We claim:

1. A cleaning composition comprising:

a) **a primary detergent component** which comprises at least one non-ionic surfactant having a critical packing parameter of ≥ 0.95

b) **inorganic based nanoparticles**, and

c) **a secondary surfactant** having a critical packing parameter of ≤0.85.

2. The composition of claim 1 wherein said **primary detergent component** is selected from the group of alkoxylates, propoxylates, butoxylates and mixed ethoxylates and propoxylates and butoxylates prepared from linear or branched hydrophobic having from 8 and 18 carbon atoms.

3. The composition of claim 2 wherein said **primary detergent component** is an alkoxylate surfactant having the formula

$R_1O-(AO)_n$ (1)

where R_1 is linear or branched, saturated or unsaturated hydrocarbyl group containing from 8 to 18 carbon atoms, AO is an alkyleneoxy group, and n is a integer from 1 to 25.

4. The composition of claim 3 wherein $(AO)_n$ is $(PO)_a(EO)_b(PO)_c$, where PO is a propyleneoxy unit, EO is an ethyleneoxy unit, a+b+c=n and a=0–5, b=1-20, and c=0–5.

5. The composition of claim 2 wherein said **primary detergent component** is selected from C_8-C_{10} alcohol + 4, 5, or 6 moles of EO, C_{10} alcohol plus 4, 5, or 6 moles of EO, C_9-C_{11} alcohol + 4, 5 or 6 moles of EO, C_{11} alcohol + 3, 4, 5, 6, 7 or 8 moles of EO, tridecyl alcohol + 4, 5, 6, 7 or 8 moles of EO, and, 2-ethylhexanol + 3, 4 or 5 moles of EO, 2-ethylhexanol + 2 moles of PO + 4, 5 or 6 moles of EO, 2-propylheptanol + 3, 4, 5 or 6 moles of EO and 2-propylheptanol + 1 mole of PO + 4 moles of EO, 2-butyloctanol + 5, 6 or 7 moles of EO, and combinations or mixtures thereof.

6. The composition of claim 1 wherein **inorganic based nanoparticles** are colloidal silica particles optionally modified amines, aluminium, boron, or mixtures of same.

7. The composition of claim 6 wherein the silica content in the sol is from about 20 to about 80 wt%, the pH of the silica sol from about 1 to about 13, and the silica sol has an S-value from about 20 to about 100.

8. The composition of claim 1 wherein said **inorganic nanoparticles** are silanized colloidal silica particles wherein at least about 40 wt% of the colloidal silica particles are silanized.

9. The composition of claim 1 wherein said **secondary surfactant** is selected from a non-ionic, cationic, amphoteric, zwitterionic or anionic surfactant or a mixture of two or more thereof, wherein said surfactants or combinations of surfactants have a CPP $\leq$0.85.

10. The composition of claim 9 wherein said **secondary surfactant** is selected from

I.) an alkyl (poly)glucoside having the formula

R^2OG_p

where,

R^2 is a straight or branched, saturated or unsaturated hydrocarbyl group, containing from 6 to 12 carbon atoms,

G is a monosaccharide residue, in one embodiment a glucoside;

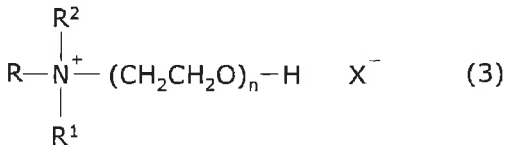
p is a real number from 1 to 5;

II.) an amine oxide of the structure

$R\text{-}N^+(R1)(R2)\text{-}O^-$

wherein R is a alkyl group containing 10-18 carbons optionally containing an amide or ester linkage, R1 and R1 can be the same or different and are selected from the group consisting of, methyl, ethyl, hydroxyl ethyl, 2-hydroxy propyl;

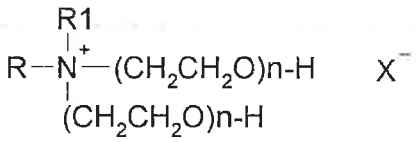
III.) a cationic surfactants is of the formula



(3)

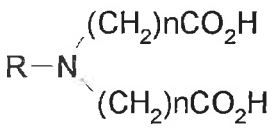
where R = C_6 - C_{22} hydrocarbyl, R^1 and R^2 are independently C_1 – C_4 alkyl, n is at least 12, and X^- is an anion, e.g. halide or methylsulfate;

IV.) a surfactant of the formula



where R = C_6 - C_{22} hydrocarbyl, R^1 is independently C_1 – C_4 alkyl, n is an integer of from12 to 17; and X^- is an anion;

V.) an amphoteric secondary surfactant of the formula



where R = C_6 - C_{22} hydrocarbyl having 6 to 22 carbon atoms, n is an integer of from 1 to 4

VI.) a nonionic surfactant comprising a C_{10-14} alcohol with 0-2 PO and 6-10 EO.

and combinations and mixtures thereof.

11. The composition of claim 10 wherein said **secondary surfactant** comprises

I.) an alkyl (poly)glucoside having the formula

R^2OG_p

where,

R^2 is a straight or branched, saturated or unsaturated hydrocarbyl group, containing from 6 to 12 carbon atoms,

G is a monosaccharide residue, in one embodiment a glucoside;

p is a real number from 1 to 5, wherein said composition additionally comprises a C_{10-14} alcohol with 0-2 PO and 6-10 EO.

12. A ready to use cleaning formulation comprising an effective amount of the composition of claim 1 wherein, the concentration of the primary non-ionic surfactant from about 0.05 to 1.5wt% based on the weight of the total composition, the concentration of the secondary surfactant from about 0.05 to 1.5 wt% based on the weight of the total composition and the weight ratio of the primary non-ionic surfactant to secondary surfactant is in the range of from about 70:30 to about 30:70.

13. The formulation of claim 11 wherein the concentration of inorganic based nanoparticles in the ready to use composition is in the range of from about 0.5 wt% up to 3 wt%.

14. A hard surface cleaning composition comprising:

a) **a primary detergent component** which comprises at least one non-ionic alcohol alkoxylate surfactant having a critical packing parameter of ≥ 0.95 having the formula

$$R_1O\text{-}(AO)_n \quad (1)$$

where R_1 is linear or branched, saturated or unsaturated alkyl group, containing from 8 to 12 carbon atoms, AO is an alkyleneoxy group, in one embodiment an ethyleneoxy, propyleneoxy or butyleneoxy group, or a mixture of two or more thereof in any order, and n is a real number from 2 to 10.

b) **inorganic based nanoparticles** comprising optionally silanized colloidal silica particles having a particle size of from about 5 to about 40 nm, and

c) **a secondary surfactant** having a critical packing parameter of ≤ 0.85, wherein said secondary surfactant is an alkyl (poly)glucoside having the formula

$$R^2OG_p$$

where,

R^2 is a straight or branched, saturated or unsaturated alkyl group containing from 6 to 10, carbon atoms,

G is glucoside; and

p is a real number from 1 to 3.

15. The hard surface cleaning composition of claim 14 additionally comprising a second secondary surfactant comprising a C_{10-14} alcohol with 0-2 PO and 6-10 EO.

16. The hard surface cleaning composition of claim 15 wherein the weight ratio of said primary non-ionic surfactant to the total amount of secondary surfactant present is in the range of from about 70:30 to about 30:70

We claim:

1. A cleaning composition comprising:

a) a primary detergent component which comprises at least one non-ionic surfactant having a critical packing parameter of $\geq$0.95,
b) silanized colloidal silica particles wherein at least about 40 wt % of the colloidal silica particles are silanized, and
c) a secondary surfactant having a critical packing parameter of <0.85,

wherein said primary detergent component is an alkoxylate surfactant having the formula

$R_1O\text{-}(AO)_n$ (1),

and

wherein R_1 is linear or branched, saturated or unsaturated hydrocarbyl group containing from 8 to 18 carbon atoms, AO is an alkyleneoxy group, and n is an integer from 1 to 25; and
wherein said secondary surfactant is selected from

I.) an alkyl (poly)glucoside having the formula

R^2OG_p

where,

R^2 is a straight or branched, saturated or unsaturated hydrocarbyl group, containing from 6 to 12 carbon atoms,

G is a monosaccharide residue;

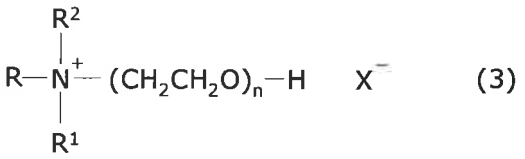
p is a real number from 1 to 5;

II.) an amine oxide of the structure

$R—N^+(R1)(R2)\text{-}O^-$

wherein R is a alkyl group containing 10-18 carbons optionally containing an amide or ester linkage, R1 and R2 can be the same or different and are selected from the group consisting of, methyl, ethyl, hydroxyl ethyl, 2-hydroxy propyl;

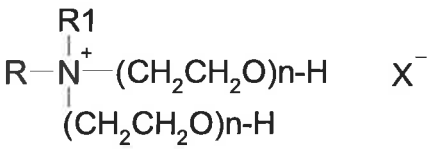
III.) a cationic surfactants is of the formula



(3)

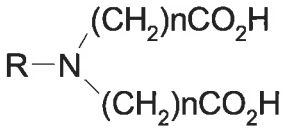
where R=C_6-C_{22} hydrocarbyl, R^1 and R^2 are independently C_1-C_4 alkyl, n is at least 12, and X^- is an anion;

IV.) a surfactant of the formula



where R=C_6-C_{22} hydrocarbyl, R^1 is independently C_1-C_4 alkyl, n is an integer of from 12 to 17; and X is an anion;

V.) an amphoteric secondary surfactant of the formula



where R=C_6-C_{22} hydrocarbyl having 6 to 22 carbon atoms, n is an integer of from 1 to 4

VI.) a nonionic surfactant comprising a C_{10-14} alcohol with 0-2 PO and 6-10 EO and combinations and mixtures thereof.

2. The composition of claim 1 wherein $(AO)_n$ is $(PO)_a(EO)_b(PO)_c$, where PO is a propyleneoxy unit, EO is an ethyleneoxy unit, a+b+c=n and a=0-5, b=1-20, and c=0-5.

3. The composition of claim 1 wherein said primary detergent component is selected from C_8-C_{10} alcohol+4, 5, or 6 moles of EO, C_{10} alcohol plus 4, 5, or 6 moles of EO, C_9-C_{11} alcohol+4, 5 or 6 moles of EO, C_{11} alcohol+3, 4, 5, 6, 7 or 8 moles of EO, tridecyl alcohol+4, 5, 6, 7 or 8 moles of EO, and, 2-ethylhexanol+3, 4 or 5 moles of EO, 2-ethylhexanol+2 moles of PO+4, 5 or 6 moles of EO, 2-propylheptanol+3, 4, 5 or 6 moles of EO and 2-propylheptanol+1 mole of PO+4 moles of EO, 2-butyloctanol+5, 6 or 7 moles of EO, and combinations or mixtures thereof.

4. The composition of claim 1 wherein the silica content in the sol is from about 20 to about 80 wt %, the pH of the silica sol from about 1 to about 13, and the silica sol has an S-value from about 20 to about 100.

5. The composition of claim 1 wherein said secondary surfactant comprises

I.) an alkyl (poly)glucoside having the formula

R^2OG_p

where,

R^2 is a straight or branched, saturated or unsaturated hydrocarbyl group, containing from 6 to 12 carbon atoms,

G is a monosaccharide residue;

p is a real number from 1 to 5, wherein said composition additionally comprises a C_{10-14} alcohol with 0-2 PO and 6-10 EO.

6. A ready to use cleaning formulation comprising an effective amount of the composition of claim 1 wherein, the concentration of the primary non-ionic surfactant from about 0.05 to 1.5 wt % based on the weight of the total composition, the concentration of the secondary surfactant from about 0.05 to 1.5 wt % based on the weight of the total composition and the weight ratio of the primary non-ionic surfactant to secondary surfactant is in the range of from about 70:30 to about 30:70.

7. The formulation of claim 6 wherein the concentration of silanized colloidal silica particles in the ready to use composition is up to about 5 wt %.

8. A hard surface cleaning composition comprising:

a) a primary detergent component which comprises at least one non-ionic alcohol alkoxylate surfactant having a critical packing parameter of >0.95 having the formula

$R_1O\text{-}(AO)_n$ (1)

where R_1 is linear or branched, saturated or unsaturated alkyl group, containing from 8 to 12 carbon atoms, AO is an alkyleneoxy group, and n is a real number from 2 to 10,

b) silanized colloidal silica particles wherein at least about 40 wt % of the colloidal silica particles are silanized, and

c) a secondary surfactant having a critical packing parameter of ≤0.85, wherein said secondary surfactant is an alkyl (poly)glucoside having the formula

R^2OG_p

where,

R^2 is a straight or branched, saturated or unsaturated alkyl group containing from 6 to 10, carbon atoms,

G is glucoside; and

p is a real number from 1 to 3.

9. The hard surface cleaning composition of claim 8 additionally comprising a second secondary surfactant comprising a $C_{10\text{-}14}$ alcohol with 0-2 PO and 6-10 EO.

10. The hard surface cleaning composition of claim 9 wherein the weight ratio of said primary non-ionic surfactant to the total amount of secondary surfactant present is in the range of from about 70:30 to about 30:70.

11. The composition of claim 1 wherein the alkyleneoxy group is an ethyleneoxy, propyleneoxy, or butyleneoxy group, or a mixture of two or more thereof in any order.

12. The composition of claim 8 wherein the alkyleneoxy group is an ethyleneoxy, propyleneoxy, or butyleneoxy group, or a mixture of two or more thereof in any order.