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(54) Titre : PRODUITS DE NETTOYAGE ET METHODES DE FABRICATION
(54) Title: CLEANING FORMULATIONS AND METHODS FOR MANUFACTURING THE SAME

(57) Abrégé/Abstract:
Cleaning compositions are provided that may include a fatty acid methyl ester and at least one of a nonionic surfactant, a cationic surfactant, a chelating agent, a silicate salt, a xylene sulfonate salt, a hydroxide base, and a combination thereof.

ABSTRACT

Cleaning compositions are provided that may include a fatty acid methyl ester and at least one of a nonionic surfactant, a cationic surfactant, a chelating agent, a silicate salt, a xylene sulfonate salt, a hydroxide base, and a combination thereof.

CLEANING FORMULATIONS AND METHODS FOR MANUFACTURING THE SAME

CROSS-REFERENCE TO RELATED APPLICATIONS

This application claims priority to U.S. Provisional Patent Application No. 60/482,618 filed on June 26, 2003.

BACKGROUND OF THE INVENTION

New compositions are desired that may be useful as cleaning agents, and more particularly, as cleaning agents for automotive vehicles such as cars and trucks. These types of compositions may be distributed to and used in a wide variety of car washes.

SUMMARY OF THE INVENTION

In one aspect, the invention may provide a cleaning composition comprising a fatty acid methyl ester and at least one of a nonionic surfactant, a cationic surfactant, a chelating agent, a silicate salt, a xylene sulfonate salt, a hydroxide base, and a combination thereof.

In another aspect, the invention may provide a cleaning pre-mixture comprising premix A including a fatty acid methyl ester; and premix B comprising a salt solution.

In yet another aspect, the invention may provide a method of formulating a cleaning composition. The method may comprise adding a fatty acid methyl ester to at least one of a nonionic surfactant, a cationic surfactant, a chelating agent, a silicate salt, a xylene sulfonate salt, a hydroxide base and a combination thereof to form the cleaning composition.

DETAILED DESCRIPTION OF THE INVENTION

One aspect of the invention is a composition that may comprise a fatty acid methyl ester and at least one of a nonionic surfactant, a cationic surfactant, a chelating agent, a silicate salt, a xylene sulfonate salt, a hydroxide base, water, and a combination thereof. The compositions described herein may be useful as cleaning agents, and more particularly, as cleaning agents for automotive vehicles such as cars and trucks. The compositions may be distributed to and used in a wide variety of car washes.

Fatty acid methyl esters may form one component of the composition. Fatty acid methyl esters may enhance degreasing capabilities and effectively remove oil and dirt from vehicles using a touchless cleaning process. Suitable fatty acid methyl esters include, but are not limited to, compounds having the formula RCO_2CH_3 wherein R may be a branched or an unbranched, saturated or unsaturated aliphatic group having from 3 to 30 carbon atoms. More particularly the R group may have from 8 to 22 carbon atoms. Examples of fatty acid methyl esters include, but are not limited to, methyl laurate (R = C11), methyl myristate (R = C13), methyl palmitate (R = C15), methyl stearate (R = C17), methyl oleate (R = C17; monounsaturated), methyl linolenate (R = C17; polyunsaturated), methyl behenate (R = C21), and methyl cerotate (R = C25). Examples of commercially available fatty acid methyl esters include the following: SOYGOLD® marketed by AG Environmental Products L.L.C.; SOYsolv® and SOYsolvII® marketed by SOYsolve Industrial Products; and soy methyl esters marketed by Columbus. A mixture of fatty acid methyl esters may also be used. In one embodiment, the R group may have from about 16 to about 18 carbon atoms.

The composition by weight of fatty acid methyl ester in the embodiment may be greater than or equal to 0%. Typically, the composition may comprise less than about 5.0% by weight fatty acid methyl ester, more particularly, less than about 3.0%, and even more particularly, less than about 1.0%.

Nonionic surfactants may form a second component of the composition. Nonionic surfactants are conventionally produced by condensing ethylene oxide with a hydrocarbon having a reactive hydrogen atom, e.g., a hydroxyl, carboxyl, amino, or amido group, in the presence of an acidic or basic catalyst. Nonionic surfactants may have the general formula $RA(CH_2CH_2O)_nH$ wherein R represents the hydrophobic moiety, A represents the group carrying the reactive hydrogen atom and n represents the average number of ethylene oxide moieties. R may be a primary or a secondary, straight or slightly branched, aliphatic alcohol having from about 8 to about 24 carbon atoms. A more complete disclosure of nonionic surfactants can be found in U.S. Pat. No. 4,111,855, Barrat, et al., issued September 5, 1978, and U.S. Pat. No. 4,865,773, Kim et al., issued September 12, 1989, which are hereby fully incorporated by reference.

Other nonionic surfactants useful in the composition include ethoxylated alcohols or ethoxylated alkyl phenols of the formula $R(OC_2H_4)_nOH$, wherein R is an aliphatic hydrocarbon radical containing from about 8 to about 18 carbon atoms or an alkyl phenyl radical in which the alkyl group contains from about 8 to about 15 carbon atoms, and n is from about 2 to about 14. Examples of such surfactants are listed in U.S. Pat. No. 3,717,630, Booth, issued Feb. 20, 1973, U.S. Pat. No. 3,332,880, Kessler et al., issued July 25, 1967, and U.S. Pat. No. 4,284,435, Fox, issued August 18, 1981, which are hereby fully incorporated by reference.

Moreover, other nonionic surfactants include the condensation products of alkyl phenols having an alkyl group containing from about 8 to about 15 carbon atoms in either a straight chain or branched chain configuration with ethylene oxide, said ethylene oxide being present in an amount from about 2 to about 14 moles of ethylene oxide per mole of alkyl phenol. The alkyl substituent in such compounds can be derived, for example, from polymerized propylene, diisobutylene, and the like.

Other useful nonionic surfactants are the condensation products of aliphatic alcohols with from about 2 to about 14 moles of ethylene oxide. The alkyl chain of the aliphatic alcohol can either be straight or branched, primary or secondary, and may contain from about 8 to about 18 carbon atoms. Examples of such ethoxylated alcohols include secondary alcohol nonionic surfactants such as ENS-70, the condensation product of myristyl alcohol condensed with about 9 moles of ethylene oxide per mole of alcohol, and the condensation product of about 7 moles of ethylene oxide with coconut alcohol (a mixture of fatty alcohols with alkyl chains varying in length from 10 to 14 carbon atoms). Examples of commercially available nonionic surfactants in this type include: Tergitol 15-S-9 marketed by Union Carbide Corporation; Neodol 45-9, Neodol 23-6.5, Neodol 45-7 and Neodol 45-4 marketed by Shell Chemical Company; Kyro EOB marketed by The Procter & Gamble Company. A mixture of nonionic surfactants may also be used.

The composition may generally comprise greater than or equal to 0% by weight nonionic surfactant. Typically, the composition may comprise less than about 20.0% by weight nonionic surfactant, more particularly, less than about 5.4%, and even more particularly, less than about 1.8%. In one specific example, the composition could comprise greater than or equal to 0% by weight ENS-70 or an

alklyl phenol ethoxylate. Typically, this composition would comprise less than about 10.2% by weight ENS-70 or an alklyl phenol ethoxylate, more particularly, less than about 2.4%, and even more particularly, less than about 0.8%. In another example, the composition could comprise greater than or equal to 0% by weight nonionic surfactant. Typically, this composition would comprise less than about 1.9% by weight nonionic surfactant, more particularly, less than about 0.6%, and even more particularly, less than about 0.2%. In yet another example, the composition could also comprise greater than or equal to 0% by weight nonionic surfactant. Typically, this composition would also comprise less than about 4.2% by weight or nonionic surfactant, more particularly, less than about 2.4%, and even more particularly, less than about 0.8%. Of course, combinations of these specific nonionic surfactants, or any other nonionic surfactants, can be employed.

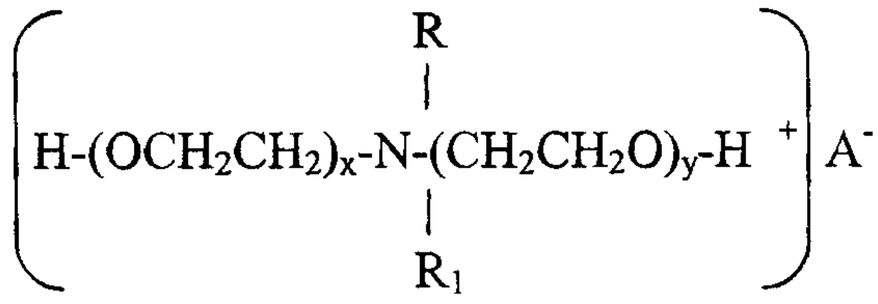
Cationic surfactants may form an additional component of the composition. Cationic surfactants may include those containing non-quaternary nitrogen, those containing quaternary nitrogen bases, those containing non-nitrogenous bases and combinations thereof. Such surfactants are disclosed in U.S. Pat. No. 3,457,109, Peist, issued July 22, 1969, U.S. Pat. No. 3,222,201, Boyle, issued Dec. 7, 1965 and U.S. Pat. No. 3,222,213, Clark, issued December 7, 1965, which are hereby fully incorporated by reference.

One category of cationic surfactants may include quaternary ammonium compounds with the general formula RXYZ N^+A^-, wherein R is an aliphatic or cycloaliphatic group having from 8 to 20 carbon atoms and X, Y and Z are members selected from the group consisting of alkyl, hydroxylated alkyl, phenyl and benzyl. A^- is a water soluble anion that may include, but is not limited to, a halogen, methosulfate, ethosulfate, sulfate and bisulfate. The R group may be bonded to the

quaternary group through hetero atoms or atom groups such as -O-, -COO-, -CON-, -N-, and -S-. Examples of such compounds include, but are not limited to, trimethyl-hexadecyl-ammonium sulfate, diethyl-octadecyl-phenyl-ammonium sulfate, dimethyl-dodecyl-benzyl-ammonium chloride, octadecylamino-ethyl-trimethyl-ammonium bisulfate, stearylamido-ethyl-trimethyl-ammonium methosulfate, dodecyloxy-methyl-trimethyl-ammonium chloride, cocoalkylcarboxyethyl-di-(hydroxyethyl)-methyl-ammonium methosulfate, and combinations thereof.

Another category of cationic surfactants may be of the di-long chain quaternary ammonium type having the general formula $XYRR_1N^+A^-$, wherein X and Y chains may contain an average of from about 12 to about 22 carbon atoms and R and R_1 may be hydrogen or C_1 to C_4 alkyl or hydroxyalkyl groups. Although X and Y may contain long chain alkyl groups, X and Y may also contain hydroxy groups or may contain heteroatoms or other linkages, such as double or triple carbon-carbon bonds, and ester, amide, or ether linkages, as long as each chain falls within the above carbon atom ranges.

An additional category of cationic surfactant may include the bis(ethoxylated) ammonium quaternary compounds having the general formula:



wherein R is methyl, ethyl or propyl group, R_1 is an alkyl group having from 8 to 18 carbon atoms, an alkenyl group having 8 to 18 carbon atoms or mixtures thereof, x is a number from 1 to 40, y is a number from 1 to 40, wherein x + y is between 10 to 60, and A is a water soluble anion. Examples of such compounds include, but are not limited to, alkyl bis(ethoxy) methyl ammonium methyl sulfate (15 moles EO), stearyl methyl bis(ethoxy) ammonium chloride (12 moles EO), stearyl ethyl bis(ethoxy) ammonium ethyl sulfate (15 moles EO), tallow methyl bis(ethoxy) ammonium methyl sulfate (15 moles EO), tallow ethyl bis(ethoxy) ammonium ethyl sulfate (15 moles EO), hydrogenated tallow methyl bis(ethoxy) ammonium chloride (15 moles EO), coco methyl bis(ethoxy) ammonium methyl sulfate (20 moles EO), and combinations thereof.

Other cationic surfactants may include sulfonium, phosphonium, and mono- or tri-long chain quaternary ammonium materials and those described in U.S. Pat. No. 4,259,217, Murphy, issued March 31, 1981, U.S. Pat. No. 4,222,905, Cockrell, September, 16, 1980, U.S. Pat. No. 4,260,529, Letton, issued April 7, 1981, U.S. Pat. No. 4,228,042, Letton, issued October 14, 1980, and U.S. Pat. No. 4,228,044, Cushman, issued October 14, 1980, each of which is fully incorporated herein by reference.

Additional cationic surfactants may include ditallowalkyldimethyl (or diethyl or dihydroxyethyl) ammonium chloride, ditallowalkyldimethylammonium methyl sulfate, dihexadecylalkyl (C_{16}) dimethyl (or diethyl, or dihydroxyethyl) ammonium chloride, dioctodecylalkyl (C_{18})dimethylammonium chloride, dieicosylalkyl(C_{20}) dimethylammonium chloride, methyl (1) tallowalkyl amido ethyl (2) tallowalkyl imidazolinium methyl sulfate (commercially available as Varisoft 475 from Ashland Chemical Company), or mixtures of those surfactants.

The composition may comprise greater than or equal to 0% by weight cationic surfactant. Typically, the composition may comprise less than about 25.0% by weight cationic surfactant, more particularly, less than about 3.0%, and even more particularly, less than about 1.0%.

Chelating agents may form another component of the embodiment's composition. Chelating agents may soften the feed water, bind insoluble metal ions present in the traffic film, increase surfactant activity and reduce the redeposition of soil. Examples of chelating agents include, but are not limited to, trisodium nitrilotriacetate, trisodium hydroxyethyl ethylene diamine tetraacetate, tetrasodium ethylene diamine tetraacetate, sodium salt of diethanol glycine, and sodium salt of polyacrylic acid.

Additionally, tripolyphosphate and pyrophosphate salts may be used. In some embodiments, these phosphate salts may be used as chelating agents. Tripolyphosphate salts have the general formula $X_5P_3O_{10}$ wherein X is an alkali metal cation. Tripolyphosphate may act as a water softener by sequestering the Mg^{2+} and Ca^{2+} in hard water, and may increase surfactant efficiency by lowering the critical micelle concentration and suspending and peptizing dirt particles.

Pyrophosphate salts have the general formula $X_4P_2O_7$ wherein X is an alkali metal cation. Mixtures of chelating agents may also be used.

The composition may comprise greater than or equal to 0% by weight chelating agent. Typically, the composition may also comprise less than about 33% by weight chelating agent, more particularly, less than about 19%, and even more particularly, less than about 6%. In one specific example, the composition could comprise greater than or equal to 0% by weight tripolyphosphate salt. Typically, this composition would comprise less than about 6.8% by weight tripolyphosphate salt, more particularly, less than about 5.1%, and even more particularly, less than about 1.7%. In another specific example, the composition could comprise greater than or equal to 0% by weight pyrophosphate salt. Typically, this composition would comprise less than about 15.0% by weight pyrophosphate salt, more particularly, less than about 5.6%, and even more particularly, less than about 2.8%.

Silicates may form another component of the composition. Silicate is a term used to describe a wide variety of compounds that generally contain silicon, oxygen, and one or more metals, although they also may contain hydrogen. Commercially available silicate products are represented by the general formula $xSiO_2:M_2O$ where M may be either Na^+ or K^+ and x represents the weight ratio of silica (SiO_2) to alkali (M_2O) in the formula. Values for x may range from about 1.6 to about 3.22 for sodium silicates and from about 1.8 to about 2.5 for potassium silicates. Sodium metasilicate is a silicate where the mole ratio of $SiO_2:Na_2O$ is 1:1. Silicates may be in powder or liquid form and may be hydrated or anhydrous.

The composition may comprise greater than or equal to 0% by weight silicate salt. Typically, the composition may also comprise less than about 25.8% by weight silicate salt, more particularly, less than about 13.8%, and even more

particularly, less than about 4.6%. In one specific example, the composition could comprise greater than or equal to 0% by weight sodium silicate. Typically, this composition would comprise less than about 19.1% by weight sodium silicate, more particularly, less than about 12.0%, and even more particularly, less than about 4.0%. In another specific example, the composition could comprise greater than or equal to 0% by weight sodium metasilicate. Typically, this composition would comprise less than about 6.8% by weight sodium metasilicate, more particularly, less than about 1.8%, and even more particularly, less than about 0.6%.

Hydroxide base may form an additional component of the embodiment's composition. Hydroxide bases may be in the form of either hydroxide salts or aqueous solutions of hydroxide salts. Hydroxide salts may have the general formula XOH, wherein X is an alkali metal cation, or $Z(OH)_2$, wherein Z is Ca^{2+}, Sr^{2+} or Ba^{2+}. In one embodiment, the source of hydroxide base is a 50% solution of sodium hydroxide.

The composition may comprise greater than or equal to 0% by weight 50% solution hydroxide base. Typically, the composition may also comprise less than about 18.0% by weight 50% solution hydroxide base, more particularly, less than about 14.0%, and even more particularly, less than about 7.0%.

Xylene sulfonate salt may form another component of the embodiment's composition. Xylene sulfonate salt acts as a hydrotrope to enhance the solubilities of certain slightly soluble organic compounds and has the structure $C_8H_9O_3SX$, wherein X is an alkali metal cation. The composition may comprise greater than or equal to 0% by weight xylene sulfonate salt. Typically, the composition may also comprise less than about 10.0% by weight xylene sulfonate salt, more particularly, less than about 4.2%, and even more particularly, less than about 1.4%.

Water may also be present in the composition. No particular provisions with regard to non-deionized or distilled water are required.

Typically, two premixes will be formulated, and subsequently mixed, to form the composition of the embodiment. The first premix may comprise a fatty acid methyl ester, and at least one of a nonionic surfactant, a cationic surfactant, water and a combination thereof. This premixture may be formed by homogeneously or heterogeneously mixing the different components. In a specific embodiment, each of the previously-recited components will be added to the first premix. The second premix may comprise at least one of a chelating agent, a silicate salt, a hydroxide base, a xylene sulfonate salt and water. These are mixed together in a similar fashion. Typically, the second premix will comprise all of these components. The first premix is then added to the second premix.

In one embodiment, the resulting mixture should be mixed until the mixture "clears." It may take as little as several minutes for clearance, however, at least about one half hour is much more typical. It usually takes less than a few hours for the mixture to clear. More particularly, it usually takes about an hour to about two hours for the mixture to clear. For best results, mixing should be discontinued for at least about one half hour after the mixture "clears." Mixing is usually discontinued for less than about three hours. Preferably, mixing is discontinued for about 2 hours after the mixture clears. Subsequently, the mixture should again be mixed. In one embodiment, the mixture is again mixed for a few minutes to a half hour. More typical, however, is mixing for at least about a half of an hour, and more particularly, at least about an hour. Best results have been obtained when the subsequent mix comprises about an hour.

The embodiment is used in a two-step cleaning process, usually as the first step. While the embodiment will clean in many conditions, its superior performance is best seen under some of the toughest cleaning conditions. Traditionally, one of the toughest conditions has been frictionless cleaning of oily road film from vehicles or equipment using cold water and no dwell time. While all cleaning processes work best at the upper ends of the dwell time and water temperature ranges, from about 1 to about 60 seconds and from about 40° F to about 150° F, respectively, some embodiments of the composition may overcome this difficulty by providing formulations that may be successfully used in frictionless cleaning processes with settings at the low end of these ranges.

The cleaning formulations of the embodiment may be applied directly as a cleaning agent when there is little to no NaOH in the formulation or, more particularly, diluted before application. The dilution ratio of water to cleaning formulation may be greater than 0:1. Typically, the dilution ratio of water to cleaning formulation may also be less than about 3000:1, more particularly, less than about 1000:1, and even more particularly, less than about 100:1. In one embodiment, the formulation may be applied using a dilution ratio of 200:1 at a water temperature of 60° F.

EXAMPLES

The following examples illustrate different embodiments of the invention but are not intended to limit the scope of the formula in any way.

EXAMPLE 1

The composition of one formulation is shown below.

	Mass (grams)
SOYGOLD®[1]	113.6
ENS-70[2]	93.1
Alkyl Bis(ethoxy) Methyl Ammonium Methyl Sulfate (15 EO)	113.6
Nonionic surfactant having 4 ethylene oxides	93.1
Nonionic surfactant having 5.5 ethylene oxides	27.3
Sodium Metasilicate (powder)	63.6
Sodium Tripolyphosphate (powder)	190.8
Sodium Hydroxide (50%)	794.9
Sodium Silicate	453.1
Sodium Xylene Sulfonate	164.6
Water	9,248.0

[1]SOYGOLD® – alkyl C_{16}-C_{18}-methyl esters.
[2]ENS-70 – Secondary Alcohol Nonionic Surfactant

The Example 1 formulation was a combination of a surfactant premix (Premix A) and a salt solution premix (Premix B). Premix B was made by dissolving 63.6 grams Sodium Metasilicate (powder) and 190.8 grams Sodium Tripolyphosphate (powder) in 2 gallons of water. To the mixture was added 794.9 grams of Sodium Hydroxide (50% solution), 453.1 grams Sodium Silicate and 164.6 grams Sodium Xylene Sulfonate. The solution was stirred to ensure adequate mixing. Care was taken to avoid fumes. Premix A was made by adding the following reagents to 113.6 grams of SOYGOLD® with thorough mixing after each addition: 93.1 grams ENS-70; 113.6 grams Alkyl Bis(ethoxy) Methyl Ammonium Methyl Sulfate (15 EO); 27.3 grams nonionic surfactant having 5.5 ethylene oxides; and 93.1 grams nonionic surfactant having 4 ethylene oxides.

Premix A was added to Premix B with stirring. The vessel previously containing Premix A was rinsed once with 1500 mL of water and again with 177 mL of water, whereby the rinsings were added to the surfactant-salt solution mixture followed by vigorous mixing. The mixture was stirred until it took on a dark brown hue.

When the formulation was scaled to 990 gallon batch size, the product was allowed to stir for 1-2 hours. The formulation took on a slightly pink hue immediately upon addition of the surfactant premix to the salt solution. After about 15 minutes, the formulation turned white. The formulation was finished when it took on a dark brown hue in the tank, after about 2 hours.

When a powdered green dye was added to Premix B, little mixing time was required to obtain the final product after the addition of Premix A.

EXAMPLE 2

The composition of another formulation is shown below.

	Mass (grams)
SOYGOLD®[1]	113.6
Alkyl phenol ethoxylate	93.1
Alkyl Bis(ethoxy) Methyl Ammonium Methyl Sulfate (15 EO)	113.6
Nonionic surfactant with 4 ethylene oxides	93.1
Nonionic surfactant with 5.5 ethylene oxides	27.3
Sodium Metasilicate (powder)	63.6
Sodium Tripolyphosphate (powder)	190.8
Sodium Hydroxide (50%)	794.9
Sodium Silicate	453.1
Sodium Xylene Sulfonate	164.6
Water	9,248.0

[1]SOYGOLD® – alkyl C_{16}-C_{18}-methyl esters.

Example 2 was made following the same procedure as described for Example 1 except that an alkyl phenol ethoxylate was substituted for ENS-70. When the formula was scaled to 990 gallon batch size, it took approximately 1 hour of stirring to reach the finished product.

EXAMPLE 3

A prophetic example is shown below.

	Mass (grams)
SOYGOLD®[1]	113.6
ENS-70[2]	93.1
Alkyl Bis(ethoxy) Methyl Ammonium Methyl Sulfate (15 EO)	113.6
Nonionic surfactant having 4 ethylene oxides	93.1
Nonionic surfactant having 5.5 ethylene oxides	27.3
Potassium Pyrophosphate	316.67
Sodium Hydroxide (50% solution)	858.49

Sodium Silicate	558.82
Sodium Xylene Sulfonate	164.6
Water	9,016.42

[1]SOYGOLD® – alkyl C_{16}-C_{18}-methyl esters.
[2]ENS-70 – Secondary Alcohol Nonionic Surfactant

Example 3 may be made following the same procedure as described for Example 2 except that sodium metasilicate is eliminated, potassium pyrophosphate is substituted for sodium tripolyphosphate, and the quantities of the remaining reagents are modified accordingly.

EXAMPLE 4

Another prophetic example is shown below.

	Mass (grams)
SOYGOLD®[1]	113.6
Alkyl phenol ethoxylate	93.1
Alkyl Bis(ethoxy) Methyl Ammonium Methyl Sulfate (15 EO)	113.6
Nonionic surfactant having 4 ethylene oxides	93.1
Nonionic surfactant having 5.5 ethylene oxides	27.3
Potassium Pyrophosphate	316.67
Sodium Hydroxide (50% solution)	858.49
Sodium Silicate	558.82
Sodium Xylene Sulfonate	164.6
Water	9,016.42

[1]SOYGOLD® – alkyl C_{16}-C_{18}-methyl esters.

Example 4 may be made following the same procedure as described for Example 3 except that an alklyl phenol ethoxylate may substituted for ENS-70.

CLAIMS

1. A cleaning composition comprising a fatty acid methyl ester and at least one of a nonionic surfactant, a cationic surfactant, a chelating agent, a silicate salt, a xylene sulfonate salt, a hydroxide base, and a combination thereof.

2. The composition of claim 1, wherein the fatty acid methyl ester comprises a compound having the formula RCO_2CH_3, wherein R is a branched or unbranched, saturated or unsaturated aliphatic group having from 3 to 30 carbon atoms.

3. The composition of claim 1 comprising greater than 0.0 % and less than about 5.0% by weight fatty acid methyl ester.

4. The composition of claim 1, wherein the composition comprises a nonionic surfactant.

5. The composition of claim 4, wherein the nonionic surfactant comprises a secondary alcohol nonionic surfactant.

6. The composition of claim 5 comprising greater than 0.0% and less than about 20.0% by weight nonionic surfactant.

7. The composition of claim 1, wherein the composition comprises a cationic surfactant.

8. The composition of claim 7, wherein the cationic surfactant comprises a bis(ethoxylated) ammonium quaternary compound.

9. The composition of claim 7 comprising greater than 0.0% and less than about 25.0% by weight cationic surfactant.

10. The composition of claim 1, wherein the composition comprises a chelating agent.

11. The composition of claim 10, wherein the chelating agent comprises at least one of a tripolyphosphate, a pyrophosphate salt, and a combination thereof.

12. The composition of claim 8 comprising greater than 0.0% and less than about 33.0% by weight chelating agent.

13. The composition of claim 3 comprising at least one of a nonionic surfactant, a cationic surfactant, and a chelating agent.

14. A cleaning pre-mixture comprising:

premix A comprising a fatty acid methyl ester; and

premix B comprising a salt solution.

15. The pre-mixture of claim 14, wherein premix A further comprises at least one of a nonionic surfactant, a cationic surfactant and a combination thereof.

16. The pre-mixture of claim 14, wherein premix A further comprises a nonionic surfactant and a cationic surfactant.

17. The pre-mixture of claim 14, wherein premix A further comprises at least one alkyl phenol having an alkyl group containing from about 8 to about 15 carbon.

18. The pre-mixture of claim 14, wherein premix B comprises at least one of a metasilicate, a chelating agent and a combination thereof.

19. The pre-mixture of claim 14, wherein premix B comprises a metasilicate and a chelating agent.

20. The pre-mixture of claim 14, wherein premix B comprises at least one of a phosphate, a silicate, and combination thereof.

21. A method of formulating a cleaning composition, the method comprising:

adding a fatty acid methyl ester to at least one of a nonionic surfactant, a cationic surfactant, a chelating agent, a silicate salt, a xylene sulfonate salt, a hydroxide base and a combination thereof to form the cleaning composition.

22. The method of claim 21, further comprising adding a nonionic surfactant.

23. The method of claim 22, wherein the nonionic surfactant comprises a secondary alcohol nonionic surfactant.

24. The method of claim 22, wherein the nonionic surfactant comprises at least one of an alcohol with four ethylene oxides, an alcohol with 5.5 ethylene oxides, and a combination thereof.

25. The method of claim 22, further comprising adding a cationic surfactant.

26. The method of claim 25, wherein the cationic surfactant comprises a bis(ethoxylated) ammonium quaternary compound.

27. The method of claim 25, further comprising adding at least one of silicate, a tripolyphosphate salt, a pyrophosphate, a hydroxide, a sulfonate and a combination thereof.

28. The method of claim 22, wherein the nonionic surfactant comprises at least one alkyl phenol having an alkyl group containing from about 8 to about 15 carbon.

29. A method of formulating a cleaning composition, the method comprising

adding premix A of claim 14 to premix B of claim 14 to form a mixture;

initially mixing the mixture for at least about one half of an hour;

discontinuing mixing for at least about one half of an hour; and

mixing for at least about one half of an hour.

30. The method of claim 29, wherein the mixing is discontinued for about two hours.

31. The method of claim 29, wherein the mixture is initially mixed for about one hour to about two hours.

32. The method of claim 31, wherein the mixing is discontinued for about two hours.

33. The method of claim 29, wherein premix A further comprises at least one of a nonionic surfactant, a cationic surfactant and a combination thereof.

34. The method of claim 29, wherein premix A further comprises a nonionic surfactant and a cationic surfactant.

35. The method of claim 29, wherein premix A further comprises at least one alkyl phenol having an alkyl group containing from about 8 to about 15 carbon.

36. The method of claim 29, wherein premix B comprises at least one of a metasilicate, a chelating agent and a combination thereof.

37. The method of claim 29, wherein premix B comprises a metasilicate and a chelating agent.

38. The method of claim 29, wherein premix B comprises at least one of a phosphate, a silicate, and combination thereof.

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