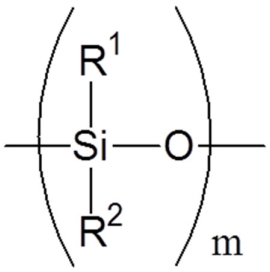
formation substrate peeled from the processed wafer or the resin layer attached to the support substrate in the processed wafer with a solvent.

[0021a]

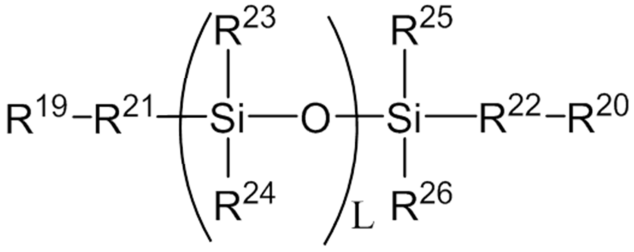
In an aspect, there is provided a resin composition comprising at least (a) a polyimide resin having a structure represented by the general formula (1) and (b) a crosslinker including a fluorene group:



(1)

wherein m is a natural number of 1 or more and 100 or less, R^1 and R^2 may be same or different and each represent an alkyl group having 1 to 30 carbon atoms, a phenyl group or a phenoxy group, and

wherein the composition further comprises (c) a siloxane polymer represented by the general formula (6):



(6)

wherein L is an integer of 10 or more and 100 or less, R^{19} and R^{20} may be same or different and each represent a monovalent organic group having 1 to 30 carbon atoms and 0 to 3 nitrogen atoms, R^{21} and R^{22} may be same or different and each represent an alkylene group having 1 to 30 carbon atoms or a phenylene group, R^{23} to R^{26} may be same or different and each represent an alkyl group having 1 to 30 carbon atoms, an alkoxy group, a phenyl group, or a phenoxy group, and an alkoxy group having 1 to 30 carbon atoms of R^{23} to R^{26} does not include a polyoxyalkylene structure.

[0021b]

In another aspect, there is provided a resin layer comprising a coating film of the resin composition as defined above.

[0021c]

In another aspect, there is provided a permanent adhesive comprising the resin composition as defined above.

[0021d]

In another aspect, there is provided an adhesive for temporary bonding comprising the resin composition as defined above.

[0021e]

In another aspect, there is provided a method for manufacturing an electronic component or a semiconductor device using the resin composition as defined above.

[0021f]

In another aspect, there is provided a laminated film comprising a heat-resistant insulating film and the resin composition as defined above laminated on at least one surface of the heat-resistant insulating film.

[0021g]

In another aspect, there is provided a method for manufacturing an electronic component or a semiconductor device using the laminated film as defined above.

[0021h]

In another aspect, there is provided a processed wafer comprising an electronic circuit formation substrate or a semiconductor circuit formation substrate and a support substrate bonded together with at least the resin layer as defined above or the laminated film as defined above interposed between the electronic circuit formation substrate or the semiconductor circuit formation substrate and the support substrate.

[0021i]

In another aspect, there is provided a method for manufacturing an electronic component or a semiconductor device using the processed wafer as defined above, the method comprising at least either of the steps of:

heat-treating the electronic circuit formation substrate or the semiconductor circuit formation substrate

in the processed wafer;

peeling the electronic circuit formation substrate or the semiconductor circuit formation substrate in the processed wafer from the support substrate; and

washing the resin layer attached to the electronic circuit formation substrate or the semiconductor circuit formation substrate peeled from the processed wafer or the resin layer attached to the support substrate in the processed wafer with a solvent.

EFFECTS

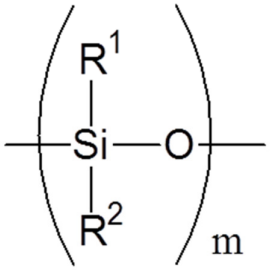
[0022]

According to the present disclosure, there can be provided a resin composition that is capable of bonding an electronic circuit formation substrate or a semiconductor circuit formation substrate and a support substrate together, has excellent heat resistance during bonding of an electronic circuit formation substrate or semiconductor circuit formation substrate having a thickness of 1 μm or more and 100 μm or less, has steady adhesive force through the process of manufacturing an electronic component, a semiconductor device or the like, and can be peeled off under mild conditions at room temperature after the manufacturing process, an adhesive, a resin layer, a laminated film, and a processed wafer containing the resin composition, as well as a method for manufacturing an

electronic component or a semiconductor device using these. The resin composition of the present disclosure can be used as a permanent adhesive or an adhesive for temporary bonding, and, in particular, can be suitably used as an adhesive for temporary bonding.

CLAIMS

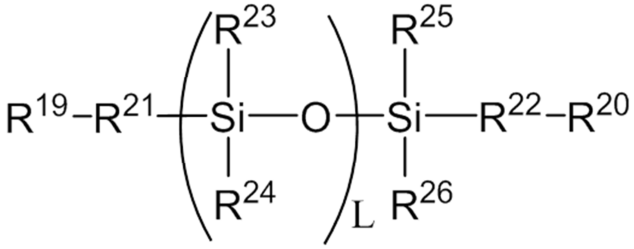
1. A resin composition comprising at least (a) a polyimide resin having a structure represented by the general formula (1) and (b) a crosslinker including a fluorene group:



(1)

wherein m is a natural number of 1 or more and 100 or less, R^1 and R^2 may be same or different and each represent an alkyl group having 1 to 30 carbon atoms, a phenyl group or a phenoxy group, and

wherein the composition further comprises (c) a siloxane polymer represented by the general formula (6):



(6)

wherein L is an integer of 10 or more and 100 or less, R^{19} and R^{20} may be same or different and each represent a monovalent organic group having 1 to 30 carbon atoms and 0 to 3 nitrogen atoms, R^{21} and R^{22} may be same or different and each represent an alkylene group having 1 to 30 carbon atoms or a phenylene group, R^{23} to R^{26} may be same or different and each

represent an alkyl group having 1 to 30 carbon atoms, an alkoxy group, a phenyl group, or a phenoxy group, and an alkoxy group having 1 to 30 carbon atoms of R^{23} to R^{26} does not include a polyoxyalkylene structure.

2. The resin composition according to claim 1, wherein the crosslinker (b) including a fluorene group is an epoxy resin including a fluorene group.

3. The resin composition according to claim 1 or 2, wherein the crosslinker (b) including a fluorene group has a 5% weight loss temperature of 250°C or more and 400°C or less.

4. The resin composition according to any of claims 1 to 3, having a content of the crosslinker (b) including a fluorene group of 0.1% by mass or more and 40% by mass or less relative to 100% by mass of the polyimide resin (a).

5. The resin composition according to any of claims 1 to 4, wherein R^{19} and R^{20} of the siloxane polymer (c) represented by the general formula (6) are amino groups.

6. The resin composition according to any of claims 1 to 5, having a content of the siloxane polymer (c) represented by the general formula (6) of 0.01% by mass or more and 30% by mass or less relative to 100% by mass of the polyimide resin

(a) having a structure represented by the general formula (1).

7. The resin composition according to any of claims 1 to 6, further comprising (d) a silane coupling agent.

8. The resin composition according to claim 7, having a content of the silane coupling agent (d) of 0.01% by mass or more and 30% by mass or less relative to 100% by mass of the polyimide resin (a) having a structure represented by the general formula (1).

9. The resin composition according to any of claims 1 to 8, further comprising (e) inorganic fine particles.

10. The resin composition according to claim 9, having a content of the inorganic fine particles (e) of 0.1% by mass or more and 40% by mass or less relative to 100% by mass of the polyimide resin (a).

11. The resin composition according to any of claims 1 to 10, having a glass transition temperature after curing of 30°C or more and 150°C or less.

12. A resin layer comprising a coating film of the resin composition according to any of claims 1 to 11.

13. A permanent adhesive comprising the resin composition according to any of claims 1 to 11.

14. An adhesive for temporary bonding comprising the resin composition according to any of claims 1 to 11.

15. The adhesive for temporary bonding according to claim 14, for bonding an electronic circuit formation substrate or a semiconductor circuit formation substrate and a support substrate together.

16. The adhesive for temporary bonding according to claim 15, wherein the support substrate is any of a silicon substrate, a glass substrate, and a film.

17. A method for manufacturing an electronic component or a semiconductor device using the resin composition according to any of claims 1 to 11.

18. A laminated film comprising a heat-resistant insulating film and the resin composition according to any of claims 1 to 11 laminated on at least one surface of the heat-resistant insulating film.

19. The laminated film according to claim 18, wherein the

heat-resistant insulating film has a release-treated surface.

20. The laminated film according to claim 18 or 19, further comprising a film having a release-treated surface laminated on a surface of the resin composition laminated on the heat-resistant insulating film.

21. A method for manufacturing an electronic component or a semiconductor device using the laminated film according to any of claims 18 to 20.

22. A processed wafer comprising an electronic circuit formation substrate or a semiconductor circuit formation substrate and a support substrate bonded together with at least the resin layer according to claim 12 or the laminated film according to any of claims 18 to 20 interposed between the electronic circuit formation substrate or the semiconductor circuit formation substrate and the support substrate.

23. The processed wafer according to claim 22, wherein the electronic circuit formation substrate or the semiconductor circuit formation substrate and the support substrate are bonded together with only the resin layer according to claim 12 or only the laminated film according to any of claims 18 to 20 interposed between the electronic circuit formation

substrate or the semiconductor circuit formation substrate and the support substrate.

24. The processed wafer according to claim 22 or 23, wherein the electronic circuit formation substrate or the semiconductor circuit formation substrate has a thickness of 1 μm or more and 100 μm or less.

25. A method for manufacturing an electronic component or a semiconductor device using the processed wafer according to any of claims 22 to 24, the method comprising at least either of the steps of:

heat-treating the electronic circuit formation substrate or the semiconductor circuit formation substrate in the processed wafer;

peeling the electronic circuit formation substrate or the semiconductor circuit formation substrate in the processed wafer from the support substrate; and

washing the resin layer attached to the electronic circuit formation substrate or the semiconductor circuit formation substrate peeled from the processed wafer or the resin layer attached to the support substrate in the processed wafer with a solvent.

26. The method for manufacturing an electronic component or a semiconductor device according to claim 25, comprising the

step of heat-treating the electronic circuit formation substrate or the semiconductor circuit formation substrate in the processed wafer at a temperature of 230°C or more and 450°C or less.