CLAIMS

1. A method of preparing a filtration membrane, the method comprising:

providing a copolymer solution by dissolving a statistical copolymer in a mixture of a co-solvent and a first organic solvent, wherein the co-solvent is ethyl ammonium nitrate; and the first organic solvent differs from the co-solvent;

coating the copolymer solution onto a porous support layer to form a polymeric layer thereon,

coagulating the polymeric layer on top of the porous support layer to afford a thin film composite membrane, and

immersing the thin film composite membrane into a water bath to obtain a filtration membrane, wherein

the copolymer solution contains the statistical copolymer at 1 to 99 w/v%, the co-solvent at 5 to 49 v/v%, and the first organic solvent at 51 to 95 v/v%;

the statistical copolymer is poly((trifluoroethyl methacrylate)-*r*-(sulfobetaine methacrylate)); and

the co-solvent is miscible with both water and the first organic solvent.

2. The method of claim 1, wherein the copolymer solution contains the statistical copolymer at 1 to 50 w/v%.

3. The method of claim 1, wherein the copolymer solution contains the statistical copolymer at 3 to 30 w/v%.

4. The method of any one of claims 1-3, wherein the first organic solvent is selected from the group consisting of trifluoroethanol, dimethyl sulfoxide, formamide, dimethyl formamide, hexafluoro isopropanol, N-methyl-2-pyrrolidone, pyridine, dioxane, toluene, chloroform, benzene, carbon tetrachloride, chlorobenzene, 1,1,2-trichloroethane, dichloromethane, ethylene dichloride, xylene, tetrahydrofuran, methanol, and ethanol.

5. The method of claim 4, wherein the first organic solvent is trifluoroethanol.

6. The method of any one of claims 1-5, wherein the coagulating step is performed via air drying the polymeric layer for 60 minutes or less or immersing the polymeric layer together with the porous support layer into a non-solvent bath for 60 minutes or less.

7. The method of claim 6, wherein the coagulating step is performed via air drying the polymeric layer for 60 minutes or less.

8. The method of claim 6, wherein the coagulating step is performed via immersing the polymeric layer together with the porous support layer into a non-solvent bath for 60 minutes or less.

9. The method of claim 8, wherein the non-solvent is methanol, ethanol, isopropanol, butanol, acetone, water, or a combination thereof.

10. The method of any one of claims 1-9, wherein the porous support layer has an effective pore size larger than that of the polymeric layer and is formed of polyethersulfone, polyphenylenesulfone, polyphenylenesulfidesulfone, polyacrylonitrile, cellulose ester, polyphenyleneoxide, polypropylene, polyvinyledenefluoride, polyvinylchloride, polyarylsulfone, polyphenylene sulfone, polyetheretherketone, polysulfone, polyamide, polyimide, or a combination thereof.

11. The method of any one of claims 1-10, wherein the porous support layer is a flat sheet membrane or a hollow fiber membrane.

12. The method of any one of claims 1-11, further comprising an annealing step after the immersing step, wherein the filtration membrane thus obtained is annealed in a water bath at 50 ^{o}C or higher.

13. A filtration membrane prepared by the method of any one of claims 1-12, wherein the membrane has an effective pore size of 0.5 to 5 nm and a water permeance of 10 $Lm^{-2}h^{-1}bar^{-1}$ or higher.

14. A process of filtering a liquid, the process comprising:

providing a filtration membrane of claim 13 that has a support layer and a polymeric selective layer;

directing a liquid through the filtration membrane, first through the polymeric selective layer and then through the support layer; and

collecting the liquid that permeates through the filtration membrane.