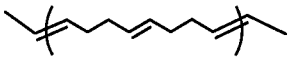
CLAIMS:

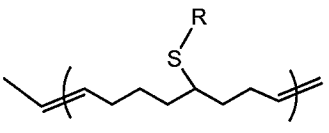
1. A composite hydrophilic porous membrane comprising a porous fluoropolymer support and a coating comprising a crosslinked polymer network, wherein the composite hydrophilic membrane is produced by coating the porous fluoropolymer support with a coating composition comprising a solvent, a crosslinking agent, a photoinitiator, and a telechelic polymer comprising a backbone made of polymerized 1,5-cyclooctadiene repeat units, wherein at least one of said repeat units comprises a pendant hydrophilic group attached thereto and at least another one of said repeat units comprises a pendant fluorinated hydrophobic group attached thereto, and crosslinking *in situ* the resulting coating.

2. The composite hydrophilic porous membrane of claim 1, wherein the telechelic polymer comprises hydrophobic and/or hydrophilic terminal end groups.

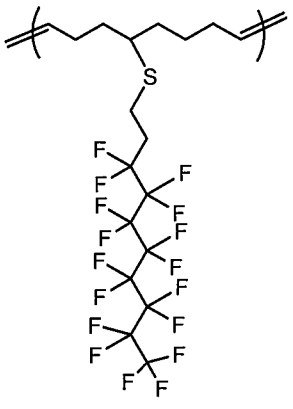
3. The composite hydrophilic porous membrane of claim 1, wherein the telechelic polymer comprises repeat units B and C, and optionally one or more repeat units A, wherein the repeat units A-C are of the formulae:



(A),



(B),



(C),

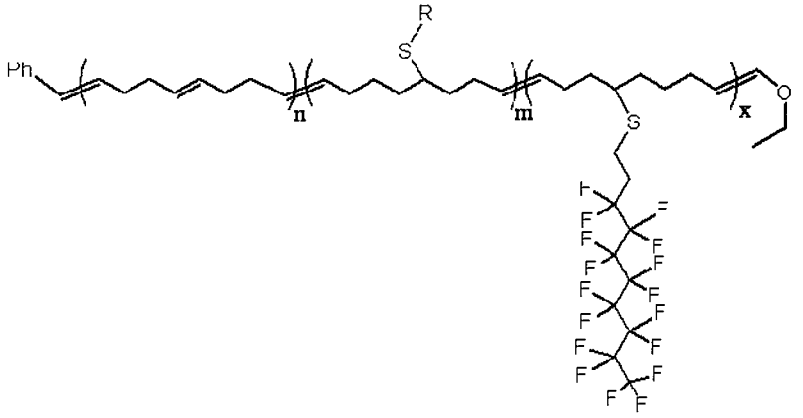
wherein R is a hydrophilic group.

4. The composite hydrophilic porous membrane of claim 3, wherein R is selected from carboxy alkyl, sulfonic alkyl, and hydroxyalkyl groups.

5. The composite hydrophilic porous membrane of any one of claims 1-3, wherein the telechelic polymer comprises repeat units A, B, and C.

6. The composite hydrophilic porous membrane of claim 2, wherein the telechelic polymer has hydrophobic terminal end groups.

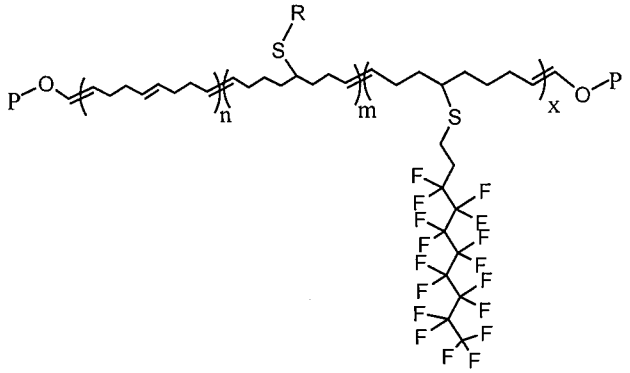
7. The composite hydrophilic porous membrane of any one of claims 1-6, wherein the telechelic polymer is of the formula:



wherein x and m are individually up to 35 mole% of n+m+x, wherein n+m+x = from 10 to 1000, and n and m are individually from about 10 to about 1000, and R is a hydrophilic group.

8. The composite hydrophilic porous membrane of any one of claims 1-5, wherein the telechelic polymer comprises hydrophilic terminal end groups.

9. The composite hydrophilic porous membrane of claim 8, wherein the telechelic polymer has the following formula:

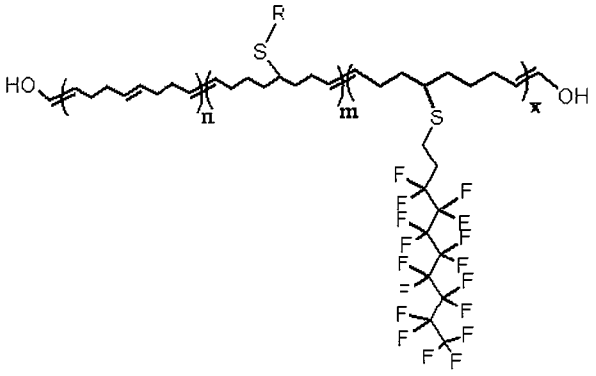


wherein P is a group capable of initiating polymerization, x and m are individually up to 35 mole% of n+m+x, and wherein n+m+x = from 10 to 1000.

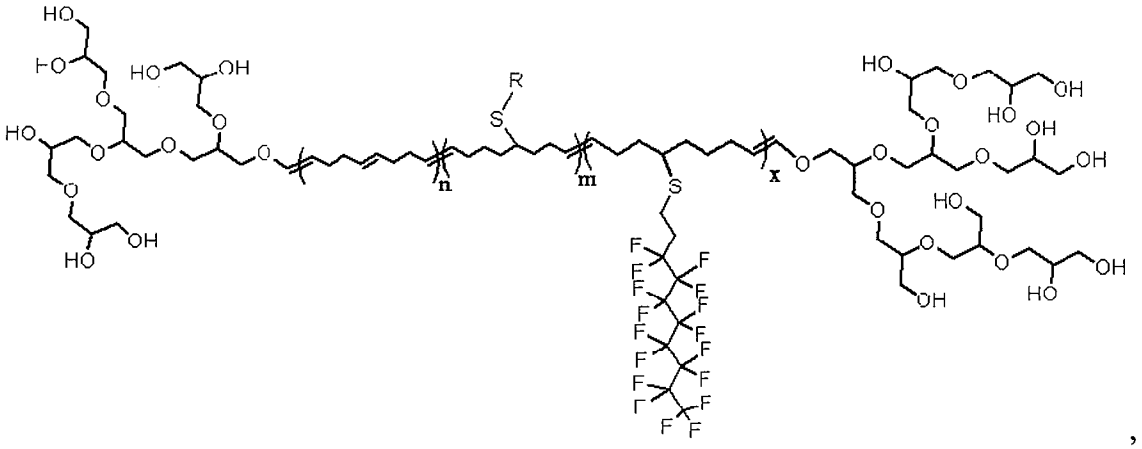
10. The composite hydrophilic porous membrane of claim 9, wherein R is selected from carboxy alkyl, sulfonic alkyl, and hydroxyalkyl groups.

11. The composite hydrophilic porous membrane of any one of claims 1-10, wherein the crosslinking agent is a bithiol or a multithiol.

12. The composite hydrophilic porous membrane of any one of claims 9-11, wherein the telechelic polymer is of the formula:



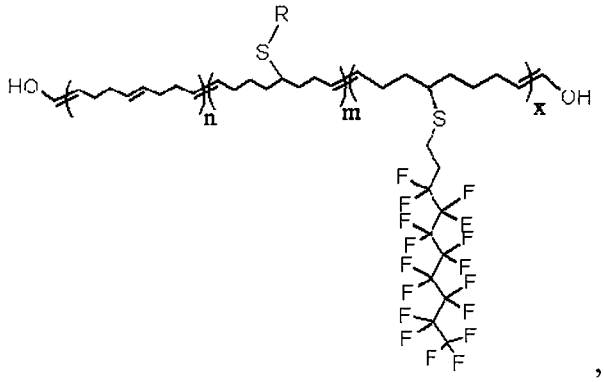
or



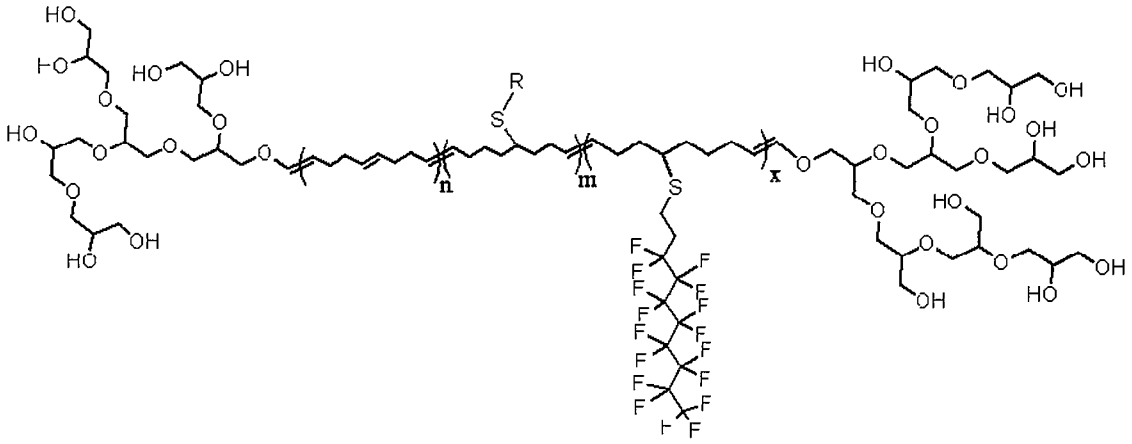
,

wherein x and m are individually up to 35 mole% of n+m+x, and wherein n+m+x = from 10 to 1000.

13. The composite hydrophilic porous membrane of any one of claims 1-12, wherein the photoinitiator is selected from camphor quinone, benzophenone, benzophenone derivatives, acetophenone, acetophenone derivatives, phosphine oxides and derivatives, benzoin alkyl ethers, benzil ketals, phenylglyoxalic esters and derivatives thereof, dimeric



, or



wherein P is a group capable of initiating polymerization and R is a hydrophilic group; x and m are individually up to 35 mole% of n+m+x, and wherein n+m+x = from 10 to 1000;

(iii) drying the coated fluoropolymer support from (ii) to remove at least some of the solvent from the coating; and

(iv) crosslinking the telechelic polymer present in the coating.

17. A method of filtering a fluid, the method comprising passing the fluid through the composite hydrophilic porous membrane of any one of claims 1-15.