Still further, it is an object of the present disclosure to provide enhanced soil removal in non-antimicrobial applications employing propoxylated surfactants and polymers for foam stabilization in highly active compositions. In each aspect of the disclosure suitable foam stabilization is desired while providing safe, environmentally friendly and economically feasible compositions for various applications of use.

Other objects, advantages and features of the present invention will become apparent from the following specification taken in conjunction with the accompanying drawings.

BRIEF SUMMARY OF THE INVENTION

An advantage of the present disclosure is the foam stabilization and enhancement in highly concentrated compositions of propoxylated compounds and anionic and/or nonionic surfactants, which can further include antimicrobial agents that maintain desired antimicrobial efficacy in the highly concentrated compositions. In additional embodiments non-antimicrobial compositions employ the combination of the propoxylated compounds and anionic and/or nonionic surfactants for soil removal with stabilized foam profiles.

In one aspect, the present disclosure provides a concentrated antimicrobial or non-antimicrobial composition comprising: between about 1 wt-% and about 30 wt-% of a propoxylated polymer or copolymer comprising one or more of a propoxylated EO-PO block copolymer; a polyethyleneimine derivative propoxylated polymer having a PO group, EO-PO group, PO-EO group, a salt thereof, or a mixture thereof; an anionic extended chain surfactant; or a nonionic extended chain surfactant having a PO group; between 1 wt-% and 50 wt-% of at least one anionic surfactant comprising an alkyl ether sulfate, alkyl sulfate, alkyl sulfonate, alkylaryl sulfonate, an extended chain surfactant or a combination thereof; and/or between 15 wt-% and 50 wt-% of at least one nonionic surfactant comprising an amine oxide, alkylpolyglucoside, or a combination thereof; and between 1 wt-% and 20 wt-% of a solvent comprising propylene glycol, hexylene glycol, or a combination thereof; wherein the composition is a low viscoelasticity liquid concentrate having an active concentration of at least 18% that is soluble in water and has a viscosity of less than 900 cPs, has a pH of 1 to 12 in a use solution, and wherein the composition does not contain ethanol.

In embodiments, a concentrated antimicrobial or non-antimicrobial composition is provided comprising: between about 1 wt-% and about 30 wt-% of a propoxylated EO/PO block copolymer surfactant (and/or propoxylated polymers); and between about 10 wt-% and about 90 wt-% of at least one anionic surfactant and/or nonionic surfactant; wherein the composition is a low viscoelasticity liquid concentrate having an active concentration of at least about 18% that is soluble in water and has a viscosity of less than about 900 cPs, has a pH of about 1 to about 12 in a use solution, and provides at least a 3 log microbial kill on a treated surface for the antimicrobial composition.

In another aspect, the present disclosure provides a kit comprising: a two-part premix composition for a concentrated liquid composition comprising a first part and a second part; wherein the first part comprises a propoxylated polymer or copolymer comprising one or more of a propoxylated homopolymer; a polyethyleneimine derivative propoxylated polymer having a PO group, EO-PO group, PO-EO group, a salt thereof, or a mixture thereof; an anionic extended chain surfactant; or a nonionic extended chain surfactant having a PO group; and wherein the second part comprises an anionic surfactant comprising an alkyl ether sulfate, alkyl sulfate, alkyl sulfonate, alkylaryl sulfonate, an extended chain surfactant or a combination thereof, a nonionic surfactant comprising an amine oxide, alkylpolyglucoside, or a combination thereof and a solvent comprising propylene glycol, hexylene glycol, or a combination thereof; wherein the premix composition comprises between 1 wt-% and 30 wt-% of the propoxylated polymer or copolymer; between 1 wt-% and 50 wt-% of the anionic surfactant; between 15 wt-% and 50 wt-% of the nonionic surfactant; and between 1 wt-% and 20 wt-% of the solvent(s); wherein the premix composition is a low viscoelasticity liquid concentrate having an active concentration of at least 18% that is soluble in water and has a viscosity of less than 900 cPs, has a pH of 1 to 12 in a use solution; and wherein the two-part premix composition does not contain alcohol. In a further embodiment, a kit to provide the concentrated antimicrobial or non-antimicrobial composition comprises: a two-part premix for a concentrated liquid composition comprising a first part and a second part; wherein the first part comprises a propoxylated EO/PO block copolymer surfactant (and/or propoxylated polymers); and wherein the second part comprises an anionic surfactant and solvent(s).

In a further aspect, a method of cleaning a surface comprises: providing a liquid composition as disclosed herein to a surface; and optionally rinsing the surface in

Claims

1. A concentrated antimicrobial or non-antimicrobial composition, comprising:

between 1 wt-% and 30 wt-% of a propoxylated polymer or copolymer comprising one or more of a propoxylated EO-PO block copolymer; a polyethyleneimine derivative propoxylated polymer having a PO group, EO-PO group, PO-EO group, a salt thereof, or a mixture thereof; an anionic extended chain surfactant; or a nonionic extended chain surfactant having a PO group;

between 1 wt-% and 50 wt-% of at least one anionic surfactant comprising an alkyl ether sulfate, alkyl sulfate, alkyl sulfonate, alkylaryl sulfonate, an extended chain surfactant or a combination thereof;

between 15 wt-% and 50 wt-% of at least one nonionic surfactant, comprising an amine oxide, alkylpolyglucoside, or a combination thereof; and

between 1 wt-% and 20 wt-% of a solvent comprising propylene glycol, hexylene glycol, or a combination thereof;

wherein the composition is a low viscoelasticity liquid concentrate having an active concentration of at least 18% that is soluble in water and has a viscosity of less than 900 cPs, has a pH of 1 to 12 in a use solution; and

wherein the composition does not contain ethanol.

2. The composition of claim 1, wherein the propoxylated EO/PO block copolymer surfactant has the following structure (EO)n(PO)m(EO)n or (PO)m(EO)n(PO)m, wherein the molecular weight is between 1000 g/mol and 15,000 g/mol.

3. The composition of claim 2, wherein the EO/PO block copolymer surfactant has at least 20% PO, at least 30% PO, at least 40% PO, at least 50% PO, or at least 60% PO with a Ross Miles Foam of greater than or equal to 40 (0.1% @ 50°C).

4. The composition of any one of claims 1-3, wherein the composition further comprises an antimicrobial agent and provides at least a 3 log microbial kill on a treated surface.

5. The composition of any one of claims 1-4, wherein the extended chain surfactant (a) has the formula R-[L]x-[O--CH_2--CH_2]y, wherein R is the lipophilic moiety, a linear or branched, saturated or unsaturated, substituted or unsubstituted, aliphatic or aromatic hydrocarbon radical having from 8 to 20 carbon atoms, L is a linking group, such as a block of poly-propylene oxide, a block of poly-ethylene oxide, a block of poly-butylene oxide or a mixture thereof; x is the chain length of the linking group ranging from 5-25; and y is the average degree of ethoxylation ranging from 1-20, and/or (b) is an extended chain anionic surfactant and has the formula R-[L]x-[O--CH_2--CH_2]y M, wherein R is the lipophilic moiety, a linear or branched, saturated or unsaturated, substituted or unsubstituted, aliphatic or aromatic hydrocarbon radical having from 8 to 20 carbon atoms, L is a linking group, such as a block of poly-propylene oxide, a block of poly-ethylene oxide, a block of poly-butylene oxide or a mixture thereof; x is the chain length of the linking group ranging from 1-15; y is the average degree of ethoxylation ranging from 1-5, and M is any ionic species, and/or (c) is an extended chain nonionic surfactant and has the formula R-$[L]_x$- $[O—CH_2--CH_2]_y$ where R is the lipophilic moiety, a linear or branched, saturated or unsaturated, substituted or unsubstituted, aliphatic or aromatic hydrocarbon radical having from 8 to 20 carbon atoms, L is a polypropylene oxide linking group; x is the chain length of the linking group ranging from 2-25; and y is the average degree of ethoxylation ranging from 1-18.

6. The composition of any one of claims 1-5, wherein the concentrate composition comprises from 1 wt-% to 15 wt-% of the propoxylated EO/PO block copolymer surfactant, from 1 wt-% to 40 wt-% of the anionic surfactant, and from 10 wt-% to 70 wt-% of the nonionic surfactant.

7. The composition of any one of claims 1-6, wherein the anionic surfactant is a C6-C18 alkyl chain length linear or branched chain, sulfate, and/or sulfonate.

8. The composition of any one of claims 1-6, wherein the anionic surfactant is comprised of sodium lauryl ether sulfate, sodium lauryl sulfate, alpha olefin sulfonate, alkylbenzene sulfonic acid, or a mixture thereof.

9. The composition of any one of claims 1-8, wherein the pH of the use solution is between 6 and 10.

10. The composition of any one of claims 1-9, further comprising water and/or one or more additional functional ingredients comprising additional surfactants, solvents, solubility modifiers, humectants, metal protecting agents, stabilizing agents, corrosion inhibitors, sequestrants and/or chelating agents, preservatives, sheeting agents, pH modifying components, fragrances and/or dyes, hydrotropes or couplers, and/or buffers.

11. The composition of any one of claims 1-10, wherein the concentrate composition comprises at least 30% actives and has a viscosity less than 500 cPs.

12. A kit comprising:

a two-part premix composition for a concentrated liquid composition comprising a first part and a second part;

wherein the first part comprises a propoxylated polymer or copolymer comprising one or more of a propoxylated homopolymer; a polyethyleneimine derivative propoxylated polymer having a PO group, EO-PO group, PO-EO group, a salt thereof, or a mixture thereof; an anionic extended chain surfactant; or a nonionic extended chain surfactant having a PO group; and

wherein the second part comprises an anionic surfactant comprising an alkyl ether sulfate, alkyl sulfate, alkyl sulfonate, alkylaryl sulfonate, an extended chain surfactant or a combination thereof, a nonionic surfactant comprising an amine oxide, alkylpolyglucoside, or a combination thereof, and a solvent comprising propylene glycol, hexylene glycol, or a combination thereof;

wherein the premix composition comprises between 1 wt-% and 30 wt-% of the propoxylated polymer or copolymer; between 1 wt-% and 50 wt-% of the anionic

surfactant; between 15 wt-% and 50 wt-% of the nonionic surfactant; and between 1 wt-% and 20 wt-% of the solvent(s);

wherein the premix composition is a low viscoelasticity liquid concentrate having an active concentration of at least 18% that is soluble in water and has a viscosity of less than 900 cPs, has a pH of 1 to 12 in a use solution; and

wherein the premix composition does not contain alcohol.

13. A method of cleaning a surface comprising:

providing a liquid composition according to any one of claims 1-11 to a surface; and

optionally rinsing the surface in need thereof,

wherein the composition provides commercially acceptable cleaning performance, and

wherein the composition is effective at low and/or high temperatures.

14. The method of claim 13, wherein the liquid composition is mixed into an aqueous use solution prior to applying to the surface in need of cleaning to dilute the composition to provide a use solution.

15. The method of any one of claims 13-14, wherein the commercially acceptable cleaning performance provides an antimicrobial efficacy of at least a 3 log microbial kill on the surface when an antimicrobial agent is included in the composition, or removal of soil after contacting the surface for a sufficient period of time.

16. The method of any one of claims 13-15, wherein the surface is ware.

17. The method of any one of claims 13-15, wherein the surface is a human tissue.