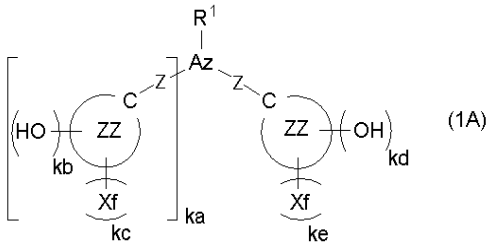
CLAIMS

1. A conductive paste composition, comprising (A) a conductive filler, (B) a phenol compound, (C) an elastomer resin, and (D) a solvent, wherein the phenol compound as the component (B) is the phenol compound represented by the following general formula (1A),

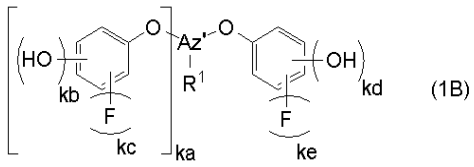


(1A)

wherein R^1 represents a hydrogen atom, a halogen atom, a cyano group, or a hydroxyl group; Az represents a linear, branched, or cyclic (ka+2)-valent hydrocarbon group or fluorinated hydrocarbon group having 1 to 20 carbon atoms, and $-CH_2-$ constituting the (ka+2)-valent hydrocarbon group is optionally substituted with -O-, -C(=O)- or $-Si(R^2R^3)-$; each of R^2 and R^3 is a linear, branched, or cyclic alkyl group having 1 to 6 carbon atoms, or a phenyl group; each Xf independently represents a hydrogen atom, a halogen atom, a linear, branched, or cyclic monovalent hydrocarbon group having 1 to 10 carbon atoms optionally substituted with a fluorine atom, an alkoxy group having 1 to 10 carbon atoms optionally substituted with a fluorine atom, or an electron-withdrawing group; Z represents a single bond or an oxygen atom; each of ring ZZ independently represents an aromatic monocyclic or polycyclic ring having 5 to 20 carbon atoms; each carbon atom of the ring ZZ is optionally substituted with a nitrogen atom, an oxygen atom, or a sulfur atom; “ka” represents an integer of 0 to 2; “kb” and “kd” each represent 1 or 2;

and “kc” and “ke” each represent an integer of 0 to 2.

2. The conductive paste composition according to claim 1, wherein the phenol compound as the component (B) is the phenol compound represented by the following general formula (1B),

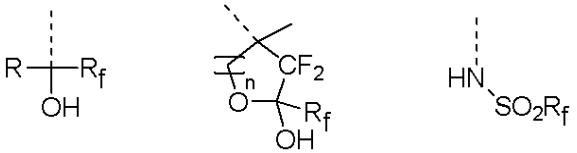


(1B)

wherein Az’ represents a linear, branched, or cyclic (ka+2)-valent hydrocarbon group or fluorinated hydrocarbon group having 1 to 19 carbon atoms, and -CH_2- constituting the (ka+2)-valent hydrocarbon group is optionally substituted with -O-, -C(=O)- or -Si(R^2R^3)-; “ka” represents 0 or 1, “kb”, “kc”, “kd”, and “ke” each represent 1 or 2; and R^1, R^2 and R^3 are as defined above.

3. The conductive paste composition according to claim 1 or 2, wherein the elastomer resin as the component (C) is polyurethane.

4. The conductive paste composition according to claim 3, wherein the elastomer resin as the component (C) is a polyurethane comprising a structure represented by the following general formulae (1a) to (1c),

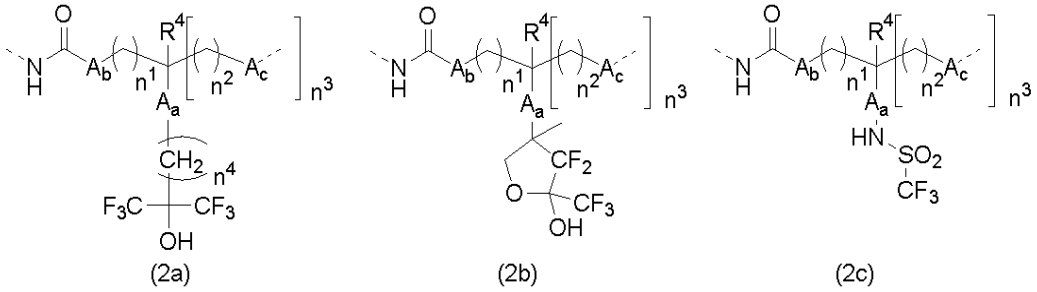


(1a) (1b) (1c)

wherein R represents a hydrogen atom, a fluorine atom, or a linear, branched, or cyclic hydrocarbon group

having 1 to 10 carbon atoms optionally substituted with a fluorine atom; R_f represents a fluorine atom, or a linear, branched, or cyclic fluorinated hydrocarbon group having 1 to 10 carbon atoms; "n" is an integer of 1 or 2; and a dashed line represents a bonding arm.

5. The conductive paste composition according to claim 4, wherein the elastomer resin as the component (C) is a polyurethane comprising a structure represented by the following general formulae (2a) to (2c),



(2a) (2b) (2c)

wherein R^4 is a hydrogen atom or a monovalent hydrocarbon group having 1 to 3 carbon atoms; A_a represents a single bond, or a linear, branched, or cyclic divalent hydrocarbon group having 1 to 20 carbon atoms; and $-CH_2-$ constituting A_a is optionally substituted with -O-, -C(=O)-, -C(=O)O- or $-C_6H_4-$, or $-NR^8-C(=O)-$; R^8 is a hydrogen atom, or a linear or branched alkyl group having 1 to 4 carbon atoms; A_b represents -O-, $-NR^8-$, or -C(=O)O-; A_c represents -O-, $-NR^8-$, -C(=O)O-, or $-NR^8-C(=O)-$; each of n^1, n^2, and n^4 is an integer of 0 to 10; n^3 is an integer of 0 or 1; and a dashed line represents a bonding arm.

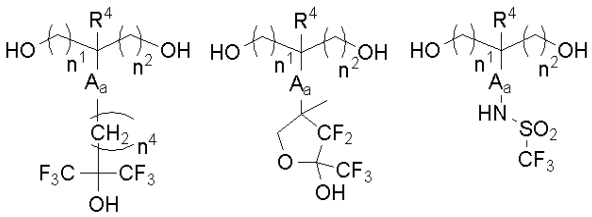
6. The conductive paste composition according to any one of claims 1 to 5, wherein the conductive filler as the component (A) is contained in a proportion exceeding 70 parts by mass relative to 100 parts by mass of a

total of the components (A) and (C).

7. The conductive paste composition according to any one of claims 1 to 6, wherein the conductive filler as the component (A) is selected from the group consisting of gold, silver, silver chloride, platinum, copper, tin, iron, titanium, nickel, palladium, aluminum, tungsten, molybdenum, ruthenium, chromium, indium, solder, carbon, and composites thereof.

8. The conductive paste composition according to any one of claims 1 to 7, wherein the conductive filler as the component (A) is a silver powder having an average particle size of 5 nm to 10 μm.

9. A method for producing the conductive paste composition according to claim 5, wherein the elastomer resin as the component (C) is produced using an alcohol represented by the following general formulae (3a) to (3c) as a chain extender,



(3a) (3b) (3c)

wherein R^4, A_a, n^1, n^2 and n^4 are as defined above.

10. A conductive wire formed on a substrate, the conductive wire comprising a baked product of the conductive paste composition according to any one of claims 1 to 8.

11. The conductive wire according to claim 10, wherein

the substrate is stretchable.

12. The conductive wire according to claim 10 or 11, wherein the substrate is a thermoplastic polyurethane.

13. The conductive wire according to any one of claims 10 to 12, wherein a change in electric resistance upon 20% elongation is 500% or less.

14. The conductive wire according to any one of claims 10 to 13, wherein a maximum electric resistance when the conductive wire is elongated and shrunk repeatedly 1000 times with an elongation ratio of 20% is 5000% or less of an electric resistance before the elongations and the shrinkages.

15. A method for producing a conductive wire by using the conductive paste composition according to any one of claims 1 to 8 to form a conductive wire on a substrate, wherein the conductive wire is formed with a baking temperature of 60°C to 160°C.

16. A method for producing a conductive wire, comprising printing the conductive paste composition according to any one of claims 1 to 8, followed by heating to form a conductive wire on a substrate.