CLAIMS

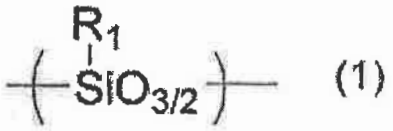
1. A composition for forming a pattern reversal film, characterized by comprising:

polysiloxane;

an additive; and

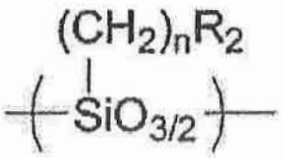
an organic solvent, wherein

the polysiloxane has a structural unit of Formula (1) and a structural unit of Formula (2):



(1)

(where R_1 is a C_{1-8} alkyl group), and



(2)

(where R_2 is an acryloyloxy group or a methacryloyloxy group; and n is an integer of 2 to 4), and

the additive is an organic acid having at least two of a carboxy group and/or a hydroxy group.

2. The composition for forming a pattern reversal film according to claim 1, wherein the additive is an organic acid selected from the group consisting of maleic acid, citric acid, salicylic acid, 3-hydroxybenzoic acid, 4-hydroxybenzoic acid, 2,6-dihydroxybenzoic acid, 3,5-dihydroxybenzoic acid, gallic acid, phthalic acid, pyromellitic acid, and ascorbic acid.

3. The composition for forming a pattern reversal film according to claim 1 or 2,

wherein the organic solvent is selected from C_{2-10} alcohols.

4. The composition for forming a pattern reversal film according to any one of claims 1 to 3, characterized in that the polysiloxane contains the structural unit of Formula (1) and the structural unit of Formula (2) in a molar ratio of 50:50 to 99:1.

5. A method for forming a reversal pattern, the method comprising:

forming a resist pattern on a substrate to be treated;

applying the composition for forming a pattern reversal film as claimed in any one of claims 1 to 4 so as to cover the pattern of the resist pattern, heating the composition at a temperature of 80°C to 180°C, and forming a pattern reversal film;

etch-backing the pattern reversal film and exposing the surface of the resist pattern; and

removing the resist pattern and forming a reversal pattern.

6. A method for removing a pattern reversal film, the method comprising:

peeling a pattern reversal film obtained by covering a resist pattern on a substrate to be treated with the composition for forming a pattern reversal film as claimed in any one of claims 1 to 4 and by heating the composition, together with the resist pattern using an organic solvent.

7. The method for removing a pattern reversal film according to claim 6, wherein the organic solvent is one or two or more selected from the group consisting of propylene glycol monomethyl ether, propylene glycol monomethyl ether acetate, ethyl lactate, and cyclohexanone.

CLAIMS

1. A composition for forming a pattern reversal film, comprising:

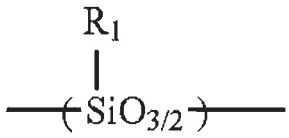
a polysiloxane;

an additive; and

an organic solvent.

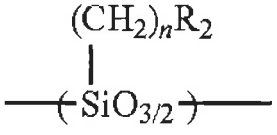
wherein:

the polysiloxane consists of one or more of a structural unit of Formula (1) and one or more of a structural unit of Formula (2):



(1)

where R_1 is a C_{1-8} alkyl group, and



(2)

where R_2 is an acryloyloxy group or a methacryloyloxy group; and n is an integer of 2 to 4, and

the additive is selected from the group consisting of maleic acid, citric acid, salicylic acid, 3-hydroxybenzoic acid, 4-hydroxybenzoic acid, 2,6-dihydroxybenzoic acid, 3,5-dihydroxybenzoic acid, gallic acid, phthalic acid, pyromellitic acid, and ascorbic acid.

2. The composition for forming a pattern reversal film according to claim 1, wherein the organic solvent is selected from C_{2-10} alcohols.

3. The composition for forming a pattern reversal film according to claim 1 or 2, wherein the polysiloxane contains the structural unit of Formula (1) and the structural unit of Formula (2) in a molar ratio of 50:50 to 99:1.

4. The composition for forming a pattern reversal film according to any one of claims 1 to 3, wherein an amount of the additive in the composition is 0.1% by mass to 5% by mass with respect to the mass of the polysiloxane.

5. A method for forming a reversal pattern, the method comprising:

forming a resist pattern on a substrate to be treated;

applying the composition for forming a pattern reversal film as claimed in any one of claims 1 to 4 so as to cover the pattern of the resist pattern, heating the composition at a temperature of 80°C to 180° C, and forming a pattern reversal film;

etch-backing the pattern reversal film and exposing the surface of the resist pattern; and

removing the resist pattern and forming a reversal pattern.

6. A method for removing a pattern reversal film, the method comprising:

peeling a pattern reversal film obtained by covering a resist pattern on a substrate to be treated with the composition for forming a pattern reversal film as claimed in any one of claims 1 to 4 and by heating the composition, together with the resist pattern using an organic solvent.

7. The method for removing a pattern reversal film according to claim 6, wherein the organic solvent is one or two or more selected from the group consisting of propylene glycol monomethyl ether, propylene glycol monomethyl ether acetate, ethyl lactate, and cyclohexanone.