CLAIM(S):

1. A porous membrane comprising a block copolymer of the formula: A-B-A (I) or A-B (II), wherein block A is:

(i) a copolymer of glycidol and allyl glycidyl ether, the copolymer having one or more allyl groups; or

(ii) a copolymer of glycidol and allyl glycidyl ether, wherein one or more of the allyl groups of the copolymer have been replaced with 1,2-dihydroxypropyl group or a group of the formula: $-(CH_2)_a-S-(CH_2)_b-X$, wherein a is 3 and b is 1 to 3, and X is selected from an acidic group, a basic group, a cation, an anion, a zwitterion, halo, hydroxyl, acyl, acyloxy, alkylthio, alkoxy, aldehydo, amido, carbamoyl, ureido, cyano, nitro, epoxy, a group of the formula $-C(H)(COOH)(NH_2)$, and a group of the formula -C(H)(COOH)(NHAc), or a salt thereof; and

block B is an aromatic hydrophobic polymeric segment selected from polysulfone, polyethersulfone, polyphenylene ether, polyphenylene oxide, polycarbonate, poly(phthalazinone ether sulfone ketone), polyether ketone, polyether ether ketone, polyether ketone ketone, polyimide, polyetherimide, and polyamide-imide.

2. The porous membrane of claim 1, wherein block A is (i) a copolymer of glycidol and allyl glycidyl ether, the copolymer having one or more allyl groups.

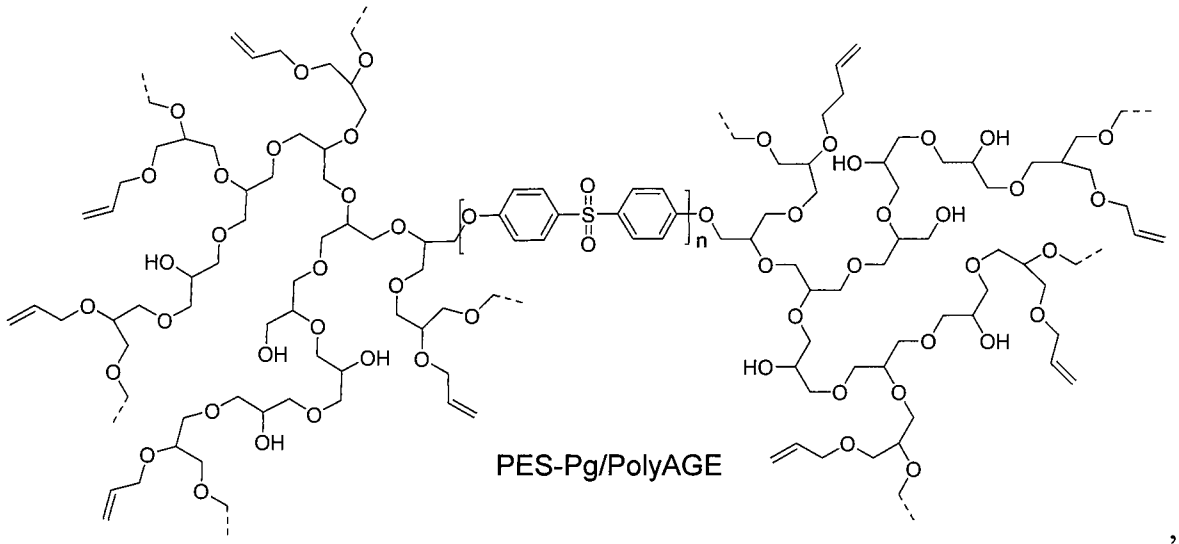
3. The porous membrane of claim 1, wherein block A is (ii) a copolymer of glycidol and allyl glycidyl ether, wherein one or more of the allyl groups of the copolymer have been replaced with 1,2-dihydroxypropyl group or a group of the formula: $-(CH_2)_a-S-(CH_2)_b-X$, wherein a is 3 and b is 1 to 3, and X is selected from an acidic group, a basic group, a cation, an anion, a zwitterion, halo, hydroxyl, acyl, acyloxy, alkylthio, alkoxy, aldehydo, amido, carbamoyl, ureido, cyano, nitro, epoxy, a group of the formula $-C(H)(COOH)(NH_2)$, and a group of the formula -C(H)(COOH)(NHAc), or a salt thereof.

4. The porous membrane of claim 1 or 3, wherein, as X, the acidic group is sulfonic acid or carboxylic acid, the basic group is an amino group, an alkylamino group, or a dialkylamino group, the cation is a quaternary ammonium group, and the zwitterion is a quaternary ammonium alkyl sulfonate group of the formula $-N^+(R^1R^2)(CH_2)_cSO_3^-$, wherein R^1 and R^2 are alkyl groups and c is 1 to 3.

5. The porous membrane of claim 1, wherein the aromatic hydrophobic polymeric segment comprises polyethersulfone.

6. The porous membrane of any one of claims 1-5, wherein block A is a branched copolymer.

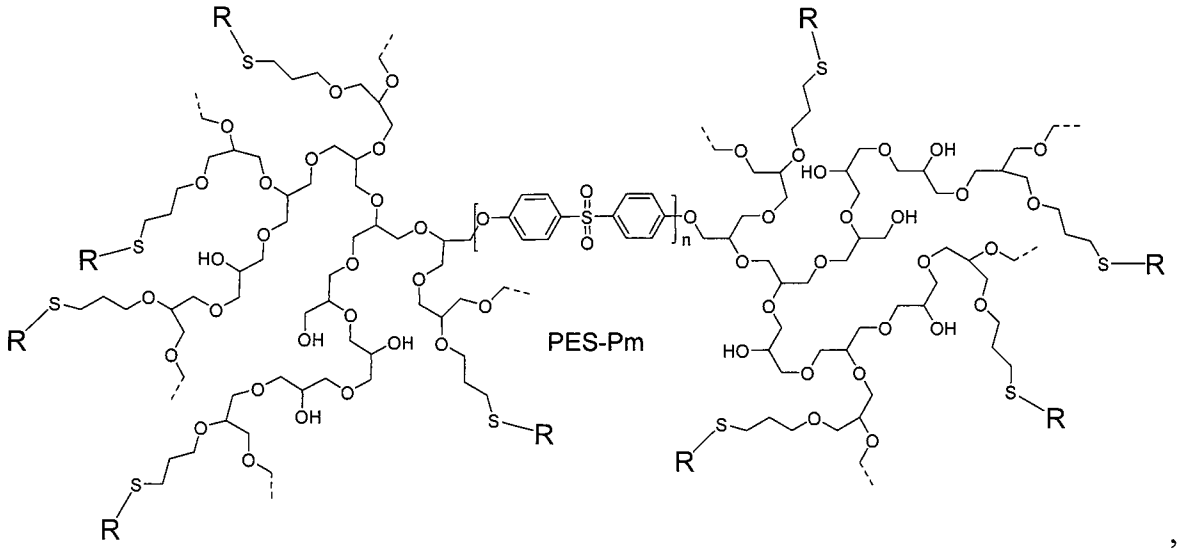
7. The porous membrane of claim 5 or 6, which has the following structure:



,

wherein n is about 10 to about 1000.

8. The porous membrane of claim 5 or 7, which has the following structure:



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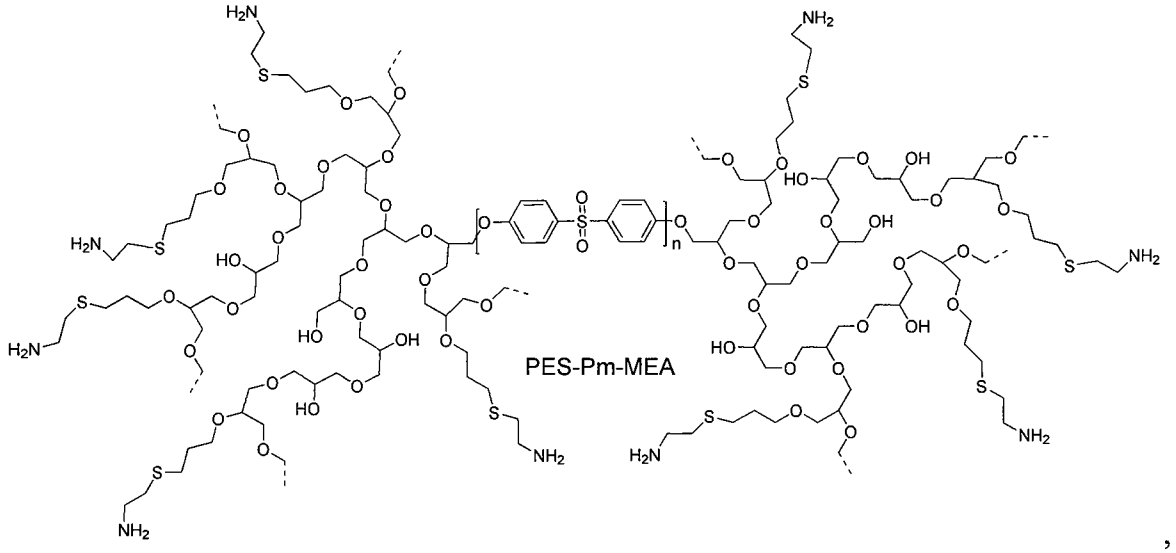
wherein R is allyl or $-(CH_2)_b-X$ wherein b is 1 to 3 and n is about 10 to about 1000.

9. The porous membrane of claim 8, wherein R is $-(CH_2)_b-X$.

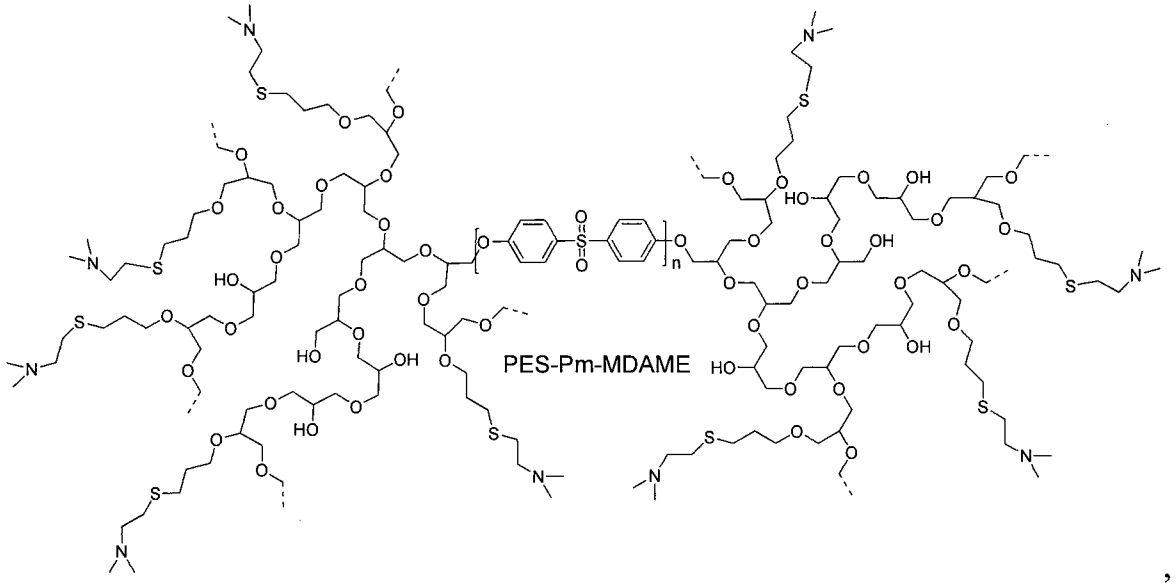
10. The porous membrane of claim 8 or 9, wherein X is selected from amino, dimethylamino, $-CH_2CH_2SO_3H$, $-CH_2CH_2CH_2SO_3H$, $-CH_2CO_2H$, and $-CH_2CH_2N^+(CH_3)_3$, and combinations thereof.

11. The porous membrane of any one of claims 1-10, wherein block A is present in an amount of about 20% to about 50 mol% and block B is present in an amount of about 50% to about 80 mol%.

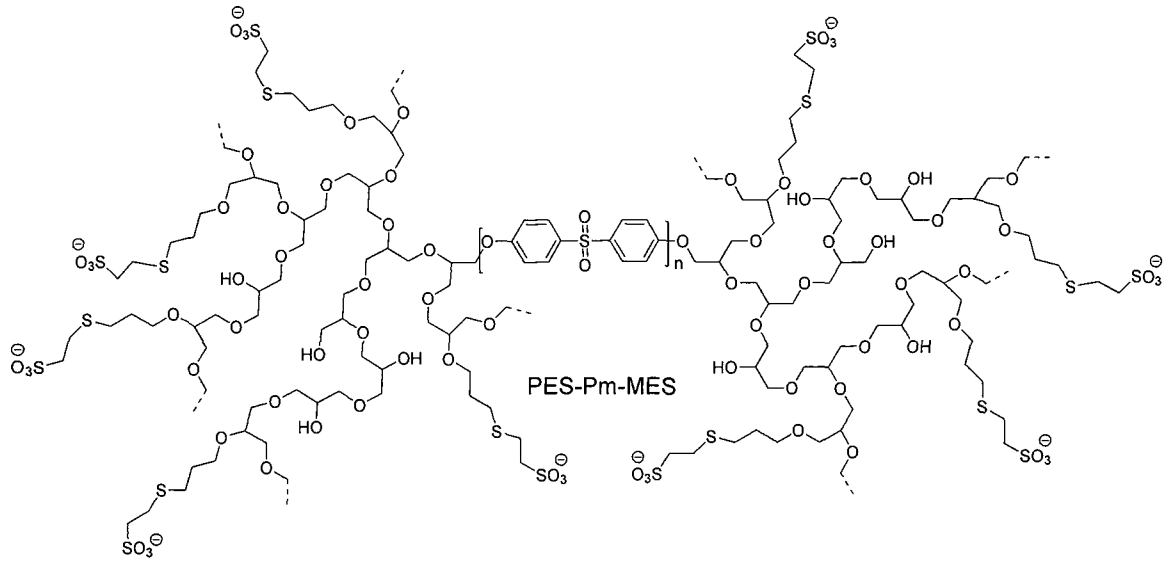
12. The porous membrane of any one of claims 1 and 3-11, which has one of the following structures:



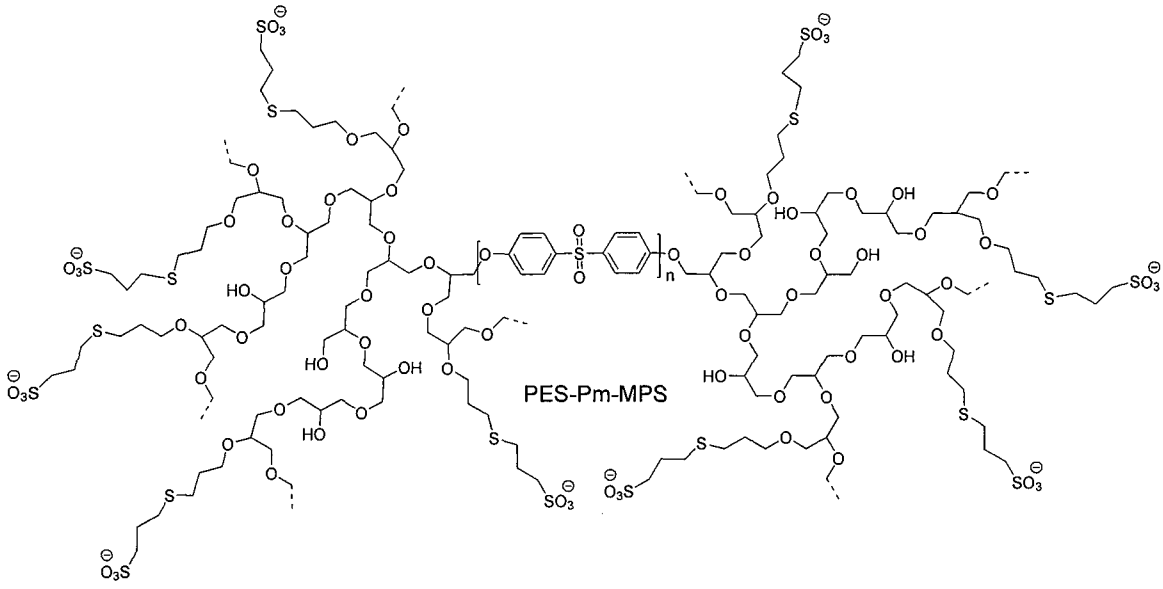
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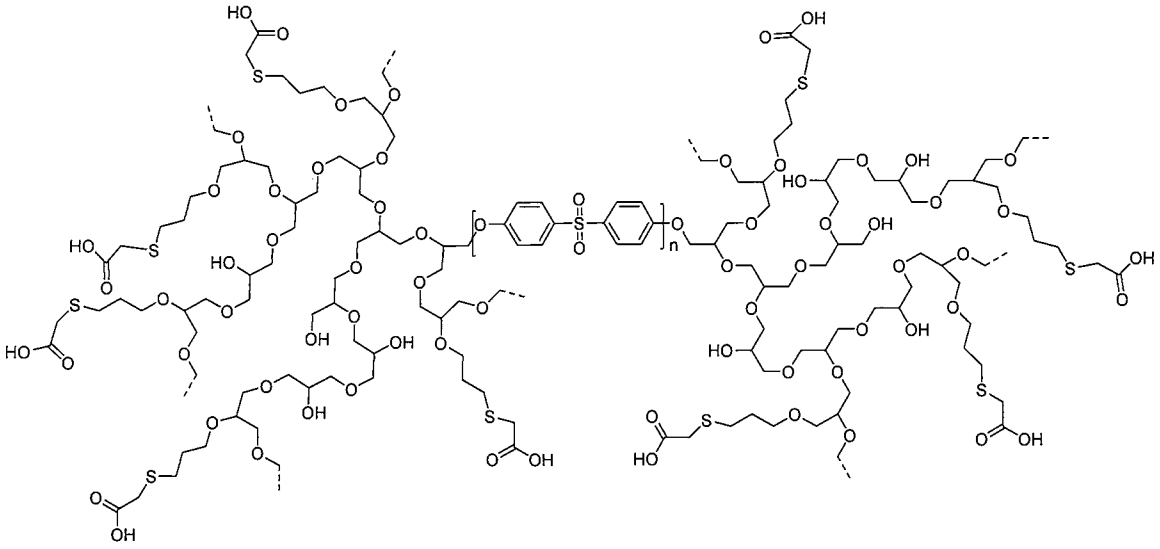
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PES-Pm-MES

,


PES-Pm-MPS

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wherein n is about 10 to about 1000.

13. A method of preparing a porous membrane according to any one of claims 1-12, comprising:

(i) providing a polymer solution comprising a solvent, said aromatic hydrophobic polymer, and said block copolymer;

(ii) casting the polymer solution as a thin film;

(iii) subjecting the thin film to phase inversion to obtain a porous membrane; and optionally

(iv) washing the porous membrane.

14. The method of claim 13, wherein the polymer solution contains N,N-dimethylformamide, N-methylpyrrolidone, or a mixture thereof, as the solvent.

15. The method of claim 13 or 14, wherein the polymer solution further contains a nonsolvent and/or a pore former.

16. The method of claim 15, wherein the nonsolvent is water.

17. The method of claim 15 or 16, wherein the pore former is polyethylene glycol, glycerin, or a mixture thereof.

18. The method of any one of claims 13-17, wherein said aromatic hydrophobic polymer and the copolymer are present in a mass ratio of from about 20% to about 80% to about 80% to about 20%.