composition has been studied, and there is a method of mixing a phenolic hydroxyl group-containing resin such as a novolak resin or a polyhydroxystyrene resin in a heat-resistant resin or a precursor thereof. Specific examples of such a mixture include a positive photosensitive resin precursor composition containing 101 parts by weight or more of a novolak resin and/or a polyhydroxystyrene resin based on 100 parts by weight of a polyimide precursor or a polybenzoxazole precursor, and a quinone diazide compound (see Patent Document 1), and a photosensitive resin composition containing a polyimide resin, a phenolic hydroxyl group-containing resin, a photo acid generator, and a crosslinking agent (see Patent Document 2).

PRIOR ART DOCUMENTS

PATENT DOCUMENTS

[0006]

Patent Document 1: Japanese Patent Laid-open Publication No. 2005-352004 (pp. 1-3)

Patent Document 2: Japanese Patent Laid-open Publication No. 2008-83359 (pp. 1-3)

SUMMARY

PROBLEMS TO BE SOLVED

[0007]

However, in the case of forming a relief pattern having

a plurality of levels on a coating film of such a resin composition by the above-mentioned method, there are problems that the surface of a thin film portion having a thickness of 0.1 μm or more and 3.0 μm or less is roughened and the coating film has a poor appearance, and the coating film is deteriorated in insulation reliability due to electric field concentration on the local thin film portion.

[0008]

The present disclosure has been made in view of the above-mentioned problems, and an object of the present disclosure is to provide a resin composition capable of suppressing surface roughness in a thin film portion and maintaining insulation reliability of a thin film portion, a cured relief pattern of the resin composition, and a method for manufacturing a semiconductor electronic component or a semiconductor equipment using the cured relief pattern.

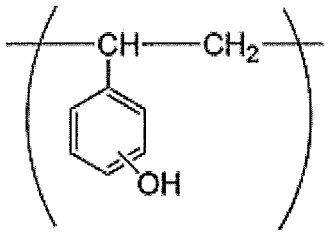
SOLUTIONS TO THE PROBLEMS

[0009]

In order to solve the above-mentioned problems, the resin composition of the present disclosure has the following constitution.

[1] In an aspect, there is provided a resin composition containing:

(a) at least one resin selected from an alkali-soluble polyimide, an alkali-soluble polybenzoxazole, an



(3)

[0014]

[10] In another aspect, there is provided a cured relief pattern that is a cured product of the resin composition according to any one of [1] to [9].

[11] The cured relief pattern according to [10], wherein at least a part of an exposed portion has a film thickness that is 5% or more and 50% or less of a film thickness of an unexposed portion.

[12] The cured relief pattern according to [10] or [11], having a breakdown voltage per a film thickness of 1 mm of 200 kV or more at a position where the cured relief pattern has a film thickness of 0.1 μm or more and 3.0 μm or less.

[13] In another aspect, there is provided a method for manufacturing a cured relief pattern, the method including the steps of:

applying the resin composition according to any one of [1] to [9] to a substrate and drying the resin composition to form a resin film;

exposing the resin film to light through a mask;

developing the exposed resin film to form a relief pattern; and

heating and curing the developed relief pattern,

wherein the step of heating and curing the developed

relief pattern includes a step of forming a cured relief pattern in which at least a part of an exposed portion has a film thickness that is 5% or more and 50% or less of a film thickness of an unexposed portion.

[14] In another aspect, there is provided an interlayer insulating film or a semiconductor protective film, including the cured relief pattern according to any one of [10] to [12].

[15] In another aspect, there is provided a method for manufacturing an interlayer insulating film or a semiconductor protective film using the cured relief pattern according to any one of [10] to [12] or a cured relief pattern manufactured by the method according to [13].

[16] In another aspect, there is provided a semiconductor electronic component or a semiconductor equipment, including the cured relief pattern according to any one of [10] to [12].

[17] In another aspect, there is provided a method for manufacturing a semiconductor electronic component or a semiconductor equipment using the cured relief pattern according to any one of [10] to [12] or a cured relief pattern manufactured by the method according to [13].

EFFECTS

[0015]

The resin composition of the present disclosure is capable of suppressing surface roughness in a thin film portion and maintaining insulation reliability of a thin film portion, and