

High performance polyarylene ether porous membranes for environmental sensing and water purification

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Polymeric membranes have been intensively used in the advanced sensors and environmental remediation for their diverse molecular tailorability, flexible processability and cost-effectiveness. Especially, polyarylene ether sulfone (PES) porous membranes have been widely used as the substrate for fabrication of biomedical sensing, separation as well as seawater desalination membranes, but their wider application is still hindered by the notorious fouling derived from the chemical inertness and hydrophobicity of PES macromolecules. In order to improve the anti-fouling and lifetime of PES membranes, we have synthesized a series of polyarylene ether nitriles (PEN) via the nucleophilic substitution polycondensation used for synthesis of PES. Thanks to the intrinsic hydrophilicity, abundant pendent reactive groups as well as good molecular compatibility with conventional PES, the PEN can be integrated with PES via both chemical co-polymerization and physical blending, which leads to a range of advanced functional ultrafiltration and nanofiltration membranes. In this talk, I will share the recent research works of our group on the construction of high performance polyarylene ether membranes for oily-water purification, dye-salt separation as well as hazardous materials adsorption and detection.

Keywords: Polyarylene ethers, porous membranes, oil-water separation, desalination, nanofiltration, hazardous compounds sensing.

Biography



Kun Jia obtained Ph.D. degree in materials science from University of Technology of Troyes in France in 2013. He joined the University of Electronic Science and Technology of China (UESTC) in 2014 as an associated professor. Currently, Dr. Kun Jia is the full professor in chemistry at School of Materials and Energy of UESTC. His research interests lie in the field of super-engineering polymers synthesis, self-assembly of block copolymers, flexible optical bio/chemical sensors, advanced separation membranes. He has published over 160 articles in peer-reviewed publications, obtained 26 Chinese patents and 3 provincial scientific awards.