CLAIMS

1. A forward osmosis membrane, wherein the membrane consists essentially of a porous support material and a polymer layer; the polymer layer comprises a skin layer and a sublayer; the skin layer comprises a plurality of pores; the sublayer comprises a plurality of macrovoids; the polymer layer is polyaniline and a dopant, wherein the dopant is an camphor sulfonic acid; and the thickness of the polymer layer is from 20 μm to 120 μm.

2. The membrane of claim 1, wherein the polyaniline is leucoemeraldine polyaniline, emeraldine polyaniline, or pernigraniline polyaniline.

3. The membrane of claim 1, wherein the molecular weight of the polyaniline is from about 30 kDa to about 100 kDa.

4. The membrane of claim 1, wherein the porous support material is a fabric.

5. The membrane of claim 1, wherein the water permeability of the membrane is greater than about 1.5×10^{-12} m/sPa.

6. The membrane of claim 1, wherein the salt passage of the membrane is less than about 16 μg/s.

7. The membrane of claim 1, wherein the pure water equilibrium contact angle of the membrane is less than about 90°.

8. A method of forming the membrane of claim 1, comprising:

a. coating a first composition comprising polyaniline and a polyaniline solvent onto a porous support material; and

b. contacting the porous support material coated with the first composition with a polyaniline nonsolvent, thereby forming the membrane.

9. The method of claim 8, wherein the polyaniline solvent is selected from N-methyl-2-pyrrolidone and 4-methylpiperidine, and mixtures thereof.

10. The method of claim 8, wherein the concentration of polyaniline in the polyaniline solvent is from about 6 wt % to about 18 wt %.

11. The method of claim 8, wherein the polyaniline is leucoemeraldine polyaniline, emeraldine polyaniline, or pernigraniline polyaniline.

12. The method of claim 8, wherein the molecular weight of the polyaniline is from about 30 kDa to about 100 kDa.

13. The method of claim 8, wherein the porous support material is a fabric.

14. The method of claim 8, wherein the polyaniline nonsolvent is water.

15. A forward osmosis method comprising passing a liquid composition through the membrane of claim 1, wherein the liquid composition comprises a solute and a solvent; and the membrane is substantially impermeably to the solute.

16. The method of claim 15, wherein the liquid composition is salt water.

17. The method of claim 15, wherein the liquid composition is brackish water.

18. The method of claim 15, wherein the solute is a pathogen or a toxin.

19. A forward osmosis membrane, wherein the membrane consists essentially of a porous support material and a polymer layer; the polymer layer is polyaniline and a dopant, wherein the dopant is an camphor sulfonic acid; the thickness of the polymer layer is from 20 μm to about 120 μm, and wherein the membrane is prepared by:

a) coating a first composition comprising polyaniline and a polyaniniline solvent onto a porous support material; and

b) contacting the porous support material coated with the first composition with a polyaniline nonsolvent thereby forming the membrane, wherein the concentration of polyaniline in the polyaniline solvent is from 6 wt % to 18 wt %.

20. The membrane of claim 19, wherein the polyaniline is leucoemeraldine polyaniline, emeraldine polyaniline, or pernigraniline polyaniline.

21. The membrane of claim 19, wherein the molecular weight of the polyaniline is from about 30 kDa to about 100 kDa.

22. The membrane of claim 19, wherein the porous support material is a fabric.

23. The membrane of claim 19, wherein the water permeability of the membrane is greater than about 1.5×10^{-12} m/sPa.

24. The membrane of claim 19, wherein the salt passage of the membrane is less than about 16 µg/s.

25. The membrane of claim 19, wherein the pure water equilibrium contact angle of the membrane is less than about 90°.