

Highly concentrated brine treatment using membrane distillation and pervaporation techniques for zero discharge:

Developing surface modified porous membrane for membrane distillation and dense polyvinyl-alcohol (PVA) membrane for the treatment of highly concentrated brine solution towards zero discharge.



UNESCO Centre for Membrane Science & Technology is the leading centre for membrane development in Australia and has an extensive range of resources available within the group and across UNSW.



UNSW
Centre for
Transformational
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Technologies

CTET houses a wide range of state-of-art facilities, enabling the development of cutting-edge technologies and commercialisation.

More information

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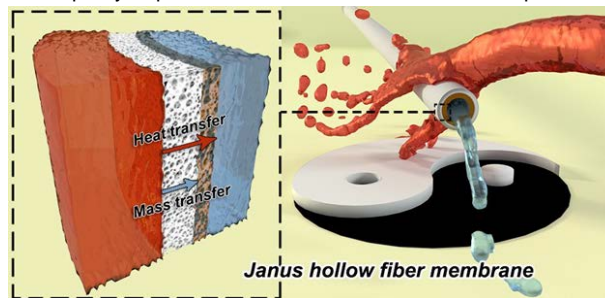
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Highly Concentrated Brine Treatment Using Membrane Distillation and Pervaporation Techniques for Zero Discharge

UNESCO Centre for Membrane Science & Technology,
School of Chemical Engineering, UNSW

Surface functionalization for membrane distillation

- Single-side modification by PDA/PEI for Janus membrane;
- Improved MD flux without compromising the salt rejection;
- High salt rejection (99.7%) for 10 g/L NaCl feed solution over long-term operation;
- Superhydrophobic membrane modification for complex brine treatment.



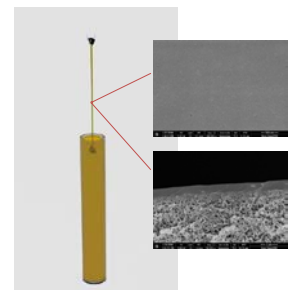
Operational optimization with crystallizer, transverse vibration and feed aeration

- Transverse vibration and feed aeration improve mass transfer;
- Crystallizer, vibration and aeration delay crystal formation on membrane;
- Suitable for the treatment of inland brine water and complex salty water.



Highly concentrated brine treatment by pervaporation

- Apply temperature difference across membrane to drive the dissolution-diffusion of water through the membrane;
- Scalable dip-coating technique to fabricate a thin PVA coating on PVDF support;
- Capable of highly concentrated brine desalination (200 g/L NaCl) with 100% salt rejection;
- Excellent anti-fouling property in the presence of humic acid.



Our experts

- **Dr. Chao Ji**, Manager, Operations, CTET

