WHAT IS CLAIMED IS:

1. A silicone hydrogel contact lens comprising:

a polymeric lens body that is the reaction product of a polymerizable composition comprising

a) at least one mono-functional acrylate-containing siloxane monomer having a molecular weight of less than 2,000;

b) at least one bi-functional acrylate-containing siloxane monomer having a molecular weight of at least 3,000;

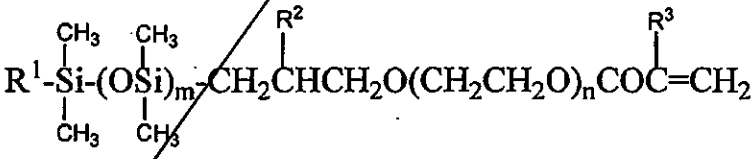
c) at least one hydrophilic vinyl-containing monomer; and

d) at least one vinyl-containing cross-linking agent,

wherein the polymerizable composition has a molar ratio of total amount of mono-functional acrylate-containing siloxane monomer to total amount of bi-functional acrylate-containing siloxane monomer of at least 30:1, respectively, and a molar ratio of total amount of hydrophilic vinyl-containing monomer to total amount of acrylate-containing siloxane monomer of from about 5:1 to about 20:1.

2. The contact lens of claim 1, wherein the mono-functional acrylate-containing siloxane monomer has a molecular weight of less than about 1,000.

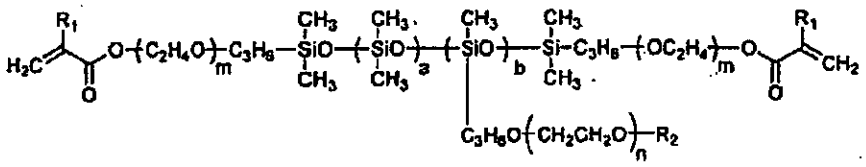
3. The contact lens of claim 1, wherein the mono-functional acrylate-containing siloxane monomer is represented by formula (I),



(I)

wherein m is an integer from 3 to 10, n is an integer from 0 to 10, R^1 is an alkyl group having 1 to 4 carbon atoms, R^2 is hydrogen or methyl group, and R^3 is hydrogen or a methyl group.

4. The contact lens of any one of the preceding claims, wherein the bi-functional acrylate-containing siloxane monomer is represented by formula (II),



(II)

wherein R_1 of formula (II) is selected from either hydrogen or a methyl group, R_2 of formula (II) is selected from either hydrogen or a C_{1-4} hydrocarbon group, m of formula (II) represents an integer of from 0 to 10; n of formula (II) represents an integer of from 4 to 100, and a and b represent integers of 1 or more.

5. The contact lens of any one of claims 1 to 3, wherein the bi-functional acrylate-containing siloxane monomer is a methacryloxypropyl-terminated polydimethylsiloxane.

6. The contact lens of claim 1, wherein the bi-functional acrylate-containing siloxane monomer has a molecular weight of at least 5,000.

7. The contact lens of claim 1, wherein the molar ratio of total amount of mono-functional acrylate-containing siloxane monomer to total amount of bi-functional acrylate-containing siloxane monomer is from about 40:1 to about 200:1.

8. The contact lens of claim 1, wherein the at least one hydrophilic vinyl-containing monomer is selected from N-vinyl-N-methyl acetamide (VMA), or N-vinyl pyrrolidone (NVP), or 1,4-butanediol vinyl ether (BVE), or ethylene glycol vinyl ether (EGVE), or diethylene glycol vinyl ether (DEGVE), or any combination thereof.

9. The contact lens of claim 1, wherein the at least one vinyl-containing cross-linking agent is selected from divinyl ether, or divinyl sulfone, or triallyl phthalate, or triallyl isocyanurate, or diallyl phthalate, or diethyleneglycol divinyl ether, or triethyleneglycol divinyl ether, or any combination thereof.

10. The contact lens of claim 1, wherein the polymerizable composition further comprises at least one non-siloxane acrylate-containing monomer.

11. The contact lens of claim 10, wherein the at least one non-siloxane acrylate-containing monomer is selected from methyl methacrylate (MMA), or 2-hydroxybutyl methacrylate (HOB), or tert butyl methacrylate (tBMA), or N,N-dimethylacrylamide (DMA), or 2-hydroxyethyl methacrylate (HEMA), or ethoxyethyl methacrylamide (EOEMA), or ethylene glycol methyl ether methacrylate (EGMA), or isobornyl methacrylate (IBM), or any combination thereof.

12. The contact lens of claim 10 or 11, wherein the polymerizable composition has a molar ratio of total amount of mono-functional acrylate-containing siloxane monomer and total amount of non-siloxane acrylate-containing monomer, combined, to total amount bi-functional acrylate-containing siloxane monomer of at least 100:1, respectively.

13. The contact lens of claim 1, wherein the polymerizable composition further comprises at least one acrylate-containing cross-linking agent.

14. The contact lens of claim 13, wherein the at least one acrylate-containing cross-linking agent is selected from triethylene glycol dimethacrylate, or ethylene glycol dimethacrylate, or a combination thereof.

15. The contact lens of claim 13 or 14, wherein the polymerizable composition has a molar ratio of total amount of acrylate-containing cross-linking agent to total amount of bi-functional acrylate-containing siloxane monomer of at least 2:1, respectively.

16. The contact lens of claim 1, wherein the polymerizable composition is substantially free of hydrophilic polymer.

17. The contact lens of claim 1 that is free of post-polymerization surface modification.

18. The contact lens of claim 1 having a wet extractable component of about 2 wt. % to about 8 wt. %.

19. The contact lens of claim 1 characterized by one or more of the following physical characteristics:

a) a dynamic advancing contact angle of $\leq 70°$ as determined using a captive bubble method;

b) an oxygen permeability of at least 60 barrers;

c) a tensile modulus from about 0.2 MPa to about 0.9 MPa;

d) an equilibrium water content from about 30 % wt/wt to about 70 % wt/wt;

e) an ionoflux of less than $6x10^{-3}$ mm^2/min; and

f) an energy loss from about 27 to about 45 %.

20. A method of manufacturing the silicone hydrogel contact lens of claim 1 comprising:

a) polymerizing the polymerizable composition to form the polymeric lens body;

b) washing the polymeric lens body with a washing liquid to remove unreacted or partially reacted components from the polymeric lens body;

c) sealing the washed polymeric lens body in a package comprising a packaging solution; and

d) sterilizing the sealed package.

21. The method of claim 20, wherein the washing liquid and any other liquid used for washing the polymeric lens body are substantially free of volatile organic solvents.

22. The method of claim 20, wherein the method does not comprise surface treating the polymeric lens body with plasma.

23. The method of claim 20, wherein the method does not comprise coating the washed polymeric lens body with a hydrophilic polymer or adding a hydrophilic polymer to the packaging solution.

Claims

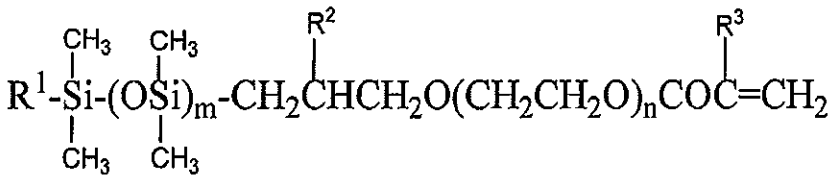
1. A silicone hydrogel contact lens comprising:

   a polymeric lens body that is the reaction product of a polymerizable composition comprising

   a) at least one mono-functional acrylate-containing siloxane monomer having a molecular weight of less than 2,000;
   b) at least one bi-functional acrylate-containing siloxane monomer having a molecular weight of at least 3,000;
   c) at least one hydrophilic vinyl-containing monomer; and
   d) at least one vinyl-containing cross-linking agent,
   wherein the polymerizable composition has a molar ratio of total amount of mono-functional acrylate-containing siloxane monomer to total amount of bi-functional acrylate-containing siloxane monomer of at least 30:1, respectively.

2. The contact lens of claim 1, wherein the mono-functional acrylate-containing siloxane monomer has a molecular weight of less than about 1,000.

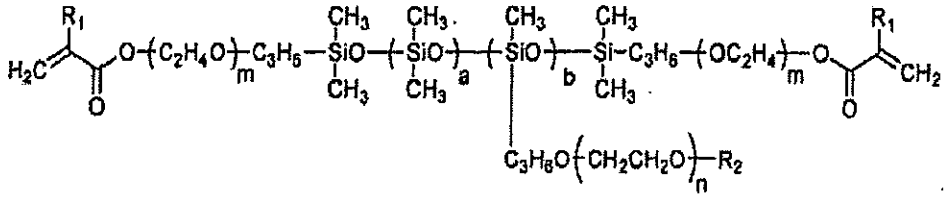
3. The contact lens of claim 1, wherein the mono-functional acrylate-containing siloxane monomer is represented by formula (I),



(I)

wherein m is an integer from 3 to 10, n is an integer from 0 to 10, R^1 is an alkyl group having 1 to 4 carbon atoms, R^2 is hydrogen or methyl group, and R^3 is hydrogen or a methyl group.

4. The contact lens of any one of the preceding claims, wherein the bi-functional acrylate-containing siloxane monomer is represented by formula (II),



(II)

wherein R_1 of formula (II) is selected from either hydrogen or a methyl group, R_2 of formula (II) is selected from either hydrogen or a C_{1-4} hydrocarbon group, m of formula (II) represents an integer of from 0 to 10; n of formula (II) represents an integer of from 4 to 100, and a and b represent integers of 1 or more.

5. The contact lens of any one of claims 1 to 3, wherein the bi-functional acrylate-containing siloxane monomer is a methacryloxypropyl-terminated polydimethylsiloxane.

6. The contact lens of any one of the preceding claims, wherein the bi-functional acrylate-containing siloxane monomer has a molecular weight of at least 5,000.

7. The contact lens of any one of the preceding claims, wherein the molar ratio of total amount of mono-functional acrylate-containing siloxane monomer to total amount of bi-functional acrylate-containing siloxane monomer is from about 40:1 to about 200:1.

8. The contact lens of any one of the preceding claims, wherein the polymerizable composition has a molar ratio of total amount of hydrophilic vinyl-containing monomer to total amount of acrylate-containing siloxane monomer of from about 5:1 to about 20:1.

9. The contact lens of any one of the preceding claims, wherein the at least one hydrophilic vinyl-containing monomer is selected from N-vinyl-N-methyl acetamide (VMA), or N-vinyl pyrrolidone (NVP), or 1,4-butanediol vinyl ether (BVE), or ethylene glycol vinyl ether (EGVE), or diethylene glycol vinyl ether (DEGVE), or any combination thereof.

10. The contact lens of any one of the preceding claims, wherein the at least one vinyl-containing cross-linking agent is selected from divinyl ether, or divinyl sulfone, or triallyl phthalate, or triallyl isocyanurate, or diallyl phthalate, or diethyleneglycol divinyl ether, or triethyleneglycol divinyl ether, or any combination thereof.

11. The contact lens of any one of the preceding claims, wherein the polymerizable composition further comprises at least one non-siloxane acrylate-containing monomer.

12. The contact lens of claim 11, wherein the at least one non-siloxane acrylate-containing monomer is selected from methyl methacrylate (MMA), or 2-hydroxybutyl methacrylate (HOB), or tert butyl methacrylate (tBMA), or N,N-dimethylacrylamide (DMA), or 2-hydroxyethyl methacrylate (HEMA), or ethoxyethyl methacrylamide (EOEMA), or ethylene glycol methyl ether methacrylate (EGMA), or isobornyl methacrylate (IBM), or any combination thereof.

13. The contact lens of claim 11 or 12, wherein the polymerizable composition has a molar ratio of total amount of mono-functional acrylate-containing siloxane monomer and total amount of non-siloxane acrylate-containing monomer, combined, to total amount bi-functional acrylate-containing siloxane monomer of at least 100:1, respectively.

14. The contact lens of any one of the preceding claims, wherein the polymerizable composition further comprises at least one acrylate-containing cross-linking agent.

15. The contact lens of claim 14, wherein the at least one acrylate-containing cross-linking agent is selected from triethylene glycol dimethacrylate, or ethylene glycol dimethacrylate, or a combination thereof.

16. The contact lens of claim 14 or 15, wherein the polymerizable composition has a molar ratio of total amount of acrylate-containing cross-linking agent to total amount of bi-functional acrylate-containing siloxane monomer of at least 2:1, respectively.

17. The contact lens of any one of the preceding claims, wherein the polymerizable composition is substantially free of hydrophilic polymer.

18. The contact lens of any one of the preceding claims that is free of post-polymerization surface modification.

19. The contact lens of any one of the preceding claims **characterized by** one or more of the following physical characteristics:

a) a dynamic advancing contact angle of ≤ 70 ° as determined using a captive bubble method;
b) an oxygen permeability of at least 60 barrers;
c) a tensile modulus from about 0.2 MPa to about 0.9 MPa;
d) an equilibrium water content from about 30 % wt/wt to about 70 % wt/wt;
e) an ionoflux of less than $6x10^{-3}$ mm^2/min; and
f) an energy loss from about 27 to about 45 %.

20. A method of manufacturing the silicone hydrogel contact lens of any one of the preceding claims comprising:

a) polymerizing the polymerizable composition to form the polymeric lens body;
b) washing the polymeric lens body with a washing liquid to remove unreacted or partially reacted components from the polymeric lens body;
c) sealing the washed polymeric lens body in a package comprising a packaging solution; and
d) sterilizing the sealed package.

21. The method of claim 20, wherein the washing liquid and any other liquid used for washing the polymeric lens body are substantially free of volatile organic solvents.