

## Maximising flux in direct contact membrane distillation using nanofibre membranes

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### ABSTRACT

Electrospun PVDF nanofibre membranes were manufactured and tested on a direct-contact membrane distillation (DCMD) unit in an effort to maximise flux rate, which is generally low using standard MD membranes. In addition, membrane performance was compared with that of commonly available PTFE, PE and PES film membranes. Salt retention in all but one membrane was above 99 %. At high recirculation velocities, very thin nanofibre layers had up to 30 % higher flux rates than the best reference membranes, though it came at the cost of higher energy losses through conduction. Considering that DCMD is the least energy efficient configuration, nanofibre membranes show a promising future for MD applications with high flux rates. We suggest that new membranes be developed with specific target applications in mind, addressing specific module and operational conditions.

*Keywords:* Membrane distillation; Direct contact membrane distillation; DCMD; Nanofibres; Polyvinylidene fluoride; Flux enhancement

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