CLAIMS

[Claim 1]

An etchant composition used to etch a silicon-containing film formed on a target substrate comprising:

at least one additive selected from the group consisting of an organic compound containing a hydroxyl group, an organic compound containing a carbonyl group, an inorganic acid and inorganic salt, hydrofluoric acid, ammonium fluoride, and an organic acid; wherein the etchant composition has a property to prevent corrosion of aluminum films and aluminum alloy films; wherein the organic acid is lactic acid, and the etchant composition has a property to prevent corrosion of a resist.

[Claim 2]

An etchant composition used to etch a silicon-containing film formed on a target substrate comprising:

at least one additive selected from the group consisting of an organic compound containing a hydroxyl group, an organic compound containing a carbonyl group, an inorganic acid and inorganic salt, hydrofluoric acid, ammonium fluoride, and an organic acid;

wherein the etchant composition has a property to prevent corrosion of aluminum films and aluminum alloy films;

wherein a concentration of hydrofluoric acid in the entire etching solution ranges from 0.5 weight % to 15 weight %, a concentration of ammonium fluoride in the entire etching solution ranges from 5 weight % to 30 weight %, a concentration of organic acid in the entire etching solution ranges from 5 weight % to 70 weight %, a concentration of additives in the entire etching solution ranges from 1 weight % to 70 weight %.

[Claim 3]

The etchant composition according to claim 1 or 2 further comprising a surfactant.

[Claim 4]

The etchant composition according to any one of claims 1 to 3, wherein

the organic acid includes at least one additive selected from the group consisting of monocarboxylic acid, polycarboxylic acid, oxycarboxylic acid, phosphonic acid and sulfonic acid.

[Claim 5]

The etchant composition according to any of claims 1 to 4, wherein

the organic acid includes at least one selected from the group consisting of acetic acid, propionic acid, oxalic acid, malonic acid, succinic acid, glutaric acid, glycolic acid, lactic acid, malic acid, tartaric acid, citric acid, amino tris (methylenephosphonic acid), 1-hydroxyethylidene-1,1-diphosphonic acid, methanesulfonic acid and ethanesulfonic acid.

[Claim 6]

The etchant composition according to any of claims 1 to 5, wherein

the organic compound containing a hydroxyl group includes at least one additive selected from the group consisting of alcohols, glycols, triols and methylols.

[Claim 7]

The etchant composition according to any of claims 1 to 6, wherein

the organic compound containing a hydroxyl group includes at least one additive selected from the group consisting of furfuryl alcohol, propylene glycol, polyethylene glycol, 1,4-butanediol, 3-methyl-1,3-butanediol, 1,6-hexanediol,

1,8-octanediol, 1,3-cyclohexanediol, 1,4-cyclohexanediol, 1,2,4-butanetriol, 3-methylpentane-1,3,5-triol and 1,4-cyclohexanedimethanol.

[Claim 8]

The etchant composition according to any of claims 1 to 7, wherein the organic compound containing a carbonyl group includes at least one additive selected from the group consisting of ketones, aldehydes and esters.

[Claim 9]

The etchant composition according to any of claims 1 to 8, wherein the organic compound containing a carbonyl group includes at least one additive selected from the group consisting of cyclopentanone and cyclohexanone.

[Claim 10]

The etchant composition according to any of claims 1 to 9, wherein the inorganic acid includes at least one additive selected from the group consisting of nitric acid, sulfuric acid and sulfamic acid.

[Claim 11]

The etchant composition according to any of claims 1 to 10, wherein the inorganic salt includes at least one selected from the group consisting of ammonium nitrate, ammonium sulfate and ammonium sulfamate.

[Claim 12]

The etchant composition according claim 3, wherein the surfactant includes at least one selected from the group consisting of an amphoteric surfactant, an anionic surfactant and a nonionic surfactant.

[Claim 13]

An etching method comprising:

applying the etchant composition of any one of claims 1 to 12.

CLAIMS

1. An etchant composition used to etch a silicon-containing film formed on a target substrate, said composition comprising:

at least one additive selected from the group consisting of an organic compound containing a hydroxyl group, an organic compound containing a carbonyl group, an inorganic acid and inorganic salt, hydrofluoric acid, ammonium fluoride, and an organic acid;

wherein the etchant composition has a property to prevent corrosion of aluminum films and aluminum alloy films;

wherein a concentration of the hydrofluoric acid in an entire etching solution ranges from 0.5 weight % to 15 weight %, a concentration of the ammonium fluoride in the entire etching solution ranges from 5 weight % to 30 weight %, a concentration of the organic acid in the entire etching solution ranges from 5 weight % to 70 weight %, and a concentration of additives in the entire etching solution ranges from 1 weight % to 70 weight %.

2. The etchant composition according to claim 1 further comprising a surfactant.

3. The etchant composition according to claim 2, wherein the surfactant includes at least one additive selected from the group consisting of an amphoteric surfactant, an anionic surfactant and a nonionic surfactant.

4. The etchant composition according to claim 1, wherein the organic acid includes at least one additive selected from the group consisting of monocarboxylic acid, polycarboxylic acid, oxycarboxylic acid, phosphonic acid and sulfonic acid.

5. The etchant composition according to claim 1, wherein the organic acid includes at least one additive selected from the group consisting of acetic acid, propionic acid, oxalic acid, malonic acid, succinic acid, glutaric acid, glycolic acid, lactic acid, malic acid, tartaric acid, citric acid, amino tris(methylenephosphonic acid), 1-hydroxyethylidene-1,1-diphosphonic acid, methane sulfonic acid and ethane sulfonic acid.

6. The etchant composition according to claim 1, wherein the organic compound containing a hydroxyl group includes at least one additive selected from the group consisting of alcohols, glycols, triols and methylols.

7. The etchant composition according to claim 1, wherein the organic compound containing a hydroxyl group includes at least one additive selected from the group consisting of: furfuryl alcohol, propylene glycol, polyethylene glycol, 1,4-butanediol, 3-methyl-1,3-butanediol, 1,6-hexanediol, 1,8-octanediol, 1,3-cyclohexanediol, 1,4-cyclohexanediol, 1,2,4-butanetriol, 3-methylpentane-1,3,5-triol and 1,4-cyclohexanedimethanol.

8. The etchant composition according to claim 1, wherein the organic compound containing a carbonyl group includes at least one additive selected from the group consisting of ketones, aldehydes and esters.

9. The etchant composition according to claim 1, wherein the organic compound containing a carbonyl group includes at least one additive selected from the group consisting of cyclopentanone and cyclohexanone.

10. The etchant composition according to claim 1, wherein the inorganic acid includes at least one additive selected from the group consisting of nitric acid, sulfuric acid and sulfamic acid.

11. The etchant composition according to claim 1, wherein the inorganic salt includes at least one additive selected from the group consisting of ammonium nitrate, ammonium sulfate and ammonium sulfamate.

12. An etching method comprising: applying the composition of claim 1.