

CLAIMS:

1. A method for the production of a poly(vinylidene fluoride-co-hexafluoropropylene) (PVDF-HFP) asymmetric hollow fiber membrane comprising:

a) preparing a dope solution comprising PVDF-HFP, an additive, and a solvent, the PVDF-HFP and the additive having been dissolved in the solvent; and

e_b) spinning the dope solution to form the PVDF-HFP asymmetric hollow fiber membrane, wherein the step of spinning is carried out using a hollow fiber spinning line with a spinneret, the hollow fiber spinning line has an air gap of about 0.2 to 40cm, additive is lithium chloride, and the concentration of lithium chloride in the dope solution ranges from about 0.1 to 15 weight %.

~~2. A method for the production of a PVDF-HFP asymmetric hollow fiber membrane as defined in claim 1 wherein the additive is a water soluble or water miscible compound.~~

~~3. A method for the production of a PVDF-HFP asymmetric hollow fiber membrane as defined in claim 1 wherein the additive is a low molecular weight salt.~~

~~4. A method for the production of a PVDF-HFP asymmetric hollow fiber membrane as defined in claim 1 wherein the additive is an ionic chloride.~~

~~5. A method for the production of a PVDF-HFP asymmetric hollow fiber membrane as defined in claim 4 wherein the additive is lithium chloride.~~

~~6. A method for the production of a PVDF-HFP asymmetric hollow fiber membrane as defined in claim 1 wherein the additive is a weak non-solvent.~~

~~7. A method for the production of a PVDF-HFP asymmetric hollow fiber membrane as defined in claim 6 wherein the additive is a sugar alcohol.~~

~~8. A method for the production of a PVDF-HFP asymmetric hollow fiber membrane as defined in claim 7 wherein the additive is glycerol.~~

~~9-2.~~ 9-2. A method for the production of a PVDF-HFP asymmetric hollow fiber membrane as defined in claim 1 wherein the concentration of PVDF-HFP in the dope solution ranges from about 13 to 30 weight %.

~~10-3.~~ 10-3. A method for the production of a PVDF-HFP asymmetric hollow fiber membrane as defined in claim ~~9-2~~ 9-2 wherein the concentration of PVDF-HFP in the dope solution ranges from about 15 to 20 weight %.

~~11.~~ A method for the production of a PVDF-HFP asymmetric hollow fiber membrane as defined in claim 5 wherein the concentration of lithium chloride in the dope solution ranges from about 0.1 to 15 weight %.

~~12.~~ A method for the production of a PVDF-HFP asymmetric hollow fiber membrane as defined in claim 8 wherein the concentration of glycerol in the dope solution ranges from about 0.1 to 20 weight %.

~~13-4.~~ 13-4. A method for the production of a PVDF-HFP asymmetric hollow fiber membrane as defined in claim 1 wherein the dope solution is formed by dissolving PVDF-HFP in a dipolar aprotic solvent.

~~14-5.~~ 14-5. A method for the production of a PVDF-HFP asymmetric hollow fiber membrane as defined in claim ~~13-4~~ 13-4 wherein the dope solution is formed by dissolving PVDF-HFP in N-Methyl-2-pyrrolidone (NMP).

~~15-6.~~ 15-6. A method for the production of a PVDF-HFP asymmetric hollow fiber membrane as defined in claim ~~5-1~~ 5-1 wherein the dope solution comprises PVDF-HFP and lithium chloride dissolved in NMP.

~~16-7.~~ 16-7. A method for the production of a PVDF-HFP asymmetric hollow fiber membrane as defined in claim ~~15-6~~ 15-6 wherein the dope solution comprises 15 weight % PVDF-HFP and 4 weight % lithium chloride dissolved in NMP.

~~17. A method for the production of a PVDF-HFP asymmetric hollow fiber membrane as defined in claim 8 wherein the dope solution comprises PVDF-HFP and glycerol dissolved in NMP.~~

~~18. A method for the production of a PVDF-HFP asymmetric hollow fiber membrane as defined in claim 17 wherein the dope solution comprises 15 weight % PVDF-HFP and 10 weight % glycerol dissolved in NMP.~~

~~19.8.~~ A method for the production of a PVDF-HFP asymmetric hollow fiber membrane as defined in claim 1 wherein the step of spinning the dope solution comprises the step of fabrication of the membrane.

~~20.9.~~ A method for the production of a PVDF-HFP asymmetric hollow fiber membrane as defined in claim 1 wherein the step of spinning is carried out using a hollow fiber spinning line with a spinneret having a temperature of about 20 °C to 60 °C.

~~21.10.~~ A method for the production of a PVDF-HFP asymmetric hollow fiber membrane as defined in claim 1 wherein the step of spinning is carried out by one or both of wet or dry-jet spinning processes.

11. A method for the production of a PVDF-HFP asymmetric hollow fiber membrane as defined in claim 9 wherein the hollow fiber spinning line has an air gap of about 0.2 to 40 cm.

~~22. A poly(vinylidene fluoride-co-hexafluoropropylene) (PVDF-HFP) asymmetric hollow fiber membrane prepared according to the method of the invention as defined in any one or more of the preceding claims.~~

~~23. A poly(vinylidene fluoride-co-hexafluoropropylene) (PVDF-HFP) asymmetric hollow fiber membrane as defined in claim 22 wherein each hollow fiber has an outer diameter of from about 500 μm to 3000 μm.~~

~~24. A poly(vinylidene fluoride-co-hexafluoropropylene) (PVDF-HFP) asymmetric hollow fiber membrane as defined in claim 23 wherein each hollow fiber has an outer diameter of from 800 μm to 1200 μm.~~

25. ~~A poly(vinylidene fluoride-co-hexafluoropropylene) (PVDF-HFP) asymmetric hollow fiber membrane as defined in claim 22 wherein each hollow fiber has an inner diameter of from about 300 μm to 1000 μm .~~

26. ~~A poly(vinylidene fluoride-co-hexafluoropropylene) (PVDF-HFP) asymmetric hollow fiber membrane as defined in claim 25 wherein each hollow fiber has an inner diameter of from 400 μm to 700 μm .~~

27. ~~A poly(vinylidene fluoride-co-hexafluoropropylene) (PVDF-HFP) asymmetric hollow fiber membrane as defined in claim 22 wherein the cross section of each of the hollow fibers of the poly(vinylidene fluoride-co-hexafluoropropylene) (PVDF-HFP) asymmetric hollow fiber membrane is substantially circular.~~

28. ~~A poly(vinylidene fluoride-co-hexafluoropropylene) (PVDF-HFP) asymmetric hollow fiber membrane as defined in claim 22 wherein the cross section of each of the hollow fibers of the poly(vinylidene fluoride-co-hexafluoropropylene) (PVDF-HFP) asymmetric hollow fiber membrane is substantially square, rectangular or hexagonal.~~