Claims

1. A laminate comprising

a semiconductor substrate,

a support substrate, and

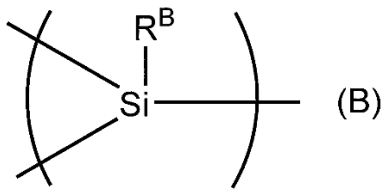
an adhesive layer and a release layer disposed between the semiconductor substrate and the support substrate, wherein

the release layer is a film formed from a releasing agent composition containing an organic resin, a branched-chain polysilane, and a solvent;

wherein the organic resin is a novolak resin.

2. A laminate according to claim 1, wherein the branched-chain polysilane includes a structural unit represented by formula (B):

[F1]




(wherein $R^B$ represents a hydrogen atom, a hydroxyl group, a silyl group, or an organic group).

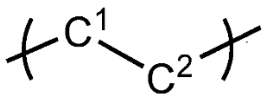
3. A laminate according to claim 2, wherein $R^B$ is an aryl group.

4. A laminate according to claim 3, wherein $R^B$ is a phenyl group.

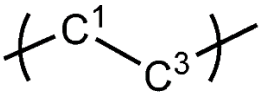
5. A laminate according to any one of claims 1 to 4, wherein the branched-chain polysilane has a weight-average molecular weight of 50 to 30,000.

6. A laminate according to any one of claims 1 to 5, wherein the branched-chain polysilane has a 5% weight loss temperature of 300°C or higher.

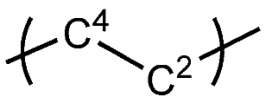
7. A laminate according to claim 1, wherein the novolak resin is a polymer including one or more members selected from the group consisting of a unit represented by formula (C1-1), a unit represented by formula (C1-2), and a unit represented by formula (C1-3):



(C1-1)



(C1-2)



(C1-3)

(wherein $C^1$ represents a group derived from a nitrogen-atom containing aromatic compound; $C^2$ represents a group including a tertiary carbon atom to which, as a side chain, at least one member selected from the group consisting of a secondary carbon atom, a quaternary carbon atom, and an aromatic ring is bonded; $C^3$ represents a group derived from an aliphatic polycyclic compound; and $C^4$ represents a group derived from a phenol, a group derived from bisphenol, a group derived from naphthol, a group derived from biphenyl, or a group derived from biphenol).

8. A laminate according to any one of claims 1 to 7, wherein the releasing agent composition contains a cross-linking agent.

9. A laminate according to any one of claims 1 to 8, wherein the adhesive layer is a film formed from an adhesive composition containing an adhesive component (S) containing at least one species selected from among a polysiloxane adhesive, an acrylic resin adhesive, an epoxy resin adhesive, a polyamide adhesive, a polystyrene adhesive, a polyimide adhesive, and a phenolic resin adhesive.

10. A laminate according to claim 9, wherein the adhesive component (S) contains a polysiloxane adhesive.

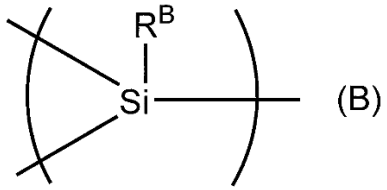
11. A laminate according to claim 10, wherein the polysiloxane adhesive contains a polysiloxane component (A) which is curable through hydrosilylation.

12. A releasing agent composition for forming a release layer of a laminate comprising a semiconductor substrate, a support substrate, and an adhesive layer and the release layer disposed between the semiconductor substrate and the support substrate, wherein

the releasing agent composition comprising an organic resin, a branched-chain polysilane, and a solvent;

wherein the organic resin is a novolak resin.

13. A releasing agent composition according to claim 12, wherein the branched-chain polysilane includes a structural unit represented by formula (B):




(B)

(wherein $R^B$ represents a hydrogen atom, a hydroxyl group, a silyl group, or an organic group).

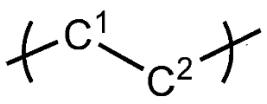
14. A releasing agent composition according to claim 13, wherein $R^B$ is an aryl group.

15. A releasing agent composition according to claim 14, wherein $R^B$ is a phenyl group.

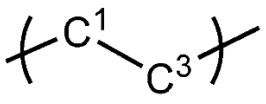
16. A releasing agent composition according to any one of claims 12 to 15, wherein the branched-chain polysilane has a weight-average molecular weight of 50 to 30,000.

17. A releasing agent composition according to any one of claims 12 to 16, wherein the branched-chain polysilane has a 5% weight loss temperature of 300°C or higher.

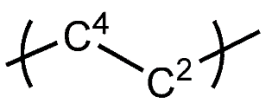
18. A releasing agent composition according to claim 17, wherein the novolak resin is a polymer including one or more members selected from the group consisting of a unit represented by formula (C1-1), a unit represented by formula (C1-2), and a unit represented by formula (C1-3):




(C1-1)




(C1-2)




(C1-3)

(wherein $C^1$ represents a group derived from a nitrogen-atom containing aromatic compound; $C^2$ represents a group including a tertiary carbon atom to which, as a side chain, at least one member selected from the group consisting of a secondary carbon atom, a quaternary carbon atom, and an aromatic ring is bonded; $C^3$ represents a group derived from an aliphatic polycyclic compound; and $C^4$ represents a group derived from a phenol, a group derived from bisphenol, a group derived from naphthol, a group derived from biphenyl, or a group derived from biphenol).

19. A releasing agent composition according to any one of claims 12 to 18, which contains a cross-linking agent.

20. A releasing agent composition according to any one of claims 12 to 19, wherein the adhesive layer is a film formed from an adhesive composition containing an adhesive component (S) containing at least one species selected from among a polysiloxane adhesive, an acrylic resin adhesive, an epoxy resin adhesive, a polyamide adhesive, a polystyrene adhesive, a polyimide adhesive, and a phenolic resin adhesive.

21. A releasing agent composition according to claim 20, wherein the adhesive component (S) contains a polysiloxane adhesive.

22. A releasing agent composition according to claim 21, wherein the polysiloxane adhesive contains a polysiloxane component (A) which is curable through hydrosilylation.

23. A processed semiconductor substrate production method comprising:

a first step of processing a semiconductor substrate of a laminate as recited in any one of claims 1 to 11;

a second step of separating the semiconductor substrate from the support substrate; and

a third step of cleaning the separated semiconductor substrate with a cleaning agent composition.

24. A processed semiconductor substrate production method according to claim 23, wherein the second step includes a step of irradiating the release layer with light.

25. A processed semiconductor substrate production method according to claim 23 or 24, wherein the cleaning agent composition contains a quaternary ammonium salt and an organic solvent.

26. A processed semiconductor substrate production method according to claim 25, wherein the quaternary ammonium salt is a halogen-containing quaternary ammonium salt.

27. A processed semiconductor substrate production method according to claim 26, wherein the halogen-containing quaternary ammonium salt is a fluorine-containing quaternary ammonium salt.