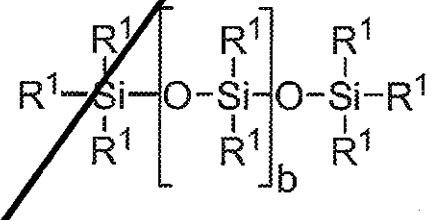
Claims

1. A silicone polymer comprising a sulfonic acid component formed from reactive components comprising (i) at least one silicone component and (ii) at least one sulfonic acid-containing component, wherein said sulfonic acid-containing component is comprised of a non-polymerizable, hydrophobic cation and a polymerizable sulfonic acid.

2. A silicone polymer of claim 1, wherein said polymerizable sulfonic acid is selected from the group consisting of 2-acrylamido-2-methylpropane sulfonic acid, p-styrenesulfonic acid, 2-methacryloyloxyethylsulfonic acid, 3-methacryloyloxy-2-hydroxypropylsulonic acid, allylsulfonic acid, 3-methacryloyloxypropylsulfonic acid, vinylsulfonic acid, and combinations thereof.

3. A silicone polymer of claim 1, wherein said hydrophobic cation is selected from the group consisting of alkyl amines, siloxy alkyl amines, and aryl alkyl amine.

4. A silicone polymer of claim 1, wherein at least one silicone component is selected from compounds of Formula I:



Formula I

wherein:

R^1 is independently selected from monovalent reactive groups, monovalent alkyl groups, or monovalent aryl groups, any of the foregoing which may further comprise functionality selected from hydroxy, amino, oxa, carboxy, alkyl carboxy, alkoxy, amido, carbamate, carbonate, halogen or combinations thereof; and monovalent siloxane chains comprising 1-100 Si-O repeat units which may further comprise functionality selected

from alkyl, hydroxy, amino, oxa, carboxy, alkyl carboxy, alkoxy, amido, carbamate, halogen or combinations thereof;

where b = 0 to 500, where it is understood that when b is other than 0, b is a distribution having a mode equal to a stated value; and

wherein at least one R^1 comprises a monovalent reactive group.

5. A silicone polymer of claim 1 wherein said at least one silicone component is selected from the group consisting of methacryloxypropyl terminated, mono-n-alkyl terminated polydialkylsiloxane; bis-3-acryloxy-2-hydroxypropyloxypropyl polydialkylsiloxane; methacryloxypropyl-terminated polydialkylsiloxane; mono-(3-methacryloxy-2-hydroxypropyloxy)propyl terminated, mono-alkyl terminated polydialkylsiloxane; and mixtures thereof.

6. A silicone polymer of claim 1 wherein said at least one silicone component is selected from monomethacrylate terminated polydimethylsiloxanes; bis-3-acryloxy-2-hydroxypropyloxypropyl polydialkylsiloxane; mono-(3-methacryloxy-2-hydroxypropyloxy)propyl terminated, mono-butyl terminated polydialkylsiloxane; and mixtures thereof.

7. A silicone polymer of claim 1, wherein said at least one silicone component comprises 3-methacryloxy-2-hydroxypropyloxy -n-butyl terminated polydialkylsiloxane.

8. A silicone polymer of claim 1, wherein said reactive components further comprise at least one non-ionic hydrophilic acrylic-containing monomer.

9. A silicone polymer of claim 7, wherein said at least one non-ionic hydrophilic acrylic-containing monomer comprises HEMA, DMA and mixtures thereof.

10. A silicone polymer of claim 1, wherein the ratio of (i) said at least one silicone component and (ii) said sulfonic acid-containing component is less than about 100 kg/mol.

11. A silicone hydrogel comprising the silicone polymer of claim 1.

12. A silicone hydrogel formed from the reaction mixture comprising (i) at least one silicone component and (ii) at least one sulfonic acid-containing component, wherein said sulfonic acid-containing component is comprised of a non-polymerizable hydrophobic cation and a polymerizable sulfonic acid.

13. A silicone hydrogel of claim 12, wherein the sulfonate group of the at least one sulfonic acid-containing component is present in a concentration to all components excluding diluent of less than 2 mol/kg.

14. A silicone hydrogel of claim 12, wherein the reaction mixture further comprises a polyamide.

15. A contact lens comprising a silicone polymer of claim 1.

16. A contact lens formed from a silicone hydrogel of claim 12.

17. A contact lens of claim 15, wherein said contact leans has a lysozyme uptake of at least 50 µg per lens.

18. A contact lens of claim 16, wherein said contact leans has a lysozyme uptake of at least 50 µg per lens.

19. A biomedical device comprising a silicone polymer of claim 1.

20. A biomedical device formed from a silicone hydrogel of claim 12.

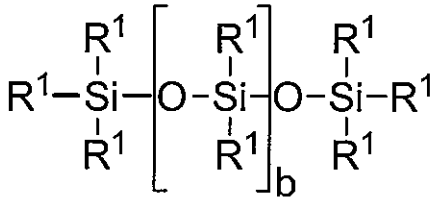
Claims

1. A process for forming a silicone polymer comprising a sulfonic acid component comprising (a) polymerizing reactive components comprising (i) at least one silicone component and (ii) at least one sulfonic acid-containing component, wherein said sulfonic acid-containing component is comprised of a non-polymerizable, hydrophobic cation and a polymerizable sulfonic acid; and (b) removing the non-polymerizable, hydrophobic cation from said silicone polymer.

2. The process of claim 1, wherein said polymerizable sulfonic acid is selected from the group consisting of 2-acrylamido-2-methylpropane sulfonic acid, p-styrenesulfonic acid, 2-methacryloyloxyethylsulfonic acid, 3-methacryloyloxy-2-hydroxypropylsulonic acid, allylsulfonic acid, 3-methacryloyloxypropylsulfonic acid, vinylsulfonic acid, and combinations thereof.

3. The process of claim 1, wherein said hydrophobic cation is selected from the group consisting of alkyl amines, siloxy alkyl amines, and aryl alkyl amine.

4. The process of claim 1, wherein at least one silicone component is selected from compounds of Formula I:



Formula I

wherein:

R^1 is independently selected from monovalent reactive groups, monovalent alkyl groups, or monovalent aryl groups, any of the foregoing which may further comprise functionality selected from hydroxy, amino, oxa, carboxy, alkyl carboxy,

alkoxy, amido, carbamate, carbonate, halogen or combinations thereof; and monovalent siloxane chains comprising 1-100 Si-O repeat units which may further comprise functionality selected from alkyl, hydroxy, amino, oxa, carboxy, alkyl carboxy, alkoxy, amido, carbamate, halogen or combinations thereof;

where b = 0 to 500, where it is understood that when b is other than 0, b is a distribution having a mode equal to a stated value; and

wherein at least one R^1 comprises a monovalent reactive group.

5. The process of claim 1 wherein said at least one silicone component is selected from the group consisting of methacryloxypropyl terminated, mono-n-alkyl terminated polydialkylsiloxane; bis-3-acryloxy-2-hydroxypropyloxypropyl polydialkylsiloxane; methacryloxypropyl-terminated polydialkylsiloxane; mono-(3-methacryloxy-2-hydroxypropyloxy)propyl terminated, mono-alkyl terminated polydialkylsiloxane; and mixtures thereof.

6. The process of claim 1 wherein said at least one silicone component is selected from monomethacrylate terminated polydimethylsiloxanes; bis-3-acryloxy-2-hydroxypropyloxypropyl polydialkylsiloxane; mono-(3-methacryloxy-2-hydroxypropyloxy)propyl terminated, mono-butyl terminated polydialkylsiloxane; and mixtures thereof.

7. The process of claim 1, wherein said at least one silicone component comprises 3-methacryloxy-2-hydroxypropyloxy -n-butyl terminated polydialkylsiloxane.

8. The process of claim 1, wherein said reactive components further comprise at least one non-ionic hydrophilic acrylic-containing monomer.

9. The process of claim 7, wherein said at least one non-ionic hydrophilic acrylic-containing monomer comprises HEMA, DMA and mixtures thereof.

10. The process of claim 1, wherein the ratio of (i) said at least one silicone component and (ii) said sulfonic acid-containing component is less than about 100 mol/kg.

11. The process of claim 1 wherein said silicone polymer comprises a silicone hydrogel.

12. The process of claim 1, wherein the sulfonate group of the at least one sulfonic acid-containing component is present in a concentration to all components excluding diluent of less than 2 mol/kg.

13. The process of claim 1, wherein the reaction mixture further comprises a polyamide.

14. The process of claim 1 wherein said silicone polymer is a contact lens.

15. The process of claim 11 wherein said silicone hydrogel is a contact lens.

16. The process of claim 14 wherein said contact lens has a lysozyme uptake of at least 50 µg per lens.

17. The process of claim 14 wherein said contact lens has a lysozyme uptake of at least 50 µg per lens.

18. The process of claim 1 wherein said silicone polymer is a biomedical device.

19. The process of claim 11 wherein said silicone polymer is a biomedical device.