CLAIMS

1. A grafted, asymmetric, porous, ultra high molecular weight polyethylene membrane having a bubble point between 540 kPa and 1100 kPa when determined by an ethoxy-nonafluorobutane bubble point test, the membrane having one or more neutral groups or ion exchange groups grafted to one or more surfaces of the membrane;

wherein the membrane has a water flow rate that is at least 50% of the water flow rate of an ungrafted, asymmetric, porous ultra high molecular weight polyethylene membrane having a bubble point between 540 kPa and 1100 kPa when determined by an ethoxy-nonafluorobutane bubble point test, the ungrafted membrane being an ungrafted counterpart of the grafted, asymmetric, porous, ultra high molecular weight polyethylene membrane; and

wherein the membrane wets in water, as indicated by the membrane turning translucent, in 10 seconds or less.

2. The membrane of Claim 1, wherein the ion exchange groups are derived from one or more of (3-acrylamidopropyl)trimethylammonium chloride, (vinyl benzyl)trimethylammonium chloride, and combinations thereof.

3. The membrane of Claim 1, wherein the ion exchange groups are derived from one or more of acrylic acid, vinyl sulfonic acid, and combinations thereof.

4. The membrane of Claim 1, wherein the grafted, asymmetric, porous, ultra high molecular weight polyethylene membrane wets in water in 5 seconds or less.

5. The membrane of Claim 1, wherein the grafted, asymmetric, porous, ultra high molecular weight polyethylene membrane wets with a liquid having a surface tension between 47 dyne/cm and 69 dyne/cm.

6. The membrane of Claim 1, wherein the grafted, asymmetric, porous, ultra high molecular weight polyethylene membrane wets with a liquid having a surface tension between 47 dyne/cm and 59 dyne/cm.

7. The membrane of Claim 1, wherein the grafted, asymmetric, porous, ultra high molecular weight polyethylene membrane wets with a liquid having a surface tension that is between 60% to 75% higher than the surface tension of an ungrafted, asymmetric, porous ultra high molecular weight polyethylene membrane having a bubble point between 540 kPa and 1100 kPa when determined by an ethoxy-nonafluorobutane bubble point test.

8. The membrane of Claim 1, wherein the neutral groups are derived from one or more of N-(hydroxymethyl)acrylamide, 2-hydroxyethylacrylate, and combinations thereof.

9. The membrane of Claim 1, wherein the ion exchange groups are derived from a cationic monomer selected from the group consisting of 2-(dimethylamino)ethyl hydrochloride acrylate, [2-(acryloyloxy)ethyl]trimethylammonium chloride, 2-aminoethyl methacrylate hydrochloride, N-(3-aminopropyl) methacrylate hydrochloride, 2-(dimethylamino)ethyl methacrylate hydrochloride, [3-(methacryloylamino)propyl]trimethylammonium chloride solution, [2-(methacryloyloxy)ethyl]trimethylammonium chloride, acrylamidopropyl trimethylammonium chloride, 2-aminoethyl methacrylamide hydrochloride, N-(2-aminoethyl) methacrylamide hydrochloride, N-(3-Aminopropy1)-methacrylamide hydrochloride, diallyldimethylammonium chloride, allylamine hydrochloride, vinyl imidazolium hydrochloride, vinyl pyridinium hydrochloride and vinyl benzyl trimethyl ammonium chloride.

10. The membrane of Claim 1, wherein the ion exchange groups are derived from an

anionic monomers is selected from the group consisting of 2-ethylacrylic acid, acrylic acid, 2-carboxyethyl acrylate, 3-sulfopropyl acrylate potassium salt, 2-propyl acrylic acid, 2-(trifluoromethyl)acrylic acid, methacrylic acid, 2-methyl-2-propene-l-sulfonic acid sodium salt, mono-2-(methacryloyloxy)ethyl maleate, 3-sulfopropyl methacrylate potassium salt, 2-acrylamido-2-methyl-l-propanesulfonic acid, 3-methacrylamido phenyl boronic acid, vinyl sulfonic acid and vinyl phosphonic acid.

11. The membrane of Claim 1, wherein the grafted, asymmetric, porous, ultra high molecular weight polyethylene membrane has a bubble point between 690 kPa and 970 kPa when determined by an ethoxy-nonafluorobutane bubble point test.

12. The membrane of Claim 1, wherein the grafted, asymmetric, porous, ultra high molecular weight polyethylene membrane has a water flow rate that is at least 75% of the water flow rate of an ungrafted, asymmetric, porous ultra high molecular weight polyethylene membrane having a bubble point between 540 kPa and 1100 kPa when challenged determined by an ethoxy-nonafluorobutane bubble point test.

13. The membrane of Claim 5, wherein the grafted, asymmetric, porous, ultra high molecular weight polyethylene membrane has a dye binding capacity between 3 $\mu g/cm^2$ and 40 $\mu g/cm^2$.

14. The membrane of Claim 13, wherein the grafted, asymmetric, porous, ultra high molecular weight polyethylene membrane has a dye binding capacity between 7 $\mu g/cm^2$ and 15 $\mu g/cm^2$,

15. A grafted, crosslinked, asymmetric, porous, ultra high molecular weight polyethylene membrane having a bubble point between 540 kPa and 1100 kPa when determined by an ethoxy-nonafluorobutane bubble point test, the membrane having one or more neutral groups or ion exchange groups grafted to one or more surfaces of the

membrane, wherein the one or more neutral groups or ion exchange groups are crosslinked with a crosslinker;

wherein the membrane has a water flow rate that is at least 50% of the water flow rate of an ungrafted, asymmetric, porous ultra high molecular weight polyethylene membrane having a bubble point between 540 kPa and 1100 kPa when determined by an ethoxy-nonafluorobutane bubble point test;

wherein the membrane wets in water, as indicated by the membrane turning translucent, in 10 seconds or less; and

wherein the membrane wets with a liquid having a surface tension between 70 dyne/cm and 72 dyne/cm.

16. A method of making a grafted, asymmetric, porous ultra high molecular weight polyethylene membrane, comprising:

a) contacting an asymmetric, ultra high molecular weight polyethylene membrane with an alcohol solution comprising benzophenone;

b) contacting the polyethylene membrane with an aqueous exchange solution for removing the alcohol solution;

c) contacting the membrane with an aqueous grafting solution comprising:

i) one or more of an anionic monomer, cationic monomer, and neutral monomer;

d) exposing the membrane to ultraviolet electromagnetic radiation, thereby resulting in a grafted, asymmetric, porous ultra high molecular weight polyethylene membrane;

wherein one or more of the aqueous exchange solution and the aqueous grafting solution comprises sodium persulfate or potassium persulfate.

17. A method of removing an impurity from a liquid, comprising contacting the liquid with a membrane according to any of Claims 1-15 or with a membrane made according to Claim 16.