

APPLICATION OF DEEP EUTECTIC SOLVENTS FOR WATER TREATMENT

Dušan Rakić¹, Aleksandra Cvetanović Kljakić¹, Sanja Panić¹, Igor Antić¹, Jelena Živančev¹,
Nataša Đurišić Mladenović¹, Nenad Grba², Mirjana Petronijević^{1*}

¹ University of Novi Sad, Faculty of Technology Novi Sad, Bulevar cara Lazara 1, Novi Sad, Serbia

² University of Novi Sad, Faculty of Sciences, Trg Dositeja Obradovića 3, Novi Sad, Serbia,
mirjana.petronijevic@uns.ac.rs*

Abstract

To ensure safe drinking water and reduce the harmful impact of wastewater on the environment, pollutants are removed using various water treatment procedures such as oxidation, adsorption, filtration, and biological processes. However, conventional methods only partially remove pesticides, pharmaceuticals, and other organic micropollutants from water. Therefore, researchers focus on improving existing procedures or finding new purification methods. One promising alternative for better efficiency of water treatment is using deep eutectic solvents (DES), as new-generation solvents. The majority of DESs are composed of binary or ternary mixtures that include at least one hydrogen bond donor and one hydrogen bond acceptor. The application of DESs in the extraction of pollutants from water, which has already shown a high percentage of extraction efficiency in laboratory-scale processes, will increase rapidly with expansion to the industrial scale and the development of new, non-toxic hydrophobic DESs. The WaDES project of the Faculty of Technology Novi Sad aims to investigate the effectiveness of hydrophobic DESs in the process of treating drinking water and wastewater. Through several steps that include the preparation, characterization and selection of DESs and then the treatment of water with selected solvents and determination of their efficiency using modern analytical methods such as ultra-high performance liquid chromatography with mass detection (UHPLC-MS/MS) the obtained results will indicate whether and to what extent these solvents can be used for the removal of various emergent pollutants and thus pave the way for further research.

Keywords: Deep eutectic solvents, Extraction, Pollutants removal, Water treatment