CLAIMS

1. A photoresist cleaning composition for stripping a photoresist pattern having a film thickness of 3-150 μm, which comprises (a) 1-3 mass % of, at least one quaternary ammonium hydroxide or mixtures of two or more quaternary ammonium hydroxides, selected from group consisting of tetraethylammonium hydroxide, tetramethylammonium hydroxide, dimethyldipropylammonium hydroxide, tetrapropylammonium hydroxide, dimethyldiethylammonium hydroxide, tetrabutylammonium hydroxide, methyltripropylammonium hydroxide or methyltributylammonium hydroxide; (b) 60-97.5 mass % of a mixture of water-soluble organic solvent comprising dimethylsulfoxide (DMSO), sulfolane or dimethylsulfone or mixtures thereof, and at least one additional organic solvent or two or more additional organic solvents; (c) 0.5-15 mass % of, at least one corrosion inhibitor or a mixture of two or more corrosion inhibitors, selected from the group consisting of catechol, tert-butyl catechol, ammonium benzoate, anthranilic acid, benzoic acid, salicylic acid, gallic acid, mono or dihydroxybenzoic acid, polyethyleneimine (PEI), diethylhydroxylamine (DEHA), hydroxylamine or dipropylhydroxylamine or salts thereof or mixtures thereof or mixtures of any of the corrosion inhibitors; and (d) 0.5-25 mass % of water.

2. The photoresist cleaning composition of claim 1, which comprises (a) 1-3 mass % of at least one quaternary ammonium hydroxide or mixtures of two or more quaternary ammonium hydroxides; (b) 82-97.5 mass % of a mixture of water-soluble organic solvent comprising dimethylsulfoxide (DMSO), sulfolane or dimethylsulfone or mixtures thereof, and at least one additional organic solvent or two or more additional organic solvents; (c) 1-5 mass % of at least one corrosion inhibitor or mixtures of two or more corrosion inhibitors; and (d) 1-10 mass % of water.

3. The photoresist cleaning composition of claim 1, wherein (b) comprises 80-96 mass % said dimethylsulfoxide (DMSO), sulfolane or dimethylsulfone or mixtures thereof, and 1-4 mass % of said at least one additional organic solvent or two or more additional organic solvents; and said (c) comprises 1-5 mass %; and said (d) comprises 1-10 mass %.

4. The photoresist cleaning composition of claim 2, wherein said (c) comprises a mixture of two or more corrosion inhibitors comprising PEI.

5. The photoresist cleaning composition of claim 1, wherein said (b) comprises 80-96 mass % dimethylsulfoxide (DMSO), sulfolane or dimethylsulfone or mixtures thereof,

and 1-4 mass % of at least one additional organic solvent or two or more additional organic solvents; wherein said (c) is 1-10 mass % of at least one corrosion inhibitor or mixtures of two or more corrosion inhibitors comprising PEI; and said (d) is 1-10 mass %.

6. The photoresist cleaning composition of claim 1, wherein said (b) comprises 35-50 mass % dimethylsulfoxide (DMSO), sulfolane or dimethylsulfone or mixtures thereof and 45-58 mass % of additional organic solvent or two or more additional organic solvents; said (c) is 1-10 mass %; and said (d) is 1-10 mass %.

7. The photoresist cleaning composition of claim 1, wherein said (a) is 1-3 mass %; said (b) is 78-85 mass %; said (c) is 10.5-15 mass %; and said (d) is 1-10 mass %.

8. The photoresist cleaning composition of claim 1, wherein said (a) is 1-3 mass %; said (b) is 59-84 mass % dimethylsulfoxide (DMSO), sulfolane or dimethylsulfone or mixtures thereof and 1-20 mass % of at least one additional organic solvent or two or more additional organic solvents; said (c) 10.5-15 mass %; and said (d) is 1-10 mass %.

9. A photoresist cleaning composition for stripping a photoresist pattern having a film thickness of 3-150 μm, which comprises (a) 1-3 mass % of, at least one quaternary ammonium hydroxide or mixtures of two or more quaternary ammonium hydroxides, selected from group consisting of tetraethylammonium hydroxide, tetramethylammonium hydroxide, dimethyldipropylammonium hydroxide, tetrapropylammonium hydroxide, dimethyldiethylammonium hydroxide, tetrabutylammonium hydroxide, methyltripropylammonium hydroxide or methyltributylammonium hydroxide; (b) 78-85 mass % of a mixture of water-soluble organic solvent comprising dimethylsulfoxide (DMSO), sulfolane or dimethylsulfone or mixtures thereof and at least one additional organic solvent or two or more additional organic solvents; (c) 10-20 mass % of diethylhydroxylamine (DEHA), hydroxylamine or dipropylhydroxylamine or salts thereof or mixtures thereof and 0.5-5 mass % of at least one additional corrosion inhibitor or mixtures of two or more additional corrosion inhibitors; and (d) 1-10 mass % of water.

10. The photoresist cleaning composition of claim 9, wherein said (c) is 10-20 mass % of diethylhydroxylamine (DEHA), hydroxylamine or dipropylhydroxylamine or salts thereof or mixtures thereof and 0.5-5 or 1-4 or 1-3 mass % of at least one additional corrosion inhibitor or mixtures of two or more additional corrosion inhibitors.

11. The photoresist cleaning composition of claim 8, wherein said (b) is 64-69 mass % of a mixture of organic solvents comprising dimethylsulfoxide (DMSO), sulfolane or

dimethylsulfone or mixtures thereof, and at least one additional organic solvent or two or more additional organic solvents comprising an alkanolamine.

12. The photoresist cleaning composition of claim 1, wherein said (b) is 75-96 mass % of a mixture of water-soluble organic solvent comprising dimethylsulfoxide and at least one additional organic solvent selected from the group consisting of propylene glycol, tetrahydrofurfuryl alcohol, a glycol ether, gamma-butyrolactone, gamma-valerolactone, dimethylacetamide, monoethanolamine and aminopropylmorpholine and mixtures thereof; said (c) is 0.5-5 mass % of at least one corrosion inhibitor selected from the group consisting of catechol, tert-butyl catechol, ammonium benzoate, anthranilic acid, benzoic acid, salicylic acid, gallic acid, mono- or di-hydroxybenzoic acid, polyethyleneimine (PEI) or mixtures thereof; and said (d) is 0.5-10 mass %.

13. The photoresist cleaning composition of claim 1, wherein said (a) comprises 1-3 mass % of a quaternary ammonium hydroxide selected from the group consisting of tetramethylammonium hydroxide or tetraethylammonium hydroxide, and mixtures thereof; said (b) is 90-96 mass % of dimethylsulfoxide and at least one additional organic solvent selected from the group consisting of propylene glycol, tetrahydrofurfuryl alcohol, glycol ether, gamma-butyrolactone, gamma-valerolactone, dimethylacetamide, monoethanolamine and aminopropylmorpholine and mixtures thereof; and said (c) is 0.5-4 mass % of at least one corrosion inhibitor selected from the group consisting of catechol, tert-butyl catechol, ammonium benzoate, anthranilic acid, benzoic acid, salicylic acid, gallic acid, mono or dihydroxybenzoic acid, polyethyleneimine (PEI) or mixtures thereof; and said (d) is 2-5 mass %.

14. The photoresist cleaning composition of claim 13, wherein said (b) is 90-95 mass % of dimethylsulfoxide and 1-6 mass % of at least one additional organic solvent selected from the group consisting of propylene glycol, tetrahydrofurfuryl alcohol, dipropyleneglycol methylether, gamma-butyrolactone, gamma-valerolactone, dimethylacetamide, monoethanolamine and aminopropylmorpholine or mixtures thereof; and said (c) is 0.5-3 mass %

15. A method for treating a substrate, comprising forming a photoresist pattern having a film thickness of 3-150 μm on a substrate having a metallic thin film thereon, providing a conductive layer on a metallic thin film-exposed area or a photoresist pattern uncovered area, and bringing the photoresist pattern into contact with the photoresist cleaning composition comprising (a) 1-3 mass % of, at least one quaternary ammonium hydroxide or mixtures of two or more quaternary ammonium hydroxides, selected from

group consisting of tetraethylammonium hydroxide, tetramethylammonium hydroxide, dimethyldipropylammonium hydroxide, tetrapropylammonium hydroxide, dimethyldiethylammonium hydroxide, tetrabutylammonium hydroxide, methyltripropylammonium hydroxide or methyltributylammonium hydroxide; (b) 60-97.5 mass % of a mixture of water-soluble organic solvent comprising dimethylsulfoxide (DMSO), sulfolane or dimethylsulfone or mixtures thereof, and at least one additional organic solvent or two or more additional organic solvents; (c) 0.5-15 mass % of, at least one corrosion inhibitor or a mixture of two or more corrosion inhibitors, selected from the group consisting of catechol, tert-butyl catechol, ammonium benzoate, anthranilic acid, benzoic acid, salicylic acid, gallic acid, mono or dihydroxybenzoic acid, polyethyleneimine (PEI), diethylhydroxylamine (DEHA), hydroxylamine or dipropylhydroxylamine or salts thereof or mixtures thereof or mixtures of any of the corrosion inhibitors; and (d) 0.5-25 mass % of water to strip and dissolve the photoresist pattern.

16. The method for treating a substrate according to claim 15, wherein the said (b) is 82-97.5 mass %; said (c) is 1-5 mass %; and said (d) is 1-10 mass %.

17. The method for treating a substrate according to claim 16, wherein said (c) comprises a mixture of two or more corrosion inhibitors comprising PEI.

18. The method for treating a substrate according to claim 15, wherein said (b) comprises 35-50 mass % dimethylsulfoxide (DMSO), sulfolane or dimethylsulfone or mixtures thereof and 45-58 mass % of additional organic solvent or two or more additional organic solvents; said (c) is 1-10 mass %; and said (d) is 1-10 mass %.

19. A method for treating a substrate, comprising forming a photoresist pattern having a film thickness of 3-150 μm on a substrate having a metallic thin film thereon, providing a conductive layer on a metallic thin film-exposed area or a photoresist pattern uncovered area, and bringing the photoresist pattern into contact with the photoresist cleaning composition comprising (a) 1-3 mass % of, at least one quaternary ammonium hydroxide or mixtures of two or more quaternary ammonium hydroxides, selected from group consisting of tetraethylammonium hydroxide, tetramethylammonium hydroxide, dimethyldipropylammonium hydroxide, tetrapropylammonium hydroxide, dimethyldiethylammonium hydroxide, tetrabutylammonium hydroxide, methyltripropylammonium hydroxide or methyltributylammonium hydroxide; (b) 78-85 mass % of a mixture of water-soluble organic solvent comprising dimethylsulfoxide (DMSO), sulfolane or dimethylsulfone or mixtures thereof and at least one additional

organic solvent or two or more additional organic solvents; (c) 10-20 mass % of diethylhydroxylamine (DEHA), hydroxylamine or dipropylhydroxylamine or salts thereof or mixtures thereof and 0.5-5 mass % of at least one additional corrosion inhibitor or mixtures of two or more additional corrosion inhibitors; and (d) 1-10 mass % of water.

20. The photoresist cleaning composition of any one of claims 1-14, or the method of any one of claims 15-19, wherein said (a) is 1.5-3 mass %.