is as follows.

[0008]

A resin composition including (A) a polymer compound and (B) a cationic polymerizable compound, in which

(A) the polymer compound is at least one compound selected from the group consisting of polyamide, polyimide, polyamideimide, and polybenzoxazole, and

the resin composition further includes (C) a cationic polymerization initiator.

EFFECTS OF THE INVENTION

[0009]

The present invention provides a resin composition having pattern processability and excellent in the glass transition temperature of a cured film and the tensile strength and the tensile elongation of a cured film under a low temperature curing condition, a resin composition film, a cured film, a hollow structure using these, and a semiconductor device.

EMBODIMENTS OF THE INVENTION

[0010]

A resin composition of the present invention includes (A) a polymer compound and (B) a cationic polymerizable compound, in which (A) the polymer compound is at least one

the structure in which the molecular chain terminal is derived from the carboxylic acid residue is 95% by mass or less in the resin composition, the cationic polymerization reaction easily proceeds, and the chemical resistance of the cured film is improved. In addition, the content of (A) the polymer compound having the structure in which the molecular chain terminal is derived from the carboxylic acid residue is more preferably 70% by mass or less in the resin composition.

[0015]

(A) The polymer compound preferably has the structure in which the molecular chain terminal is derived from the carboxylic acid residue. When the molecular chain terminal of (A) the polymer compound has a structure derived from the carboxylic acid residue, the molecular chain terminal can have a molecular structure that does not have an amine end structure which can serve as an inhibitory functional group for cationic polymerization. As a result, it is preferable from the viewpoint that sufficient cationic polymerizability can be exhibited even when polyamide, po~~rr~~ely imide, or polyamideimide is used.

[0016]

Here, the structure derived from the carboxylic acid residue at the molecular chain terminal of (A) the polymer compound is an organic group derived from the carboxylic

substance that dissolves in an amount of 0.1 g or more at 25°C with respect to 100 g of a 2.38% by mass aqueous solution of tetramethylammonium hydroxide. In order to exhibit alkali solubility, (A) the polymer compound desirably has an alkali-soluble functional group. The alkali-soluble functional group is a functional group having acidity, and specific examples thereof include a phenolic hydroxyl group, a carboxyl group, and a sulfonic acid group. Among the above-described alkali-soluble functional groups, the alkali-soluble functional group is preferably a phenolic hydroxyl group because of problems such as storage stability of the photosensitive resin composition ~~composition~~ and corrosion to copper wiring as a conductor. That is, (A) the polymer compound is preferably a compound having a phenolic hydroxyl group in a molecular chain.

[0018]

Examples of the structure (organic group) in which the molecular chain terminal of (A) the polymer compound is derived from the carboxylic acid residue include an aromatic dicarboxylic acid, an aromatic acid dianhydride, an alicyclic dicarboxylic acid, an alicyclic acid dianhydride, an aliphatic dicarboxylic acid, and an aliphatic acid dianhydride, but are not limited thereto. In addition, these are used alone or in combination of two

increasing the dielectric constant, decreasing the dielectric constant, and the like.

[0072]

The shape of the resin composition of the present invention before curing is not limited, and examples thereof include a varnish state and a film shape. The resin composition film of the present invention has a film shape as a form of the resin composition of the present invention, that is, is a resin composition coating film formed from the resin composition of the present invention. Therefore, the resin composition film of the present invention may be a film-shaped resin composition film formed on a support, that is, may be a resin composition film having a resin composition coating film formed from the resin composition of the present invention on a support, or may be in an aspect without a support. When used in a varnish state, a solution obtained by dissolving the (A) to (C) components and components added as necessary in an organic solvent can be used. In addition, the resin composition film is obtained, for example, by applying the resin composition of the present invention onto a support and then drying the resultant as necessary.

[0073]

Next, a method for producing a resin composition film using the resin composition ~~composition~~ of the present

present invention may have a protective film on the film in order to protect the surface. Thereby, the surface of the photosensitive resin composition film can be protected from contaminants such as rubbish and dust in air. Examples of the protective film include a polyolefin film and a polyester film. The protective film preferably has a small adhesive force to the resin composition film.

[0078]

Examples of the method for applying the resin composition varnish to the support include methods such as a spin coating using a spinner, a spray coating, a roll coating, a screen printing, a blade coater, a die coater, a die coater, a calender coater, a meniscus coater, a bar coater, a roll coater, a comma roll coater, a gravure coater, a screen coater, and a slit die coater. In addition, the film thickness applied varies depending on the application technique, the solid content concentration and the viscosity of the composition, and the like, but usually, the film thickness after drying is preferably 0.5 μm or more and 100 μm or less.

[0079]

For drying, an oven, a hot plate, infrared rays, or the like can be used. The drying temperature and the drying time may be in a range in which the organic solvent can be volatilized, and it is preferable to appropriately

[0100]

As described above, the resin composition of the present invention can be used as the roof portion of a ~~middle~~ hollow structure. In particular, when used as the roof portion, the amount of creep deformation at 180°C after the resin composition coating film of the resin composition film is thermally cured is preferably 0.5% or more and 2.5% or less. When the amount of creep deformation is 0.5% or more, the toughness of the cured film is high, and when the electronic component having the cured film of the present invention as the roof structure of the hollow structure is blocked with a molding resin, generation of cracks in the roof structure is suppressed, and the yield of the electronic component is improved. On the other hand, when the amount of creep deformation is 2.5% or less, the bending of the roof structure is suppressed by the pressure upon mold blocking when blocked with the molding resin, and improve the yield of the mold-blocked electronic component can be improved while holding the hollow structure portion.

[0101]

The method for measuring the amount of creep deformation at 180°C after the resin composition coating film is thermally cured can be carried out as follows. First, the resin composition film on which the resin composition coating film having a thickness of 30 μm is