constituent components. DESs, are of particular interest to researchers around the world. DESs can be considered as representatives of 'green chemistry' solvents with many advantages including high biodegradability, low toxicity, high thermal and air stability, low volatility, nonflammability, biorenewability, and biocompatibility together with low cost and ease of preparation. They are applied in miscellaneous areas: reaction media, biomass and biodiesel processes, extraction and sorption technology, analytical chemistry, electrochemical and catalytic studies, nanotechnology [1-3].

DESs are considered as new generation of solvents for the separation of azeotropic mixtures, which is a crucial issue in chemical technology, in particular in the production of esters, as well as for purifying ester from alcohol in the esterification reaction. This way opens up the prospect of using DES for second-generation ester-based biofuels and new gasoline fuel additives.

This work focuses on the experimental study of liquid-liquid equilibria (tie-lines, binodal curves) in alcohol-ester systems with DES formed by choline chloride as HBA and various HBDs (dibasic carboxylic acids//urea/polyols). Separation performance of DESs used for the systems containing alcohols (ethanol, n-propanol, n-butanol) and esters (formates, acetates, propanoates) is characterized with distribution coefficients and values of selectivity to alcohol. Results of thermodynamic modeling for the systems under consideration are discussed.

[1] Hansen, B.B., et al. Deep Eutectic Solvents: A Review of Fundamentals and Applications. Chem. Rev. 2021, 121, 1232.

[2] Marcus, Y. Deep Eutectic Solvents; Springer International Publishing: Cham, 2019.

[3] Smith, E. L., et al. Deep Eutectic Solvents (DESs) and Their Applications. Chem. Rev. 2014, 114, 11060.

证书

Certificate

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Prikhodko Igor

邀请报告人
Invited Speaker

Title: Deep eutectic solvents based on choline
chloride as promising extractants for separating
alcohol-ester systems

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参会证明

Certificate of Attendance

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Prikhodko Igor

参会人员

Attendance



哈尔滨工业大学副校长

Vice President of Harbin Institute of Technology

