

## **Stability, Selectivity and Permeance – Where to for OSN?”**

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Membranes have had a huge impact in molecular separations in aqueous systems, especially desalination. It is generally accepted that 40-70% of capital and operating costs in chemical and pharmaceutical industries are dedicated to separations; and a substantial fraction of this cost is related to processing of organic liquids. Membrane technology has the potential to provide game changing alternatives to conventional concentration and purification technologies such as distillation, liquid extraction, adsorption and chromatography, through Organic Solvent Nanofiltration (OSN) [1]. The membranes must offer resistance to organic environments, and attractive selectivities and permeance; ideally they should also be resistant to physical aging under use.

This presentation will share research from Imperial College into new membrane materials for OSN and describe approaches that have been taken to enhance membrane stability, selectivity, and permeance in turn. In the context of potential organic process production platforms which utilise OSN, the relative merits of these three characteristics will be introduced. How can detailed mathematical analysis assist in guiding the direction research should follow to facilitate OSN becoming an accepted technology?

[1] Marchetti P, Jimenez-Solomon, MF, Szekely, G and Livingston AG “Molecular Separation with Organic Solvent Nanofiltration – A Critical Review” Chemical Reviews 114 (2014) 10735 – 10806