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Natural Designer Solvents for Greening Analytical Chemistry

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Highlights

- NADES offer excellent skills as green solvents for their use at different steps of any analytical method
- NADES have the advantages of low vapour pressure, nonvolatility, low toxicity, non-flammability, good thermal stability, wide liquid range, good biodegradability and ability to be reutilized.
- The possible combinations of starting materials provides a powerful tool to achieve tailor made solvents
- Preparation, chemical structure, analytical applications as well as future perspectives are discussed

Abstract

Developing new green solvents is one of the key subjects in Green Chemistry. Ionic liquids and deep eutectic solvents were discovered as an option to replace organic solvents. However, ionic liquids and deep eutectic solvents (DES) have still some limitations to be applied to real chemical industry. In this sense, a new generation of designer solvents have emerged in the last decade as promising green media. When the compounds that constitute DES are primary metabolites, namely, aminoacids, organic acids, sugars, or choline derivatives, DES are called Natural Deep Eutectic Solvents (NADES). NADES fully represent green chemistry principles. These solvents offer many striking advantages including biodegradability, low toxicity, solute stabilization, sustainability, low costs and simple preparation. Thus, interesting applications in health-related areas can be proposed. This review presents an overview in order to up-to-date knowledge regarding NADES with special emphasis on their analytical applications and further perspectives as truly green solvents.

Keywords: natural deep eutectic solvents, green analytical chemistry, sample preparation, detection enhancement, green solvents