Claims

1. An adhesive composition for use in debonding with light irradiation,

which composition can achieve debonding through irradiation with light, ~~characterized in that~~wherein

the adhesive composition comprises an adhesive component and carbon black, and the adhesive component contains a component (A) which is cured through hydrosilylation;

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); and

the adhesive composition for use in debonding with light irradiation has a carbon black content of 5 to 50 mass% with respect to the amount of the adhesive component.

2. An adhesive composition for use in debonding with light irradiation according to claim 1, which further comprises a component (B) containing at least one species selected from the group consisting of a component containing an epoxy-modified polyorganosiloxane, a component containing a methyl-group-containing polyorganosiloxane, and a component a phenyl-group-containing polyorganosiloxane.

~~3. An adhesive composition for use in debonding with light irradiation according to claim 1 or 2, 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).~~

~~4. An adhesive composition for use in debonding with light irradiation according to any one of claims 1 to 3, which has a carbon black content of 0.1 to 50 mass% with respect to the amount of the adhesive component.~~

~~5~~3. An adhesive composition for use in debonding with light irradiation according to any one of claim~~s~~ 1 ~~to 4~~or 2, which contains a solvent.

~~6~~4. An adhesive composition for use in debonding with light irradiation according to claim ~~5~~3, which has a solvent content of 10 to 90 mass% with respect to the entire amount of the adhesive composition.

~~7~~5. An adhesive composition for use in debonding with light irradiation according to any one of claims 1 to ~~6~~4, which contains a component containing at least one species selected from the group consisting of a component containing an epoxy-modified polyorganosiloxane, a component containing a methyl-group-containing polyorganosiloxane, and a component a phenyl-group-containing polyorganosiloxane.

~~8~~6. A laminate comprising a first substrate formed of a semiconductor-forming substrate, a second substrate formed of a support substrate which allows passage of laser light, and an adhesive layer, wherein

the adhesive layer is a cured film formed from an adhesive composition for use in debonding with light irradiation as recited in any one of claims 1 to ~~7~~5.

~~9~~7. A method for producing a laminate, the method comprising

a first step of applying an adhesive composition for use in debonding with light irradiation as recited in any one of claims 1 to ~~7~~5 onto a surface of a first or second substrate, to thereby form an adhesive coating layer; and

a second 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.

~~10~~8. A debonding method comprising irradiating a laminate produced through a laminate production method as recited in claim ~~9~~7 with laser light from the second substrate side of the laminate, to thereby debond the second substrate.

~~11~~9. A debonding method according to claim ~~10~~8, wherein the laser light has a wavelength of 190 nm to 600 nm.