

The salt can be present in the second part in a range from about 0.001ppm to about 49% by weight. The system can further include a third part the comprises one or combination of surfactant, enzyme, salt, perfume, colourant, and dye transfer inhibition agent.

5 In an aspect, the invention is a skin sanitization product, comprising:

a) a first part comprising first hydrophobized colloidal particles, said first hydrophobized colloidal particles containing first microdroplets, said first microdroplets comprising a first aqueous solution of a peroxide, a first acid and water to form a first encapsulate containing a first reaction element;

10 b) at least a second part comprising second hydrophobized colloidal particles, said second hydrophobized colloidal particles containing second microdroplets, said second microdroplets comprising a second aqueous solution of a salt of a transition metal, a second acid and water to form a second encapsulate containing a second reaction element; and

15 wherein in use said first and second parts are mixed together on a user's skin to form a mixture and upon being subjected to mechanical action said first and second encapsulates are broken, releasing and mixing said first and second reaction elements.

In a particular embodiment, the skin sanitization product includes a first part
20 which comprises, by weight:

about 84% water; about 1% phosphoric acid (75%); about 12% hydrogen peroxide 50%; and about 3% fumed silica; and

a second part which comprises, by weight:

25 about 92.6% water; about 0.4% phosphoric acid (75%); about 4.0% copper sulphate; and about 3.0% fumed silica.

| In another ~~aspect~~embodiment, the ~~invention~~disclosure provides a bleach product, comprising:

a) a first part comprising first hydrophobized colloidal particles, said first hydrophobized colloidal particles containing first microdroplets, said first microdroplets
30 comprising a first aqueous solution of water and one or combination of percarboxylic acid and bleach activator, to form a first encapsulate containing a first reaction element; and

b) at least a second part comprising second hydrophobized colloidal particles, said second hydrophobized colloidal particles containing second

microdroplets, said second microdroplets comprising a second aqueous solution of a salt of a transition metal and water to form a second encapsulate containing a second reaction element; and

wherein in use said first and second parts are mixed together to form a mixture and upon being subjected to mechanical action said first and second encapsulates are broken, releasing and mixing said first and second reaction elements.

In an embodiment, the first part of the bleach product comprises, by weight: about 93% water; about 4.0% sodium percarbonate; about 3% fumed silica; and the second part comprises, by weight: about 96.98% water; about 0.02% Mn(Bcyclam)Cl₂; and about 3.0% fumed silica.

The bleach product can further comprise a third part, wherein the third part comprises, by weight, about 50.0% zeolite; about 25.0% linear alkylbenzene sulphonate; about 15.0% C12-15 EO5 alcohol ethoxylate; and about 10.0% sodium silicate.

Another aspect provides a method for producing a system for storing and releasing complementary reaction reagents, comprising the steps:

- a) dissolving at least one first reaction reagent in water to form a first aqueous solution;
- b) mixing and agitating said first aqueous solution with hydrophobized colloidal particles comprising fumed silica to form first colloidal particles encapsulating droplets of said first aqueous solution to form a first encapsulate wherein said fumed silica is present within said first particles in an amount less than 5% by weight;
- c) dissolving at least one second reaction reagent in water to form at least one second solution;
- d) mixing and agitating said second solution with hydrophobized colloidal particles comprising fumed silica to form at least second colloidal particles encapsulating droplets of said second solution to form a second encapsulate wherein said fumed silica is present within said second particles in an amount less than 5% by weight; and

e) mixing said first and second encapsulate without breaking said first and second encapsulates to form an inter-dispersed composition of said first and second encapsulates.

5 Steps b) and d) can be accomplished with one of a high-shear rotary mixer and a blender.

Another aspect provides a method for producing a system for storing and releasing complementary reaction reagents, comprising the steps:

10 a) dissolving at least one first reaction reagent comprising a peroxide and a first acid in water to form a first aqueous solution;

b) mixing and agitating said first aqueous solution with hydrophobized particles comprising metal oxide powders to form first particles encapsulating droplets of said first aqueous solution to form a first encapsulate;

15 c) dissolving at least one second reaction reagent comprising a salt of a transition metal and a second acid in water to form at least one second solution;

20 d) mixing and agitating said second solution with said hydrophobized particles to form at least second particles encapsulating droplets of said second solution to form a second encapsulate; and

e) mixing said first and second encapsulates without breaking said first and second encapsulates to form an inter-dispersed composition of said first and second encapsulates.

microdroplets, said second microdroplets comprising a second aqueous solution of a salt of a transition metal and water to form a second encapsulate containing a second reaction element; and

wherein in use said first and second parts are mixed together to form a mixture and upon being subjected to mechanical action said first and second encapsulates are broken, releasing and mixing said first and second reaction elements.

In an embodiment, the first part of the bleach product comprises, by weight: about 93% water; about 4.0% sodium percarbonate; about 3% fumed silica; and the second part comprises, by weight: about 96.98% water; about 0.02% $\text{Mn}(\text{Bcyclam})\text{Cl}_2$; and about 3.0% fumed silica.

The bleach product can further comprise a third part, wherein the third part comprises, by weight, about 50.0% zeolite; about 25.0% linear alkylbenzene sulphonate; about 15.0% C12-15 EO5 alcohol ethoxylate; and about 10.0% sodium silicate.

In another aspect, there is provided a method for producing a system for storing and releasing complementary reaction reagents, comprising the steps:

a) dissolving at least one first reaction reagent in water to form a first aqueous solution;

b) mixing and agitating said first aqueous solution with hydrophobized colloidal particles comprising fumed silica to form first colloidal particles encapsulating droplets of said first aqueous solution to form a first encapsulate wherein said fumed silica is present said first particles in an amount less than 5% by weight;

c) dissolving at least one second reaction reagent in water to form at least one second solution;

d) mixing and agitating said second solution with hydrophobized colloidal particles comprising fumed silica to form at least second colloidal particles encapsulating droplets of said second solution to form a second encapsulate wherein said fumed silica is present within said second particles in an amount less than 5% by weight; and

e) mixing said first and second encapsulate without breaking said first and second encapsulates to form an inter-dispersed composition of said first and second encapsulates;

wherein said at least one first reaction reagent comprises a peroxide, a first acid and water, and wherein said at least one second reaction reagent comprises a salt of a transition metal, a second acid and water.

Another embodiment provides a method for producing a system for storing and releasing complementary reaction reagents, comprising the steps:

a) dissolving at least one first reaction reagent in water to form a first aqueous solution;

b) mixing and agitating said first aqueous solution with hydrophobized colloidal particles comprising fumed silica to form first colloidal particles encapsulating droplets of said first aqueous solution to form a first encapsulate wherein said fumed silica is present within said first particles in an amount less than 5% by weight;

c) dissolving at least one second reaction reagent in water to form at least one second solution;

d) mixing and agitating said second solution with hydrophobized colloidal particles comprising fumed silica to form at least second colloidal particles encapsulating droplets of said second solution to form a second encapsulate wherein said fumed silica is present within said second particles in an amount less than 5% by weight; and

e) mixing said first and second encapsulate without breaking said first and second encapsulates to form an inter-dispersed composition of said first and second encapsulates.

Steps b) and d) can be accomplished with one of a high-shear rotary mixer and a blender.

Another aspect provides a method for producing a system for storing and releasing complementary reaction reagents, comprising the steps:

a) dissolving at least one first reaction reagent comprising a peroxide and a first acid in water to form a first aqueous solution;

b) mixing and agitating said first aqueous solution with hydrophobized colloidal

particles comprising metal oxide powders to form first particles encapsulating droplets of said first aqueous solution to form a first encapsulate;

c) dissolving at least one second reaction reagent comprising a salt of a transition metal and a second acid in water to form at least one second solution;

d) mixing and agitating said second solution with said hydrophobized colloidal particles to form at least second particles encapsulating droplets of said second solution to form a second encapsulate; and

e) mixing said first and second encapsulates without breaking said first and second encapsulates to form an inter-dispersed composition of said first and second encapsulates.

Another ~~aspect-embodiment~~ provides a method for producing a system for storing and releasing complementary reaction reagents, comprising the steps:

a) dissolving at least one first reaction reagent comprising one or combination of percarboxylic acid and bleach activator in water to form a first aqueous solution;

b) mixing and agitating said first aqueous solution with hydrophobized colloidal particles comprising metal oxide powders to form first particles encapsulating droplets of said first aqueous solution to form a first encapsulate;

c) dissolving at least one second reaction reagent comprising a salt of a transition metal in water to form at least one second solution;

d) mixing and agitating said second solution with hydrophobized colloidal particles to form at least second particles encapsulating droplets of said second solution to form a second encapsulate; and

e) mixing said first and second encapsulates without breaking said first and second encapsulates to form an inter-dispersed composition of said first and second encapsulates.

A system of the ~~invention-disclosure~~ can be as described above in which the first and second parts are included within a suitable carrier formulation selected from the group consisting of a cream, gel and paste.

Another aspect relates to a method for delivering a skin sanitizing product, the method comprising:

(i) applying the product to the skin of a user, the product comprising a mixture of:

A) a first part comprising a first encapsulate comprising hydrophobized colloidal particles and microdroplets comprising an aqueous solution of a peroxide, a first acid and water; and

B) at least a second part comprising a second encapsulate comprising hydrophobized colloidal particles and microdroplets comprising an aqueous solution of the salt of a transition metal, a second acid and water; and

(ii) subjecting the product to mechanical force by hand-rubbing the product on the user's skin with sufficient force to break open the first and second

encapsulates to release and mix said components of the first and second parts with each other.

The hydrophobized colloidal particles of the first and second parts can comprise fumed silica.

5 The first acid and said second acid can each include, independently of the other, one or more of phosphoric acid, phosphonic acid, citric acid, sulfonic acid, sulphuric acid, hydrochloric acid, itaconic acid, methanoic acid, alpha-hydroxy acid, maleic acid, gluconic acid, propanoic acid, butanoic acid, pentanoic acid, hexanoic acid, heptanoic acid, octanoic mono-acid, octanoic di-acid, octanoic tri-acid, beta-
10 hydroxy-acid, sodium tripolyphosphate, ethylenediaminetetraacetic acid, diethylenetriaminepentaacetic acid, N-(hydroxyethyl)-ethylenediami-netriacetic acid, 2-hydroxyethyliminodiacetic acid, benzoic acid, salicylic acid, and aminobenzoic acid.

15 ~~The invention includes~~ Another aspect relates to a method for cleansing a surface, the method comprising the steps:

(i) applying ~~the a~~ product to the surface, the product comprising a mixture of:

(I) a first encapsulate comprising hydrophobized colloidal particles encapsulating an aqueous solution of at least one first reaction reagent comprising a peroxide, a first acid and water; and

(II) a second encapsulate comprising hydrophobized colloidal particles encapsulating an aqueous solution of at least one second reaction reagent comprising a salt ~~fe~~of a transition metal, a second acid and water;

wherein the first and second reagents chemically react when exposed to each other to form a cleansing agent;

(ii) subjecting the product to mechanical force by hand-rubbing the product on the surface with sufficient force to break open the first and second encapsulates to release and mix said first and second reaction reagents and thereby expose the surface to the cleansing agent.

Another ~~aspect~~ embodiment provides a method for cleansing a surface, the method comprising the steps:

(I) applying the product to the surface, the product comprising a mixture of:

(i) a first encapsulate comprising hydrophobized colloidal particles encapsulating microdroplets comprising an aqueous solution of at least one first reaction reagent comprising one or combination of percarboxylic acid and bleach activator; and

(ii) a second encapsulate comprising hydrophobized colloidal particles encapsulating microdroplets comprising an aqueous solution of at least one second reaction reagent comprising a salt of a transition metal;

wherein the first and second reagents chemically react when exposed to each other to form a cleansing agent;

(II) subjecting the product to mechanical force by hand-rubbing the product on the surface with sufficient force to break open the first and second encapsulates to release and mix said first and second reagents and thereby expose the surface to the cleansing agent.

An embodiment of the present ~~invention~~ disclosure provides a skin sanitization product comprising a mixture of two dry powder components, where each dry powder component is formed from a phase inversion process involving vigorous mixing. The dry powder is stabilized by colloidal fumed silica particles, which assist in generating stable "dry water" microdroplets. One dry powder component comprises encapsulates containing microdroplets comprising an aqueous solution of hydrogen peroxide, and the other dry powder component comprises encapsulates containing microdroplets comprising an aqueous solution of copper sulphate or another suitable source of a transition metal ion. When the hand sanitization product is agitated by rubbing together of ones hands, the encapsulates rupture and the two aqueous solutions undergo a Fenton reaction upon contact. The Fenton reaction is catalyzed to produce hydroxyl free-radicals that generate an effective bactericidal dose.

DETAILED DESCRIPTION OF THE INVENTION

Generally speaking, the embodiments described herein are directed to a system for storing and delivering two or more reaction reagents stored in microdroplets coated and encapsulated by hydrophobic colloidal particles to be released at the point and time of use by mechanical agitation of the stored reaction reagents in the encapsulates which are commingled such that the mechanical action releases the reagents which then react to give a desired reaction product. As required, embodiments of the present invention are disclosed herein. However, the disclosed embodiments are merely exemplary, and it should be understood that the

~~THEREFORE WHAT IS CLAIMED IS:~~

1. A skin sanitization product, comprising:

a) a first part comprising first hydrophobized colloidal particles, said first hydrophobized colloidal particles containing first microdroplets, said first microdroplets comprising a first aqueous solution of a peroxide, a first acid and water to form a first encapsulate containing a first reaction element; and

b) at least a second part comprising second hydrophobized colloidal particles, said second hydrophobized colloidal particles containing second microdroplets, said second microdroplets comprising a second aqueous solution of a salt of a transition metal, a second acid and water to form a second encapsulate containing a second reaction element; and

wherein in use said first and second parts are mixed together on a user's skin to form a mixture and upon being subjected to mechanical action said first and second encapsulates are broken, releasing and mixing said first and second reaction elements.

2. The skin sanitization product according to claim 1, wherein said first and second hydrophobized colloidal particles comprise fumed silica.

3. The skin sanitization product according to claim 1 or 2, wherein said first acid and said second acid are each selected, independently of the other, from the group consisting of phosphoric acid, phosphonic acid, citric acid, sulfonic acid, sulphuric acid, hydrochloric acid, itaconic acid, methanoic acid, alpha-hydroxy acid, maleic acid, gluconic acid, propanoic acid, butanoic acid, pentanoic acid, hexanoic acid, heptanoic acid, octanoic mono-acid, octanoic di-acid, octanoic tri-acid, beta-hydroxy-acid, sodium tripolyphosphate, ethylenediaminetetraacetic acid, diethylenetriaminepentaacetic acid, N-(hydroxyethyl)-ethylenediami-netriacetic acid, 2-hydroxyethyliminodiacetic acid, benzoic acid, salicylic acid, and aminobenzoic acid.

4. The skin sanitization product according to any one of claims 1 to 3, wherein said transition metal is selected from the group consisting of iron, copper, manganese, cobalt, vanadium, titanium, chromium, lead, aluminum, gold and silver.

5. The skin sanitization product according to any one of claims 1 to 4, wherein said first acid is present in said first part in a range from 0.1% to 10% by weight.
6. The skin sanitization product according to any one of claims 1 to 5, wherein said second acid is present in said second part in a range from 0.1% to 10% by weight.
7. The skin sanitization product according to any one of claims 1 to 6, wherein said peroxide is hydrogen peroxide present in said first part in a range from 0.1% to 70% by weight.
8. The skin sanitization product according to any one of claims 1 to 7, wherein said salt is present in said second part in a range from 0.1% to 70% by weight.
9. The skin sanitization product according to any one of claims 1 to 8, wherein said water is present in said first part in a range from 50% to 99% by weight.
10. The skin sanitization product according to any one of claims 1 to 9, wherein said water is present in said second part in a range from 50% to 99% by weight.
11. The skin sanitization product according to any one of claims 1 to 10, wherein said hydrophobized colloidal particles are present within said first and second parts combined in an amount less than 5% by weight.
12. The skin sanitization product according to any one of claims 1 to 11, wherein said salt is present at substantially the same molar concentration in said first part as said peroxide is present in said second part.
13. The skin sanitization product according to any one of claims 1 to 12, wherein said first part comprises, by weight:
about 84% water; about 1% phosphoric acid (75%); about 12% hydrogen peroxide 50%; and about 3% fumed silica; and
wherein said second part comprises, by weight:
about 92.6% water; about 0.4% phosphoric acid (75%); about 4.0% copper sulphate; and about 3.0% fumed silica.
14. A bleach product, comprising:
a) a first part comprising first hydrophobized colloidal particles, said first hydrophobized colloidal particles containing first microdroplets, said first microdroplets comprising a first aqueous solution of water and one or combination of

percarboxylic acid and bleach activator, to form a first encapsulate containing a first reaction element; and

b) at least a second part comprising second hydrophobized colloidal particles, said second hydrophobized colloidal particles containing second microdroplets, said second microdroplets comprising a second aqueous solution of a salt of a transition metal and water to form a second encapsulate containing a second reaction element; and

wherein in use said first and second parts are mixed together to form a mixture and upon being subjected to mechanical action said first and second encapsulates are broken, releasing and mixing said first and second reaction elements.

15. The bleach product according to claim 14, wherein said one or combination of percarboxylic acid and bleach activator is present in said first part in a range from 1% to 50% by weight.

16. The bleach product according to claim 14 or 15, wherein said salt is present in said second part in a range from 0.001 ppm to 49% by weight.

17. The bleach product according to claim 14, comprising:

a) a first part comprising first hydrophobized particles comprising fumed silica, said first hydrophobized particles containing first microdroplets, said first microdroplets comprising a first aqueous solution of water and sodium percarbonate, to form a first encapsulate containing a first reaction element; and

b) at least a second part comprising second hydrophobized particles comprising fumed silica, said second hydrophobized particles containing second microdroplets, said second microdroplets comprising a second aqueous solution of $\text{Mn}(\text{Bcyclam})\text{Cl}_2$ and water to form a second encapsulate containing a second reaction element;

wherein said first part comprises, by weight:

about 93% water, 4.0% sodium percarbonate; about 3% fumed silica; and

wherein said second part comprises, by weight:

about 96.98% water, 0.02% $\text{Mn}(\text{Bcyclam})\text{Cl}_2$; and about 3.0% fumed silica.

18. The bleach product according to any one of claims 14 to 17 further comprising a third part, said third part comprising one or combination of surfactant, enzyme, salt, perfume, colourant, and dye transfer inhibition agent.

19. The bleach product according to any one of claims 14 to 17, further comprising a third part, said third part comprising, by weight, about 50.0% zeolite; about 25.0% linear alkylbenzene sulphonate; about 15.0% C12-15 EO5 alcohol ethoxylate; and about 10.0% sodium silicate.

20. A method for producing a system for storing and releasing complementary reaction reagents, comprising the steps:

- a) dissolving at least one first reaction reagent in water to form a first aqueous solution;
- b) mixing and agitating said first aqueous solution with hydrophobized colloidal particles comprising fumed silica to form first colloidal particles encapsulating droplets of said first aqueous solution to form a first encapsulate wherein said fumed silica is present said first particles in an amount less than 5% by weight;
- c) dissolving at least one second reaction reagent in water to form at least one second solution;
- d) mixing and agitating said second solution with hydrophobized colloidal particles comprising fumed silica to form at least second colloidal particles encapsulating droplets of said second solution to form a second encapsulate wherein said fumed silica is present within said second particles in an amount less than 5% by weight; and
- e) mixing said first and second encapsulate without breaking said first and second encapsulates to form an inter-dispersed composition of said first and second encapsulates.

21. The method according to claim 20, wherein said at least one first reaction reagent comprises a peroxide, a first acid and water, and wherein said at least one second reaction reagent comprises a salt of a transition metal, a second acid and water.

22. A method for producing a system for storing and releasing complementary reaction reagents, comprising the steps:

- a) dissolving at least one first reaction reagent comprising a peroxide and a first acid in water to form a first aqueous solution;
- b) mixing and agitating said first aqueous solution with hydrophobized particles comprising metal oxide powders to form first particles encapsulating droplets of said first aqueous solution to form a first encapsulate;
- c) dissolving at least one second reaction reagent comprising a salt of a transition metal and a second acid in water to form at least one second solution;
- d) mixing and agitating said second solution with said hydrophobized particles to form at least second particles encapsulating droplets of said second solution to form a second encapsulate; and
- e) mixing said first and second encapsulates without breaking said first and second encapsulates to form an inter-dispersed composition of said first and second encapsulates.

23. The method according to claim 21 or 22, wherein steps b) and d) are accomplished with one of a high-shear rotary mixer and a blender.

24. The method according to any one of claims 21 to 23, wherein said first acid and said second acid are each selected, independently of the other, from the group consisting of phosphoric acid, phosphonic acid, citric acid, sulfonic acid, sulphuric acid, hydrochloric acid, itaconic acid, methanoic acid, alpha-hydroxy acid, maleic acid, gluconic acid, propanoic acid, butanoic acid, pentanoic acid, hexanoic acid, heptanoic acid, octanoic mono-acid, octanoic di-acid, octanoic tri-acid, beta-hydroxy-acid, sodium tripolyphosphate, ethylenediaminetetraacetic acid, diethylenetriaminepentaacetic acid, N-(hydroxyethyl)-ethylenediami-netriacetic acid, 2-hydroxyethyliminodiacetic acid, benzoic acid, salicylic acid, aminobenzoic acid.

25. The method according to any one of claims 21 to 24, wherein said transition metal in said salt is selected from the group consisting of iron, copper, manganese, cobalt, vanadium, titanium, chromium, lead, aluminum, gold and silver.

26. The method according to any one of claims 21 to 25, wherein said first acid is dissolved in said first solution in a range from 0.1% to 10%.

27. The method according to any one of claims 21 to 26, wherein said second acid is dissolved in said second solution in a range from 0.1% to 10%.

28. The method according to any one of claims 21 to 27, wherein said peroxide is hydrogen peroxide dissolved in said first solution in a range from 0.1% to 70%.

29. The method according to any one of claims 21 to 28, wherein said salt is dissolved in said second solution in a range from 0.1% to 70%.

30. The method according to any one of claims 21 to 29, wherein after step b), said water is present in said first solution in a range from 50% to 99%.

31. The method according to any one of claims 21 to 30, wherein after step d), said water is present in said second solution in a range from 50% to 99%.

32. The method according to any one of claims 21 to 31, wherein said salt of a transition metal is present at substantially the same molar concentration in said second encapsulate as said peroxide is present in said first encapsulate.

33. The method according to claim 20, wherein said at least one first reaction reagent comprises an aqueous solution of water and one or combination of percarboxylic acid and bleach activator, and wherein said at least one second reaction reagent comprises an aqueous solution of a salt of a transition metal and water.

34. A method for producing a system for storing and releasing complementary reaction reagents, comprising the steps:

- a) dissolving at least one first reaction reagent comprising one or combination of percarboxylic acid and bleach activator in water to form a first aqueous solution;
- b) mixing and agitating said first aqueous solution with hydrophobized particles comprising metal oxide powders to form first particles encapsulating droplets of said first aqueous solution to form a first encapsulate;
- c) dissolving at least one second reaction reagent comprising a salt of a transition metal in water to form at least one second solution;

d) ~~mixing and agitating said second solution with hydrophobized particles to form at least second particles encapsulating droplets of said second solution to form a second encapsulate; and~~

e) mixing said first and second encapsulates without breaking said first and second encapsulates to form an inter-dispersed composition of said first and second encapsulates.

35. The method according to claim 33 or 34, wherein said one or combination of percarboxylic acid and bleach activator is dissolved in said first solution in a range from 1% to 50% by weight.

36. The method according to any one of claims 33 to 35, wherein said salt is dissolved in said second solution in a range from .001ppm to 49% by weight.

37. The method according to any one of claims 33 to 36, further comprising the steps of:

mixing a third composition, comprising of one or combination of surfactant, enzyme, salt, perfume, colourant, and dye transfer inhibition agent; and mixing said inter-dispersed composition with said third composition.

38. The product according to any one of claims 1 to 19, wherein said first and second parts are included within a suitable carrier formulation selected from the group consisting of a cream, gel and paste.

39. A method for delivering a skin sanitizing product, the method comprising:

(i) applying the product to the skin of a user, the product comprising a mixture of:

A) a first part comprising a first encapsulate comprising hydrophobized colloidal particles and microdroplets comprising an aqueous solution of a peroxide, a first acid and water; and

B) at least a second part comprising a second encapsulate comprising hydrophobized colloidal particles and microdroplets comprising an aqueous solution of the salt of a transition metal, a second acid and water; and

(ii) subjecting the product to mechanical force by hand-rubbing the product on the user's skin with sufficient force to break open the first and second

~~encapsulates to release and mix said components of the first and second parts with each other.~~

40. The method of claim 39, wherein said hydrophobized colloidal particles of the first and second parts comprise fumed silica.

41. The method of claim 40, wherein said first acid and said second acid are each, independently of the other, selected from the group consisting of phosphoric acid, phosphonic acid, citric acid, sulfonic acid, sulphuric acid, hydrochloric acid, itaconic acid, methanoic acid, alpha-hydroxy acid, maleic acid, gluconic acid, propanoic acid, butanoic acid, pentanoic acid, hexanoic acid, heptanoic acid, octanoic mono-acid, octanoic di-acid, octanoic tri-acid, beta-hydroxy-acid, sodium tripolyphosphate, ethylenediaminetetraacetic acid, diethylenetriaminepentaacetic acid, N-(hydroxyethyl)-ethylenediami-netriacetic acid, 2-hydroxyethyliminodiacetic acid, benzoic acid, salicylic acid, and aminobenzoic acid.

42. The method of claim 40 to 41, wherein said transition metal is selected from the group consisting of iron, copper, manganese, cobalt, vanadium, titanium, chromium, lead, aluminum, gold and silver.

43. The method of any one of claims 40 to 42, wherein said first acid is present in said first part in a range from 0.1% to 10% by weight.

44. The method of any one of claims 40 to 43, wherein said second acid is present in said second part in a range from 0.1% to 10% by weight.

45. The method of any one of claims 40 to 44, wherein said peroxide is hydrogen peroxide present in said first part in a range from 0.1% to 70% by weight.

46. The method of any one of claims 40 to 45, wherein said salt is present in said second part in a range from 0.1% to 70% by weight.

47. The method of any one of claims 40 to 46, wherein said water is present in said first part in a range from 50% to 99% by weight.

48. The method of any one of claims 40 to 47, wherein said water is present in said second part in a range from 50% to 99% by weight.

49. The method of any one of claims 40 to 48, wherein said fumed silica is present within said first and second parts combined in an amount less than 5% by weight.

50. The method of any one of claims 40 to 49, wherein said salt is present at substantially the same molar concentration in said first part as said peroxide is present in said second part.

51. The method of any one of claims 40 to 50, wherein:

said first part comprises, by weight:

about 84% water; about 1% phosphoric acid (75%); about 12% hydrogen peroxide (50%); and about 3% fumed silica; and

said second part comprises, by weight:

about 92.6% water; about 0.4% phosphoric acid (75%); about 4.0% copper sulphate; and about 3.0% fumed silica.

52. A method for cleansing a surface, the method comprising the steps:

(i) applying the product to the surface, the product comprising a mixture of:

(I) a first encapsulate comprising hydrophobized colloidal particles encapsulating an aqueous solution of at least one first reaction reagent comprising a peroxide, a first acid and water; and

(II) a second encapsulate comprising hydrophobized colloidal particles encapsulating an aqueous solution of at least one second reaction reagent comprising a salt of a transition metal, a second acid and water;

wherein the first and second reagents chemically react when exposed to each other to form a cleansing agent;

(ii) subjecting the product to mechanical force by hand-rubbing the product on the surface with sufficient force to break open the first and second encapsulates to release and mix said first and second reaction reagents and thereby expose the surface to the cleansing agent.

53. The method according to claim 52, wherein each of the first and second encapsulate comprises hydrophobized colloidal particles comprising fumed silica and microdroplets of the aqueous solution formed by high-shear rotary mixing and blending.

54. The method according to claim 53, wherein said fumed silica is present within said first and second encapsulates in an amount less than 5% by weight.

55. The method according to claim 52, wherein each of the first and second encapsulate comprises hydrophobized colloidal particles comprising metal oxide powders and microdroplets of the aqueous solution formed by high-shear rotary mixing and blending.

56. The method according to any one of claims 52 to 55, wherein said first acid and said second acid are both selected from the group consisting of phosphoric acid, phosphonic acid, citric acid, sulfonic acid, sulphuric acid, hydrochloric acid, itaconic acid, methanoic acid, alpha-hydroxy acid, maleic acid, gluconic acid, propanoic acid, butanoic acid, pentanoic acid, hexanoic acid, heptanoic acid, octanoic mono-acid, octanoic di-acid, octanoic tri-acid, beta-hydroxy-acid, sodium tripolyphosphate, ethylenediaminetetraacetic acid, diethylenetriaminepentaacetic acid, N-(hydroxyethyl)-ethylenediami-netriacetic acid, 2-hydroxyethyliminodiacetic acid, benzoic acid, salicylic acid, aminobenzoic acid.

57. The method according to any one of claims 52 to 56, wherein said transition metal in said salt is selected from the group consisting of iron, copper, manganese, cobalt, vanadium, titanium, chromium, lead, aluminum, gold and silver.

58. The method according to any one of claims 52 to 57, wherein said first acid is dissolved in said first encapsulate solution in a range from 0.1% to 10%.

59. The method according to any one of claims 52 to 58, wherein said second acid is dissolved in said second encapsulate solution in a range from 0.1% to 10%.

60. The method according to any one of claims 52 to 59, wherein said peroxide is hydrogen peroxide dissolved in said first encapsulate solution in a range from 0.1% to 70%.

61. The method according to any one of claims 52 to 60, wherein said salt is dissolved in said second encapsulate solution in a range from 0.1% to 70%.

62. The method according to any one of claims 52 to 61, wherein said water is present in said first encapsulate solution in a range from 50% to 99%.

63. The method according to any one of claims 52 to 62, wherein said water is present in said second solution in a range from 50% to 99%.

64. The method according to any one of claims 52 to 63, wherein said salt of a transition metal is present at substantially the same molar concentration in said first encapsulate as said peroxide is present in said second encapsulate.

65. A method for cleansing a surface, the method comprising the steps:

(I) applying the product to the surface, the product comprising a mixture of:

(i) a first encapsulate comprising hydrophobized colloidal particles encapsulating microdroplets comprising an aqueous solution of at least one first reaction reagent comprising one or combination of percarboxylic acid and bleach activator; and

(ii) a second encapsulate comprising hydrophobized colloidal particles encapsulating microdroplets comprising an aqueous solution of at least one second reaction reagent comprising a salt of a transition metal;

wherein the first and second reagents chemically react when exposed to each other to form a cleansing agent;

(II) subjecting the product to mechanical force by hand-rubbing the product on the surface with sufficient force to break open the first and second encapsulates to release and mix said first and second reagents and thereby expose the surface to the cleansing agent.

66. The method according to claim 65, wherein said one or combination of percarboxylic acid and bleach activator is dissolved in said aqueous solution of said first encapsulate in a range from 1% to 50% by weight.

67. The method according to claim 65 or 66, wherein said salt is dissolved in said aqueous solution of said second encapsulate in a range from about 0.001ppm to about 49% by weight.

THEREFORE WHAT IS CLAIMED IS:

1. A skin sanitization product, comprising:

a) a first part comprising first hydrophobized colloidal particles, said first hydrophobized colloidal particles containing first microdroplets, said first microdroplets comprising a first aqueous solution of a peroxide, a first acid and water to form a first encapsulate containing a first reaction element; and

b) at least a second part comprising second hydrophobized colloidal particles, said second hydrophobized colloidal particles containing second microdroplets, said second microdroplets comprising a second aqueous solution of a salt of a transition metal, a second acid and water to form a second encapsulate containing a second reaction element; and

wherein in use said first and second parts are mixed together on a user's skin to form a mixture and upon being subjected to mechanical action said first and second encapsulates are broken, releasing and mixing said first and second reaction elements.

2. The skin sanitization product according to claim 1, wherein said first and second hydrophobized colloidal particles comprise fumed silica.

3. The skin sanitization product according to claim 1 or 2, wherein said first acid and said second acid are each selected, independently of the other, from the group consisting of phosphoric acid, phosphonic acid, citric acid, sulfonic acid, sulphuric acid, hydrochloric acid, itaconic acid, methanoic acid, alpha-hydroxy acid, maleic acid, gluconic acid, propanoic acid, butanoic acid, pentanoic acid, hexanoic acid, heptanoic acid, octanoic mono-acid, octanoic di-acid, octanoic tri-acid, beta-hydroxy-acid, sodium tripolyphosphate, ethylenediaminetetraacetic acid, diethylenetriaminepentaacetic acid, N-(hydroxyethyl)-ethylenediamine-triacetic acid, 2-hydroxyethyliminodiacetic acid, benzoic acid, salicylic acid, and aminobenzoic acid.

4. The skin sanitization product according to any one of claims 1 to 3, wherein said transition metal is selected from the group consisting of iron, copper, manganese, cobalt, vanadium, titanium, chromium, lead, aluminum, gold and silver.

5. The skin sanitization product according to any one of claims 1 to 4, wherein said first acid is present in said first part in a range from 0.1% to 10% by weight.
6. The skin sanitization product according to any one of claims 1 to 5, wherein said second acid is present in said second part in a range from 0.1% to 10% by weight.
7. The skin sanitization product according to any one of claims 1 to 6, wherein said peroxide is hydrogen peroxide present in said first part in a range from 0.1% to 70% by weight.
8. The skin sanitization product according to any one of claims 1 to 7, wherein said salt is present in said second part in a range from 0.1% to 70% by weight.
9. The skin sanitization product according to any one of claims 1 to 8, wherein said water is present in said first part in a range from 50% to 99% by weight
10. The skin sanitization product according to any one of claims 1 to 9, wherein said water is present in said second part in a range from 50% to 99% by weight.
11. The skin sanitization product according to any one of claims 1 to 10, wherein said hydrophobized colloidal particles are present within said first and second parts combined in an amount less than 5% by weight.
12. The skin sanitization product according to any one of claims 1 to 11, wherein said salt is present at the same molar concentration in said first part as said peroxide is present in said second part.
13. The skin sanitization product according to any one of claims 1 to 12, wherein said first part comprises, by weight:
about 84% water; about 1% phosphoric acid (75%); about 12% hydrogen peroxide (50%); and about 3% fumed silica; and wherein said second part comprises, by weight:

about 92.6% water; about 0.4% phosphoric acid (75%); about 4.0% copper sulphate; and about 3.0% fumed silica.

14. A method for producing a system for storing and releasing complementary reaction reagents, comprising the steps:

a) dissolving at least one first reaction reagent in water to form a first aqueous solution;

b) mixing and agitating said first aqueous solution with hydrophobized colloidal particles comprising fumed silica to form first colloidal particles encapsulating droplets of said first aqueous solution to form a first encapsulate wherein said fumed silica is present said first particles in an amount less than 5% by weight;

c) dissolving at least one second reaction reagent in water to form at least one second solution;

d) mixing and agitating said second solution with hydrophobized colloidal particles comprising fumed silica to form at least second colloidal particles encapsulating droplets of said second solution to form a second encapsulate wherein said fumed silica is present within said second particles in an amount less than 5% by weight; and

e) mixing said first and second encapsulate without breaking said first and second encapsulates to form an inter-dispersed composition of said first and second encapsulates;

wherein said at least one first reaction reagent comprises a peroxide, a first acid and water, and wherein said at least one second reaction reagent comprises a salt of a transition metal, a second acid and water.

15. A method for producing a system for storing and releasing complementary reaction reagents, comprising the steps:

a) dissolving at least one first reaction reagent comprising a peroxide and a first acid in water to form a first aqueous solution;

b) mixing and agitating said first aqueous solution with hydrophobized colloidal particles comprising metal oxide powders to form first particles encapsulating droplets of said first aqueous solution to form a first encapsulate;

c) dissolving at least one second reaction reagent comprising a salt of a

transition metal and a second acid in water to form at least one second solution;

d) mixing and agitating said second solution with said hydrophobized colloidal particles to form at least second particles encapsulating droplets of said second solution to form a second encapsulate; and

e) mixing said first and second encapsulates without breaking said first and second encapsulates to form an inter-dispersed composition of said first and second encapsulates.

16. The method according to claim 14 or 15, wherein steps b) and d) are accomplished with one of a high-shear rotary mixer and a blender.

17. The method according to any one of claims 14 to 16, wherein said first acid and said second acid are each selected, independently of the other, from the group consisting of phosphoric acid, phosphonic acid, citric acid, sulfonic acid, sulphuric acid, hydrochloric acid, itaconic acid, methanoic acid, alpha-hydroxy acid, maleic acid, gluconic acid, propanoic acid, butanoic acid, pentanoic acid, hexanoic acid, heptanoic acid, octanoic mono-acid, octanoic di-acid, octanoic tri-acid, beta-hydroxy-acid, sodium tripolyphosphate, ethylenediaminetetraacetic acid, diethylenetriaminepentaacetic acid, N-(hydroxyethyl)-ethylenediaminetriacetic acid, 2-hydroxyethyliminodiacetic acid, benzoic acid, salicylic acid, aminobenzoic acid.

18. The method according to any one of claims 14 to 17, wherein said transition metal in said salt is selected from the group consisting of iron, copper, manganese, cobalt, vanadium, titanium, chromium, lead, aluminum, gold and silver.

19. The method according to any one of claims 14 to 18, wherein said first acid is dissolved in said first solution in a range from 0.1% to 10%.

20. The method according to any one of claims 14 to 19, wherein said second acid is dissolved in said second solution in a range from 0.1% to 10%.

21. The method according to any one of claims 14 to 20, wherein said peroxide is hydrogen peroxide dissolved in said first solution in a range from 0.1% to 70%.

22. The method according to any one of claims 14 to 21, wherein said salt is dissolved in said second solution in a range from 0.1% to 70%.
23. The method according to any one of claims 14 to 22, wherein after step b), said water is present in said first solution in a range from 50% to 99%.
24. The method according to any one of claims 14 to 23, wherein after step d), said water is present in said second solution in a range from 50% to 99%.
25. The method according to any one of claims 14 to 24, wherein said salt of a transition metal is present at the same molar concentration in said second encapsulate as said peroxide is present in said first encapsulate.
26. The product according to any one of claims 1 to 13, wherein said first and second parts are included within a suitable carrier formulation selected from the group consisting of a cream, gel and paste.
27. A method for delivering a skin sanitizing product, the method comprising:
- (i) applying the product to the skin of a user, the product comprising a mixture of:
 - A) a first part comprising a first encapsulate comprising hydrophobized colloidal particles and microdroplets comprising an aqueous solution of a peroxide, a first acid and water; and
 - B) at least a second part comprising a second encapsulate comprising hydrophobized colloidal particles and microdroplets comprising an aqueous solution of the salt of a transition metal, a second acid and water; and
 - (ii) subjecting the product to mechanical force by hand-rubbing the product on the user's skin with sufficient force to break open the first and second encapsulates to release and mix said components of the first and second parts with each other.
28. The method of claim 27, wherein said hydrophobized colloidal particles of the first and second parts comprise fumed silica.

29. The method of claim 28, wherein said first acid and said second acid are each, independently of the other, selected from the group consisting of phosphoric acid, phosphonic acid, citric acid, sulfonic acid, sulphuric acid, hydrochloric acid, itaconic acid, methanoic acid, alpha-hydroxy acid, maleic acid, gluconic acid, propanoic acid, butanoic acid, pentanoic acid, hexanoic acid, heptanoic acid, octanoic mono-acid, octanoic di-acid, octanoic tri-acid, beta-hydroxy-acid, sodium tripolyphosphate, ethylenediaminetetraacetic acid, diethylenetriaminepentaacetic acid, N-(hydroxyethyl)-ethylenediamine-triacetic acid, 2-hydroxyethyliminodiacetic acid, benzoic acid, salicylic acid, and aminobenzoic acid.

30. The method of claim 28 or 29, wherein said transition metal is selected from the group consisting of iron, copper, manganese, cobalt, vanadium, titanium, chromium, lead, aluminum, gold and silver.

31. The method of any one of claims 28 to 30, wherein said first acid is present in said first part in a range from 0.1% to 10% by weight.

32. The method of any one of claims 28 to 31, wherein said second acid is present in said second part in a range from 0.1% to 10% by weight.

33. The method of any one of claims 28 to 32, wherein said peroxide is hydrogen peroxide present in said first part in a range from 0.1% to 70% by weight.

34. The method of any one of claims 28 to 33, wherein said salt is present in said second part in a range from 0.1% to 70% by weight.

35. The method of any one of claims 28 to 34, wherein said water is present in said first part in a range from 50% to 99% by weight.

36. The method of any one of claims 28 to 35, wherein said water is present in said second part in a range from 50% to 99% by weight.

37. The method of any one of claims 28 to 36, wherein said fumed silica is present within said first and second parts combined in an amount less than 5% by weight.

38. The method of any one of claims 28 to 37, wherein said salt is present at the same molar concentration in said first part as said peroxide is present in said second part.

39. The method of any one of claims 28 to 38, wherein:

said first part comprises, by weight:

about 84% water; about 1% phosphoric acid (75%); about 12% hydrogen peroxide (50%); and about 3% fumed silica; and

said second part comprises, by weight:

about 92.6% water; about 0.4% phosphoric acid (75%); about 4.0% copper sulphate; and about 3.0% fumed silica.

40. A method for cleansing a surface, the method comprising the steps:

(i) applying a product to the surface, the product comprising a mixture of:

(I) a first encapsulate comprising hydrophobized colloidal particles encapsulating an aqueous solution of at least one first reaction reagent comprising a peroxide, a first acid and water; and

(II) a second encapsulate comprising hydrophobized colloidal particles encapsulating an aqueous solution of at least one second reaction reagent comprising a salt of a transition metal, a second acid and water;

wherein the first and second reagents chemically react when exposed to each other to form a cleansing agent;

(ii) subjecting the product to mechanical force by hand-rubbing the product on the surface with sufficient force to break open the first and second encapsulates to release and mix said first and second reaction reagents and thereby expose the surface to the cleansing agent.

41. The method according to claim 40, wherein each of the first and second encapsulate comprises hydrophobized colloidal particles comprising fumed silica and microdroplets of the aqueous solution formed by high-shear rotary mixing and

blending.

42. The method according to claim 41, wherein said fumed silica is present within said first and second encapsulates in an amount less than 5% by weight.

43. The method according to claim 40, wherein each of the first and second encapsulate comprises hydrophobized colloidal particles comprising metal oxide powders and microdroplets of the aqueous solution formed by high-shear rotary mixing and blending.

44. The method according to any one of claims 40 to 43, wherein said first acid and said second acid are both selected from the group consisting of phosphoric acid, phosphonic acid, citric acid, sulfonic acid, sulphuric acid, hydrochloric acid, itaconic acid, methanoic acid, alpha-hydroxy acid, maleic acid, gluconic acid, propanoic acid, butanoic acid, pentanoic acid, hexanoic acid, heptanoic acid, octanoic mono-acid, octanoic di-acid, octanoic tri-acid, beta-hydroxy-acid, sodium tripolyphosphate, ethylenediaminetetraacetic acid, diethylenetriaminepentaacetic acid, N-(hydroxyethyl)-ethylenediaminetriacetic acid, 2-hydroxyethyliminodiacetic acid, benzoic acid, salicylic acid, aminobenzoic acid.

45. The method according to any one of claims 40 to 44, wherein said transition metal in said salt is selected from the group consisting of iron, copper, manganese, cobalt, vanadium, titanium, chromium, lead, aluminum, gold and silver.

46. The method according to any one of claims 40 to 45, wherein said first acid is dissolved in said first encapsulate solution in a range from 0.1% to 10%.

47. The method according to any one of claims 40 to 46, wherein said second acid is dissolved in said second encapsulate solution in a range from 0.1% to 10%.

48. The method according to any one of claims 40 to 47, wherein said peroxide is hydrogen peroxide dissolved in said first encapsulate solution in a range from 0.1% to 70%.

49. The method according to any one of claims 40 to 48, wherein said salt is dissolved in said second encapsulate solution in a range from 0.1% to 70%.

50. The method according to any one of claims 40 to 49, wherein said water is present in said first encapsulate solution in a range from 50% to 99%.

51. The method according to any one of claims 40 to 50, wherein said water is present in said second solution in a range from 50% to 99%.

52. The method according to any one of claims 40 to 51, wherein said salt of a transition metal is present at the same molar concentration in said first encapsulate as said peroxide is present in said second capsule.