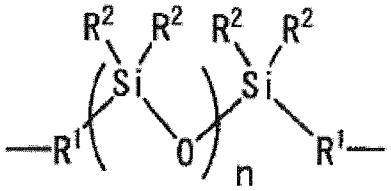
[0007]

There is provided an adhesive agent comprising a polyimide (a), an epoxy compound (b), and an acid-modified rosin (c).

[0007a]

In a first aspect, there is provided an adhesive agent comprising a polyimide (a), an epoxy compound (b), an acid-modified rosin (c) and a basic latent hardener, wherein the acid modified rosin (c) has a cyclohexane ring, wherein the polyimide (a) is a polymer having a structure represented by a general formula (2) or a general formula (3) and containing a structure represented by a general formula (1) as R^4 in the general formula (2) or the general formula (3) in an amount of 5 to 15% by mass with respect to the total amount of the polymer:

[Chem. 1]

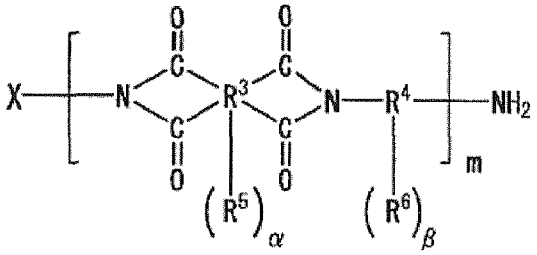


(1)

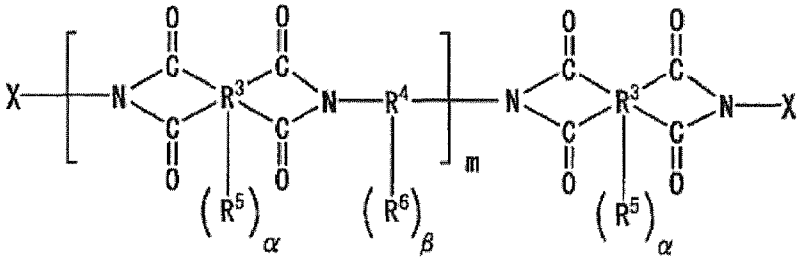
in which R^1s represent a divalent hydrocarbon group, and may be the same or different in one molecule and may be the same or different in different molecules , R^2s represent a monovalent hydrocarbon group, and may be the same or different in one molecule and may be the same or different in different molecules,

and n is an integer of 1 to 10;

[Chem. 2]



(2)



(3)

in which R^3s are a 4- to 14-valent organic group, and may be the same or different in one molecule and may be the same or different in different molecules; R^4s are a 2- to 12-valent organic group, and may be the same or different in one molecule and may be the same or different in different molecules; at least one of R^3 and R^4 is an aromatic group containing at least one of one or more groups selected from the group consisting of a 1,1,1,3,3,3-hexafluoropropyl group, an isopropyl group, an ether group, a thioether group, and a SO_2 group; R^5s and R^6s represent one or more groups selected from the group consisting of a phenolic hydroxyl group, a sulfonic acid group, and a thiol group, and may be the same or different in one molecule and may be the same or different in different molecules; X represents a monovalent organic group; m represents an integer of 8 to 200;

α and β are each an integer of 0 to 10, and $\alpha + \beta$ is an integer of 0 to 10; and in which $\alpha + \beta$ is 1 to 10 in 20 to 90% of repeating units whose number is represented by m.

[0007b]

In a second aspect, there is provided an adhesive agent film comprising the adhesive agent as defined above.

[0007c]

In a third aspect, there is provided a semiconductor device including a hardened article of the adhesive agent as defined above or a hardened article of the adhesive agent film as defined above.

[0007d]

In a fourth aspect, there is provided a method for producing a semiconductor device, wherein the adhesive agent as defined above or the adhesive agent film as defined above is interposed between a first circuit member and a second circuit member; and the first circuit member and the second circuit member are electrically connected to each other through application of heat and pressure.

EFFECTS

[0008]

According to the present disclosure, an adhesive agent is provided which has excellent stability against heating treatment during a heat-drying process and an assembly process.

EMBODIMENTS OF THE INVENTION

[0009]

The adhesive agent of the present invention is an adhesive agent comprising a polyimide (a), an epoxy compound (b), and an acid-modified rosin (c).

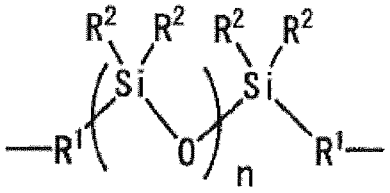
[0010]

The adhesive agent of the present invention contains the polyimide (a), and is therefore excellent in heat resistance and chemical resistance. Particularly, a hardened article having a higher-density network structure can be obtained by using a polyimide having, in its side chain, at least one highly polar functional group selected from the group consisting of a phenolic hydroxyl group, a sulfonic acid group, and a thiol group since the solubility in an organic solvent and the compatibility with an epoxy resin of polyimide are improved and a ring-opening reaction of the epoxy compound and an addition

CLAIMS

1. An adhesive agent comprising a polyimide (a), an epoxy compound (b), an acid-modified rosin (c), and a basic latent hardener, wherein the acid modified rosin (c) has a cyclohexane ring, wherein the polyimide (a) is a polymer having a structure represented by a general formula (2) or a general formula (3) and containing a structure represented by a general formula (1) as R^4 in the general formula (2) or the general formula (3) in an amount of 5 to 15% by mass with respect to the total amount of the polymer:

[Chem. 1]



(1)

in which R^1s represent a divalent hydrocarbon group, and may be the same or different in one molecule and may be the same or different in different molecules , R^2s represent a monovalent hydrocarbon group, and may be the same or different in one molecule and may be the same or different in different molecules, and n is an integer of 1 to 10;

[Chem. 2]

units whose number is represented by m.

2. The adhesive agent according to claim 1, wherein the content of the acid-modified rosin (c) in the adhesive agent is 5 parts by mass or more and 30 parts by mass or less with respect to 100 parts by mass of the epoxy compound (b).

3. The adhesive agent according to claim 1 or 2 further containing inorganic particles (d), wherein the content of the inorganic particles (d) is 30 to 80% by mass with respect to the total amount of the components (a) to (d).

4. An adhesive agent film comprising the adhesive agent according to any one of claims 1 to 3.

5. The adhesive agent film according to claim 4, wherein a minimum melt viscosity after stored for one month under the circumstance of 23°C and 55% in relative humidity (RH) is 100 to 10000 Pa·s.

6. A semiconductor device including a hardened article of the adhesive agent according to any one of claims 1 to 3 or a hardened article of the adhesive agent film according to claim 4 or 5.

7. A method for producing a semiconductor device, wherein the adhesive agent according to any one of claims 1 to 3 or the adhesive agent film according to claim 4 or 5 is interposed between a first circuit member and a second circuit member; and the first circuit member and the second circuit member are electrically connected to each other through application of