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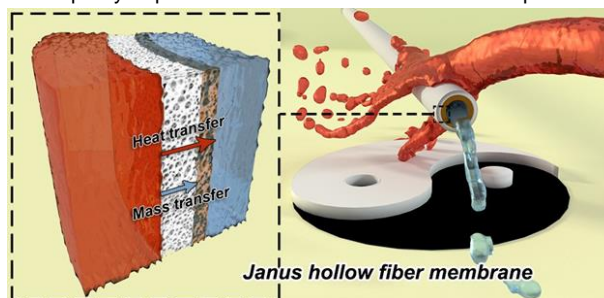
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Highly Concentrated Brine Treatment Using Membrane Distillation and Pervaporation Techniques for Zero Discharge

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.



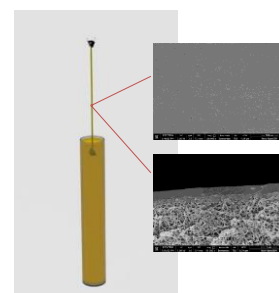
Operational optimization with crystallizer, transverse vibration and feed aeration

- 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



新南威尔士大学火炬创新园区
Torch Innovation Precinct at UNSW