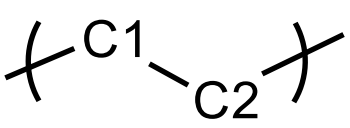
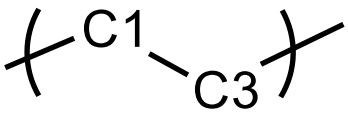
CLAIMS

1. A laminated body for processing an object to be processed, the laminated body comprising an intermediate layer that is disposed between a support and the object to be processed and peelably adheres to the support and the object to be processed, wherein the intermediate layer includes at least a peeling layer in contact with the support, and the peeling layer contains a novolac resin that absorbs light with a wavelength of 190 nm to 600 nm incident through the support, resulting in modification,

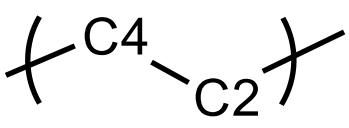
wherein the peeling layer contains a polymer (C) having the following unit structure (C1-1), (C1-2), or (C1-3), or a combination thereof



Formula (C1-1)



Formula (C1-2)



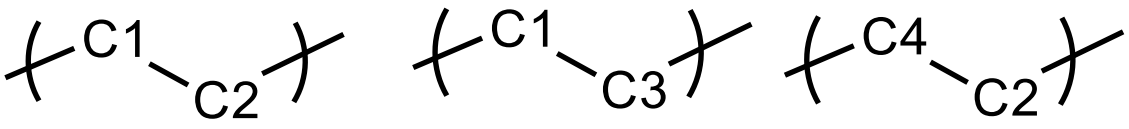
Formula (C1-3)

and wherein (C1) is a group derived from an aromatic compound having a nitrogen atom, (C2) is a group forming a secondary carbon atom, a quaternary carbon atom, or a tertiary carbon atom having an aromatic ring in a side chain, (C3) is a group derived from an aliphatic polycyclic compound, and (C4) is a group derived from phenol, bisphenol, naphthol, biphenyl, biphenol, or a combination thereof.

2. A laminated body for cutting a plurality of chips with a redistribution layer that are fixed by a resin after peeling a support into a small number of chips, the laminated body comprising an intermediate layer that is disposed between the support and the redistribution layer having the chips fixed by the resin and peelably adheres to the support and the redistribution layer, wherein the intermediate layer includes at least a peeling layer in contact with the support, and the peeling layer contains a novolac resin that absorbs light with a wavelength of 190 nm to 600 nm incident through the support,

resulting in modification,

wherein the peeling layer contains a polymer (C) having the following unit structure (C1-1), (C1-2), or (C1-3), or a combination thereof

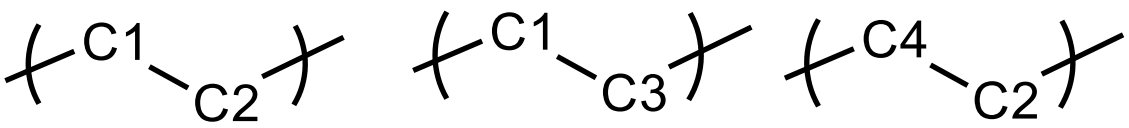


Formula (C1-1) Formula (C1-2) Formula (C1-3)

and wherein (C1) is a group derived from an aromatic compound having a nitrogen atom, (C2) is a group forming a secondary carbon atom, a quaternary carbon atom, or a tertiary carbon atom having an aromatic ring in a side chain, (C3) is a group derived from an aliphatic polycyclic compound, and (C4) is a group derived from phenol, bisphenol, naphthol, biphenyl, biphenol, or a combination thereof.

3. A laminated body for polishing a back surface of a wafer, comprising an intermediate layer that is disposed between a support and a circuit surface of the wafer and peelably adheres to the support and the circuit surface, wherein the intermediate layer includes an adhesion layer in contact with the wafer and a peeling layer in contact with the support, and the peeling layer contains a novolac resin that absorbs light with a wavelength of 190 nm to 600 nm incident through the support, resulting in modification,

wherein the peeling layer contains a polymer (C) having the following unit structure (C1-1), (C1-2), or (C1-3), or a combination thereof



Formula (C1-1) Formula (C1-2) Formula (C1-3)

and wherein (C1) is a group derived from an aromatic compound having a nitrogen atom, (C2) is a group forming a secondary carbon atom, a quaternary carbon atom, or a tertiary carbon atom having an aromatic ring in a side chain, (C3) is a group derived from an aliphatic polycyclic compound, and (C4) is a group derived from phenol, bisphenol, naphthol, biphenyl, biphenol, or a combination thereof.

4. The laminated body according to any one of claims 1 to 3, wherein a light transmittance of the peeling layer at a wavelength range of 190 nm to 600 nm is 1 to 90%.

5. The laminated body according to any one of claims 1 to 4, wherein the modification caused by absorption of light having the wavelength is photodecomposition of the novolac resin.

6. The laminated body according to claim 3, wherein the intermediate layer includes the adhesion layer containing a component (A) to be cured by a hydrosilylation reaction and a component (B) containing a polydimethylsiloxane.

7. The laminated body according to claim 6, wherein the component (A) contains a polysiloxane selected from the group consisting of a siloxane unit (Q unit) of SiO_2, a siloxane unit (M unit) of $R^1R^2R^3SiO_{1/2}$, a siloxane unit (D unit) of $R^4R^5SiO_{2/2}$, and a siloxane unit (T unit) of $R^6SiO_{3/2}$ (provided that R^1 to R^6 each are bonded to a silicon atom through an Si-C bond or an Si-H bond), and contains a polysiloxane (A1) containing a polyorganosiloxane (a1) in which monovalent chemical groups of R^1 to R^6 each contain a C_{1-10} alkyl group and a C_{2-10} alkenyl group, and a polyorganosiloxane (a2) in which the monovalent chemical groups of R^1 to R^6 each contain a C_{1-10} alkyl group and a hydrogen atom, and a platinum group metal-based catalyst (A2).

8. The laminated body according to claim 6 or 7, wherein the component (A) further contains an inhibitor (A3).

9. The laminated body according to any one of claims 6 to 8, wherein the component (B) is a polydimethylsiloxane having a viscosity of 1,000 mm^2/s to 2,000,000 mm^2/s.

10. The laminated body according to any one of claims 6 to 8, wherein the component (B) is a polydimethylsiloxane having a viscosity of 10,000 mm^2/s to 1,000,000 mm^2/s.

11. The laminated body according to any one of claims 6 to 10, wherein a ratio in % by mass of the component (A) to the component (B) in an adhesive is 80:20 to 50:50.

12. The laminated body according to any one of claims 1 to 11, wherein the group (C1) derived from an aromatic compound having a nitrogen atom is a group derived from carbazole or phenylnaphthylamine.

13. The laminated body according to any one of claims 1 to 12, wherein the group (C2) is a group derived from 1- naphthaldehyde, 1-pyrenecarboxyaldehyde, or 4-(trifluoromethyl)benzaldehyde, and the group (C3) is a group derived from dicyclopentadiene.

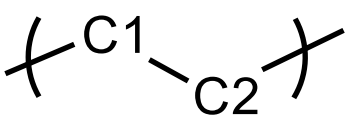
14. A method for producing the laminated body according to any one of claims 3 to 5 comprising steps of:

applying an adhesive for forming the adhesion layer according to any one of claims 6 to 11 to the circuit surface of the wafer to form the adhesion layer;

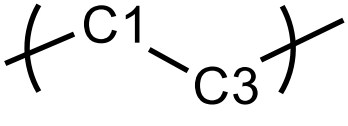
applying a peeling layer-forming composition for forming the peeling layer according to claim 3 to the support to form the peeling layer; and

bonding the wafer and the support so that the adhesion layer is in contact with the peeling layer followed by heating at 120°C to 300°C to achieve joining,

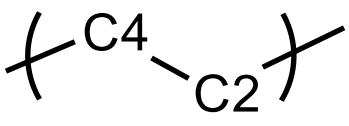
wherein the peeling layer contains a polymer (C) having the following unit structure (C1-1), (C1-2), or (C1-3), or a combination thereof



Formula (C1-1)



Formula (C1-2)



Formula (C1-3)

and wherein (C1) is a group derived from an aromatic compound having a nitrogen atom, (C2) is a group forming a secondary carbon atom, a quaternary carbon atom, or a tertiary carbon atom having an aromatic ring in a side chain, (C3) is a group derived from an aliphatic polycyclic compound, and (C4) is a group derived from phenol, bisphenol, naphthol, biphenyl, biphenol, or a combination thereof.

15. The method for producing the laminated body according to claim 14, wherein the group (C1) derived from an aromatic compound having a nitrogen atom is a group derived from carbazole or phenylnaphthylamine.

16. The method for producing the laminated body according to claim 14 or 15, wherein the group (C2) is a group derived from 1- naphthaldehyde, 1-pyrenecarboxyaldehyde, or 4-(trifluoromethyl)benzaldehyde, and the group (C3) is a group derived from dicyclopentadiene.

17. The method for producing the laminated body according to any one of claims 14 to 16, wherein the bonding is carried out under a reduced pressure of 10 Pa to 10,000 Pa.

18. A method for peeling the support and the object to be processed according to any one of claims 1 to 5, wherein the support is a glass substrate, and irradiation with light with a wavelength of 190 nm to 400 nm is carried out from a side of the support.

19. A removing method, wherein the object to be processed according to claim 18 is a wafer, and the adhesion layer or the peeling layer is removed from the support or the wafer using a tape after peeling the support and the wafer.