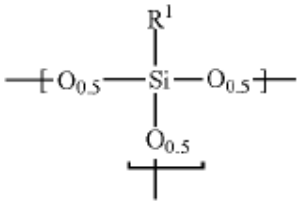
CLAIMS

1. A photosensitive siloxane composition, comprising:

(I) a polysiloxane comprising a repeating unit represented by the following formula (Ia):

(Ia)



in which

R_1 is hydrogen, a mono- to trivalent saturated or unsaturated straight, branched or cyclic aliphatic hydrocarbon group of $C_{1\ to\ 30}$, or a mono- to trivalent aromatic hydrocarbon group of $C_{6\ to\ 30}$;

provided that,

in said aliphatic or aromatic hydrocarbon group,

one or more methylene is substituted with oxy, imido or carbonyl, or unsubstituted,

one or more hydrogen is substituted with fluorine, hydroxy or alkoxy, or unsubstituted, and

one or more carbon is substituted with a silicon, or unsubstituted; and further

provided that, if R^1 is a di- or trivalent group, R^1 links Si atoms contained in the plural repeating units;

(II) a photosensitive agent,

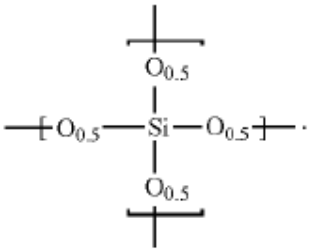
(III) hydrophobic hollow silica particles which have structures comprising inside voids and silica layers enclosing said voids, said silica layer comprising an organic

substance, and said hydrophobic hollow silica particles have a mean particle size of 30 to 200 nm, and

(IV) a solvent.

2. The composition according to claim **1**, wherein said polysiloxane further comprises a repeating unit represented by the following formula (Ib):

(Ib)



3. The composition according to claim **1**; wherein said polysiloxane forms, after prebaking, a film having a dissolution rate of 50 to 5000 Å/second in a 2.38 wt % aqueous solution of tetramethylammonium hydroxide, so as to function as a positive type photosensitive composition.

4. The composition according to claim **1**; wherein said polysiloxane forms, after prebaking, a film having a dissolution rate of 50 to 20000 Å/second in a 2.38 wt % aqueous solution of tetramethylammonium hydroxide, so as to function as a negative type photosensitive composition.

5. The composition according to claim **1**, wherein said hydrophobic hollow silica particles are obtained by subjecting untreated hollow silica particles to hydrophobic treatment with a silane coupling agent having a refractive index of 1.6 or less at 550 nm or otherwise by coating the untreated hollow silica particles with an organic polymer having a refractive index of 1.6 or less at 550 nm.

6. The composition according to claim **1**, wherein said voids have a mean diameter of 3 to 180 nm.

7. The composition according to claim **1**, wherein the volume ratio of said voids to said hydrophobic hollow silica particles is 5 to 80% inclusive.

8. The composition according to claim **1**, wherein the volume ratio between said hydrophobic hollow silica particles and said polysiloxane satisfies the condition of:

hydrophobic hollow silica particles: polysiloxane =10:90 to 75:25.

9. A cured film formed from the photosensitive siloxane composition according to claim **1**.

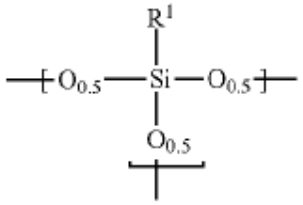
10. The cured film according to claim **9**, having a refractive index of 1.45 or less at a wavelength of 550 nm.

11. An electronic device comprising the cured film according to claim **9**.

12. A photosensitive siloxane composition, comprising:

(I) a polysiloxane comprising a repeating unit represented by the following formula (Ia):

(Ia)



in which

R^1 is hydrogen, a mono- to trivalent saturated or unsaturated straight, branched or cyclic aliphatic hydrocarbon group of $C_{1\ to\ 30}$, or a mono- to trivalent aromatic hydrocarbon group of $C_{6\ to\ 30}$;

provided that,

in said aliphatic or aromatic hydrocarbon group,

one or more methylene is substituted with oxy, imido or carbonyl, or unsubstituted,

one or more hydrogen is substituted with fluorine, hydroxy or alkoxy, or unsubstituted, and

one or more carbon is substituted with a silicon, or unsubstituted; and further

provided that, if R^1 is a di- or trivalent group, R^1 links Si atoms contained in the plural repeating units;

(II) a photosensitive agent,

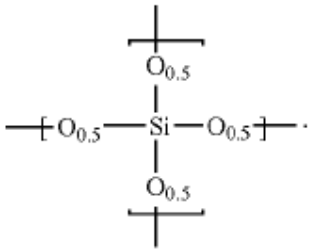
(III) hydrophobic hollow silica particles which have structures comprising inside voids and silica layers enclosing said voids, said silica layer comprising a binder, and

said hydrophobic hollow silica particles have a mean particle size of 30 to 200 nm, and

(IV) a solvent.

13. The composition according to claim **12**, wherein said polysiloxane further comprises a repeating unit represented by the following formula (Ib):

(Ib)



14. The composition according to claim **12**; wherein said polysiloxane forms, after prebaking, a film having a dissolution rate of 50 to 5000 Å/second in a 2.38 wt % aqueous solution of tetramethylammonium hydroxide, so as to function as a positive type photosensitive composition.

15. The composition according to claim **12**; wherein said polysiloxane forms, after prebaking, a film having a dissolution rate of 50 to 20000 Å/second in a 2.38 wt % aqueous solution of tetramethylammonium hydroxide, so as to function as a negative type photosensitive composition.

16. The composition according to claim **12**, wherein said hydrophobic hollow silica particles are obtained by subjecting untreated hollow silica particles to hydrophobic treatment with a silane coupling agent having a refractive index of 1.6 or less at 550 nm or otherwise by coating the untreated hollow silica particles with an organic polymer having a refractive index of 1.6 or less at 550 nm.

17. The composition according to claim **12**, wherein said voids have a mean diameter of 3 to 180 nm.

18. The composition according to claim **12**, wherein the volume ratio of said voids to said hydrophobic hollow silica particles is 5 to 80% inclusive.

19. The composition according to claim **12**, wherein the volume ratio between said hydrophobic hollow silica particles and said polysiloxane satisfies the condition of:

hydrophobic hollow silica particles:polysiloxane =10:90 to 75:25.