N°900 / PC
TOPIC(s) : Alternative solvents

Tunable Hydrophobic Deep Eutectic Solvents based on Terpenes

AUTHORS

Mónia A.R. MARTINS / CICECO, DEPARTAMENTO DE QUÍMICA, UNIVERSIDADE DE AVEIRO, EXTRAE-FEA, UNIVERSIDADE DE CAMPINAS, COMPLEXO DE LABORATÓRIOS TECNOLÓGICOS CAMPUS UNIVERSITÁRIO DE SANTIAGO, AVEIRO
Paula V.A. PONTES / EXTRAE-FEA, UNIVERSIDADE DE CAMPINAS, RUA MONTEIRO LOBATO, 80 - UNICAMP - BARÃO GERALDO, CAMPINAS
Guilherme J. MÁXIMO / EXTRAE-FEA, UNIVERSIDADE DE CAMPINAS, RUA MONTEIRO LOBATO, 80 - UNICAMP - BARÃO GERALDO, CAMPINAS
Eduardo A. C. BATISTA / EXTRAE-FEA, UNIVERSIDADE DE CAMPINAS, RUA MONTEIRO LOBATO, 80 - UNICAMP - BARÃO GERALDO, CAMPINAS
Simão P. PINHO / ASSOCIATE LABORATORY LSRE-LCM, INSTITUTO POLITÉCNICO DE BRAGANÇA, CAMPUS DE SANTA APOLÓNIA, BRAGANÇA
João A. P. COUTINHO / CICECO, DEPARTAMENTO DE QUÍMICA, UNIVERSIDADE DE AVEIRO, COMPLEXO DE LABORATÓRIOS TECNOLÓGICOS CAMPUS UNIVERSITÁRIO DE SANTIAGO, AVEIRO

PURPOSE OF THE ABSTRACT

Nowadays the modern chemistry is usually linked to the green concept and thus, demands for new eco-friendly solvents able to dissolve a large spectrum of solutes. The actual focus of researchers are supercritical fluids, ionic liquids (ILs) and eutectic solvents, namely deep eutectic solvents (DES). Due to their similar physicochemical properties DES have been presented as possible substituents of ILs, due to their cheap, quick and easy way of preparation.

DES have been mostly prepared through the combination of a salt or an ionic liquid with nontoxic and biodegradable compounds such as carboxylic acids, polyols, and sugars; being the majority hydrophilic. To the best of our knowledge, only a few works reported hydrophobic eutectic mixtures and, among them, the absence of phase diagrams is common, despite the important information they can provide on the range of compositions and temperatures for operating these systems. Moreover, a thermodynamic evaluation of the physical properties of these systems is rarely presented.

Due to their very low solubility in water, terpenes arise as candidates to prepare sustainable and cheap hydrophobic solvents. This vast class of natural organic compounds is constituent of essential oils and produced in large-scale in the chemical, pharmaceutical, cosmetics or food industries.

The main goal of this work is to prepare eutectic solvents composed by terpenes and monocarboxylic acids, and mixtures of terpenes. Phase diagrams of these mixture will be characterized and analyzed in the whole composition range, through differential scanning calorimetry (DSC). Moreover, some physico-chemical properties such as density, viscosity and water solubilities will be measured in order to understand their impact in these systems. Finally the eutectic composition solvent will be evaluated in biomolecules extraction performance.

FIGURES

FIGURE 1

FIGURE 2

KEYWORDS

BIBLIOGRAPHY