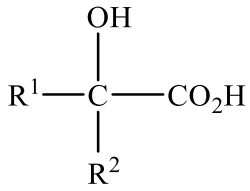
We claim:

1. A cleaning composition for semiconductor substrates comprising:

(i) between 5% by weight ± 5% and 50% by weight ± 5% of an alkanolamine having two or more or more than two alkanol groups;

(ii) between 25% by weight and 70% by weight ± 5% of an alkanolamine having one alkanol group;

(iii) an alpha hydroxy acid having the following structure:



wherein R^1 and R^2 are each independently selected from H, an aromatic carbon ring, a non-aromatic carbon ring, a saturated carbon ring, an unsaturated carbon ring, a straight-chain alkyl group, a branched chain alkyl group or a cyclic alkyl group; and

(iv) water, and

wherein the cleaning composition is substantially free of halide-containing compound.

2. The composition of claim 1, further comprising one or both of (v) catechol and (vi) gallic acid.

3. The composition of claim 1, further comprising (vii) a corrosion inhibitor.

4. The composition of claim 1, wherein the alkanolamine having two or more or more than two alkanol groups comprises triethanolamine.

5. The composition of claim 1, wherein the alkanolamine having one alkanol group comprises one or more of monoethanolamine, 2-(2-Aminoethoxy)ethanol, N-methylethanolamine and monoisopropylamine.

6. The composition of claim 1, wherein the alkanolamine having one alkanol group comprises monoethanolamine.

7. The composition of claim 1, wherein the alpha hydroxy acid is selected from the group of glycolic acid, lactic acid, tartaric acid, citric acid, malic acid, gluconic acid, glyceric acid, mandelic acid, tartronic acid, saccharic acid and dihydroxymalonic acid and mixtures thereof.

8. The composition of claim 1, wherein the alpha hydroxy acid comprises gluconic acid.

9. The composition of claim 1, wherein the composition comprises between 2.5% by weight ± 5% and 25% by weight ± 5% of the alpha hydroxy acid.

10. The composition of claim 1, wherein the composition comprises 10% by weight ± 5% of the alpha hydroxy acid.

11. The composition of claim 1, wherein the composition comprises between 2.5% by weight ± 5% and 25% by weight ± 5% of gluconic acid.

12. The composition of claim 1, wherein the composition comprises 10% by weight ± 5% of gluconic acid.

13. The composition of claim 1, wherein the composition comprises 6% by weight ± 5% of catechol.

14. The composition of claim 1, wherein the composition comprises 3% by weight ± 5% of gallic acid.

15. The composition of claim 1, wherein the composition comprises between 5% by weight ± 5% and 15% by weight in combination of catechol and gallic acid.

16. The composition of claim 1, wherein the composition comprises 10% by weight ± 5% in combination of catechol and gallic acid.

17. The composition of claim 1, wherein the composition comprises (i) 20% by weight ± 5% of triethanolamine and (ii) between 35% by weight ± 5% and 45% by weight ± 5% of monoethanolamine.

18. The composition of claim 1, wherein the composition comprises (i) 20% by weight ± 5% of triethanolamine, (ii) between 35% by weight ± 5% and 45% by weight ± 5% of monoethanolamine and (iii) 10% by weight ± 5% of gluconic acid.

19. The composition of claim 1, wherein the composition comprises (i) 20% by weight ± 5% of triethanolamine, (ii) between 35% by weight ± 5% and 45% by weight ± 5% of monoethanolamine, (iii) 10% by weight ± 5% of gluconic acid and (iv) 9% by weight ± 5% in combination of catechol and gallic acid.

20. A method of removing residues from a microelectronic device or semiconductor substrate comprising the step of contacting the device or substrate with the cleaning composition of claim 1.