

We claim:

1. An ink composition for making cosmetic contact lenses, the ink composition comprising:
(a) a colorant; and (b) a nonreactive hydrophilic polymer; and optionally (c) a binder polymer.
2. The ink composition of claim 1 wherein the nonreactive hydrophilic polymer comprises a polyamide.
3. The ink composition of claim 1 wherein the nonreactive hydrophilic polymer comprises:
dextran, poly(ethylene oxide), polyvinyl alcohol (PVA), poly (N-isopropylacrylamide),
poly(oligoethylene oxide), polyethylene glycol (PEG), poly (N,N-dimethylaminoethyl acrylate),
poly(imine), poly(acrylic acid), or mixtures of two or more thereof.
4. The ink composition of any one of claims 1 to 3 wherein the optional binder polymer
comprises a copolymer formed from a hydrophilic monomer comprising functionality selected
from the group consisting of hydroxyalkyl, aminoalkyl, and mixtures thereof; a silicone-
containing macromer; and optionally a silicone-containing monomer.
5. The ink composition of any of claims 1 to 4, further comprising (d) a solvent.
6. The ink composition of claim 5 wherein the solvent comprises: ethanol, 1-propanol, 2-
propanol, 1-ethoxy-2-propanol (1E2P), t-butyl alcohol, t-amyl alcohol, and 3,7-dimethyl-1,7-
octanediol (D3O), tripropylene glycol methyl ether (TPME), isopropyl lactate (IPL), 1-(2-
hydroxy ethyl)-2-pyrrolidone (HEP), glycerol or mixtures of two or more thereof.
7. The ink composition of any one of claims 1 to 6 wherein the nonreactive hydrophilic
polymer comprises a cyclic polyamide.
8. The ink composition of any one of claims 1 to 7 wherein the colorant comprises:
phthalocyanine blue, phthalocyanine green, carbazole violet, vat orange #1, iron oxide black, iron
oxide brown, iron oxide yellow, iron oxide red, titanium dioxide, dichlorotriazine, vinyl sulfone-
based dyes, and mixtures of two or more thereof.
9. The ink composition of any one of claims 1 to 8 comprising: from 0.1 to about 25 weight
percent of the colorant; from about 1 to about 50 weight percent of the nonreactive hydrophilic

polymer; from about 1 to 60 weight percent of the binder polymer; and from about 50 to about 95 weight percent of a solvent, each based on the total weight of the ink composition.

10. The ink composition of any of any one of claims 1 to 9 wherein the binder polymer has a weight average molecular weight in the range of about 10 to about 100 kDa.

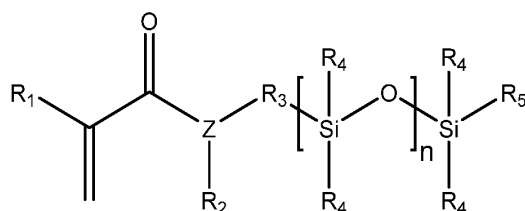
11. The ink composition of any of claims 1 to 10 wherein the nonreactive hydrophilic polymer is poly(vinylpyrrolidone).

12. The ink composition of claim 4, wherein the hydrophilic monomer comprises 2-hydroxyethyl (meth)acrylate, 2-hydroxypropyl (meth)acrylate, 3-hydroxypropyl (meth)acrylate, 2,3-dihydroxypropyl (meth)acrylate, 2-hydroxybutyl (meth)acrylate, 3-hydroxybutyl (meth)acrylate, 4-hydroxybutyl (meth)acrylate, N-(2-hydroxyethyl) (meth)acrylamide, N,N-bis(2-hydroxyethyl) (meth)acrylamide, N-(2-hydroxypropyl) (meth)acrylamide, N,N-bis(2-hydroxypropyl) (meth)acrylamide, N-(3-hydroxypropyl) (meth)acrylamide, N-(2-hydroxybutyl) (meth)acrylamide, N-(3-hydroxybutyl) (meth)acrylamide, N-(4-hydroxybutyl) (meth)acrylamide, or mixtures thereof.

13. The ink composition of claim 12, wherein the hydrophilic monomer is 2-hydroxyethyl (meth)acrylate.

14. The ink composition of any of claims 4 to 13 wherein the silicone-containing macromer comprises a polymerizable functional group selected from the group consisting of (meth)acrylate, (meth)acrylamide, styryl, vinyl, N-vinyl lactam, N-vinylamides, O-vinylethers, O-vinylcarbonates, and O-vinylcarbonates.

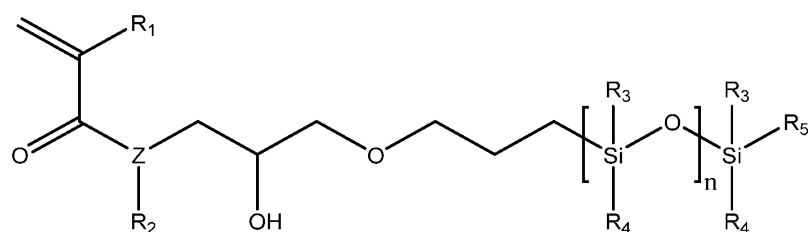
15. The ink composition of any of claims 4 to 14, wherein the silicone-containing macromer comprises a chemical structure shown in Formula I:



Formula I

wherein Z is selected from O, N, S or $\text{NCH}_2\text{CH}_2\text{O}$; when $Z = \text{O}$ or S, R_2 is not required; wherein R_1 is a hydrogen atom or methyl; wherein n is a whole number between 1 and 200; wherein R_3 is an alkylene segment $(\text{CH}_2)_y$ in which y is a whole number from 1 to 6, and each methylene group may be optionally further and independently substituted with a group selected from the group consisting of ethers, amines, esters, ketones, carbonyls, carboxylates, and carbamates, or when y is 2 or more a non-terminal methylene group is optionally replaced with a carbamate group; or wherein R_3 is an oxyalkylene segment $\text{O}(\text{CH}_2)_z$ in which z is a whole number from 1 to 3, or wherein R_3 is a mixture of alkylene and oxyalkylene segments and the sum of y and z is between 1 and 9; wherein R_2 and R_4 are independently a hydrogen atom, a linear, branched, or cyclic alkyl group containing between one and six carbon atoms, a linear, branched, or cyclic alkoxy group containing between one and six carbon atoms, a linear or branched polyethylenoxyalkyl group, an alkyl-siloxanyl-alkyl group, a phenyl group, a benzyl group, a substituted or unsubstituted aryl group, a fluoroalkyl group, a partially fluorinated alkyl group, a perfluoroalkyl group, a fluorine atom, a mono-, di, or tri-hydroxyalkyl group containing between one and six carbon atoms, or combinations thereof; and wherein R_5 is a substituted or unsubstituted linear, branched, or cyclic alkyl group having 1 to 8 carbon atoms or an aryl group, any of which may be further substituted with one or more fluorine atoms or trimethylsiloxy groups.

16. The ink composition of any one of claims 4 to 15, wherein the silicone-containing macromer is selected from the group consisting of monoalkyl terminated, mono(meth)acrylate terminated poly(dialkylsiloxanes), monoalkyl terminated, monoalkyl terminated, mono(meth)acrylate terminated poly(diarylsiloxanes), monoalkyl terminated, mono(meth)acrylate terminated poly(alkylarylsiloxanes), and mixtures thereof.
17. The ink composition of claim 16, wherein the silicone-containing macromer is mono-n-butyl terminated monomethacryloxypropyl terminated polydimethylsiloxane.
18. The ink composition of any of claims 4 to 17, wherein the silicone-containing macromer comprises a chemical structure shown in Formula VIII:



Formula VIII

wherein Z is selected from O, N, S or NCH₂CH₂O; wherein R₁ is independently hydrogen atom or methyl group; wherein R₂, R₃, and R₄ are independently a hydrogen atom or a linear, branched, or cyclic alkyl group containing one to eight carbon atoms, any of which may be further substituted with at least one hydroxy group, and which may be optionally substituted with amido, ether, amino, carboxyl, carbonyl groups and combinations thereof; for Z = O and S, R₂ is not required; wherein n is the number of siloxane repeating units and is from 4 to 200; and wherein R₅ is selected from straight or branched C₁ to C₈ alkyl groups.

19. The ink composition of any one of claims 4 to 18, wherein the silicone-containing macromer is mono-n-butyl terminated mono-(2-hydroxy-3-methacryloxypropyl)-propyl ether terminated polydimethylsiloxane.
20. The ink composition of any of claims 4 to 19, wherein the silicone-containing macromer is selected from the group consisting of mono-n-butyl terminated monomethacryloxypropyl terminated polydimethylsiloxane, mono-n-butyl terminated mono-(2-hydroxy-3-methacryloxypropyl)-propyl ether terminated polydimethylsiloxane, and mixtures thereof.
21. The ink composition of any one of claims 4 to 20, wherein the silicone-containing macromer has a number average molecular weight greater than 500 Daltons.
22. The ink composition of any one of claims 4 to 20, wherein the silicone-containing macromer has a number average molecular weight between about 500 Daltons and about 20,000 Daltons.

23. The ink composition of any of claims 4 to 22, wherein the repeating units of the silicone-containing macromer are present in the range of about 30 and about 80 weight percent of the total weight of the binder polymer.
24. The ink composition of any of claims 4 to 23, wherein the silicone-containing monomer is selected from the group consisting of: 3-methacryloxypropyl tris(trimethylsiloxy)silane, 3-acryloxypropyl tris(trimethylsiloxy)silane, 3-methacrylamidopropyl tris(trimethylsiloxy)silane, 3-acrylamidopropyl tris(trimethylsiloxy)silane, tris(trimethylsiloxy)silyl styrene, 2-methyl-2-hydroxy-3-[3-[1,3,3,3-tetramethyl-1-[(trimethylsilyl)oxy]disiloxanyl]propoxy]propyl ester, N-(2,3-dihydroxypropyl) N-(3-tetra(dimethylsiloxy)dimethylbutylsilane)propyl acrylamide and mixtures thereof.
25. A method for making a cosmetic contact lens, the method comprising: (i) applying a clear coat to a lens forming surface of a first lens forming mold; (ii) applying to the clear coat the ink composition of any one of claims 1 to 24; (iii) optionally repeating step (i), step (ii), or both step (i) and step (ii); (iv) dispensing a lens material to the first lens forming mold; (v) applying a second lens forming mold; and (vi) curing the lens material to form the cosmetic contact lens.
26. A cosmetic contact lens comprising: a contact lens having applied thereon the ink composition of any one of claims 1 to 24.
27. The cosmetic contact lens of claim 26 that is a cosmetic silicone hydrogel contact lens.
28. The cosmetic contact lens of claim 27 further comprising an internal wetting agent.
29. The cosmetic contact lens of any one of claims 26 to 28 wherein the lens comprises multiple layers of ink composition wherein the multiple layers of ink composition may be the same or different.
30. The cosmetic contact lens of any one of claims 26 to 29 further comprising an ink layer that is free of nonreactive hydrophilic polymer.