CLAIMS

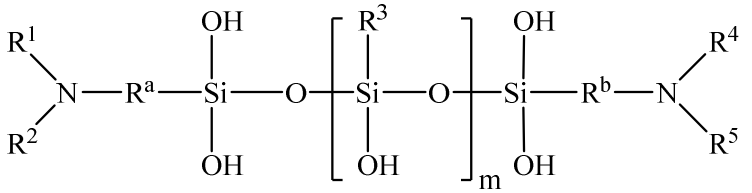
What is claimed is:

1. A composition comprising:

A. approximately 70% or less by weight of neat phosphoric acid;

B. approximately 30% or greater by weight of a mixture comprising at least one of:

I. a compound of Formula I:



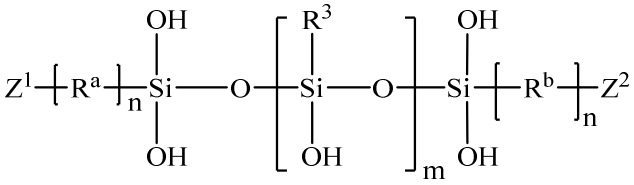
wherein:

(i) m = 0-20,

(ii) each of R^1, R^2, R^3, R^4 and R^5 is independently selected from the group of hydrogen, a C_1 to C_{10} linear alkyl group, a C_1 to C_{10} linear alkyl group substituted with fluorine, a nitrogen-containing group, an oxygen-containing group, a C_3 to C_{10} branched alkyl group, a C_3 to C_{10} cyclic alkyl group, a C_5 to C_{12} aryl group, a C_2 to C_{10} linear or branched alkenyl group and a C_2 to C_{10} linear or branched alkynyl group, –≀–OH, and

(iii) each of R^a and R^b is independently selected from a C_1 to C_{10} linear alkyl group, a C_3 to C_{10} branched alkyl group, a C_3 to C_{10} cyclic alkyl group, a C_5 to C_{12} aryl group, a C_2 to C_{10} linear or branched alkenyl group and a C_2 to C_{10} linear or branched alkynyl group, –≀–NH-C_1-C_{10} alkyl, a C_1-C_{10} alkyl substituted with –≀–OH; or

II. a compound of Formula II:



wherein:

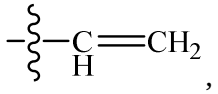
(i) m = 0-20,

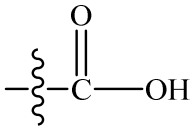
(ii) n =0-20,

(iii) R^3 is selected from the group of hydrogen, a C_1 to C_{10} linear alkyl group, a C_1 to C_{10} linear alkyl group substituted with fluorine, a nitrogen-containing group, an oxygen-containing group, a C_3 to C_{10} branched alkyl group, a C_3 to C_{10} cyclic alkyl group, a C_5 to C_{12} aryl group, a C_2 to C_{10} linear or branched alkenyl group and a C_2 to C_{10} linear or branched alkynyl group, –≀–OH, Z^1 and Z^2, and

(iv) each of R^a and R^b is independently selected from a C_1 to C_{10} linear alkyl group, a C_3 to C_{10} branched alkyl group, a C_3 to C_{10} cyclic alkyl group, a C_5 to C_{12} aryl group, a C_2 to C_{10} linear or branched alkenyl group and a C_2 to C_{10} linear or branched alkynyl group, –≀–NH-C_1-C_{10} alkyl, a C_1-C_{10} alkyl substituted with –≀–OH,

(v) Z^1 and Z^2 are each independently selected from:

a. ,

b. ,

c. –≀–$N^+(CH_3)_3Cl^-$, and

d. –≀–$CH(OH)CH_2OH$; and

III. an aqueous solvent.

2. The composition of claim 1, wherein the mixture further comprises at least one additional acid other than neat phosphoric acid selected from HNO_3, H_2SO_4, HCl and methane sulfuric acid.

3. The composition of claim 1, wherein (i) the mixture further comprises neat sulfuric acid and (ii) a combined content of the neat phosphoric acid and the neat sulfuric acid is between approximately 80% and approximately 85% by weight of the composition.

4. The composition of claim 1, wherein (i) the mixture further comprises sulfuric acid and (ii) a combined content of the neat phosphoric acid and the neat sulfuric acid is approximately 83.5% by weight of the composition.

5. The composition of claim 1, wherein the mixture further comprises one or more additional silicon-containing compound selected from alkylsilsesquioxanes,

vinylsilsesquioxane, carboxylic acid alkylsilsesquioxane and alkyleneglycol alkylsilsesquioxane.

6. The composition of claim 1, wherein the mixture comprises a compound of Formula I and the aqueous solvent.

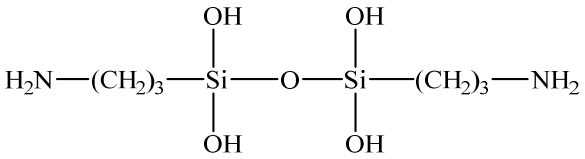
7. The composition of claim 1, wherein the mixture comprises a compound of Formula II.

8. The composition of claim 1, wherein m in one or both of Formula I and Formula II is 0.

9. The composition of claim 1, wherein a content of the compound of Formula I is approximately 5% or less by weight.

10. The composition of claim 1, comprising a compound of Formula I, wherein

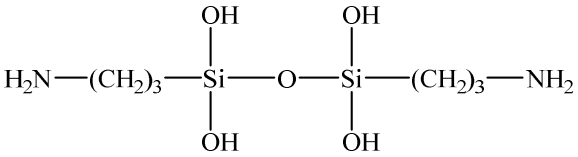
(i) the compound of Formula I comprises:



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11. The composition of claim 1, comprising a compound of Formula I, wherein

(i) the compound of Formula I comprises:

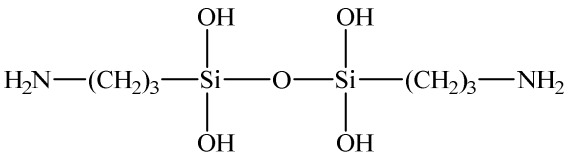


(ii) the mixture further comprises neat sulfuric acid, and

(iii) a combined content of the neat phosphoric acid and the neat sulfuric acid is between approximately 80% and approximately 85% by weight of the composition.

12. The composition of claim 1, comprising a compound of Formula I, wherein

(i) the compound of Formula I comprises:

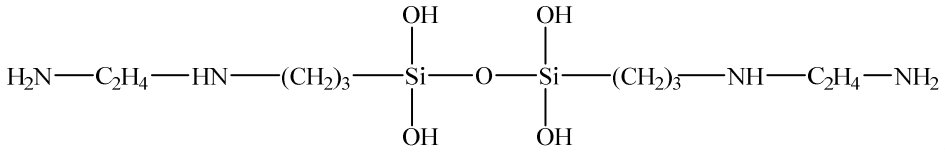


(ii) the mixture further comprises sulfuric acid, and

(iii) a combined content of the neat phosphoric acid and the neat sulfuric acid is approximately 83.5% by weight of the composition.

13. The composition of claim 1, comprising a compound of Formula I, wherein

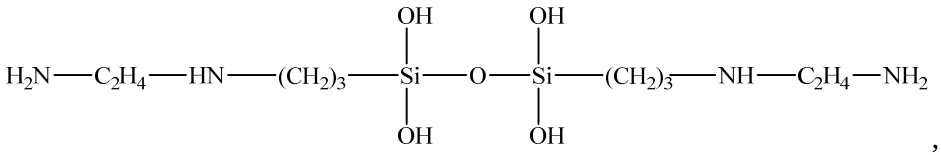
(i) the compound of Formula I comprises:



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14. The composition of claim 1, comprising a compound of Formula I, wherein

(i) the compound of Formula I comprises:



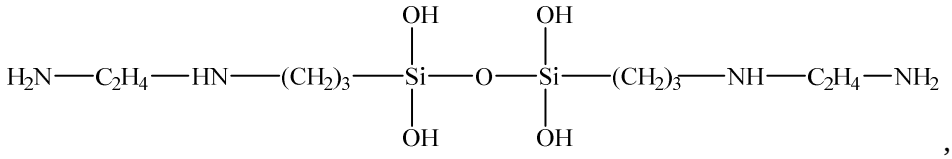
,

(ii) the mixture further comprises neat sulfuric acid, and

(iii) a combined content of the neat phosphoric acid and the neat sulfuric acid is between approximately 80% and approximately 85% by weight of the composition.

15. The composition of claim 1, comprising a compound of Formula I, wherein

(i) the compound of Formula I comprises:



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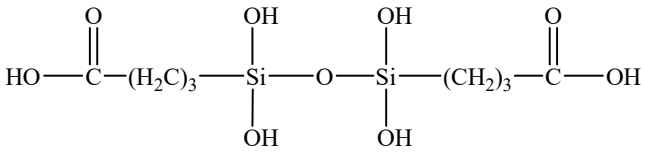
(ii) the mixture further comprises sulfuric acid, and

(iii) a combined content of the neat phosphoric acid and the neat sulfuric acid is approximately 83.5% by weight of the composition.

16 The composition of claim 1, wherein a content of the compound of Formula II is approximately 5% or less by weight.

17. The composition of claim 1, comprising a compound of Formula II, wherein

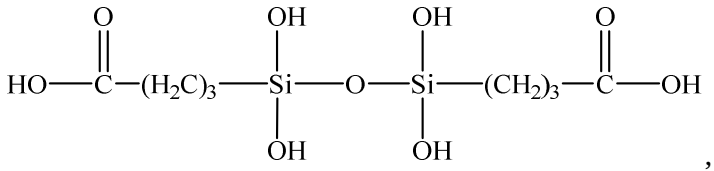
(i) the compound of Formula II comprises:



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18. The composition of claim 1, comprising a compound of Formula II, wherein

(i) the compound of Formula II comprises:



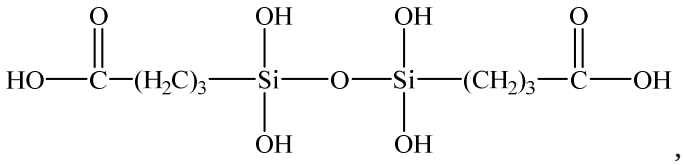
,

(ii) the mixture further comprises neat sulfuric acid, and

(iii) a combined content of the neat phosphoric acid and the neat sulfuric acid is between approximately 80% and approximately 85% by weight of the composition.

19. The composition of claim 1, comprising a compound of Formula II, wherein

(i) the compound of Formula II comprises:



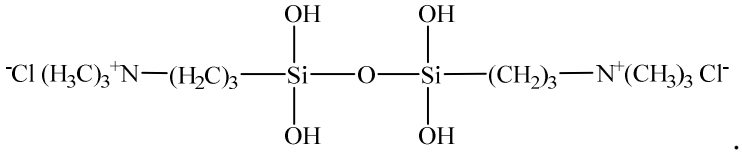
,

(ii) the mixture further comprises sulfuric acid, and

(iii) a combined content of the neat phosphoric acid and the neat sulfuric acid is approximately 83.5% by weight of the composition.

20. The composition of claim 1, comprising a compound of Formula II, wherein

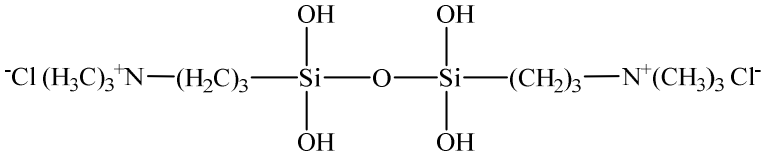
(i) the compound of Formula II comprises:



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21. The composition of claim 1, comprising a compound of Formula II, wherein

(i) the compound of Formula II comprises:



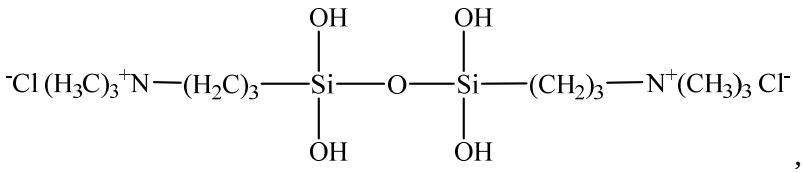
,

(ii) the mixture further comprises neat sulfuric acid, and

(iii) a combined content of the neat phosphoric acid and the neat sulfuric acid is between approximately 80% and approximately 85% by weight of the composition.

22. The composition of claim 1, comprising a compound of Formula II, wherein

(i) the compound of Formula II comprises:



,

(ii) the mixture further comprises sulfuric acid, and

(iii) a combined content of the neat phosphoric acid and the neat sulfuric acid is approximately 83.5% by weight of the composition.

23. A method of selectively enhancing the etch rate of silicon nitride relative to silicon dioxide on a semiconductor substrate comprising silicon nitride and silicon dioxide, the method comprising the steps of:

a. contacting the semiconductor substrate comprising silicon nitride and silicon dioxide with the composition of claim 1; and

b. rinsing the semiconductor device after the silicon nitride is at least partially removed.