CLAIMS

1. A positive type photosensitive siloxane composition comprising:

(I) a polysiloxane is produced by hydrolyzing and condensing a silane compound represented by the following formula (ia),

$$R^1[Si(OR^2)_3]_p \qquad \text{(ia)}$$

wherein

p is 1 to 3; and

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

R^2 is an alkyl group of $C_{1\text{ to }10}$,

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 diazonaphthoquinone derivative;

(III) an additive selected from the group consisting of compounds having >N-C(=O)- or >N-C(=S)- structures and not having any other binding sites for said polysiloxane, and the additive contains two substitutents R^a, wherein each R^a is independently silyl, alkylsilyl, alkylsilylalkyl or silylalkyl group, and the additive does not contain an alkoxysilyl group or hydroxysilyl group;

(IV) a solvent and

(V) a photoacid generator.

2. The composition according to claim 1, wherein said polysiloxane further comprises a silane compound represented by the following formula (ib),

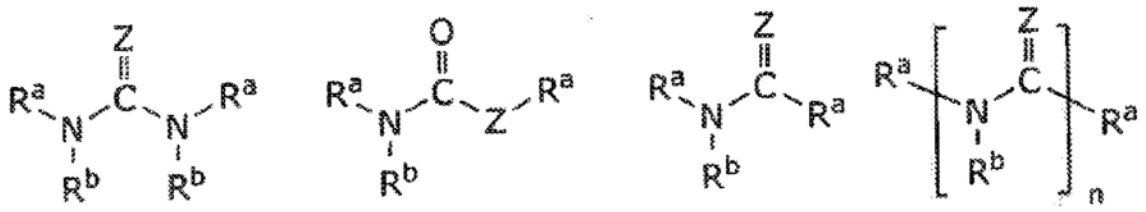
$$Si(OR^2)_4 \qquad \text{(ib)}$$

wherein R^2 is an alkyl group of $C_{1 \text{ to } 10}$.

3. The composition according to claim 1, wherein said polysiloxane forms, after prebaking, a film having a dissolution rate of 200 to 5000 Å/second in a 2.38 wt% aqueous solution of tetramethylammonium hydroxide.

4. The composition according to claim 1, wherein said additive (III) is in an amount of 0.1 to 5 weight parts based of 100 weight parts of said polysiloxane.

5. The composition according to claim 1, wherein said additive (III) is represented by one selected from the group consisting of the following formulas (III-i) to (III-iv):



(III-i) (III-ii) (III-iii) (III-iv)

in which

Z is oxygen or sulfur;

each R^a is independently silyl, alkylsilyl, alkylsilylalkyl or silylalkyl group,

provided that

in said alkyl group,

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

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

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

each R^b is independently hydrogen or an alkyl group of $C_{1\text{ to }4}$, provided that two R^bs in (III-ii) may form a cyclic structure; and

n is an integer of 1 to 3.

6. A cured film comprising a substrate and a coating formed from the positive type photosensitive siloxane composition according to claim 1.

7. The cured film according to claim 6, having a light transmittance of 90% or more at a wavelength of 400 nm.

8. In an electronic device wherein the improvement comprises the cured film according to claim 6.

9. A positive type photosensitive siloxane composition comprising:

(I) a polysiloxane is produced by hydrolyzing and condensing a silane compound represented by the following formula (ia),

$$R^1[Si(OR^2)_3]_p \qquad \text{(ia)}$$

wherein

p is 1 to 3; and

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

R^2 is an alkyl group of $C_{1\text{ to }10}$,

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 diazonaphthoquinone derivative;

(III) an additive selected from the group consisting of compounds having >N-C(=O)- or >N-C(=S)- structures and not having any other binding sites for said polysiloxane, with the proviso that the additive is not a thiourea and the additive contains two substitutents R^a, wherein each R^a is independently silyl, alkylsilyl, alkylsilylalkyl or silylalkyl group, and the additive does not contain an alkoxysilyl group or hydroxysilyl group;

and

(IV) a solvent and

(V) a photoacid generator.

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10. The composition according to claim 9, wherein said polysiloxane further comprises a-silane compound represented by the following formula (ib),

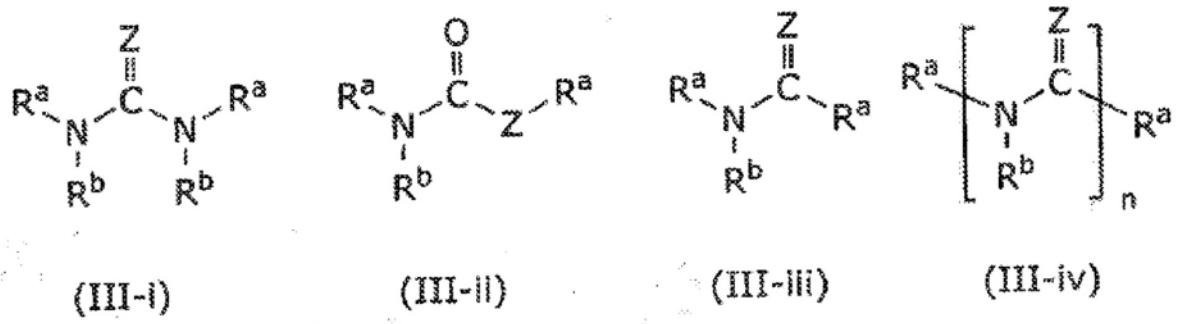
$$Si(OR^2)_4 \qquad \text{(ib)}$$

wherein R^2 is an alkyl group of $C_{1\ to\ 10}$.

11. The composition according to claim 9, wherein said polysiloxane forms, after prebaking, a film having a dissolution rate of 200 to 5000 Å/second in a 2.38 wt% aqueous solution of tetramethylammonium hydroxide.

12. The composition according to claim 9, wherein said additive (III) is in an amount of 0.l to 5 weight parts based of 100 weight parts of said polysiloxane.

13. The composition according to claim 9, wherein said additive (III) is represented by one selected from the group consisting of the following formulas (III-i) to (III-iv):



(III-i) (III-ii) (III-iii) (III-iv)

in which

Z is oxygen or sulfur;

each R^a is independently silyl, alkylsilyl, aslkylsilylalkyl or silylalkyl group,

provided that

in said alkyl group,

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

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

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

each R^b is independently hydrogen or an alkyl group of $C_{1\ to\ 4}$, provided that two R^bs in (III-ii) may form a cyclic structure; and

n is an integer of 1 to 3 contains neither an alkoxysilyl group nor a hydroxysilyl group.

14. A cured film comprising a substrate and a coating formed from the positive type photosensitive siloxane composition according to claim 9.

15. The cured film according to claim 14, having a light transmittance of 90% or more at a wavelength of 400 nm.

16. In an electronic device wherein the improvement comprises the cured film according to claim 14.

17. A positive type photosensitive siloxane composition comprising:

(I) a polysiloxane is produced by hydrolyzing and condensing a silane compound represented by the following formula (ia),

$$R^1[Si(OR^2)_3]_p \qquad \text{(ia)}$$

wherein

p is 1 to 3; and

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

R^2 is an alkyl group of $C_{1\text{ to }10}$,

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 diazonaphthoquinone derivative;

(III) an additive compound which has >N-C(=O)- structures and not having any other binding sites for said polysiloxane and the additive contains two substituents Ra, wherein each Ra is independently silyl, alkylsilyl, alkylsilylalskyl, or silylalkyl group, and the additive does not contain an alkoxysilyl group or hydroxysilyl group;

(IV) a solvent and

(V) a photoacid generator.

18. The composition according to claim 17, wherein said polysiloxane further comprises a-silane compound represented by the following formula (ib),

$$Si(OR^2)_4 \qquad \text{(ib)}$$

wherein R^2 is an alkyl group of $C_{1\ to\ 10}$.

19. A cured film comprising a substrate and a coating formed from the positive type photosensitive siloxane composition according to claim 17.

20. In an electronic device wherein the improvement comprises the cured film according to claim 19.