Claims

1. An adhesive composition comprising an adhesive component (S) and a release component (H) formed of a polyorganosiloxane having a complex viscosity of 3,400 (Pa·S) or higher,

wherein said polyorganosiloxane does not have any silanol groups.

2. An adhesive composition according to claim 1, wherein the polyorganosiloxane includes at least one species selected from the group consisting of an epoxy-group-containing polyorganosiloxane, a methyl-group-containing polyorganosiloxane, and a phenyl-group-containing polyorganosiloxane.

3. An adhesive composition according to claim 2, wherein the polyorganosiloxane includes a methyl-group-containing polyorganosiloxane.

4. An adhesive composition according to any one of claims 1 to 3, wherein the polyorganosiloxane has a complex viscosity of 30,000 (Pa·S) or lower.

5. An adhesive composition according to any one of claims 1 to 3, wherein the polyorganosiloxane has a complex viscosity of 4,000 to 25,000 (Pa·S).

6. An adhesive composition according to any one of claims 1 to 5, wherein the adhesive component (S) contains a component (A) which is cured through hydrosilylation.

7. An adhesive composition according to claim 6, wherein the component (A) which is cured through hydrosilylation comprises a polysiloxane (A1) having one or more units selected from the group consisting of a siloxane unit represented by SiO_2 (unit Q), a siloxane unit represented by $R^1R^2R^3SiO_{1/2}$ (unit M), a siloxane unit represented by $R^4R^5SiO_{2/2}$ (unit D), and a siloxane unit represented by $R^6SiO_{3/2}$ (unit T) (wherein each of R^1 to R^6 is a group or an atom bonded to a silicon atom and represents an alkyl group, an alkenyl group, or a hydrogen atom) and a platinum group metal catalyst (A2); and

the polysiloxane (A1) comprises a polyorganosiloxane (a1) having one or more units selected from the group consisting of a siloxane unit represented by SiO_2 (unit Q'), a siloxane unit represented by $R^1'R^2'R^3'SiO_{1/2}$ (unit M'), a siloxane unit represented by $R^4'R^5'SiO_{2/2}$ (unit D'), and a siloxane unit represented by $R^6'SiO_{3/2}$ (unit T'), and at least one unit selected from the group consisting of unit M', unit D', and unit T' (wherein each of R^1' to R^6' is a group bonded to a silicon atom and represents an alkyl group or an alkenyl group, and at least one of R^1' to R^6' is an alkenyl group), and a polyorganosiloxane (a2) having one or more units selected from the group consisting of a siloxane unit represented by SiO_2 (unit Q''), a siloxane unit represented by $R^1''R^2''R^3''SiO_{1/2}$ (unit M''), a siloxane unit represented by $R^4''R^5''SiO_{2/2}$ (unit D''), and a siloxane unit represented by $R^6''SiO_{3/2}$ (unit T''), and at least one unit selected from

the group consisting of unit M'', unit D'', and unit T'' (wherein each of R^{1}'' to R^{6}'' is a group or an atom bonded to a silicon atom and represents an alkyl group or a hydrogen atom, and at least one of R^{1}'' to R^{6}'' is a hydrogen atom).

8. A laminate comprising a first substrate formed of a semiconductor-forming substrate, a second substrate formed of a support substrate, and an adhesive layer which binds the first substrate to the second substrate in a peelable manner,

wherein the adhesive layer is a film formed from an adhesive composition comprising an adhesive component (S) and a release component (H) formed of a polyorganosiloxane having a complex viscosity of 3,400 (Pa·S) or higher.

9. A method for producing a laminate, the method comprising a step of applying an adhesive composition onto a first substrate formed of a semiconductor-forming substrate or a second substrate formed of a support substrate, to thereby form an adhesive coating layer; and

a step including adhering the first substrate to the second substrate by the mediation of the adhesive coating layer; applying a load to the first substrate and the second substrate in a thickness direction, to thereby closely bind the first substrate, the adhesive coating layer, and the second substrate, while at least one of a heat treatment and a reduced pressure treatment is performed; and then performing a post-heat treatment,

wherein the adhesive composition comprises an adhesive component (S) and a release component (H) formed of a

polyorganosiloxane having a complex viscosity of 3,400 (Pa·S) or higher.

10. A method for debonding a laminate, the method comprising a step of applying an adhesive composition onto a first substrate formed of a semiconductor-forming substrate or a second substrate formed of a support substrate, to thereby form an adhesive coating layer;

a step including adhering the first substrate to the second substrate by the mediation of the adhesive coating layer; applying a load to the first substrate and the second substrate in a thickness direction, to thereby closely bind the first substrate, the adhesive coating layer, and the second substrate, while at least one of a heat treatment and a reduced pressure treatment is performed; and then performing a post-heat treatment, to thereby produce a laminate; and

a second step of debonding the laminate at the interface between the first substrate and the adhesive layer,

wherein the adhesive composition comprises an adhesive component (S) and a release component (H) formed of a polyorganosiloxane having a complex viscosity of 3,400 (Pa·S) or higher.

11. A method for processing a semiconductor-forming substrate, the method comprising

a step of applying an adhesive composition onto a first substrate formed of a semiconductor-forming substrate or a second substrate formed of a support substrate, to thereby

form an adhesive coating layer;

a step including adhering the first substrate to the second substrate by the mediation of the adhesive coating layer; applying a load to the first substrate and the second substrate in a thickness direction, to thereby closely bind the first substrate, the adhesive coating layer, and the second substrate, while at least one of a heat treatment and a reduced pressure treatment is performed; and then performing a post-heat treatment, to thereby produce a laminate; and

a step of processing the first substrate of the laminate,

wherein the adhesive composition comprises an adhesive component (S) and a release component (H) formed of a polyorganosiloxane having a complex viscosity of 3,400 (Pa·S) or higher.

12. The laminate according to claim 8, or the method according to any one of claims 9 to 11, wherein the polyorganosiloxane includes at least one species selected from the group consisting of an epoxy-group-containing polyorganosiloxane, a methyl-group-containing polyorganosiloxane, and a phenyl-group-containing polyorganosiloxane.

13. The laminate according to any one of claims 8 or 12, or the method according to any one of claims 9 to 12, wherein the polyorganosiloxane includes a methyl-group-containing polyorganosiloxane.

14. The laminate according to any one of claims 8, 12 to 13, or the method according to any one of claims 9 to 13, wherein the polyorganosiloxane has a complex viscosity of 30,000 (Pa·S) or lower.

15. The laminate according to any one of claims 8, 12 to 14, or the method according to any one of claims 9 to 14, wherein the polyorganosiloxane has a complex viscosity of 4,000 to 25,000 (Pa·S).

16. The laminate according to any one of claims 8, 12 to 15, or the method according to any one of claims 9 to 15, wherein the adhesive component (S) contains a component (A) which is cured through hydrosilylation.

17. The laminate according to any one of claims 8, 12 to 16, or the method according to any one of claims 9 to 16, wherein the component (A) which is cured through hydrosilylation comprises a polysiloxane (A1) having one or more units selected from the group consisting of a siloxane unit represented by SiO_2 (unit Q), a siloxane unit represented by $R^1R^2R^3SiO_{1/2}$ (unit M), a siloxane unit represented by $R^4R^5SiO_{2/2}$ (unit D), and a siloxane unit represented by $R^6SiO_{3/2}$ (unit T) (wherein each of R^1 to R^6 is a group or an atom bonded to a silicon atom and represents an alkyl group, an alkenyl group, or a hydrogen atom) and a platinum group metal catalyst (A2); and

the polysiloxane (A1) comprises a polyorganosiloxane (a1) having one or more units selected from the group consisting of a siloxane unit represented by SiO_2 (unit Q'),

a siloxane unit represented by $R^{1'}R^{2'}R^{3'}SiO_{1/2}$ (unit M'), a siloxane unit represented by $R^{4'}R^{5'}SiO_{2/2}$ (unit D'), and a siloxane unit represented by $R^{6'}SiO_{3/2}$ (unit T'), and at least one unit selected from the group consisting of unit M', unit D', and unit T' (wherein each of $R^{1'}$ to $R^{6'}$ is a group bonded to a silicon atom and represents an alkyl group or an alkenyl group, and at least one of $R^{1'}$ to $R^{6'}$ is an alkenyl group), and a polyorganosiloxane (a2) having one or more units selected from the group consisting of a siloxane unit represented by SiO_2 (unit Q''), a siloxane unit represented by $R^{1''}R^{2''}R^{3''}SiO_{1/2}$ (unit M''), a siloxane unit represented by $R^{4''}R^{5''}SiO_{2/2}$ (unit D''), and a siloxane unit represented by $R^{6''}SiO_{3/2}$ (unit T''), and at least one unit selected from the group consisting of unit M'', unit D'', and unit T'' (wherein each of $R^{1''}$ to $R^{6''}$ is a group or an atom bonded to a silicon atom and represents an alkyl group or a hydrogen atom, and at least one of $R^{1''}$ to $R^{6''}$ is a hydrogen atom).