Nanoporous Graphene Membrane For Water Desalination

The Invention

- The membrane consists of an atomically thin layer of graphene with sub-nanometer pores that provide tunable selectivity.
- Leakage is prevented by patent-pending defect-sealing methods
- Graphene allows fast water transport, and exhibits high resistance to chlorine and chemicals compared to polymeric membranes.

Market Need

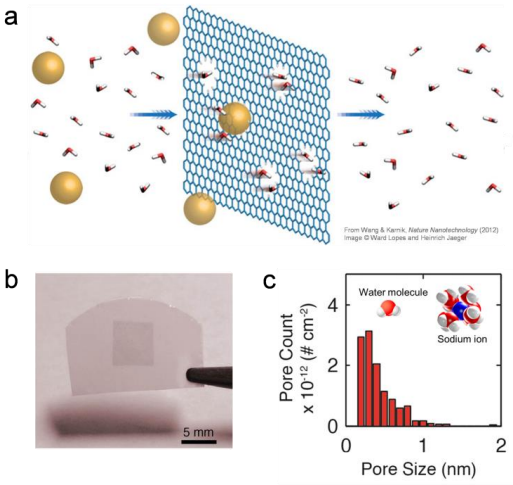
- High-flux, chemical/fouling resistant membranes are urgently needed to improve energy efficiency and control fouling in water desalination by reverse osmosis.
- Chemical processing industry is in need of solvent-resistant membranes to replace distillation with energy-efficient membrane separation.

Competitive Advantage

Graphene membranes have the potential to considerably improve water desalination by enabling energy-efficient reverse osmosis with smaller membrane area, improved control of fouling, and easier membrane cleaning compared to state-of-the-art polymeric membranes. Similarly, in chemical separations, graphene membranes have potential for universal solvent resistance with reproducible performance, opening new opportunities to use membranes where suitable membranes do not exist.

Looking for a Development Partner

Proof-of-concept of nanofiltration using membranes with pores that are less than 1 nanometer in size has been demonstrated in the laboratory.
We have set up a company and are looking for early-stage investment and partners to develop scalable fabrication methods and optimize the membranes for commercial use.



a) Schematic of filtration across hexagonal graphene membrane lattice with nanoscale pores. b) Membrane photograph. c) Measured pore size distribution compared to a water molecule and a sodium ion.

Patent Protection

The invention is covered by patent applications US13/835173, EP13762039.9, AU2017210547 and patents CN201380022427.5, IN8466/DELNP/2014, AU2013231930

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