Towards sustainable membranes preparation using Deep eutectic solvents (DESs)

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Membrane technology meets most of the 17 Sustainable Development Objectives (SDGs). One of the recent trends is the sustainability related to membrane preparation. The aim of this work is to study and develop new highly sustainable polymeric membranes, using Natural deep eutectic solvents (NADES) and sulfobetaine-based DESs for water treatment application [1]. They are well known as environmentally friendly solvents for their properties such as low or absent toxicity, high recycle and reuse capability, chemical and thermal stability, and non-flammability. The membranes were produced via phase inversion. The thermodynamic aspects (i.e., solubility and polymer-solvent distance) and kinetic parameters were deeply investigated. The affinity with non-solvent (water or/and water-isopropanol) and the interaction with co-solvent (polarclean®, triethyl phosphite and dimethyl sulfoxide) on the morphology and performance of prepared membranes were also studied.