MAR17-2016-007306

Abstract for an Invited Paper
for the MAR17 Meeting of
the American Physical Society

Nanostructured membranes based on polysulfone homopolymers and copolymers.

SUZANA NUNES, King Abdullah University of Science and Technology

Polyethersulfone is one of the most successful polymers for membranes with applications varying from seawater desalination to hemodialysis. Their manufacture however is traditionally done by solution casting and phase inversion using solvents, which are now considered negative for the environment. We have been working on the membrane manufacture using ionic liquids as green solvent alternative. Polyethersulfone, and polyetherimide sulfone membranes, as flat-sheet and hollow fibers, were prepared from solutions in different ionic liquids (D. Kim et al. Green Chemistry 2016). Thermodynamic and rheological investigation were conducted to optimize the membrane morphology, leading to permeances of 20-65 Lm-2h-1bar-1 useful for instance for separations of peptides with molecular weight in the range of 800 to 3500 gmol-1. We also synthesized block copolymers with polysulfone segments and explored them for membrane preparation with low fouling, high porosity and narrow pore size distribution (Y. Xie et al. Polymer Chemistry). The self-assembly of the copolymer in solution, leading to the membrane formation was investigated by cryo electron microscopy, supported by modeling (dissipative particle dynamics).

In collaboration with: Dooli Kim, Yihui xie, Burhannudin Sutisna, King Abdullah University of Science and Technology