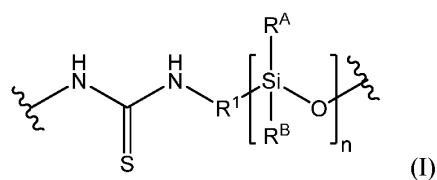


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CLAIMS

1. A liquid polysiloxane comprising a siloxane-thiourea segment and a crosslinkable functional group(s) selected from one or more ethylenically unsaturated groups, silyl hydride groups, alkylenethiol groups and combinations thereof.
2. The polysiloxane according to claim 1, wherein the siloxane-thiourea segment comprises a structure of formula (I):

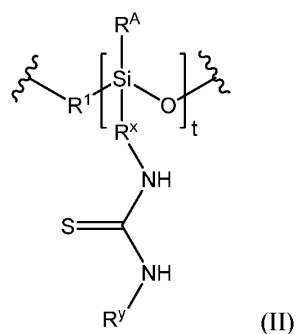


wherein:

each R^A and R^B are independently selected from H, optionally substituted alkyl, optionally substituted aryl, optionally substituted siloxane, a moiety comprising an alkylenethiol group, and a moiety comprising one or more ethylenically unsaturated groups;

R^1 is optionally substituted alkylene or optionally substituted arylene; and
 n is an integer of at least 1.

3. The polysiloxane according to claim 1, wherein the polysiloxane-thiourea segment comprises a structure of formula (II):



wherein:

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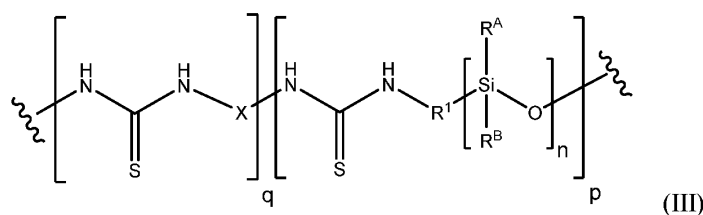
each R^A is independently selected from H, optionally substituted alkyl, optionally substituted aryl, optionally substituted siloxane, a moiety comprising an alkenethiol group, and a moiety comprising one or more ethylenically unsaturated groups;

R^1 and each R^x are each independently optionally substituted alkylene or optionally substituted siloxane;

each R^y is independently optionally substituted alkyl, optionally substituted siloxane, a moiety comprising an alkenethiol group, and a moiety comprising one or more ethylenically unsaturated groups; and

t is an integer of at least 1.

4. The polysiloxane according to claim 1, wherein the siloxane-thiourea segment comprises a structure of formula (III):



wherein:

each R^A and R^B are independently selected from H, optionally substituted alkyl, optionally substituted aryl, optionally substituted siloxane, a moiety comprising an alkenethiol group, and a moiety comprising one or more ethylenically unsaturated groups;

each X is independently selected from optionally substituted alkylene, optionally substituted arylene, (poly)siloxane, polyether, polyimide and polyester;

each R^1 is independently optionally substituted alkylene or optionally substituted arylene;

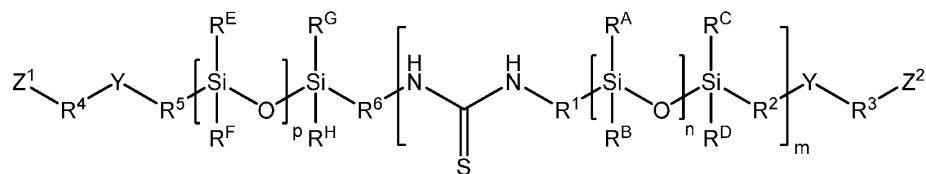
n is an integer of at least 1;

p is an integer of at least 1; and

q is an integer of at least 1.

5. The polysiloxane according to claim 1 having a structure of formula (IV):

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(IV)

wherein:

each R^A , R^B , R^C , R^D , R^E and R^F , and R^G and R^H are independently selected from H, optionally substituted alkyl, optionally substituted aryl, optionally substituted siloxane, optionally substituted alkylenethiol, and a moiety comprising one or more ethylenically unsaturated groups;

each R^1 and R^2 are independently optionally substituted alkylene or optionally substituted arylene;

R^3 , R^4 , R^5 and R^6 are each independently optionally substituted alkylene or optionally substituted arylene;

Y represents a divalent linking group;

Z^1 and Z^2 are each independently selected from a moiety comprising one or more silyl hydride groups, a moiety comprising one or more alkylenethiol groups, and a moiety comprising one or more ethylenically unsaturated groups;

n is an integer of at least 1;

m is an integer of at least 1; and

p is an integer of at least 1.

6. The polysiloxane according to claim 5, wherein Y is a moiety of formula $-NH-C(O)-NH-$ or $NH-C(S)-NH-$.

7. The polysiloxane according to any one of the preceding claims, wherein the one or more ethylenically unsaturated groups form part of a (meth)acryloyl group, (meth)acryloyloxy group, styrenyl group, vinyl ether group, vinyl ester group or (meth)acrylamide group.

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8. The polysiloxane according to any one of claims 1 to 6, wherein the one or more ethylenically unsaturated groups has a structure represented by $-R-(X)C=C(Y)_2$, where R is Si or alkylene and X and each Y is independently alkyl or H.
9. The polysiloxane according to any one of the preceding claims further comprising a Diels-Alder adduct that can undergo a retro Diels-Alder reaction.
10. A liquid resin composition comprising a polysiloxane of any one of the preceding claims and an agent for promoting crosslinking of the crosslinkable functional group(s).
11. The resin composition according to claim 10, wherein the agent is selected from a catalyst and a radical initiator.
12. The resin composition according to claim 10 or 11, wherein the agent is a photo-radical initiator.
13. The resin composition according to claim 12, wherein the composition further comprises a photo-absorber.
14. The resin composition according to any one of claims 10 to 13 further comprising a reactive diluent.
15. The resin composition according to any one of claims 10 to 14 further comprising nanoparticulate material.
16. A silicone article comprising a crosslinked form of the polysiloxane of any one of claims 1 to 9.
17. A silicone article comprising a crosslinked form of the resin composition according to any one of claims 10 to 15.

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18. A method of producing a silicone article, the method comprising printing a resin composition according to any one of claims 10 to 15 using a three dimensional printer and crosslinking the printed resin composition.

19. The method according to claim 18, wherein the agent for promoting crosslinking is a photo-initiator and crosslinking is promoted by exposing the printed resin to UV light.

20. An adhesive, sealant or printing cartridge comprising a resin composition according to any one of claims 10 to 15.