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(71) Applicant: **THE PROCTER & GAMBLE
COMPANY**
One Procter & Gamble Plaza
Cincinnati Ohio 45202(US)

(72) Inventor: **Corn, Ian**
Klauwaartslaan 39
B-1820 Strombeek-Bever(BE)
Inventor: **De Waele, Johan Karel Emma**
Voorjaarsstraat 44/3
B-2610 Wilrijk(BE)
Inventor: **Evers, Mark**
Jozef Van Elewijckstraat 26
B-1820 Strombeek-Bever(BE)
Inventor: **König, Axel**
St. Erasmuslaan 3
B-1810 Wemmel(BE)

(74) Representative: **Canonici, Jean-Jacques et al**
Procter & Gamble European Technical
Center N.V. Temselaan 100
B-1853 Strombeek-Bever(BE)

(54) **Hard-surface cleaning compositions.**

(57) Liquid hard surface cleaning composition as described which comprises anionic surfactant ammonium salts, ethanol, n-butoxypropanol and a primary or secondary alcohol having a C₅ alkyl branched or linear. The composition which may also comprise ammonium and n-propoxypropanol are especially suitable for use as a spray composition.

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HARD-SURFACE CLEANING COMPOSITIONS

Technical field

5 The invention relates to a hard surface cleaning composition which provides at the same time good cleaning performance and good shine. The compositions of the invention are especially suitable for use as a spray cleaning composition.

Background

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Hard surface cleaning compositions are well known in the art and their cleaning performances have been well improved over the years. While focusing on cleaning performances, a new problem has been encountered in that good shine results were not obtained with these compositions, unless the surface which had been cleaned had also been rinsed afterwards, i.e., that good shine performance was incompatible with
15 good cleaning performance, in a non rinse-type hard surface cleaner. Indeed, when used, most compositions leave streaking traces and/or a residual film on the cleaned surfaces which, as a consequence, do not have a good appearance.

Such problem is particularly a nuisance when the hard surface cleaner is used to clean windows or mirrors, because the residual film is even more apparent.

20 As far as windows are concerned, compositions have been formulated which yield "volatile" cleaners, which deal efficiently with this problem; such compositions, however, may not be used to clean all surfaces because they often contain solvents which tend to dissolve some materials. Additionally, these compositions have other negatives such as inflammability and noxious odor.

US 3,591,510 discloses hard surface cleaners which contain surfactants possibly in the form of their
25 ammonium salt, a solvent mixture, and a water soluble builder.

US3,591,509 discloses compositions containing surfactants possibly present in the form of their ammonium salt, a solvent mixture, a water soluble builder and a water soluble carboxymethylcellulose.

GB 2 160 887 discloses a composition containing an anionic surfactant, water soluble and water insoluble alcohols and an organic solvent.

30 J 62034998 discloses compositions containing an anionic surfactant salt, a water soluble solvent, sodium or potassium hydroxide, and monoethanolamine.

J 58101198 discloses compositions containing alkanolamine, a mixture of anionic and nonionic surfactant and polypropylene glycol.

UK application 89-09157.3 which is unpublished at the date of filing of this application discloses
35 compositions containing anionic surfactant ammonium salts, mono- and/or di- and/or tri- ethanolamine, or mixtures thereof and a solvent system.

It is an object of the present invention to provide liquid, hard surface cleaning compositions which have good cleaning performance as well as good shine performance, i.e. which are suitable on a non-rinse use.

40 It is another object of the present invention to provide liquid, hard surface cleaning compositions which can be used on all surfaces, and which are especially efficient on glass.

It is still another object of the invention to provide a hard surface cleaner which is suitable for use with any dispensing means, especially with a spray dispenser.

Other objects and advantages of the present invention will appear from the following description.

45

Summary of the invention

The invention provides hard surface cleaning compositions which have a pH of in the range of from 6 to 11 and which comprise

- 50 - from 0.04% to 0.6% by weight of the total composition of anionic surfactants ammonium salts,
 - from 0% to 0.5% by weight of the total composition of ammonia,
 - from 1% to 9% by weight of the total composition of ethanol,
 - from 0.5% to 3% by weight of the total composition of n-butoxypropanol,
 - from 0% to 3% by weight of the total composition of n-propoxypropanol,
 - from 0.5% to 3% of a primary or secondary monoalcohol having a C₅ unsubstituted alkyl branched on

linear chain, or mixtures thereof.

The compositions are substantially free of monoethanolamine, diethanolamine, triethanolamine or mixtures thereof.

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Detailed description of the invention

The compositions of the invention contain anionic surfactants ammonium salts, at a level ranging from 0.04% to 0.6%, preferably from 0.07% to 0.45% by weight of the total composition.

10 The anionic surfactants for use herein include alkyl benzene sulfonates or sulfates, paraffin sulfonates, olefin sulfonates, sulfonates of fatty acids and of fatty acid esters and the like which are well known in the detergency art. Also suitable are ethoxylated species such as alkyl polyethoxy sulfates and sulfosuccinates.

Preferred surfactants for use herein are C₈-C₁₈ alkyl benzene sulfonates and C₈-C₁₈ alkyl polyethoxy sulfates.

15 Most preferred for the working of the invention, is a mixture of C₈-C₁₈ linear alkyl benzene sulphonate and a 3 times ethoxylated C₈-C₁₈ alkyl sulfate.

All anionic surfactants are present in the composition in the form of their ammonium salts.

The compositions of the invention also further contain a specific solvent mixture which consists of from 1% to 9% by weight of the total composition, preferably from 8% to 9%, of ethanol, from 0.5% to 3% by 20 weight of the total composition, preferably from 1.5% to 2%, of n-butoxypropanol, and from 0.5% to 3% by weight of the total composition, preferably from 1.5% to 2%, of a primary or secondary monoalcohol having a C₅ alkyl unsubstituted linear or branched chain, or mixtures thereof.

This definition comprises 1-pentanol, 2-pentanol, 3-pentanol, 2-methyl-1-butanol, neopentyl alcohol, 3-methyl-2-butanol, and isoamyl alcohol.

25 Preferably, this alcohol is selected from 2-pentanol, n-pentanol, and isoamylalcohol. Highly preferred for use in the present compositions is 2-pentanol.

Importantly, the tertiary alcohol according to this formula (tertiary amyl alcohol) is not suitable for use in the compositions of the invention.

The solvent system of the present invention may additionally comprise n-propoxypropanol, up to 3% by 30 weight of the total composition.

The composition of the invention preferably contains ammonia, in amounts up to 0.5% by weight of the total composition.

Depending on presence of ammonia, the compositions of the invention have a pH which is in the range of from 9 to 11 (if the composition contains ammonia), or in the range of from 6 to 9 (if the compositions are 35 free of ammonia).

The compositions of the invention are substantially free of monoethanolamine, diethanolamine, triethanolamine and mixtures thereof.

The compositions of the invention may additionally contain very low amounts, specifically below 0.2%, of builders such as nitrilotriacetates, polycarboxylates, nitrates, water soluble phosphates, silicates, ethylene 40 diamine tetraacetate (EDTA), amino polyphosphonates, phosphates and mixtures thereof.

The compositions of the invention are obtained by mixing all the ingredients together; the hard surface cleaners thus obtained are suitable for use in any dispensing means currently used in this technological field, but preferably, they will be used as spray cleaners. These compositions are suitable for use on all surfaces, especially on windows or any glass material.

45 The composition of the invention may contain optionals at conventional levels; such optionals include perfumes, dyes, optical brighteners, thickeners, soil suspending agents, enzymes, freeze thaw, bactericides and preservatives.

Example 1

50

The following composition according to the invention is prepared by mixing all ingredients (percentages are by weight of total composition)

0.15% Linear alkyl benzene sulfonate ammonium salt

55 1.5% n-butoxy propanol

1% ethanol

1.5% 2-pentanol

0.1% ammonia

up to 100% water and miscellaneous
the compositions of the invention have a pH of 10

This composition was compared to a reference compositions of the following formula, as a representative of the prior art:

- 5 0.15% Linear alkyl benzene sulfonate ammonium salt
9% ethanol
1.5% n-butoxy propanol
0.75% n-propoxy propanol
up to 100% water and minors

- 10 These two compositions were compared for their shine performance (on mirrors) as well as for their cleaning performance.

The cleaning performance was evaluated on synthetic soils as described in the following :

- KD soil : is composed of 25% HSW^R soil with carbon black (2), 37.5% Crisco^R(1) oil, 37.5% Puritan^R (1) oil.
This soil is rolled onto stainless steel plates (beforehand cleaned with a detergent and then with alcohol)
15 using a paint roller. A very thin uniform layer is needed since the soil is difficult to cure. The plates are placed in the oven at 115° C ("soft soil") or 170° C ("hard soil") for 2 hours and then allowed to age at least 1 day.

(1) commercial cooking oil sold by The Procter & Gamble Company

(2) commercial soil sold by Chem Pack Inc., U.S.A.

- 20 The test conditions were as follows :

All tests were run with the aid of an Erichsen washability machine. A sponge of approximately 9,5 x 5 x 4 cm was used after being carefully washed under hot running water and squeezed through drying rolls. 5g. of the undiluted cleanser to be tested on spread over one side of the sponge. The number of strokes of the cleaning machine needed to clean the plates were counted.

- 25 The cleaning performance testing results are the following :

	KD Hard soil	KD Soft soil
	(# strokes)	
Reference	110	34
Invention	30	2

35

The shine performance was evaluated on mirrors; using the compositions either in "spray mode", or in "foam-mode"; the spray mode refers to the use of a conventional spray dispenser, whereas the foam mode refers to the use of a spray dispenser equipped with a sieve, i.e. a foaming device. The composition on the mirror is then wiped, using three different cloths :

- 40 Kitchen = dry cotton towel

Cif Ballerina R (wet cloth), commercially available

Domex R paper towel, commercially available

The degree of filming/streaking is visually evaluated by 3 judges working independently using a 0-4 scale, whereby 0 = no difference and 4 = great difference.

- 45 The results are :

PSU Grades		
	Spray	Foam
Kitchen	+ 0,25	0
Cif Ballerina	+ 0,08	+ 0,41
Domex	0	+ 1,17

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The above results show that the composition of the invention exhibit outstanding cleaning performance, and at least as good shine results as the reference compositions.

		Examples			
		no. 2	no. 3	no. 4	no. 5
		% by weight of the total composition			
5	NH ₄ Linear alkyl benzene sulphonate :	0.1	0.2	0.15	0.2
	Ammonia :	0.2	0.1	0	0.15
	Ethanol :	8	9	7	6
	n-Butoxypropanol :	1.5	1	3	2
10	n-propoxypropanol :	0	0.5	1	1.5
	Primary or secondary monoalcohol having a C ₅ alkyl unsubstituted linear or branched chain :	2 (2-pentanol)	1.5 (1-pentanol)	2 (isoaryl alcohol)	1.5 (2-methyl-1-Bytoxy)
15	Water and minors :	up to 100%			

20 Claims

1. A hard surface cleaning composition which is substantially free of monoethanolamine, diethanolamine and triethanolamine comprising
 - from 0.04% to 0.6% of the total composition of anionic surfactant ammonium salt,
 - 25 - from 0% to 0.5% of ammonia
 - from 1% to 9% ethanol
 - from 0.5% to 3% of n-butoxypropanol
 - from 0% to 3% of n-propoxypropanol
 - from 0.5% to 3% of a primary or secondary monoalcohol having a C₅ alkyl branched or linear chain, or mixtures thereof.
2. A hard surface cleaning composition according to claim 1, which comprises
 - from 0.1% to 0.2% of the total composition of anionic surfactant ammonium salt,
 - from 0.1% to 0.2% of ammonia
 - from 8% to 9% ethanol
 - 35 - from 1.5% to 2% n-butoxypropanol
 - from 1.5% to 2% of a C₅ branched or linear monoalcohol
3. A hard surface cleaning composition according to claim 1 or 2 wherein the monoalcohol having a C₅ alkyl branched or linear chain is 2-pentanol.
4. A hard surface cleaning composition according to any of the preceding claims characterized in that it has a pH in the range of from 6 to 11.
5. A hard surface cleaning composition according to claim 4 characterized in that it has a pH in the range of from 6 to 9, and it is substantially free of ammonia.
6. A hard surface cleaning composition according to claim 4 characterized in that it has a pH in the range of from above 9 to 11, and it contains ammonia.
- 45 7. The use of the hard surface cleaning compositions according to any of the preceding claims as a spray composition.



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EUROPEAN SEARCH REPORT

Application Number

EP 89 87 0186

DOCUMENTS CONSIDERED TO BE RELEVANT			
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int. Cl.5)
A	EP-A-0 261 874 (PROCTER & GAMBLE) * Page 3, lines 24-51; examples; claims *	1	C 11 D 3/43
A	US-A-4 152 306 (L. DE MATTEO, Jr.) * Column 5, lines 53-63; claims * ---	1	
A	EP-A-0 288 858 (HENKEL) * Examples * -----	1	
			TECHNICAL FIELDS SEARCHED (Int. Cl.5)
			C 11 D
The present search report has been drawn up for all claims			
Place of search THE HAGUE		Date of completion of the search 04-07-1990	Examiner GOLLER P.
CATEGORY OF CITED DOCUMENTS X : particularly relevant if taken alone Y : particularly relevant if combined with another document of the same category A : technological background O : non-written disclosure P : intermediate document T : theory or principle underlying the invention E : earlier patent document, but published on, or after the filing date D : document cited in the application L : document cited for other reasons & : member of the same patent family, corresponding document			