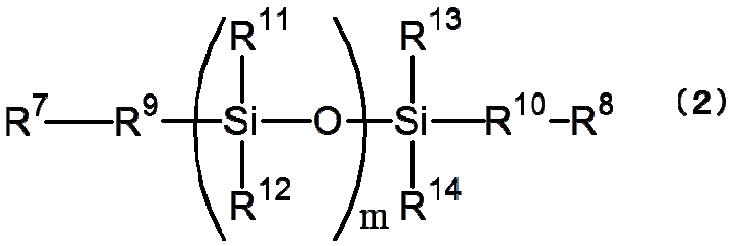
CLAIMS

1. A temporary-bonding adhesive, wherein the temporary-bonding adhesive is a resin composition containing (a) a resin (excluding a siloxane polymer represented by a general formula (2)), and at least one of (b-1) a siloxane polymer represented by a general formula (2) and (b-2) a compound represented by a general formula (3).

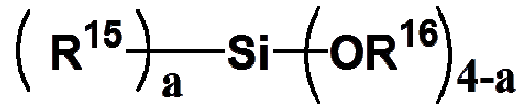
[Chemical Formula 3]



(2)

in which m is an integer of 10 to 100, R^7 and R^8 may be the same or different and represent a monovalent organic group having 1 to 30 carbon atoms and 0 to 3 nitrogen atoms. R^9 and R^{10} may be the same or different and represent an alkylene group having 1 to 30 carbon atoms or a phenylene group, and R^{11} to R^{14} may be the same or different and represent an alkyl group having 1 to 30 carbon atoms, an alkylene group having 1 to 30 carbon atoms, an alkoxy group having 1 to 30 carbon atoms, a phenyl group, or a phenoxy group.

[Chemical Formula 4]



(3)

in which R^{15} represents a monovalent organic group having 2 to 20 carbon atoms and 1 to 3 nitrogen atoms, R^{16} represents hydrogen, an alkyl group having 1 to 20 carbon atoms, or an aromatic group, and a represents an integer of 0 to 4.

2. The temporary-bonding adhesive according to claim 1, wherein a glass transition temperature of the (a) resin is 100°C or lower.

3. The temporary-bonding adhesive according to claim 1 or 2, wherein a 1% weight Loss temperature of the (a) resin is 300°C or higher.

4. The temporary-bonding adhesive according to any one of claims 1 to 3, wherein the (a) resin is a polyimide resin.

5. The temporary-bonding adhesive according to any one of claims 1 to 4, containing the (b-1) siloxane polymer represented by a general formula (2) in an amount of 0.01 to 30 wt% with respect to the (a) resin.

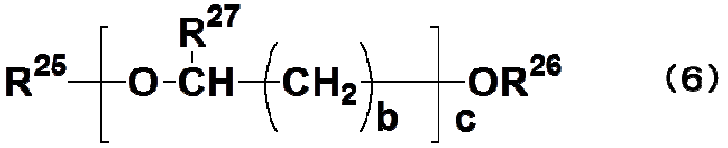
6. The temporary-bonding adhesive according to any one of claims 1 to 5, containing the (b-2) compound represented by a general formula (3) in an amount of 0.01 to 30 wt% with respect to the (a) resin.

7. The temporary-bonding adhesive according to any one of claims 1 to 6, further comprising (c) a solvent.

8. The temporary-bonding adhesive according to claim 7, wherein the (c) solvent contains a solvent having an SP value of 7.5 to 9.0.

9. The temporary-bonding adhesive according to claim 7 or 8, wherein the (c) solvent contains a solvent represented by a general formula (6):

[Chemical Formula 5]



(6)

in which R^{25} and R^{26} independently represent hydrogen, alkyl groups having 1 to 12 carbon atoms, an acetyl group, or aromatic groups, R^{27} represents hydrogen or a methyl group, b is either 0, 1 or 2, and c is an integer of 1 to 3.

10. The temporary-bonding adhesive according to any one of claims 1 to 9, further comprising inorganic particles.

11. An adhesive layer obtained by forming a coating of the temporary-bonding adhesive according to any one of claims 1 to

10.

12. A wafer work piece formed by bonding a semiconductor circuit formation substrate to a support substrate with at least the adhesive layer according to claim 11 interposed therebetween.

13. A wafer work piece formed by bonding a semiconductor circuit formation substrate to a support substrate with the adhesive layer according to claim 11 interposed therebetween.

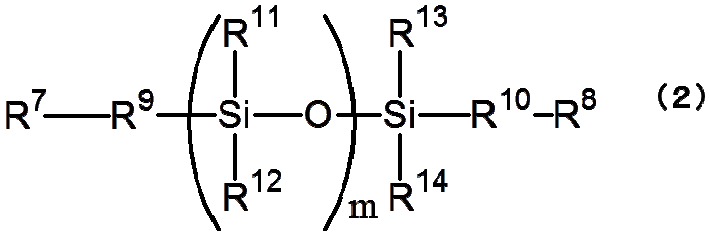
14. A method for manufacturing a semiconductor device using the wafer work piece according to claim 12 or 13 comprising at least any one of a step of fabricating the semiconductor circuit formation substrate into a thinner one, a step of subjecting the semiconductor circuit formation substrate of the wafer work piece to device processing, a step of de-bonding off the semiconductor circuit formation substrate of the wafer work piece from a support substrate, and a step of washing, with a solvent, an adhesive layer adhering to the semiconductor circuit formation substrate de-bonded off from the wafer work piece or the support substrate of the wafer work piece.

15. A method for manufacturing a semiconductor device, wherein the step of fabricating the semiconductor circuit

formation substrate into a thinner one according to claim 14 comprises a step of fabricating a thickness of the semiconductor circuit formation substrate to at least 1 μm and at most 100 μm.

16. A resin composition containing (a) a resin (excluding a siloxane polymer represented by a general formula (2)), and at least one of (b-1) a siloxane polymer represented by a general formula (2) and (b-2) a compound represented by a general formula (3), wherein the (a) resin is a polyimide resin having at least an acid dianhydride residue and a diamine residue and including, in the diamine residue, a polysiloxane-based diamine residue represented by a general formula (5) which is 40 mol% or more in all diamine residues.

[Chemical Formula 9]

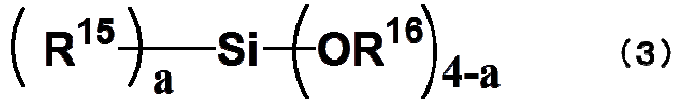


(2)

in which m is an integer of 10 to 100, R^7 and R^8 may be the same or different and represent a monovalent organic group having 1 to 30 carbon atoms and 0 to 3 nitrogen atoms, R^9 and R^{10} may be the same or different and represent an alkylene group having 1 to 30 carbon atoms or a phenylene group, and R^{11} to R^{14} may be the same or different and represent an alkyl group having

1 to 30 carbon atoms, an alkylene group having 1 to 30 carbon atoms, an alkoxy group having 1 to 30 carbon atoms, a phenyl group, or a phenoxy group,

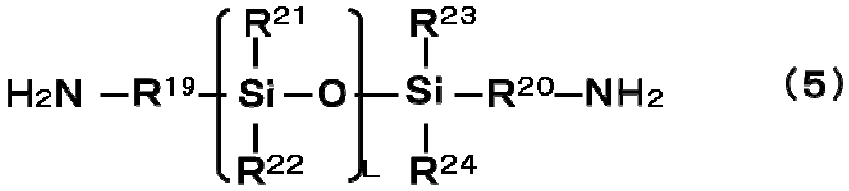
[Chemical Formula 10]



(3)

in which R^{15} represents a monovalent organic group having 2 to 20 carbon atoms and 1 to 3 nitrogen atoms, R^{16} represents hydrogen, an alkyl group having 1 to 20 carbon atoms, or an aromatic group, and a represents an integer of 0 to 4,

[Chemical Formula 11]



(5)

in which L is an integer of 1 to 100, R^{19} and R^{20} may be the same or different and represent an alkylene group having 1 to 30 carbon atoms or a phenylene group, and R^{21} to R^{24} may be the same or different and represent an alkyl group having 1 to 30 carbon atoms, a phenyl group, or a phenoxy group.