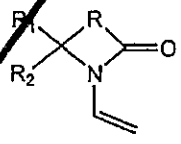
What is claimed is:

1. A method of applying a hydrophilic coating onto a silicone hydrogel contact lens, comprising the steps of:
   (a) contacting the contact lens with a first coating solution having a temperature of from about 45°C to about 95°C to form a prime coating which is not covalently attached to the contact lens, wherein the first coating solution includes a polyaionic material having a first hydrophobic backbone and multiple ionizable pendant groups, wherein the first coating solution has a pH sufficient low to substantially prevent the ionizable groups from ionizing, wherein the prime coating comprises at least one layer of the polyanionic material; and
   (b) contacting said contact lens with a second coating solution having a temperature of from about 45°C to about 95°C to form a top coating over the prime coating, wherein the second coating solution contains a non-charged hydrophilic polymer having a second hydrophobic backbone, wherein the top coating comprises at least one layer of the hydrophilic polymer.
2. The method of claim 1, wherein the polyionic polymeric material is a polyanionic polymeric material.
3. The method of claim 1, wherein the polyionic polymeric material is a polycationic polymeric material.
4. The method of claim 2, wherein the polyanionic polymeric material is selected from the group consisting of a linear polyacrylic acid, a branched polyacrylic acid, a polymethacrylic acid, a copolymer of acrylic acid with at least one hydrophilic vinylic monomer, a copolymer of methacrylic acid with at least one vinylic monomer, and a mixture thereof.
5. The method of claim 4, wherein the non-charged hydrophilic polymer is selected from the group consisting of a polyvinyl alcohol, a homopolymer of a vinyl lactam, a copolymer of at least one vinyl lactam with at least one hydrophilic vinylic monomer, and a mixture thereof, wherein the vinyl lactam has a structure of formula (I)



(I)

wherein R is an alkylene di-radical having from 2 to 8 carbon atoms; R_1 is hydrogen, methyl, ethyl or propyl, aryl having up to 10 carbon atoms, or aralkyl or alkaryl having up to 14 carbon atoms; and R_2 is hydrogen, methyl, ethyl, or propyl.

6. The method of claim 4, wherein the non-charged hydrophilic polymer is polyvinyl pyrrolidone (PVP).
7. The method of claim 4, further comprising a step of, prior to contacting with the first coating solution, rinsing the contact lens with an organic solvent or a mixture of organic solvents at room temperature.
8. The method of claim 7, further comprising a step of rinsing the contact lens coated with the first polyionic material with water at room temperature.
9. The method of claim 4, wherein the contact lens is obtained by cast-molding of a silicone hydrogel lens-forming material, wherein the silicone-hydrogel lens-forming material comprises at least one member selected from the group consisting of a silicone-containing vinylic monomer, a silicone-containing macromer with ethylenically unsaturated groups, a crosslinkable silicone-containing prepolymer, and mixtures thereof.
10. The method of claim 9, wherein the silicone-hydrogel lens-forming material is a solution, solvent-free liquid, or melt of one or more silicone-containing prepolymers with ethylenically unsaturated groups optionally in presence of other components, wherein the lens-forming material is cured actinically under a spatial limitation of actinic radiation in a reusable mold to form the contact lens.
11. The method of claim 4, wherein the temperatures of the first and second coating solutions are from about 50°C to about 95°C.
12. The method of claim 4, wherein the temperatures of the first and second coating solutions are from about 70°C to about 95°C.
13. A silicone hydrogel contact lens, comprising:

    a core silicone hydrogel material; and

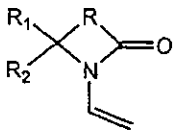
    a hydrophilic coating,

wherein the core silicone hydrogel material is the copolymerization product of a silicone hydrogel lens-forming material, wherein the silicone-hydrogel lens-forming material comprises at least one member selected from the group consisting of a silicone-containing vinylic monomer, a silicone-containing macromer with ethylenically unsaturated groups, a crosslinkable silicone-containing prepolymer, and mixtures thereof, wherein the hydrophilic coating is not covalently attached to the core silicone hydrogel material and comprises one innermost layer of a polyionic polymeric material with a first hydrophobic backbone and one outmost layer of a non-charge hydrophilic polymer with a second hydrophobic backbone,

wherein the silicone hydrogel contact lens has an oxygen permeability of at least 40 barres,

wherein the hydrophilic coating has an averaged water contact angle of 80 degrees or less, a good intactness characterized by its incapability of being stained by Sudan Black dye, and a good durability characterized by surviving a digital rubbing test or repeated autoclave test.

14. The silicone hydrogel contact lens of claim 13, wherein the polyanion polymeric material is selected from the group consisting of a linear polyacrylic acid, a branched polyacrylic acid, a polymethacrylic acid, a copolymer of acrylic acid with at least one hydrophilic vinylic monomer, a copolymer of methacrylic acid with at least one vinylic monomer, and a mixture thereof, wherein the non-charged hydrophilic polymer is selected from the group consisting of a polyvinyl alcohol, a homopolymer of a vinyl lactam, a copolymer of at least one vinyl lactam with at least one hydrophilic vinylic monomer, and a mixture thereof, wherein the vinyl lactam has a structure of formula (I)



(I)

wherein R is an alkylene di-radical having from 2 to 8 carbon atoms; R_1 is hydrogen, methyl, ethyl or propyl, aryl having up to 10 carbon atoms, or aralkyl or alkaryl having up to 14 carbon atoms; and R_2 is hydrogen, methyl, ethyl, or propyl.

15. The silicone hydrogel contact lens of claim 14, wherein the non-charged hydrophilic polymer is polyvinyl pyrrolidone.

16. The silicone hydrogel contact lens of claim 14, further comprising at least one antimicrobial agent in an amount sufficient to have an antimicrobial activity characterized by having at least a 5-fold reduction (≥80% inhibition).

17. The silicone hydrogel contact lens of claim 16, wherein the antimicrobial agent is silver nanoparticles.

18. The silicone hydrogel contact lens of claim 14, wherein contact lens has an elastic modulus of about 1.5 MPa or less.

19. The silicone hydrogel contact lens of claim 14, wherein the contact lens has an Ionoflux Diffusion Coefficient, D, of at least about 1.5×10^{-6} mm^2/min.

What is claimed is:

1. A method of applying a hydrophilic coating onto a silicone hydrogel contact lens, comprising the steps of:

(a) prior to contacting with a first coating solution for forming a prime coating which is not covalently attached to the contact lens, rinsing an uncoated contact lens with an organic solvent or a mixture of organic solvents at room temperature;

(b) contacting the rinsed contact lens with the first coating solution having a temperature of from about 45° C. to about 95° C. to form the prime coating, wherein the first coating solution includes a polyanionic material having a first hydrophobic backbone and multiple ionizable pendant groups, wherein the first coating solution has a pH sufficient low to substantially prevent the ionizable groups from ionizing, wherein the prime coating comprises at least one layer of the polyanionic material;

(c) rinsing the contact lens coated with the polyanionic material with water at room temperature; and

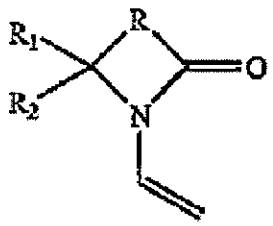
(d) applying a top coating over the prime coating of the contact lens by contacting said contact lens, which is rinsed in step (c) with water at room temperature, with a second coating solution having a temperature of from about 45° C. to about 95° C. to form the hydrophilic coating on the contact lens, wherein the second coating solution contains a non-charged hydrophilic polymer having a second hydrophobic backbone,

wherein the formed hydrophilic coating on the contact lens exhibits an increased hydrophilicity and a good durability characterized by surviving a digital rubbing test or 5 autoclave test.

2. The method of claim 1, wherein the polyanionic polymeric material is selected from the group consisting of a linear polyacrylic acid, a branched polyacrylic acid, a polymethacrylic acid, a copolymer of acrylic acid with at least one hydrophilic vinylic monomer, a copolymer of methacrylic acid with at least one vinylic monomer, and a mixture thereof.

3. The method of claim 2, wherein the non-charged hydrophilic polymer is selected from the group consisting of a

polyvinyl alcohol, a homopolymer of a vinyl lactam, a copolymer of at least one vinyl lactam with at least one hydrophilic vinylic monomer, and a mixture thereof, wherein the vinyl lactam has a structure of formula (I)



(I)

wherein R is an alkylene di-radical having from 2 to 8 carbon atoms; R_1 is hydrogen, methyl, ethyl or propyl, aryl having up to 10 carbon atoms, or aralkyl or alkaryl having up to 14 carbon atoms; and R_2 is hydrogen, methyl, ethyl, or propyl.

4. The method of claim 2, wherein the non-charged hydrophilic polymer is polyvinyl pyrrolidone (PVP).

5. The method of claim 2, wherein the contact lens is obtained by cast-molding of a silicone hydrogel lens-forming material, wherein the silicone-hydrogel lens-forming material comprises at least one member selected from the group consisting of a silicone-containing vinylic monomer, a silicone-containing macromer with ethylenically unsaturated groups, a crosslinkable silicone-containing prepolymer, and mixtures thereof.

6. The method of claim 5, wherein the silicone-hydrogel lens-forming material is a solution, solvent-free liquid, or melt of one or more silicone-containing prepolymers with ethylenically unsaturated groups optionally in presence of other components, wherein the lens-forming material is cured actinically under a spatial limitation of actinic radiation in a reusable mold to form the contact lens.

7. The method of claim 2, wherein the temperatures of the first and second coating solutions are from about 50° C. to about 95° C.

8. The method of claim 2, wherein the temperatures of the first and second coating solutions are from about 70° C. to about 95° C.

9. The method of claim 3, wherein the temperatures of the first and second coating solutions are from about 50° C. to about 95° C.

10. The method of claim 3, wherein the temperatures of the first and second coating solutions are from about 70° C. to about 95° C.

11. The method of claim 4, wherein the temperatures of the first and second coating solutions are from about 50° C. to about 95° C.

12. The method of claim 4, wherein the temperatures of the first and second coating solutions are from about 70° C. to about 95° C.

13. The method of claim 5, wherein the temperatures of the first and second coating solutions are from about 50° C. to about 95° C.

14. The method of claim 5, wherein the temperatures of the first and second coating solutions are from about 70° C. to about 95° C.

15. The method of claim 6, wherein the temperatures of the first and second coating solutions are from about 50° C. to about 95° C.

16. The method of claim 6, wherein the temperatures of the first and second coating solutions are from about 70° C. to about 95° C.

17. The method of claim 3, wherein the contact lens is obtained by cast-molding of a silicone hydrogel lens-forming material, wherein the silicone-hydrogel lens-forming material comprises at least one member selected from the group consisting of a silicone-containing vinylic monomer, a silicone-containing macromer with ethylenically unsaturated groups, a crosslinkable silicone-containing prepolymer, and mixtures thereof.

18. The method of claim 17, wherein the silicone-hydrogel lens-forming material is a solution, solvent-free liquid, or melt of one or more silicone-containing prepolymers with ethylenically unsaturated groups optionally in presence of other components, wherein the lens-forming material is cured actinically under a spatial limitation of actinic radiation in a reusable mold to form the contact lens.

19. The method of claim **18**, wherein the temperatures of the first and second coating solutions are from about 50° C. to about 95° C.

20. The method of claim **18**, wherein the temperatures of the first and second coating solutions are from about 70° C. to about 95° C.