What is claimed is:

1. A water-processable prepolymer, comprising:

(1) siloxane-containing monomeric units and/or polysiloxane-containing crosslinking units, wherein the siloxane-containing monomeric units are derived from one or more siloxane-containing vinylic monomers each having at least one hydrophilic moiety selected from the group consisting of a hydrophilic polymeric chain with a molecular weight of up to about 10000 Daltons (preferably about 7500 Dalton or less, even more preferably about 5000 Daltons or less), a hydroxyl group, an amide linkage, a urethane linkage (or carbamate linkage), a diurethane linkage, an oligo-ethyleneoxide linkage (i.e., composed about 2 to 12 ethyleneoxide units), a 2-hydroxy-substituted propyleneoxide linkage, and combinations thereof, wherein the polysiloxane-containing crosslinking units are derived from at least one hydrophilized polysiloxane crosslinker and/or chain-extended hydrophilized polysiloxane crosslinker each having one or more pendant hydrophilic polymeric chains;

(2) hydrophilic monomeric units derived from one or more hydrophilic vinylic monomers;

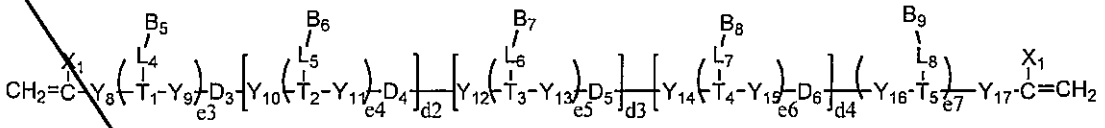
(3) from about 0.05% to about 5%, preferably from about 0.1% to about 4%, more preferably from about 0.5 to about 3% by weight of polymerizable units each having a pendant or terminal, ethylenically-unsaturated group and free of any polysiloxane segment; and

(4) optionally hydrophobic units derived from at least one hydrophobic vinylic monomer free of silicone,

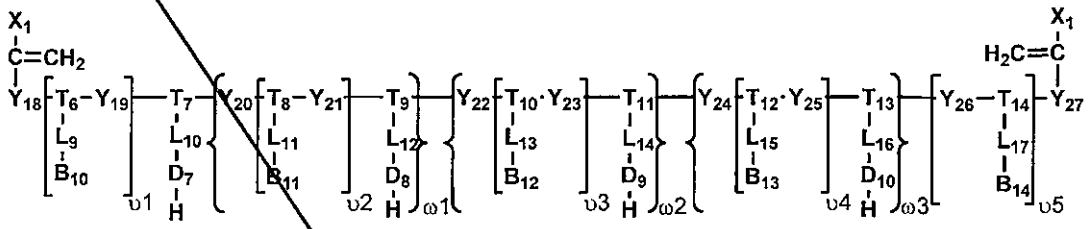
wherein the prepolymer comprises from about 20% to about 50%, preferably from about 25% to about 45%, more preferably from 28% to about 40%, by weight of silicone relative to the total weight of the prepolymer and has a high water solubility or dispersibility of at least about 5%, preferably at least about 10%, more preferably at least about 20% by weight in water, wherein the prepolymer is capable of being actinically crosslinked, in the absence of one or more vinylic monomers, to form a silicone hydrogel contact lens having a water content of from about 20% to about 75% (preferably from about 25% to about 70%, more preferably from about 30% to about 65%) by weight when fully hydrated, an oxygen permeability (Dk) of at least about 40 barrers (preferably at least about 50 barrers, more preferably at least about 60 barrers, and even more preferably at least about 70 barrers), and optionally (but preferably) a hydrophilic surface characterized by an average water contact angle of about 90 degrees or less (preferably about 80 degrees or less, more preferably 70 degrees or less, even more preferably about 60 degrees or less) without post-molding surface

treatment.

2. The prepolymer of claim 1, wherein the prepolymer comprises a hydrophilized polysiloxane or chain-extended polysiloxane crosslinker of formula (7) or (8)



(7)



(8)

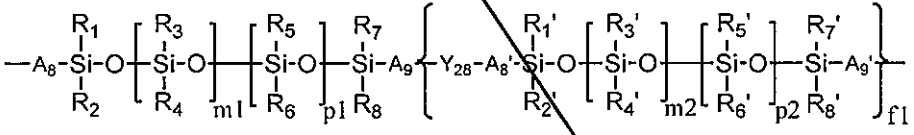
In which

d2, d3, d4, ω1, ω2, and ω3 independent of one another are an integer from 0 to 20;

e3, e4, e5, e6, e7, υ1, υ2, υ3, υ4, and υ5 independent of one other are 0, 1, 2 or 3 and (e3+e4+e5+e6+e7)≥1 and (υ1+υ2+υ3+υ4+υ5) ≥1;

X_1 is hydrogen or methyl;

D_3, D_4, D_5, D_6, D_7, D_8, D_9, and D_{10} independently of one other are a divalent group of formula (9)



(9)

in which Y_{28} is as defined below, A_8, A_8', A_9, and A_9' independent of one other are a direct bond, a linear or branched C_1–C_{10} alkylene divalent radical, –$(CH_2CH_2O)_{r1}$–CH_2CH_2– in which r1 is an integer of 1 to 20, or a C_1-C_7 alkyleneoxy–C_1-C_7 alkylene divalent radical, and R_1, R_2, R_3, R_4, R_5, R_6, R_7, R_8, R_1', R_2', R_3', R_4', R_5', R_6', R_7', and R_8' independently of one another, are C_1-C_4-alkyl, –alk–$(OCH_2CH_2)_{r2}$–OR_9 in which alk is C_1-C_6-alkylene divalent radical, R_9 is C_1-C_4 alkyl and r2 is an integer from 1 to 20, f1 is an integer of 0 to 8, m1, m2, p1 and p2 independently of each other are an integer of from 0 to 150, (m1+p1) and (m2+p2) independent of each other are from 2 to 150;

L_4, L_5, L_6, L_7, L_8, L_9, L_{10}, L_{11}, L_{12}, L_{13}, L_{14}, L_{15}, L_{16}, L_{17}, Y_8, Y_9, Y_{10}, Y_{11}, Y_{12}, Y_{13}, Y_{14}, Y_{15}, Y_{16}, Y_{17}, Y_{18}, Y_{19}, Y_{20}, Y_{21}, Y_{22}, Y_{23}, Y_{24}, Y_{25}, Y_{26}, Y_{27}, and Y_{28} independent of one

another are a direct bond or a divalent radical of

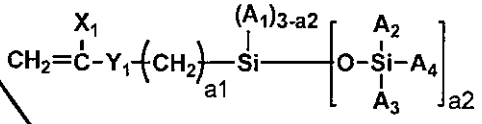
$-Z_1-X_2-Z_2-X_3-Z_3-X_4-Z_4-$ In which X_2, X_3 and X_4 independent of one other are a linkage selected from the group consisting of a direct bond, –O–, –NR'– in which R' is H or C_1-C_4 alkyl, –C(O)–NH–, –NH–C(O)–, –NH–C(O)–NH–, –O–C(O)–NH–, –S–, –NH–C(O)–O–, –C(O)–O–,–O–C(O)–, –NH–C(O)–NH–Z_0–NH–C(O)–NH–, –O–C(O)–NH–Z_0–NH–C(O)–O–, –O–C(O)–NH–Z_0–NH–C(O)–NH–, and –NH–C(O)–NH–Z_0–NH–C(O)–O–, Z_0 is a linear or branched C_2-C_{12} alkylene divalent radical or a C_5-C_{45} cycloaliphatic or aliphatic-cycloaliphatic divalent radical optionally containing therein one or more linkages of –O–, –NR'–, –S– and –C(O)–, Z_1, Z_2, Z_3 and Z_4 independent of one other are is a direct bond, a linear or branched C_1–C_{12} alkylene divalent radical optionally containing therein one or more linkages of –O–, –NR'–, –S– and –C(O)–, a divalent radical of $-CH_2$-CH(OH)-CH_2– or $-(CH_2CH_2O)_{r1}$-CH_2CH_2– with r1 as defined above, or a C_5-C_{45} cycloaliphatic or aliphatic-cycloaliphatic divalent radical optionally containing therein one or more linkages of –O–, –NR'–, –S– and –C(O)–;

B_5, B_6, B_7, B_8, B_9, B_{10}, B_{11}, B_{12}, B_{13}, and B_{14} independent of one another are hydroxyl or (preferably) a linear or 3-arm hydrophilic polymer chain having a molecular weight of about 10000 Daltons or less (preferably about 7500 daltons or less, more preferably about 5000 daltons or less, even more preferably about 2500 Daltons or less, most preferably about 1000 Daltons or less) and comprising at least about 60% (preferably at least about 70%, more preferably at least about 80%, even more preferably at least about 90%) by weight of one or more hydrophilic monomeric units selected from the group consisting of ethyleneoxide units, (meth)acrylamide units, C_1-C_3 alkyl (meth)acrylamide units, di-(C_1-C_3 alkyl) (meth)acrylamide units, N-vinylpyrrole units, N-vinyl-2-pyrrolidone units, 2-vinyloxazoline units, 4-vinylpyridine units, mono-C_1-C_4 alkoxy, mono-(meth)acryloyl terminated polyethyleneglycol units having a molecular weight of 600 Daltons or less, di(C_1-C_3 alkyl amino)(C_2-C_4 alkyl) (meth)acrylate units, N-C_1-C_4 alkyl-3-methylene-2-pyrrolidone units, N-C_1-C_4 alkyl-5-methylene-2-pyrrolidone units, N-vinyl C_1-C_6 alkylamide units, N-vinyl-N- C_1-C_6 alkyl amide units, and combinations thereof, provided that at least one of B_5, B_6, B_7, B_8, and B_9 and at least one of B_{10}, B_{11}, B_{12}, B_{13}, and B_{14} are the linear or 3-arm hydrophilic polymer chain; and

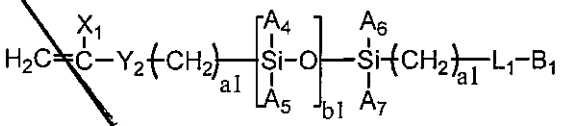
T_1, T_2, T_3, T_4, T_5, T_6, T_7, T_8, T_9, T_{10}, T_{11}, T_{12}, T_{13}, and T_{14} independent of one another are an aliphatic or cycloaliphatic or aliphatic-cycloaliphatic trivalent radical which has up to 15 carbon atoms and can be interrupted by –O–, –NR'–, –C(O)– and/or –S–.

3. The prepolymer of claim 2, wherein the prepolymer comprises a hydrophilized polysiloxane or chain-extended polysiloxane crosslinker of formula (7).

4. The prepolymer of claim 1, 2 or 3, wherein the prepolymer comprises a siloxane-containing vinylic monomer of formula (1), (2) or (3)



(1)



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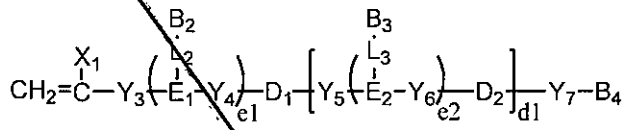


(3)

in which

a1 is an integer from 1 to 5;

a2 is an integer of 1, 2 or 3;

b1 is an integer from 1 to 10;

d1 is an integer from 0 to 4;

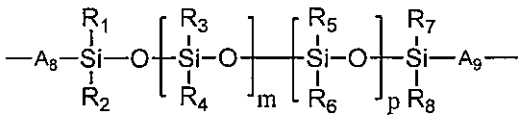
e1 and e2 independent of each other are 0, 1, 2 or 3;

A_1, A_2, A_3, A_4, A_5, A_6, and A_7 independent of one another are methyl or ethyl;

X_1 is hydrogen or methyl;

Y_1 is a radical of $-M_1-X_2-M_2-X_3-M_3-X_4-M_4-$ in which M_1, M_2, M_3 and M_4 independent of one another are a direct bond, $-CH_2-$, $-C_2H_4-$, $-C_3H_6-$, $-CH_2-CH(OH)-CH_2-$, or $-(C_2H_4-O-)_{a3}-$ in which a3 is an integer from 2 to 12, X_2, X_3, and X_4 independent of one other are a linkage selected from the group consisting of a direct bond, –O–, –NR'– in which R' is H or C_1-C_4 alkyl,–C(O)–NH–, –NH–C(O)–, –NH–C(O)–NH–, –O–C(O)–NH–, –S–, –NH–C(O)–O–, –C(O)–O–, –O–C(O)–, –NH–C(O)–NH–Z_0–NH–C(O)–NH–, –O–C(O)–NH–Z_0–NH–C(O)–O–, –O–C(O)–NH–Z_0–NH–C(O)–NH–, and –NH–C(O)–NH–Z_0–NH–C(O)–O–, in which Z_0 is a linear or branched C_2-C_{12} alkylene divalent radical or a C_5-C_{45} cycloaliphatic or aliphatic-cycloaliphatic divalent radical optionally containing therein one or more linkages of –O–, –NR'–, –S– and –C(O)–;

D_1 and D_2 independently of each other are a divalent group of formula (4)



(4)

in which A_8 and A_9 independent of each other are a direct bond, a linear or branched C_1–C_{10} alkylene divalent radical, $-(CH_2CH_2O)_{r1}-CH_2CH_2-$ in which r1 is an integer of 1 to 20, or a C_1-C_7 alkyleneoxy–C_1-C_7 alkylene divalent radical, and R_1, R_2, R_3, R_4, R_5, R_6, R_7, and R_8, independently of one another, are C_1-C_4-alkyl, –alk–$(OCH_2CH_2)_{r2}$–OR_9 in which alk is C_1-C_6-alkylene divalent radical, R_9 is C_1-C_4 alkyl and r2 is an integer from 1 to 20, m and p independently of each other are an integer of from 0 to 150 and (m+p) is from 2 to 150;

L_1, L_2, L_3, Y_2, Y_3, Y_4, Y_5, Y_6, and Y_7 independent of one another are a direct bond or a divalent radical of $-Z_1-X_2-Z_2-X_3-Z_3-X_4-Z_4-$ In which X_2, X_3, and X_4 are as defined, Z_1, Z_2, Z_3, and Z_4 independent of one other are is a direct bond, a linear or branched C_1–C_{12} alkylene divalent radical optionally containing therein one or more linkages of –O–, –NR'–, –S– and –C(O)–, a divalent radical of $-CH_2-CH(OH)-CH_2-$ or $-(CH_2CH_2O)_{r1}-CH_2CH_2-$ with r1 as defined above, or a C_5-C_{45} cycloaliphatic or aliphatic-cycloaliphatic divalent radical optionally containing therein one or more linkages of –O–, –NR'–, –S– and –C(O)–;

B_1, B_2, B_3 and B_4 independent of one another are hydroxyl or (preferably) a linear or 3-arm hydrophilic polymer chain having a molecular weight of about 10,000 Daltons or less (preferably about 7500 daltons or less, more preferably about 5000 daltons or less, even more preferably about 2500 Daltons or less, most preferably about 1000 Daltons or less) and comprising at least about 60% (preferably at least about 70%, more preferably at least about 80%, even more preferably at least about 90%) by weight of one or more hydrophilic monomeric units selected from the group consisting of ethyleneoxide units, (meth)acrylamide units, C_1-C_3 alkyl (meth)acrylamide units, di-(C_1-C_3 alkyl) (meth)acrylamide units, N-vinylpyrrole units, N-vinyl-2-pyrrolidone units, 2-vinyloxazoline units, 4-vinylpyridine units, mono-C_1-C_4 alkoxy, mono-(meth)acryloyl terminated polyethyleneglycol units having a molecular weight of 600 Daltons or less, di(C_1-C_3 alkyl amino)(C_2-C_4 alkyl) (meth)acrylate units, N-C_1-C_4 alkyl-3-methylene-2-pyrrolidone units, N-C_1-C_4 alkyl-5-methylene-2-pyrrolidone units, N-vinyl C_1-C_6 alkylamide units, N-vinyl-N-C_1-C_6 alkyl amide units, and combinations thereof, provided that at least one of B_2, B_3 and B_4 is the linear or 3-arm hydrophilic polymer chain;

E_1 and E_2 independent of each another are an aliphatic or cycloaliphatic or aliphatic-cycloaliphatic trivalent radical which has up to 15 carbon atoms and can be interrupted by –O–, –NR'–, –C(O)– and/or –S–.

5. The prepolymer of claim 4, wherein the prepolymer comprises a siloxane-containing vinylic monomer of formula (1) in which a2 is an integer 2.

6. The prepolymer of claim 4, wherein the prepolymer comprises a siloxane-containing vinylic monomer of formula (2).
7. The prepolymer of claim 4, wherein the prepolymer comprises a siloxane-containing vinylic monomer of formula (3).
8. The prepolymer of any one of claims 1 to 7, wherein the hydrophilic monomeric units are derived from at least one hydrophilic vinylic monomer selected from the group consisting of N,N-dimethylacrylamide (DMA), N,N-dimethylmethacrylamide (DMMA), 2-acrylamidoglycolic acid, 3-acryloylamino-1-propanol, N-hydroxyethyl acrylamide, *N*-[tris(hydroxymethyl)methyl]-acrylamide, N-methyl-3-methylene-2-pyrrolidone, 1-ethyl-3-methylene-2-pyrrolidone, 1-methyl-5-methylene-2-pyrrolidone, 1-ethyl-5-methylene-2-pyrrolidone, 5-methyl-3-methylene-2-pyrrolidone, 5-ethyl-3-methylene-2-pyrrolidone, 1-n-propyl-3-methylene-2-pyrrolidone, 1-n-propyl-5-methylene-2-pyrrolidone, 1-isopropyl-3-methylene-2-pyrrolidone, 1-isopropyl-5-methylene-2-pyrrolidone, 1-n-butyl-3-methylene-2-pyrrolidone, 1-tert-butyl-3-methylene-2-pyrrolidone, 2-hydroxyethylmethacrylate (HEMA), 2-hydroxyethyl acrylate (HEA), hydroxypropyl acrylate, hydroxypropyl methacrylate (HPMA), trimethylammonium 2-hydroxy propylmethacrylate hydrochloride, aminopropyl methacrylate hydrochloride, dimethylaminoethyl methacrylate (DMAEMA), glycerol methacrylate (GMA), N-vinyl-2-pyrrolidone (NVP), allyl alcohol, vinylpyridine, a C_1-C_4-alkoxy polyethylene glycol (meth)acrylate having a weight average molecular weight of up to 1500, methacrylic acid, N-vinyl formamide, N-vinyl acetamide, N-vinyl isopropylamide, N-vinyl-N-methyl acetamide, N-vinyl caprolactam, and mixtures thereof.
9. The prepolymer of claim 8, wherein said at least one hydrophilic monomer is selected from the group consisting of N-vinylpyrrolidone, N,N-dimethyl (meth)acrylamide, (meth)acrylamide, N-vinyl formamide, N-vinyl acetamide, N-vinyl isopropylamide, N-vinyl-N-methyl acetamide, N-methyl-3-methylene-2-pyrrolidone, 1-ethyl-3-methylene-2-pyrrolidone, 1-methyl-5-methylene-2-pyrrolidone, 1-ethyl-5-methylene-2-pyrrolidone, 5-methyl-3-methylene-2-pyrrolidone, 5-ethyl-3-methylene-2-pyrrolidone, and combinations thereof .
10. The prepolymer of any one of claims 1 to 9, wherein the polymerizable units are free of any polysiloxane segment and each comprise a basic monomeric unit being a part of a polymer chain of the prepolymer and having a pendant or terminal, ethylenically-unsaturated group attached thereon, wherein each basic monomeric unit is derived from a first ethylenically functionalizing vinylic monomer having a first reactive functional group, wherein the pendant or terminal ethylenically unsaturated group is derived from a second ethylenically functionalizing vinylic monomer having a second reactive functional group which reacts with one first reactive functional in the presence

or absence of a crosslinking agent to form a covalent linkage, wherein the first and second reactive functional groups are selected from the group consisting of amino group, hydroxyl group, carboxyl group, azlactone group, isocyanate group, epoxy group, aziridine group, acid chloride, and combination thereof.

11. The prepolymer of claim 10, wherein the first and second ethylenically functionalizing vinylic monomers independent of each other are selected from the group consisting of C_2 to C_6 hydroxylalkyl (meth)acrylate, C_2 to C_6 hydroxyalkyl (meth)acrylamide, allylalcohol, allylamine, amino–C_2-C_6 alkyl (meth)acrylate, C_1-C_6 alkylamino–C_2-C_6 alkyl (meth)acrylate, vinylamine, amino–C_2-C_6 alkyl (meth)acrylamide, C_1-C_6 alkylamino–C_2-C_6 alkyl (meth)acrylamide, acrylic acid, C_1-C_4 alkylacrylic acid (e.g., methacrylic ethylacrylic acid, propylacrylic acid, butylacrylic acid), *N*-[tris(hydroxymethyl)-methyl]acrylamide, N,N-2-acrylamidoglycolic acid, beta methyl-acrylic acid (crotonic acid), alpha-phenyl acrylic acid, beta-acryloxy propionic acid, sorbic acid, angelic acid, cinnamic acid, 1-carobxy-4-phenyl butadiene-1,3, itaconic acid, citraconic acid, mesaconic acid, glutaconic acid, aconitic acid, maleic acid, fumaric acid, aziridinyl C_1-C_{12} alkyl (meth)acrylate (e.g., 2-(1-aziridinyl) ethyl (meth)acrylate, 3-(1-aziridinyl) propyl (meth)acrylate, 4-(1-aziridinyl) butyl (meth)acrylate, 6-(1-aziridinyl) hexyl (meth)acrylate, or 8-(1-aziridinyl) octyl (meth)acrylate), glycidyl (meth)acrylate, vinyl glycidyl ether, allyl glycidyl ether, (meth)acrylic acid halide groups (—COX, X= Cl, Br, or I), C_1 to C_6 isocyanatoalkyl (meth)acrylate, azlactone-containing vinylic monomers (e.g., 2-vinyl-4,4-dimethyl-1,3-oxazolin-5-one, 2-isopropenyl-4,4-dimethyl-1,3-oxazolin-5-one, 2-vinyl-4-methyl-4-ethyl-1,3-oxazolin-5-one, 2-isopropenyl-4-methyl-4-butyl-1,3-oxazolin-5-one, 2-vinyl-4,4-dibutyl-1,3-oxazolin-5-one, 2-isopropenyl-4-methyl-4-dodecyl-1,3-oxazolin-5-one, 2-isopropenyl-4,4-diphenyl-1,3-oxazolin-5-one, 2-isopropenyl-4,4-pentamethylene-1,3-oxazolin-5-one, 2-isopropenyl-4,4-tetramethylene-1,3-oxazolin-5-one, 2-vinyl-4,4-diethyl-1,3-oxazolin-5-one, 2-vinyl-4-methyl-4-nonyl-1,3-oxazolin-5-one, 2-isopropenyl-4-methyl-4-phenyl-1,3-oxazolin-5-one, 2-isopropenyl-4-methyl-4-benzyl-1,3-oxazolin-5-one, 2-vinyl-4,4-pentamethylene-1,3-oxazolin-5-one, and 2-vinyl-4,4-dimethyl-1,3-oxazolin-6-one, with 2-vinyl-4,4-dimethyl-1,3-oxazolin-5-one (VDMO) and 2-isopropenyl-4,4-dimethyl-1,3-oxazolin-5-one (IPDMO) as preferred azlactone-containing vinylic monomers), and combinations thereof.

12. The prepolymer of claim 11, wherein the first ethylenically functionalizing vinylic monomer is selected from the group consisting of hydroxyethyl (meth)acrylate, hydroxypropyl (meth)acrylate, hydroxyethyl (meth)acrylamide, hydroxypropyl (meth)acrylamide, allyl alcohol, aminoethyl (meth)acrylate, aminopropyl (meth)acrylate, aminoethyl (meth)acrylamide, aminopropyl (meth)acrylamide, allyl amine, (meth)acrylic acid, ethylacrylic acid, propylacrylic acid, butylacrylic acid, glycidyl (meth)acrylate, vinyl

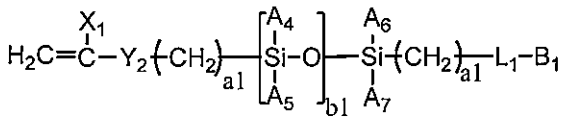
glycidyl ether, allyl glycidyl ether, isocynatoethyl (meth)acrylate, 2-(1-aziridinyl) ethyl (meth)acrylate, 3-(1-aziridinyl) propyl (meth)acrylate, 4-(1-aziridinyl) butyl (meth)acrylate, 2-vinyl-4,4-dimethyl-1,3-oxazolin-5-one (VDMO), 2-isopropenyl-4,4-dimethyl-1,3-oxazolin-5-one (IPDMO), and combination thereof.

13. A silicone hydrogel contact lens obtained by curing a lens forming formulation including a water-processable prepolymer of any one of claims 1 to 12, wherein the contact lens has at least one property selected from the group consisting of a water content of from about 20% to about 75% (preferably from about 25% to about 70%, more preferably from about 30% to about 65%) by weight when fully hydrated, an oxygen permeability (Dk) of at least about 40 barrers (preferably at least about 50 barrers, more preferably at least about 60 barrers, and even more preferably at least about 70 barrers), a hydrophilic surface characterized by an average water contact angle of about 90 degrees or less (preferably about 80 degrees or less, more preferably 70 degrees or less, even more preferably about 60 degrees or less) without post molding surface treatment, an elastic modulus of from about 0.1 MPa to about 2.0 MPa (preferably from about 0.2 MPa to about 1.5 MPa, more preferably from about 0.3 MPa to about 1.2 MPa, even more preferably from about 0.4 MPa to about 1.0 MPa); an Ionoflux Diffusion Coefficient, D, of, at least about 1.0×10^{-5} mm^2/min (more preferably at least about 2.0×10^{-5} mm^2/min, even more preferably at least about 6.0×10^{-5} mm^2/min); and combinations thereof.

14. A method for making silicone hydrogel contact lenses, comprising the steps of:

(1) introducing a lens formulation into a mold for making contact lenses, wherein the lens-forming formulation comprises

(a) a water-processable polysiloxane-containing polymerizable material selected from the group consisting of a prepolymer of any one of claims 1-12, a siloxane-containing vinylic monomer of formula (2), a siloxane-containing vinylic monomer of formula (3), a crosslinker of formula (7), a crosslinker of formula (8), and combinations thereof,



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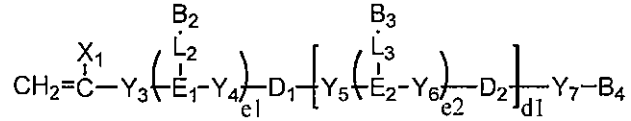
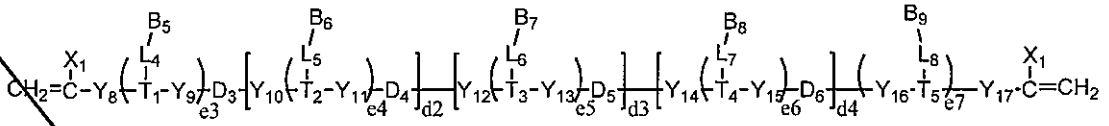


(3)



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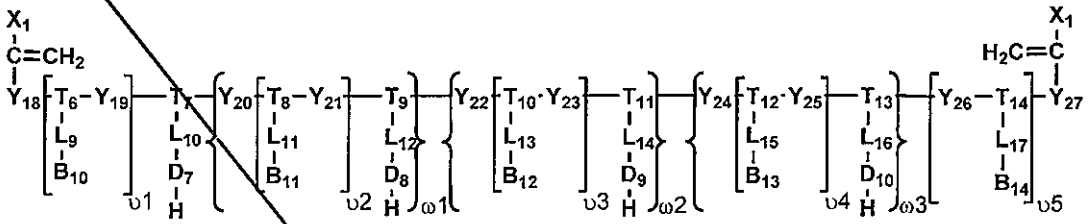
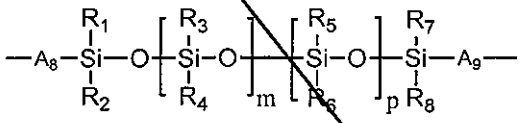


(8)

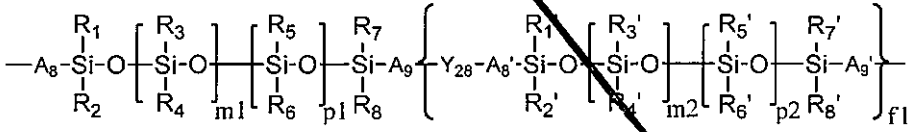
In which

D_1 and D_2 independently of each other are a divalent group of formula (4),



(4)

D_3, D_4, D_5, D_6, D_7, D_8, D_9, and D_{10} independently of one other are a divalent group of formula (9),



(9)

X_1 is hydrogen or methyl,

a1 is an integer from 1 to 5,

b1 is an integer from 1 to 10,

d1 is an integer from 0 to 4,

d2, d3, d4, ω1, ω2, and ω3 independent of one another are an integer from 0 to 20,

e1, e2, e3, e4, e5, e6, e7, υ1, υ2, υ3, υ4, and υ5 independent of one other are 0, 1, 2 or 3 and (e3+e4+e5+e6+e7)≥1 and (υ1+υ2+υ3+υ4+υ5) ≥1,

A_1, A_2, A_3, A_4, A_5, A_6, and A_7 independent of one another are methyl or ethyl,

A_8, A_8', A_9, and A_9' independent of one other are a direct bond, a linear or branched C_1–C_{10} alkylene divalent radical, $–(CH_2CH_2O)_{r1}–CH_2CH_2–$ in which r1 is an integer of 1 to 20, or a C_1-C_7 alkyleneoxy–C_1-C_7 alkylene divalent radical, and R_1, R_2, R_3, R_4, R_5, R_6, R_7, R_8, R_1', R_2', R_3', R_4', R_5', R_6', R_7', and R_8' independently of one another, are C_1-C_4-alkyl, –alk–$(OCH_2CH_2)_{r2}–OR_9$ in which alk is C_1-C_6-alkylene

divalent radical, R_9 is C_1-C_4 alkyl and r2 is an integer from 1 to 20,
f1 is an integer of 0 to 8,
m1, m2, p1 and p2 independently of each other are an integer of from 0 to 150,
(m1+p1) and (m2+p2) independent of each other are from 2 to 150,
L_1, L_2, L_3, L_4, L_5, L_6, L_7, L_8, L_9, L_{10}, L_{11}, L_{12}, L_{13}, L_{14}, L_{15}, L_{16}, L_{17}, Y_8, Y_9, Y_{10}, Y_{11}, Y_{12}, Y_{13}, Y_{14}, Y_{15}, Y_{16}, Y_{17}, Y_{18}, Y_{19}, Y_{20}, Y_{21}, Y_{22}, Y_{23}, Y_{24}, Y_{25}, Y_{26}, Y_{27}, and Y_{28} independent of one another are a direct bond or a divalent radical of $-Z_1-X_2-Z_2-X_3-Z_3-X_4-Z_4-$ In which X_2, X_3 and X_4 independent of one other are a linkage selected from the group consisting of a direct bond, –O–, –NR'– in which R' is H or C_1-C_4 alkyl, –C(O)–NH–, –NH–C(O)–, –NH–C(O)–NH–, –O–C(O)–NH–, –S–, –NH–C(O)–O–, –C(O)–O–,–O–C(O)–, –NH–C(O)–NH–Z_0–NH–C(O)–NH–, –O–C(O)–NH–Z_0–NH–C(O)–O–, –O–C(O)–NH–Z_0–NH–C(O)–NH–, and –NH–C(O)–NH–Z_0–NH–C(O)–O–, Z_0 is a linear or branched C_2-C_{12} alkylene divalent radical or a C_5-C_{45} cycloaliphatic or aliphatic-cycloaliphatic divalent radical optionally containing therein one or more linkages of –O–, –NR'–, –S– and –C(O)–, Z_1, Z_2, Z_3 and Z_4 independent of one other are is a direct bond, a linear or branched C_1–C_{12} alkylene divalent radical optionally containing therein one or more linkages of –O–, –NR'–, –S– and –C(O)–, a divalent radical of $-CH_2-CH(OH)-CH_2-$ or $-(CH_2CH_2O)_{r1}-CH_2CH_2-$ with r1 as defined above, or a C_5-C_{45} cycloaliphatic or aliphatic-cycloaliphatic divalent radical optionally containing therein one or more linkages of –O–, –NR'–, –S– and –C(O)–,
B_5, B_6, B_7, B_8, B_9, B_{10}, B_{11}, B_{12}, B_{13}, and B_{14} independent of one another are a linear or 3-arm hydrophilic polymer chain having a molecular weight of about 10000 Daltons or less (preferably about 7500 daltons or less, more preferably about 5000 daltons or less, even more preferably about 2500 Daltons or less, most preferably about 1000 Daltons or less) and comprising at least about 60% (preferably at least about 70%, more preferably at least about 80%, even more preferably at least about 90%) by weight of one or more hydrophilic monomeric units selected from the group consisting of ethyleneoxide units, (meth)acrylamide units, C_1-C_3 alkyl (meth)acrylamide units, di-(C_1-C_3 alkyl) (meth)acrylamide units, N-vinylpyrrole units, N-vinyl-2-pyrrolidone units, 2-vinyloxazoline units, 4-vinylpyridine units, mono-C_1-C_4 alkoxy, mono-(meth)acryloyl terminated polyethyleneglycol units having a molecular weight of 600 Daltons or less, di(C_1-C_3 alkyl amino)(C_2-C_4 alkyl) (meth)acrylate units, N-C_1-C_4 alkyl-3-methylene-2-pyrrolidone units, N-C_1-C_4 alkyl-5-methylene-2-pyrrolidone units, N-vinyl C_1-C_6 alkylamide units, N-vinyl-N- C_1-C_6 alkyl amide units, and combinations thereof,
E_1 and E_2 independent of each another are an aliphatic or cycloaliphatic or

aliphatic-cycloaliphatic trivalent radical which has up to 15 carbon atoms and can be interrupted by –O–, –NR'–, –C(O)– and/or –S–, and

T_1, T_2, T_3, T_4, T_5, T_6, T_7, T_8, T_9, T_{10}, T_{11}, T_{12}, T_{13}, and T_{14} independent of one another are an aliphatic or cycloaliphatic or aliphatic-cycloaliphatic trivalent radical which has up to 15 carbon atoms and can be interrupted by –O–, –NR'–, –C(O)– and/or –S–;

(b) a solvent selected from the group consisting of water, 1,2-propylene glycol, a polyethyleneglycol having amolecular weight of about 400 Daltons or less, and mixtures thereof,

wherein the lens-forming formulation is free of any non-reactive solvent other than water, 1,2-propylene glycol, a polyethyleneglycol having amolecular weight of about 400 Daltons or less;

(2) polymerizing the lens formulation in the mold to form a silicone hydrogel contact lens, wherein the formed silicone hdyrogel contact lens has a water content of from about 20% to about 75% (preferably from about 25% to about 70%, more preferably from about 30% to about 65%) by weight when fully hydrated, an oxygen permeability (Dk) of at least about 40 barrers (preferably at least about 50 barrers, more preferably at least about 60 barrers, and even more preferably at least about 70 barrers), and optionally (but preferably) a hydrophilic surface characterized by an average water contact angle of about 90 degrees or less (preferably about 80 degrees or less, more preferably 70 degrees or less, even more preferably about 60 degrees or less) without post molding surface treatment.

15. The method of claim 14, further comprising a step of extracting the formed silicone hydrogel contact lens with water or an aqueous solution.

16. The method of claim 14 or 15, wherein the mold is a reusable mold, wherein the lens-forming composition is cured (i.e., polymerized) actinically under a spatial limitation of actinic radiation to form the silicone hydrogel contact lens, and wherein the resusable is cleaned with an ophthalmically compatible solvent.

17. The method of claim 16, wherein the mold is made of quartz, glass, sapphire, CaF_2, a cyclic olefin copolymer, polymethylmethacrylate (PMMA), polyoxymethylene, polyetherimide, and combinations thereof.

What is claimed is:

1. A water-processable prepolymer, comprising:

(1) siloxane-containing monomeric units and/or polysiloxane-containing crosslinking units, wherein the siloxane-containing monomeric units are derived from one or more siloxane-containing vinylic monomers each having at least one hydrophilic polymeric chain with a number-average molecular weight of up to 10000 Daltons, wherein the polysiloxane-containing crosslinking units are derived from at least one hydrophilized polysiloxane crosslinker and/or chain-extended hydrophilized polysiloxane crosslinker each having one or more pendant hydrophilic polymeric chains;

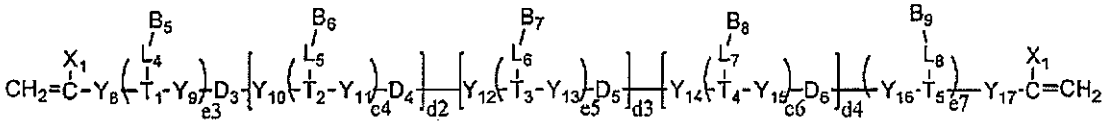
(2) hydrophilic monomeric units derived from one or more hydrophilic vinylic monomers;

(3) from 0.05% to 5% by weight of polymerizable units each having a pendant or terminal, ethylenically-unsaturated group and free of any polysiloxane segment; and

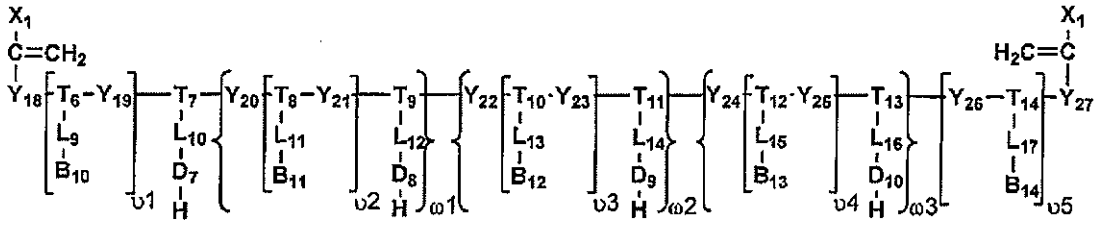
(4) optionally hydrophobic units derived from at least one hydrophobic vinylic monomer free of silicone,

wherein the prepolymer comprises from 20% to 50% by weight of silicone relative to the total weight of the prepolymer and has a high water solubility or dispersibility of at least 5% by weight in water, wherein the prepolymer is capable of being actinically crosslinked, in the absence of one or more vinylic monomers, to form a silicone hydrogel contact lens having a water content of from 20% to 75% by weight when fully hydrated, an oxygen permeability (Dk) of at least 40 barrers as measured according to procedures described in Example 1 and where "barrer" is defined as $[(cm^3 \text{ oxygen})(mm) / (cm^2)(sec)(mm\ Hg)] \times 10^{-10}$, and a hydrophilic surface characterized by an average water contact angle of 90 degrees or less as measured by Sessile Drop at 20°C without post-molding surface treatment.

2. The prepolymer of claim 1, wherein the prepolymer comprises a hydrophilized polysiloxane or chain-extended polysiloxane crosslinker of formula (7) or (8)



(7)



(8)

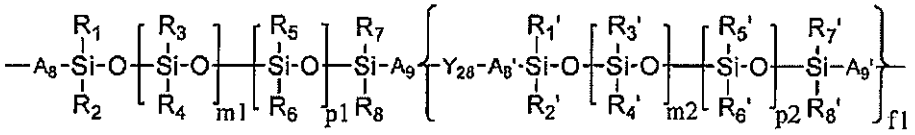
In which

d2, d3, d4, ω1, ω2, and ω3 independent of one another are an integer from 0 to 20;

e3, e4, e5, e6, e7, υ1, υ2, υ3, υ4, and υ5 independent of one other are 0, 1, 2 or 3 and (e3+e4+e5+e6+e7)≥1 and (υ1+υ2+υ3+υ4+υ5) ≥1;

X_1 is hydrogen or methyl;

D_3, D_4, D_5, D_6, D_7, D_8, D_9, and D_{10} independently of one other are a divalent group of formula (9)



(9)

in which Y_{28} is as defined below, A_8, A_8', A_9, and A_9' independent of one other are a direct bond, a linear or branched C_1–C_{10} alkylene divalent radical, –$(CH_2CH_2O)_{r1}$–CH_2CH_2– in which r1 is an integer of 1 to 20, or a C_1-C_7 alkyleneoxy–C_1-C_7 alkylene divalent radical, and R_1, R_2, R_3, R_4, R_5, R_6, R_7, R_8, R_1', R_2', R_3', R_4', R_5', R_6', R_7', and R_8' independently of one another, are C_1-C_4-alkyl, –alk–$(OCH_2CH_2)_{r2}$–OR_9 in which alk is C_1-C_6-alkylene divalent radical, R_9 is C_1-C_4 alkyl and r2 is an integer from 1 to 20, f1 is an integer of 0 to 8, m1, m2, p1 and p2 independently of each other are an integer of from 0 to 150, (m1+p1) and (m2+p2) independent of each other are from 2 to 150;

L_4, L_5, L_6, L_7, L_8, L_9, L_{10}, L_{11}, L_{12}, L_{13}, L_{14}, L_{15}, L_{16}, L_{17}, Y_8, Y_9, Y_{10}, Y_{11}, Y_{12}, Y_{13}, Y_{14}, Y_{15}, Y_{16}, Y_{17}, Y_{18}, Y_{19}, Y_{20}, Y_{21}, Y_{22}, Y_{23}, Y_{24}, Y_{25}, Y_{26}, Y_{27}, and Y_{28} independent of one another are a direct bond or a divalent radical of

–Z_1–X_2–Z_2–X_3–Z_3–X_4–Z_4– In which X_2, X_3 and X_4 independent of one other are a linkage selected from the group consisting of a direct bond, –O–, –NR'– in which R' is H or C_1-C_4 alkyl, –C(O)–NH–, –NH–C(O)–, –NH–C(O)–NH–, –O–C(O)–NH–,

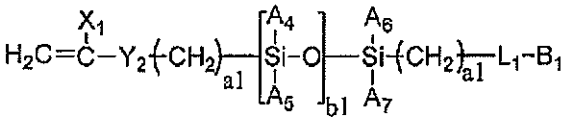
–S–, –NH–C(O)–O–, –C(O)–O–, –O–C(O)–, –NH–C(O)–NH–Z_0–NH–C(O)–NH–, –O–C(O)–NH–Z_0–NH–C(O)–O–, –O–C(O)–NH–Z_0–NH–C(O)–NH–, and –NH–C(O)–NH–Z_0–NH–C(O)–O–, Z_0 is a linear or branched C_2-C_{12} alkylene divalent radical or a C_5-C_{45} cycloaliphatic or aliphatic-cycloaliphatic divalent radical optionally containing therein one or more linkages of –O–, –NR'–, –S– and –C(O)–, Z_1, Z_2, Z_3 and Z_4 independent of one other are is a direct bond, a linear or branched C_1–C_{12} alkylene divalent radical optionally containing therein one or more linkages of –O–, –NR'–, –S– and –C(O)–, a divalent radical of $–CH_2$-$CH(OH)$-CH_2– or $–(CH_2CH_2O)_{r1}$-CH_2CH_2– with r1 as defined above, or a C_5-C_{45} cycloaliphatic or aliphatic-cycloaliphatic divalent radical optionally containing therein one or more linkages of –O–, –NR'–, –S– and –C(O)–;

B_5, B_6, B_7, B_8, B_9, B_{10}, B_{11}, B_{12}, B_{13}, and B_{14} independent of one another are hydroxyl or (preferably) a linear or 3-arm hydrophilic polymer chain having a number-average molecular weight of 10000 Daltons or less and comprising at least 60% by weight of one or more hydrophilic monomeric units selected from the group consisting of ethyleneoxide units, (meth)acrylamide units, C_1-C_3 alkyl (meth)acrylamide units, di-(C_1-C_3 alkyl) (meth)acrylamide units, N-vinylpyrrole units, N-vinyl-2-pyrrolidone units, 2-vinyloxazoline units, 4-vinylpyridine units, mono-C_1-C_4 alkoxy, mono-(meth)acryloyl terminated polyethyleneglycol units having a number-average molecular weight of 600 Daltons or less, di(C_1-C_3 alkyl amino)(C_2-C_4 alkyl) (meth)acrylate units, N-C_1-C_4 alkyl-3-methylene-2-pyrrolidone units, N-C_1-C_4 alkyl-5-methylene-2-pyrrolidone units, N-vinyl C_1-C_6 alkylamide units, N-vinyl-N- C_1-C_6 alkyl amide units, and combinations thereof, provided that at least one of B_5, B_6, B_7, B_8, and B_9 and at least one of B_{10}, B_{11}, B_{12}, B_{13}, and B_{14} are the linear or 3-arm hydrophilic polymer chain; and

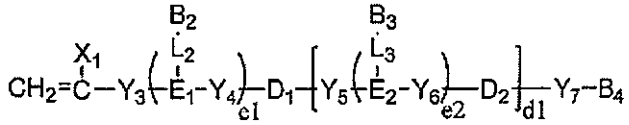
T_1, T_2, T_3, T_4, T_5, T_6, T_7, T_8, T_9, T_{10}, T_{11}, T_{12}, T_{13}, and T_{14} independent of one another are an aliphatic or cycloaliphatic or aliphatic-cycloaliphatic trivalent radical which has up to 15 carbon atoms and can be interrupted by –O–, –NR'–, –C(O)– and/or –S–.

3. The prepolymer of claim 2, wherein the prepolymer comprises a hydrophilized polysiloxane or chain-extended polysiloxane crosslinker of formula (7).

4. The prepolymer of claim 1, 2 or 3, wherein the prepolymer comprises a siloxane-containing vinylic monomer of formula (2) or (3)



(2)



(3)

in which

b1 is an integer from 1 to 10;

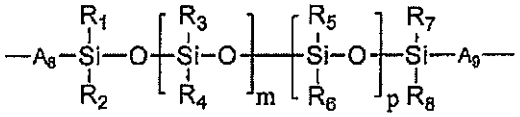
d1 is an integer from 0 to 4;

e1 and e2 independent of each other are 0, 1, 2 or 3;

A_4, A_5, A_6, and A_7 independent of one another are methyl or ethyl;

X_1 is hydrogen or methyl;

D_1 and D_2 independently of each other are a divalent group of formula (4)



(4)

in which A_8 and A_9 independent of each other are a direct bond, a linear or branched C_1–C_{10} alkylene divalent radical, $-(CH_2CH_2O)_{r1}-CH_2CH_2-$ in which r1 is an integer of 1 to 20, or a C_1-C_7 alkyleneoxy–C_1-C_7 alkylene divalent radical, and R_1, R_2, R_3, R_4, R_5, R_6, R_7, and R_8, independently of one another, are C_1-C_4-alkyl, –alk–$(OCH_2CH_2)_{r2}$–OR_9 in which alk is C_1-C_6-alkylene divalent radical, R_9 is C_1-C_4 alkyl and r2 is an integer from 1 to 20, m and p independently of each other are an integer of from 0 to 150 and (m+p) is from 2 to 150;

L_1, L_2, L_3, Y_2, Y_3, Y_4, Y_5, Y_6, and Y_7 independent of one another are a direct bond or a divalent radical of $–Z_1–X_2–Z_2–X_3–Z_3–X_4–Z_4–$ In which X_2, X_3, and X_4 independent of one other are a linkage selected from the group consisting of a direct bond, –O–, –NR'– in which R' is H or C_1-C_4 alkyl, –C(O)–NH–, –NH–C(O)–, –NH–C(O)–NH–, –O–C(O)–NH–, –S–, –NH–C(O)–O–, –C(O)–O–, –O–C(O)–, –NH–C(O)–NH–Z_0–NH–C(O)–NH–, –O–C(O)–NH–Z_0–NH–C(O)–O–, –O–C(O)–NH–Z_0–NH–C(O)–NH–, and –NH–C(O)–NH–Z_0–NH–C(O)–O–, in which Z_0 is a linear or branched C_2-C_{12} alkylene divalent radical or a C_5-C_{45} cycloaliphatic or

aliphatic-cycloaliphatic divalent radical optionally containing therein one or more linkages of –O–, –NR'–, –S– and –C(O)–, Z_1, Z_2, Z_3, and Z_4 independent of one other are is a direct bond, a linear or branched C_1–C_{12} alkylene divalent radical optionally containing therein one or more linkages of –O–, –NR'–, –S– and –C(O)–, a divalent radical of $–CH_2$-CH(OH)-CH_2– or $–(CH_2CH_2O)_{r1}$-CH_2CH_2– with r1 as defined above, or a C_5-C_{45} cycloaliphatic or aliphatic-cycloaliphatic divalent radical optionally containing therein one or more linkages of –O–, –NR'–, –S– and –C(O)–;

B_1 is a linear or 3-arm hydrophilic polymer chain having a number-average molecular weight of 10,000 Daltons or less and comprising at least 60% by weight of one or more hydrophilic monomeric units selected from the group consisting of ethyleneoxide units, (meth)acrylamide units, C_1-C_3 alkyl (meth)acrylamide units, di-(C_1-C_3 alkyl) (meth)acrylamide units, N-vinylpyrrole units, N-vinyl-2-pyrrolidone units, 2-vinyloxazoline units, 4-vinylpyridine units, mono-C_1-C_4 alkoxy, mono-(meth)acryloyl terminated polyethyleneglycol units having a number-average molecular weight of 600 Daltons or less, di(C_1-C_3 alkyl amino)(C_2-C_4 alkyl) (meth)acrylate units, N-C_1-C_4 alkyl-3-methylene-2-pyrrolidone units, N-C_1-C_4 alkyl-5-methylene-2-pyrrolidone units, N-vinyl C_1-C_6 alkylamide units, N-vinyl-N-C_1-C_6 alkyl amide units, and combinations thereof, provided that at least one of B_2, B_3 and B_4 is the linear or 3-arm hydrophilic polymer chain;

B_2, B_3 and B_4 independent of one another are hydroxyl or a linear or 3-arm hydrophilic polymer chain having a number-average molecular weight of 10,000 Daltons or less and comprising at least 60% by weight of one or more hydrophilic monomeric units selected from the group consisting of ethyleneoxide units, (meth)acrylamide units, C_1-C_3 alkyl (meth)acrylamide units, di-(C_1-C_3 alkyl) (meth)acrylamide units, N-vinylpyrrole units, N-vinyl-2-pyrrolidone units, 2-vinyloxazoline units, 4-vinylpyridine units, mono-C_1-C_4 alkoxy, mono-(meth)acryloyl terminated polyethyleneglycol units having a number–average molecular weight of 600 Daltons or less, di(C_1-C_3 alkyl amino)(C_2-C_4 alkyl) (meth)acrylate units, N-C_1-C_4 alkyl-3-methylene-2-pyrrolidone units, N-C_1-C_4 alkyl-5-methylene-2-pyrrolidone units, N-vinyl C_1-C_6 alkylamide units, N-vinyl-N-C_1-C_6 alkyl amide units, and combinations thereof, provided that at least one of B_2, B_3 and B_4 is the linear or 3-arm hydrophilic polymer chain;

E_1 and E_2 independent of each another are an aliphatic or cycloaliphatic or aliphatic-cycloaliphatic trivalent radical which has up to 15 carbon atoms and can

be interrupted by –O–, –NR'–, –C(O)– and/or –S–.

5. The prepolymer of claim 4, wherein the prepolymer comprises a siloxane-containing vinylic monomer of formula (2).
6. The prepolymer of claim 4, wherein the prepolymer comprises a siloxane-containing vinylic monomer of formula (3).
7. The prepolymer of any one of claims 1 to 6, wherein the hydrophilic monomeric units are derived from at least one hydrophilic vinylic monomer selected from the group consisting of N,N-dimethylacrylamide (DMA), N,N-dimethylmethacrylamide (DMMA), 2-acrylamidoglycolic acid, 3-acryloylamino-1-propanol, N-hydroxyethyl acrylamide, *N*-[tris(hydroxymethyl)methyl]-acrylamide, N-methyl-3-methylene-2-pyrrolidone, 1-ethyl-3-methylene-2-pyrrolidone, 1-methyl-5-methylene-2-pyrrolidone, 1-ethyl-5-methylene-2-pyrrolidone, 5-methyl-3-methylene-2-pyrrolidone, 5-ethyl-3-methylene-2-pyrrolidone, 1-n-propyl-3-methylene-2-pyrrolidone, 1-n-propyl-5-methylene-2-pyrrolidone, 1-isopropyl-3-methylene-2-pyrrolidone, 1-isopropyl-5-methylene-2-pyrrolidone, 1-n-butyl-3-methylene-2-pyrrolidone, 1-tert-butyl-3-methylene-2-pyrrolidone, 2-hydroxyethylmethacrylate (HEMA), 2-hydroxyethyl acrylate (HEA), hydroxypropyl acrylate, hydroxypropyl methacrylate (HPMA), trimethylammonium 2-hydroxy propylmethacrylate hydrochloride, aminopropyl methacrylate hydrochloride, dimethylaminoethyl methacrylate (DMAEMA), glycerol methacrylate (GMA), N-vinyl-2-pyrrolidone (NVP), allyl alcohol, vinylpyridine, a C_1-C_4-alkoxy polyethylene glycol (meth)acrylate having a number-average molecular weight of up to 1500, methacrylic acid, N-vinyl formamide, N-vinyl acetamide, N-vinyl isopropylamide, N-vinyl-N-methyl acetamide, N-vinyl caprolactam, and mixtures thereof.
8. The prepolymer of claim 7, wherein said at least one hydrophilic monomer is selected from the group consisting of N-vinylpyrrolidone, N,N-dimethyl (meth)acrylamide, (meth)acrylamide, N-vinyl formamide, N-vinyl acetamide, N-vinyl isopropylamide, N-vinyl-N-methyl acetamide, N-methyl-3-methylene-2-pyrrolidone, 1-ethyl-3-methylene-2-pyrrolidone, 1-methyl-5-methylene-2-pyrrolidone, 1-ethyl-5-methylene-2-pyrrolidone, 5-methyl-3-methylene-2-pyrrolidone, 5-ethyl-3-methylene-2-pyrrolidone, and combinations thereof.
9. The prepolymer of any one of claims 1 to 8, wherein the polymerizable units are free of any polysiloxane segment and each comprise a basic monomeric unit being a part of a polymer chain of the prepolymer and having a pendant or terminal, ethylenically-unsaturated group attached thereon, wherein each basic monomeric unit is derived from a first ethylenically functionalizing vinylic monomer having a first

reactive functional group, wherein the pendant or terminal ethylenically unsaturated group is derived from a second ethylenically functionalizing vinylic monomer having a second reactive functional group which reacts with one first reactive functional in the presence or absence of a crosslinking agent to form a covalent linkage, wherein the first and second reactive functional groups are selected from the group consisting of amino group, hydroxyl group, carboxyl group, azlactone group, isocyanate group, epoxy group, aziridine group, acid chloride, and combination thereof.

10. The prepolymer of claim 9, wherein the first and second ethylenically functionalizing vinylic monomers independent of each other are selected from the group consisting of C_2 to C_6 hydroxylalkyl (meth)acrylate, C_2 to C_6 hydroxyalkyl (meth)acrylamide, allylalcohol, allylamine, amino–C_2-C_6 alkyl (meth)acrylate, C_1-C_6 alkylamino–C_2-C_6 alkyl (meth)acrylate, vinylamine, amino–C_2-C_6 alkyl (meth)acrylamide, C_1-C_6 alkylamino–C_2-C_6 alkyl (meth)acrylamide, acrylic acid, C_1-C_4 alkylacrylic acid, *N*-[tris(hydroxymethyl)-methyl]acrylamide, N,N-2-acrylamidoglycolic acid, beta methyl-acrylic acid (crotonic acid), alpha-phenyl acrylic acid, beta-acryloxy propionic acid, sorbic acid, angelic acid, cinnamic acid, 1-carobxy-4-phenyl butadiene-1,3, itaconic acid, citraconic acid, mesaconic acid, glutaconic acid, aconitic acid, maleic acid, fumaric acid, aziridinyl C_1-C_{12} alkyl (meth)acrylate, glycidyl (meth)acrylate, vinyl glycidyl ether, allyl glycidyl ether, (meth)acrylic acid halide groups (–COX, X= Cl, Br, or I), C_1 to C_6 isocyanatoalkyl (meth)acrylate, azlactone-containing vinylic monomers, and combinations thereof.

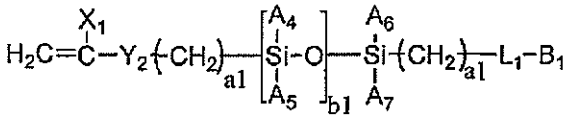
11. The prepolymer of claim 10, wherein the first ethylenically functionalizing vinylic monomer is selected from the group consisting of hydroxyethyl (meth)acrylate, hydroxypropyl (meth)acrylate, hydroxyethyl (meth)acrylamide, hydroxypropyl (meth)acrylamide, allyl alcohol, aminoethyl (meth)acrylate, aminopropyl (meth)acrylate, aminoethyl (meth)acrylamide, aminopropyl (meth)acrylamide, allyl amine, (meth)acrylic acid, ethylacrylic acid, propylacrylic acid, butylacrylic acid, glycidyl (meth)acrylate, vinyl glycidyl ether, allyl glycidyl ether, isocynatoethyl (meth)acrylate, 2-(1-aziridinyl) ethyl (meth)acrylate, 3-(1-aziridinyl) propyl (meth)acrylate, 4-(1-aziridinyl) butyl (meth)acrylate, 2-vinyl-4,4-dimethyl-1,3-oxazolin-5-one (VDMO), 2-isopropenyl-4,4-dimethyl-1,3-oxazolin-5-one (IPDMO), and combination thereof.

12. A silicone hydrogel contact lens obtained by curing a lens forming formulation including a water-processable prepolymer of any one of claims 1 to 11.

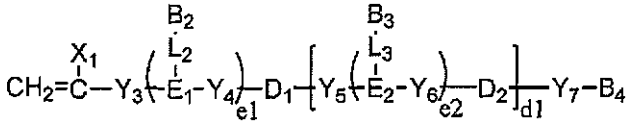
13. A method for making silicone hydrogel contact lenses, comprising the steps of:

(1) introducing a lens formulation into a mold for making contact lenses, wherein the lens-forming formulation comprises

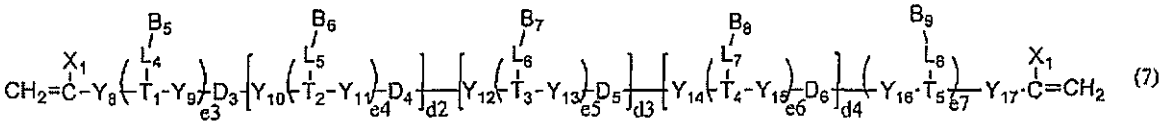
(a) a water-processable polysiloxane-containing polymerizable material selected from the group consisting of a prepolymer of any one of claims 1-11, a siloxane-containing vinylic monomer of formula (2), a siloxane-containing vinylic monomer of formula (3), a crosslinker of formula (7), a crosslinker of formula (8), and combinations thereof,



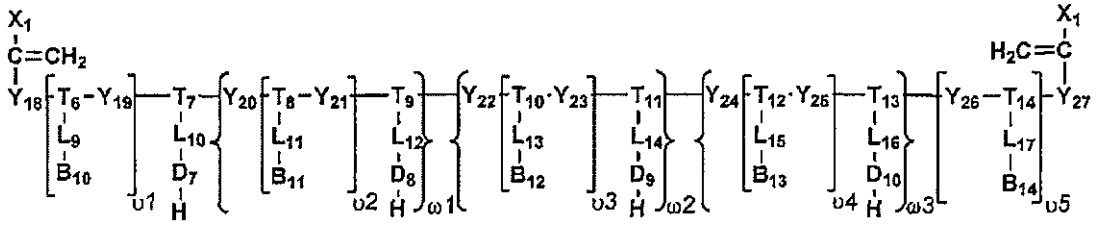
(2)



(3)



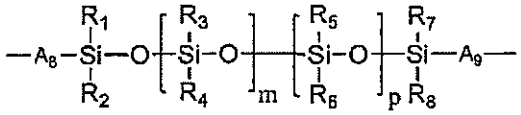
(7)



(8)

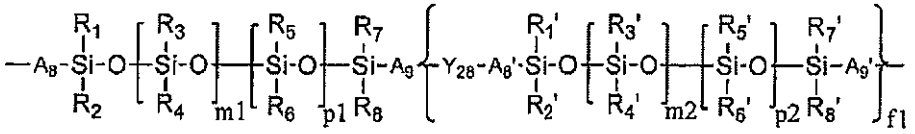
In which

D_1 and D_2 independently of each other are a divalent group of formula (4),



(4)

D_3, D_4, D_5, D_6, D_7, D_8, D_9, and D_{10} independently of one other are a divalent group of formula (9),



(9)

X_1 is hydrogen or methyl,

a1 is an integer from 1 to 5,

b1 is an integer from 1 to 10,

d1 is an integer from 0 to 4,

d2, d3, d4, ω1, ω2, and ω3 independent of one another are an integer from 0 to 20,

e1, e2, e3, e4, e5, e6, e7, υ1, υ2, υ3, υ4, and υ5 independent of one other are 0, 1, 2 or 3 and (e3+e4+e5+e6+e7)≥1 and (υ1+υ2+υ3+υ4+υ5) ≥1,

A_1, A_2, A_3, A_4, A_5, A_6, and A_7 independent of one another are methyl or ethyl,

A_8, A_8', A_9, and A_9' independent of one other are a direct bond, a linear or branched C_1–C_{10} alkylene divalent radical, $–(CH_2CH_2O)_{r1}–CH_2CH_2–$ in which r1 is an integer of 1 to 20, or a C_1-C_7 alkyleneoxy–C_1-C_7 alkylene divalent radical, and R_1, R_2, R_3, R_4, R_5, R_6, R_7, R_8, R_1', R_2', R_3', R_4', R_5', R_6', R_7', and R_8' independently of one another, are C_1-C_4-alkyl, –alk–$(OCH_2CH_2)_{r2}–OR_9$ in which alk is C_1-C_6-alkylene divalent radical, R_9 is C_1-C_4 alkyl and r2 is an integer from 1 to 20,

f1 is an integer of 0 to 8,

m1, m2, p1 and p2 independently of each other are an integer of from 0 to 150, (m1+p1) and (m2+p2) independent of each other are from 2 to 150,

L_1, L_2, L_3, L_4, L_5, L_6, L_7, L_8, L_9, L_{10}, L_{11}, L_{12}, L_{13}, L_{14}, L_{15}, L_{16}, L_{17}, Y_8, Y_9, Y_{10}, Y_{11}, Y_{12}, Y_{13}, Y_{14}, Y_{15}, Y_{16}, Y_{17}, Y_{18}, Y_{19}, Y_{20}, Y_{21}, Y_{22}, Y_{23}, Y_{24}, Y_{25}, Y_{26}, Y_{27}, and Y_{28} independent of one another are a direct bond or a divalent radical of $–Z_1–X_2–Z_2–X_3–Z_3–X_4–Z_4–$ In which X_2, X_3 and X_4 independent of one other are a linkage selected from the group consisting of a direct bond, –O–, –NR'– in which R' is H or C_1-C_4 alkyl, –C(O)–NH–, –NH–C(O)–, –NH–C(O)–NH–, –O–C(O)–NH–, –S–, –NH–C(O)–O–, –C(O)–O–, –O–C(O)–, –NH–C(O)–NH–Z_0–NH–C(O)–NH–, –O–C(O)–NH–Z_0–NH–C(O)–O–, –O–C(O)–NH–Z_0–NH–C(O)–NH–, and –NH–C(O)–NH–Z_0–NH–C(O)–O–, Z_0 is a linear or branched C_2-C_{12} alkylene divalent radical or a C_5-C_{45} cycloaliphatic or aliphatic-cycloaliphatic divalent radical optionally containing therein one or more linkages of –O–, –NR'–, –S– and –C(O)–, Z_1, Z_2,

Z_3 and Z_4 independent of one other are is a direct bond, a linear or branched C_1–C_{12} alkylene divalent radical optionally containing therein one or more linkages of –O–, –NR'–, –S– and –C(O)–, a divalent radical of $–CH_2–CH(OH)–CH_2–$ or $–(CH_2CH_2O)_{r1}–CH_2CH_2–$ with r1 as defined above, or a C_5-C_{45} cycloaliphatic or aliphatic-cycloaliphatic divalent radical optionally containing therein one or more linkages of –O–, –NR'–, –S– and –C(O)–,

B_6, B_8, B_7, B_8, B_9, B_{10}, B_{11}, B_{12}, B_{13}, and B_{14} independent of one another are a linear or 3-arm hydrophilic polymer chain having a number-average molecular weight of 10000 Daltons or less and comprising at least 60% by weight of one or more hydrophilic monomeric units selected from the group consisting of ethyleneoxide units, (meth)acrylamide units, C_1-C_3 alkyl (meth)acrylamide units, di-(C_1-C_3 alkyl) (meth)acrylamide units, N-vinylpyrrole units, N-vinyl-2-pyrrolidone units, 2-vinyloxazoline units, 4-vinylpyridine units, mono-C_1-C_4 alkoxy, mono-(meth)acryloyl terminated polyethyleneglycol units having a number-average molecular weight of 600 Daltons or less, di(C_1-C_3 alkyl amino)(C_2-C_4 alkyl) (meth)acrylate units, N-C_1-C_4 alkyl-3-methylene-2-pyrrolidone units, N-C_1-C_4 alkyl-5-methylene-2-pyrrolidone units, N-vinyl C_1-C_6 alkylamide units, N-vinyl-N-C_1-C_6 alkyl amide units, and combinations thereof,

E_1 and E_2 independent of each another are an aliphatic or cycloaliphatic or aliphatic-cycloaliphatic trivalent radical which has up to 15 carbon atoms and can be interrupted by –O–, –NR'–, –C(O)– and/or –S–, and

T_1, T_2, T_3, T_4, T_5, T_6, T_7, T_8, T_9, T_{10}, T_{11}, T_{12}, T_{13}, and T_{14} independent of one another are an aliphatic or cycloaliphatic or aliphatic-cycloaliphatic trivalent radical which has up to 15 carbon atoms and can be interrupted by –O–, –NR'–, –C(O)– and/or –S–;

(b) a solvent selected from the group consisting of water, 1,2-propylene glycol, a polyethyleneglycol having a number-average molecular weight of 400 Daltons or less, and mixtures thereof,

wherein the lens-forming formulation is free of any non-reactive solvent other than water, 1,2-propylene glycol, a polyethyleneglycol having a number-average molecular weight of 400 Daltons or less;

(2) polymerizing the lens formulation in the mold to form a silicone hydrogel contact lens.

14. The method of claim 13, further comprising a step of extracting the formed silicone hydrogel contact lens with water or an aqueous solution.

15. The method of claim 13 or 14, wherein the mold is a reusable mold, wherein the lens-forming composition is cured actinically under a spatial limitation of actinic radiation to form the silicone hydrogel contact lens, and wherein the resusable is cleaned with an ophthalmically compatible solvent.

16. The method of claim 15, wherein the mold is made of quartz, glass, sapphire, CaF_2, a cyclic olefin copolymer, polymethylmethacrylate (PMMA), polyoxymethylene, polyetherimide, and combinations thereof.