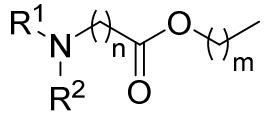
CLAIMS

1. A formulation for a shampoo, comprising:

at least one surfactant of Formula I,



Formula I

wherein R^1 and R^2 may be the same or different, and may be selected from the group consisting of hydrogen and C_1-C_6 alkyl, wherein the C_1-C_6 alkyl may optionally be substituted with one or more substituents selected from the group consisting of hydroxyl, amino, amido, sulfonyl, sulfonate, carbonyl, carboxyl, and carboxylate;

n is an integer from 2 to 5 (including 2 and 5);

m is an integer from 9 to 20 (including 9 and 20);

the terminal nitrogen is optionally further substituted with R^3, wherein R^3 is selected from the group consisting of hydrogen, oxygen, hydroxyl, and C_1-C_6 alkyl, wherein the C_1-C_6 alkyl may optionally be substituted with one or more substituents selected from the group consisting of hydroxyl, amino, amido, sulfonyl, sulfonate, carbonyl, carboxyl, and carboxylate;

an optional counterion associated with the compound which, if present, is selected from the group consisting of chloride, bromide, iodide, and hydroxide;

at least one of a foaming agent, a foam booster, and a thickener;

at least one of a pH stabilizer, a soil penetration agent or a fragrance; and

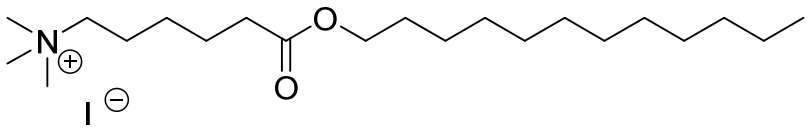
water.

2. The formulation of Claim 1, further comprising a pH stabilizer.

3. The formulation of either Claim 1 or Claim 2, further comprising a soil penetration agent.

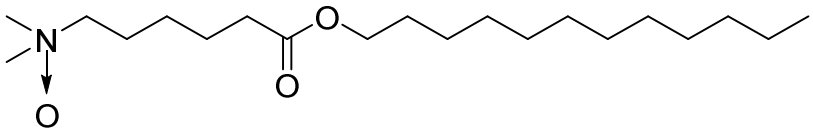
4. The formulation of any of Claims 1-3, further comprising a fragrance.

5. The formulation of any of Claims 1-4, wherein the surfactant comprises at least one of 6-(dodecyloxy)-N,N,N-trimethyl-6-oxohexan-1-aminium iodide, having the following formula:



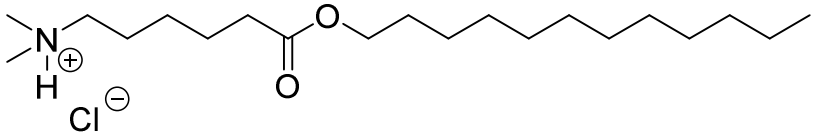
;

dodecyl 6-(dimethylamino)hexanoate *N*-oxide, having the following formula:



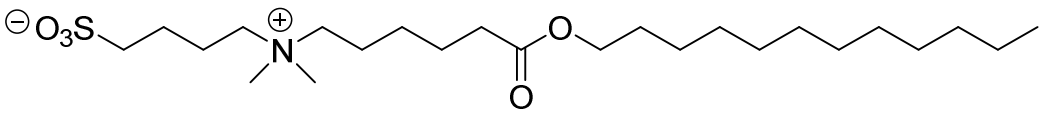
;

6-(dodecyloxy)-N,N-dimethyl-6-oxohexan-1-aminium chloride, having the following formula:



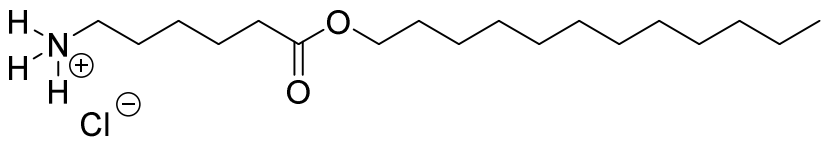
;

4-((6-(dodecyloxy)-6-oxohexyl)dimethylammonio)butane-1-sulfonate, having the following formula:



;

6-(dodecyloxy)-6-oxohexan-1-aminium chloride, having the following formula:

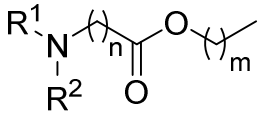


; and

combinations thereof.

6. A formulation for a hair conditioner, comprising:

at least one surfactant of Formula I,



Formula I

wherein R^1 and R^2 may be the same or different, and may be selected from the group consisting of hydrogen and C_1-C_6 alkyl, wherein the C_1-C_6 alkyl may optionally be substituted with one or more substituents selected from the group consisting of hydroxyl, amino, amido, sulfonyl, sulfonate, carbonyl, carboxyl, and carboxylate;

n is an integer from 2 to 5 (including 2 and 5);

m is an integer from 9 to 20 (including 9 and 20);

the terminal nitrogen is optionally further substituted with R^3, wherein R^3 is selected from the group consisting of hydrogen, oxygen, hydroxyl, and C_1-C_6 alkyl, wherein the C_1-C_6 alkyl may optionally be substituted with one or more substituents selected from the group consisting of hydroxyl, amino, amido, sulfonyl, sulfonate, carbonyl, carboxyl, and carboxylate;

an optional counterion associated with the compound which, if present, is selected from the group consisting of chloride, bromide, iodide, and hydroxide;

at least one of a fatty component and an emulsifier; and

water.

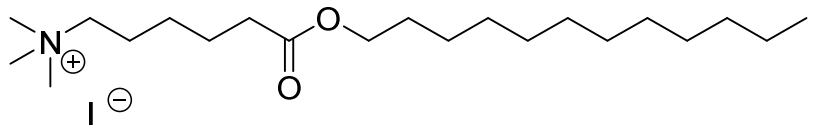
7. The formulation of Claim 6, further comprising at least one thickening agent.

8. The formulation of either Claim 6 or Claim 7, further comprising a foaming agent.

9. The formulation of any of Claims 6-8, further comprising at least one clay.

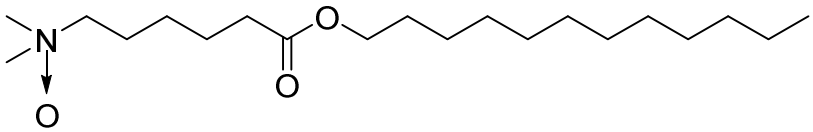
10. The formulation of any of Claims 6-9, further comprising a fragrance.

11. The formulation of any of Claims 6-10, wherein the surfactant comprises at least one of 6-(dodecyloxy)-N,N,N-trimethyl-6-oxohexan-1-aminium iodide, having the following formula:



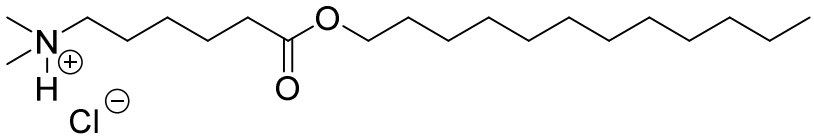
;

dodecyl 6-(dimethylamino)hexanoate *N*-oxide, having the following formula:



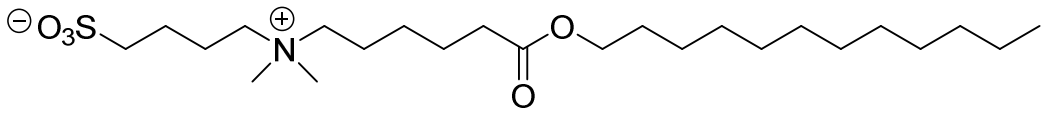
;

6-(dodecyloxy)-N,N-dimethyl-6-oxohexan-1-aminium chloride, having the following formula:



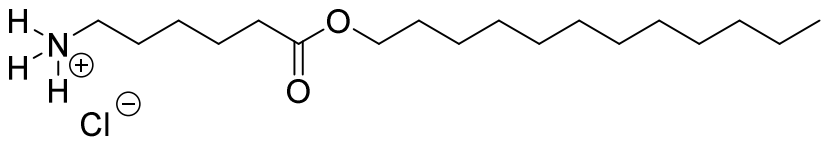
;

4-((6-(dodecyloxy)-6-oxohexyl)dimethylammonio)butane-1-sulfonate, having the following formula:



;

6-(dodecyloxy)-6-oxohexan-1-aminium chloride, having the following formula:

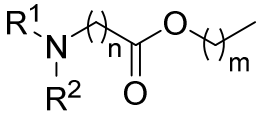


; and

combinations thereof.

12. A formulation for a cleanser, comprising:

at least one surfactant of Formula I,



Formula I

wherein R^1 and R^2 may be the same or different, and may be selected from the group consisting of hydrogen and C_1-C_6 alkyl, wherein the C_1-C_6 alkyl may optionally be substituted with one or more substituents selected from the group consisting of hydroxyl, amino, amido, sulfonyl, sulfonate, carbonyl, carboxyl, and carboxylate;

n is an integer from 2 to 5 (including 2 and 5);

m is an integer from 9 to 20 (including 9 and 20);

the terminal nitrogen is optionally further substituted with R^3, wherein R^3 is selected from the group consisting of hydrogen, oxygen, hydroxyl, and C_1-C_6 alkyl, wherein the C_1-C_6 alkyl may optionally be substituted with one or more substituents selected from the group consisting of hydroxyl, amino, amido, sulfonyl, sulfonate, carbonyl, carboxyl, and carboxylate;

an optional counterion associated with the compound which, if present, is selected from the group consisting of chloride, bromide, iodide, and hydroxide;

at least one of a solvent, a water-soluble polymer, and a humectant; and

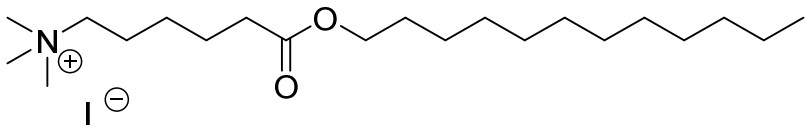
water.

13. The formulation of Claim 12, further comprising a fatty component.

14. The formulation of either Claim 12 or Claim 13, further comprising at least one conditioner.

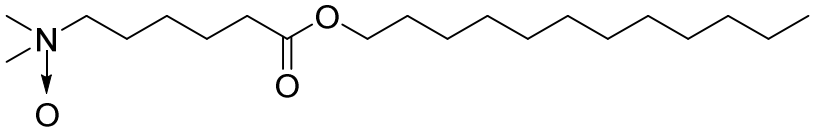
15. The formulation of any of Claims 12-14, further comprising a hydrophobicity modifier.

16. The formulation of any of Claims 12-15, wherein the surfactant comprises at least one of 6-(dodecyloxy)-N,N,N-trimethyl-6-oxohexan-1-aminium iodide, having the following formula:



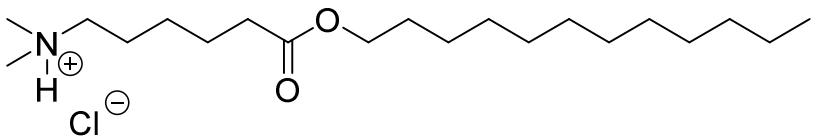
;

dodecyl 6-(dimethylamino)hexanoate *N*-oxide, having the following formula:



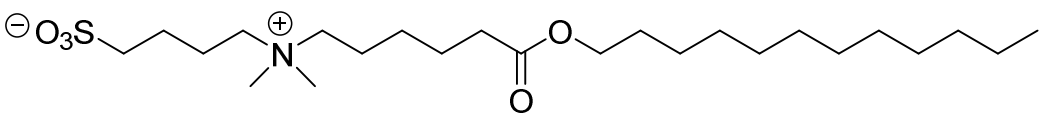
;

6-(dodecyloxy)-N,N-dimethyl-6-oxohexan-1-aminium chloride, having the following formula:



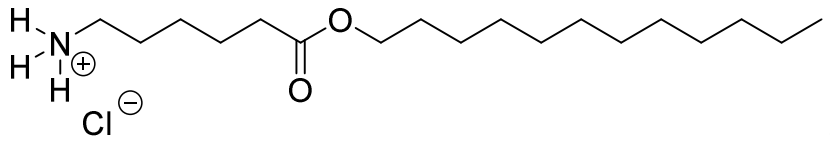
;

4-((6-(dodecyloxy)-6-oxohexyl)dimethylammonio)butane-1-sulfonate, having the following formula:



;

6-(dodecyloxy)-6-oxohexan-1-aminium chloride, having the following formula:

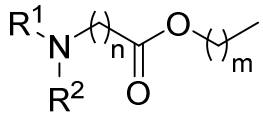


; and

combinations thereof.

17. A formulation for a toothpaste, comprising:

at least one surfactant of Formula I,



Formula I

wherein R^1 and R^2 may be the same or different, and may be selected from the group consisting of hydrogen and C_1-C_6 alkyl, wherein the C_1-C_6 alkyl may optionally be substituted with one or more substituents selected from the group consisting of hydroxyl, amino, amido, sulfonyl, sulfonate, carbonyl, carboxyl, and carboxylate;

n is an integer from 2 to 5 (including 2 and 5);

m is an integer from 9 to 20 (including 9 and 20);

the terminal nitrogen is optionally further substituted with R^3, wherein R^3 is selected from the group consisting of hydrogen, oxygen, hydroxyl, and C_1-C_6 alkyl, wherein the C_1-C_6 alkyl may optionally be substituted with one or more substituents selected from the group consisting of hydroxyl, amino, amido, sulfonyl, sulfonate, carbonyl, carboxyl, and carboxylate;

an optional counterion associated with the compound which, if present, is selected from the group consisting of chloride, bromide, iodide, and hydroxide;

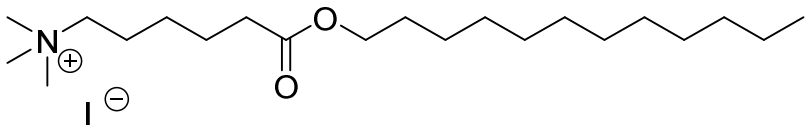
at least one of fluoride ion source and calcium carbonate; and

water.

18. The formulation of Claim 17, further comprising at least one basic amino acid.

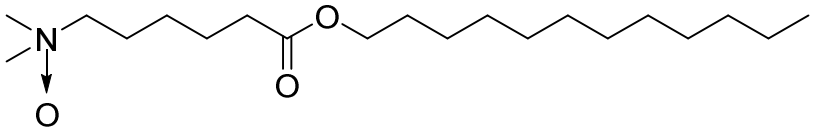
19. The formulation of either Claim 17 or Claim 18, further comprising a flavoring agent.

20. The formulation of any of Claims 17-19, wherein the surfactant comprises at least one of 6-(dodecyloxy)-N,N,N-trimethyl-6-oxohexan-1-aminium iodide, having the following formula:



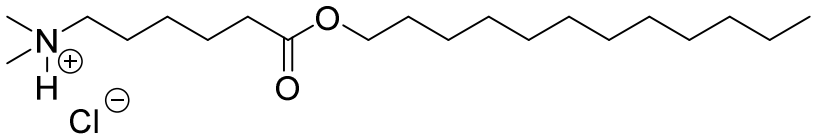
;

dodecyl 6-(dimethylamino)hexanoate *N*-oxide, having the following formula:



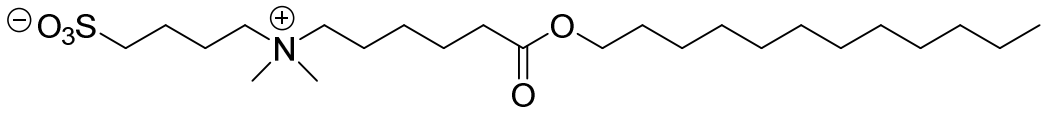
;

6-(dodecyloxy)-N,N-dimethyl-6-oxohexan-1-aminium chloride, having the following formula:



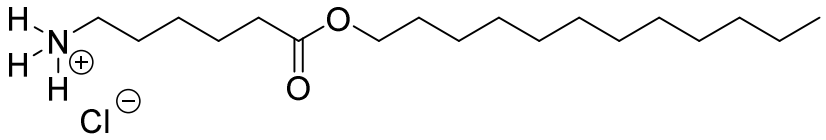
;

4-((6-(dodecyloxy)-6-oxohexyl)dimethylammonio)butane-1-sulfonate, having the following formula:



;

6-(dodecyloxy)-6-oxohexan-1-aminium chloride, having the following formula:



; and

combinations thereof.

21. The formulation of Claim 1, wherein the surfactant of Formula I is a cationic surfactant, a nonionic surfactant, or a combination thereof.

22. The formulation of Claim 5, wherein the surfactant of Formula I is a cationic surfactant, a nonionic surfactant, or a combination thereof.

23. The formulation of Claim 12, wherein the surfactant of Formula I is a cationic surfactant, a nonionic surfactant, or a combination thereof.

24. The formulation of Claim 17, wherein the surfactant of Formula I is a cationic surfactant, a nonionic surfactant, or a combination thereof.