Claims

1. A hollow fiber membrane for vacuum membrane distillation, the hollow fiber membrane having a maximum tensile strength of ≥ 3.5 MPa and a liquid entry pressure (LEP) of ≥ 3.0 bar, wherein the hollow fiber membrane is a single layer hollow fiber membrane comprising a wall with a thickness of ≤ 150 µm and a cross-section comprising two open cell layers with an array of interconnected pores and a macrovoid layer between the two open cell layers, wherein the hollow fiber membrane is prepared from a dope composition comprising a hydrophobic polymer, an additive and a solvent, the additive comprising a Li^+-containing additive.

2. The hollow fiber membrane according to claim 1, wherein the hollow fiber membrane comprises an outer surface on its outer side and an inner surface on its inner side and facing its lumen, wherein the hollow fiber membrane has a continuous skin on its inner surface and on its outer surface, wherein pores are formed in the skin of the inner surface and in the skin of the outer surface.

3. The hollow fiber membrane according to claim 1, wherein the hollow fiber membrane has a porosity of ≥ 60%.

4. The hollow fiber membrane according to claim 1, wherein the hollow fiber membrane is hydrophobic.

5. The hollow fiber membrane according to claim 1, wherein the weight ratio of the hydrophobic polymer to the additive to the solvent is 12-16%:8-15%:69-80%.

6. The hollow fiber membrane according to claim 1, wherein the hydrophobic polymer is polyvinylidene fluoride (PVDF).

7. The hollow fiber membrane according to claim 1, wherein the additive is a non-solvent.

8. The hollow fiber membrane according to claim 7, wherein the non-solvent is selected from the group consisting of: ethylene glycol, polyethylene glycol, propanol, glycerol, water, lithium perchlorate, lithium chloride, and a combination thereof.

9. The hollow fiber membrane according to claim 1, wherein the solvent is selected from the group consisting of: N-methyl-2-pyrrolidone (NMP), dimethylacetamide (DMAC), dimethylformamide (DMF), dimethylsulfoxide (DMSO) and a combination thereof.

10. The hollow fiber membrane according to claim 1, wherein the thickness of the macrovoid layer is 1-60 μm.

11. The hollow fiber membrane according to claim 1, wherein the hollow fiber membrane has a substantially circular cross-section.

12. The hollow fiber membrane according to claim 1, wherein the hollow fiber membrane has a vacuum permeation flux of ≥ 8 kg/m^2 h at 60°C seawater feed.

13. The hollow fibre membrane according to claim 1, wherein the additive comprises at least two additives, and wherein one of the at least two additives is Li^+-containing additive.

14. The hollow fibre membrane according to claim 1, wherein the additive comprises lithium chloride and ethylene glycol.