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(54) **Detergent compositions**

Detergenszusammensetzungen

Compositions détergentes

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Description

Field of the Invention

This invention relates to detergent compositions, particularly but not exclusively to built detergent compositions for washing fabrics.

Background of the Invention

Detergent compositions traditionally contain one of more detergent active materials in addition to various other ingredients such as detergency builders, bleaches, flourescers, perfumes etc. Notable applications of detergent compositions are to clean fabrics, usually by washing portable fabric items in a bowl or in a washing machine, to clean crockery and cooking utensils, again by washing in a bowl (hand dishwashing), and to clean hard surfaces such as glass, glazed surfaces, plastics, metals and enamels. A number of classes of surfactant materials have been used as detergent active materials, including anionic and nonionic materials.

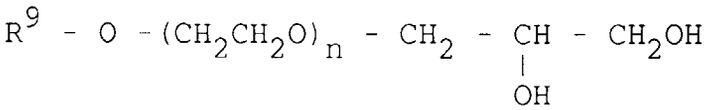
One known category of nonionic surfactants are compounds which are often known as alkylpolyglycosides. These are of the general formula

$$RO\,(R'O)_t\,(G)_x \qquad (I)$$

in which R is an organic hydrophobic residue, R'O is an alkoxy group which may be absent because t can be zero, and G is a saccharide residue and x is at least unity. A more detailed definition is set out hereinafter.

We have now found that a combination of alkylpolyglycoside with certain unethoxylated nonionic surfactants provides unexpected advantages. Such combinations have been found to give a synergistic benefit of enhanced oily/fatty soil detergency. Furthermore, such combinations have been found to provide stable structured liquid detergent compositions containing significant levels of nonionic surfactant. By eliminating ethylene oxide groups from the nonionic surfactant, aquatic toxicity is reduced and the possibility of carcinogenic contamination removed.

EP 75 995A and EP 75 996A (Procter & Gamble) disclose alkylpolyglycosides in combination with various nonionic surfactants. Among the numerous classes of nonionic cosurfactants disclosed are ethoxylated nonionic alcohol surfactants, optionally together with glyceryl ethers of the general formula



wherein R^9 is a C_{8-18} alkyl or alkenyl group or a C_{5-14} alkaryl group and n is from 0 to 6.

The use of these materials is disclosed in minor proportions in combination with major proportions of ethoxylated alcohol nonionic surfactants, such as C_{12-13} 3EO and 6.5EO ethoxylates.

Definiton of the invention

According to the present invention there is provided a detergent composition having a surfactant mixture consisting of:

(i) an alkylpolyglycoside of the general formula

$$RO(R'O)_t\,(G)_x$$

in which R is a linear or branched alkyl, alkenyl, hydroxyalkyl or hydroxyalkenyl group or an aryl, alkyl-aryl, alkenyl-aryl or hydroxy alkyl-aryl aryl group, R containing from 8 to 20 carbon atoms, preferably 10 to 20 carbon atoms, R' is an alkylene group containing from 2 to 4 carbon atoms, G is a saccharide residue containing 5 or 6 carbon atoms, t is in the range of from 0 to 25 and x is in the range of from 1 to 10;

(ii) an unethoxylated nonionic surfactant which is an ether of the formula

$$R^3OZ$$

wherein R^3 is an organic hydrophobic residue having from 7 to 20 carbon atoms and Z denotes part of a polyhydric alcohol whose formula is HOZ and which has 2 to 4 carbon atoms,
the total amount of (i) and (ii) constituting from 75 to 100% by weight of the surfactant mixture, and the ratio of (i) to (ii) being within the range of from 4:1 to 3:2, (iii) optionally a further nonionic surfactant having an HLB value greater than 10.5, in an amount not exceeding 25 wt% of the total surfactant mixture.

The weight ratio of the alkyl polyglycoside and the unethoxylated nonionic surfactant (ii) lies within a range of from 4:1 to 3:2. The preferred ratio of the surfactants will depend on the specific surfactants and the nature of the product.

For structured liquids it will generally be desirable to achieve both good stability and good but not necessarily optimum detergency. For particulate compositions it may be possible to optimise detergency.

The weight ratio range which gives synergy will vary depending on the specific surfactants used and can be determined by experiment.

The invention also provides a method of washing which comprises contacting fabrics, or an inanimate surface to be cleaned, with a composition according to this invention or a wash liquor obtainable by adding the composition to water, notably in an amount ranging from 0.5 to 50 grams of composition per litre of water.

The alkylpolyglycoside (i)

In the general formula

$$RO(R'O)_t\,(G)_x$$

the hydrophobic group R is straight or branched alkyl, alkenyl, hydroxyalkyl or hydroxyalkenyl. However, it may include an aryl, alkyl-aryl, alkenyl-aryl or hydroxyalkyl-aryl group. Particularly preferred is that R is alkyl or alkenyl of 8 to 16 carbon atoms.

The value of t in the general formula above in the range from 0 to 25 and is preferably zero, so that the $-(RO)_t-$ unit of the general formula is absent. In that case the general formula becomes

$$RO(G)_x \qquad (II)$$

If t is non-zero it is preferred that R'O is an ethylene oxide residue. Other likely possibilities are propylene oxide and glycerol residues. If the parameter t is non-zero so that R'O is present, the value of t (which may be an average value) will preferably lie in the range from 0.5 to 10.

The group G is a saccharide residue containing 5 or 6 carbon atoms typically derived from fructose, glucose, mannose, galactose, talose, gulose, allose, altrose, idose, arabinose, xylose, lyxose and/or ribose. Preferably, the G is provided substantially exclusively by glucose units.

The value x, which is an average, is usually termed the degree of polymerisation. x is in the range of from 1 to 10 and desirably x varies between 1 and 8. Values of x may lie between 1 and 3, especially 1 and 1.8.

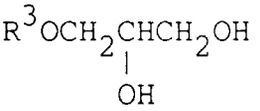
Polyglycosides of particular interest have x in the narrow range from 1 or 1.2 up to 1.4 or especially 1.3. If x exceeds 1.3 it preferably lies in the range 1.3 or 1.4 to 1.8.

When x lies in the range 1 to 1.4 it is preferred that R is C_8 to C_{14} alkyl or alkenyl. The even narrower range of C_8 to C_{12} may be used.

The nonionic surfactant (ii)

These specified nonionic surfactants are generally hydrophobic in character. This is manifested by formation of a turbid dispersion rather than an isotropic solution when placed, alone, in deionised water at a surfactant concentration of 1% or more by weight.

The cosurfactants are typically monoglyceryl ethers of the formula



in which R^3 is as specified previously, ie an organic hydrophobic residue of 7 to 20 carbon atoms. R^3 is preferably a saturated or unsaturated aliphatic residue. In particular R^3 may be linear or branched alkyl or alkenyl. More preferably, R^3 is a substantially linear alkyl or alkenyl moiety having from 8 to 16 carbon atoms, notably a C_8-C_{12} alkyl moiety. Most preferably, R^3 is decyl, undecyl or dodecyl.

The monoglyceryl ethers of alkanols are known materials and can be prepared, for example, by the condensation of a higher alkanol with glycidol. Glycerol monoesters are of course well known and available from various suppliers including Alkyril Chemicals Inc.

Further surfactants

Detergent compositions of the invention may contain a further surfactant (iii). The amount of this additional surfactant does not exceed 25%, and may even be less than 10%, by weight of the overall surfactant mixture.

The further surfactant is a nonionic surfactant with an HLB value greater than 10.5. This may for instance be ethoxylated fatty alcohol.

Compositions of this invention will generally contain a surfactant mixture consisting of (i) the specified alkylpolyglycoside, (ii) the specified nonionic surfactant and (iii) optionally a further specified nonionic surfactant, in a total amount which is from 1 to 60% by weight of the composition.

Preferred amounts are 2 to 45%, better 5 to 40% or 35%. The amount of the specified surfactants (i) and (ii) may itself be at least 2% or at least 5% of the overall composition.

Other ingredients

The compositions of the invention may contain an electrolyte, for instance present in such an amount to give a concentration of at least 0.01 molar, when the composition is added to water at a concentration of 1 g/litre. Electrolyte concentration may possibly be higher such as at least 0.05 or 0.1 molar especially if the composition is of solid form: liquid compositions generally limit electrolyte for the sake of stability. 1 g/litre is approximately the lowest level at which detergent compositions for fabric washing are used in usual practice. More usual is usage at a level of 4 to 50 g/litre. The amount of electrolyte may be such as to achieve an electrolyte concentration of 0.01 molar, most preferably at least 0.1 molar, when the composition is added to water at a concentration of 4 g/litre.

If the composition of the invention is intended as a fabric washing composition it will generally contain detergency builder in an amount from 7 to 70% by weight of the composition.

If it is in solid form, the composition is likely to contain at least 10 or 15% of builder.

It is desirable that the compositions according to the invention be approximately neutral or at least slightly alkaline, that is when the composition is dissolved in an amount to give surfactant concentration of 1 g/l in distilled water at 25°C the pH should desirably be at least 7.5. For solid compositions the pH will usually be greater, such as at least 9. To achieve the required pH, the compositions may include a water-soluble alkaline salt. This salt may be a detergency builder (as described in more detail below) or a non-building alkaline material.

When the compositions of the invention contain a detergency builder material, this may be any material capable of reducing the level of free calcium ions in the wash liquor and will preferably provide the compositions with other beneficial properties such as the generation of an alkaline pH and the suspension of soil removed from the fabric.

Examples of phosphorus-containing inorganic detergency builders, when present, include the water-soluble salts, especially alkali metal pyrophosphates, orthophosphates, polyphosphates and phosphonates. Specific examples of inorganic phosphate builders include sodium and potassium tripolyphosphates, ortho phosphates and hexametaphosphates.

Examples of non-phosphorus-containing inorganic detergency builders, when present, include water-soluble alkali metal carbonates, bicarbonates, silicates and crystalline and amorphous alumino silicates. Specific examples include sodium carbonate (with or without calcite seeds), potassium carbonate (with or without calcite seeds), sodium and potassium bicarbonates and silicates.

Examples of organic detergency builders, when present include the alkali metal, ammonium and substituted ammonium polyacetates, carboxylates, polycarboxylates, polyacetyl carboxylates and polyhydroxysulphonates. Specific examples include sodium, potassium, lithium, ammonium and substituted ammonium salts of ethylenediaminetetraacetic acid, nitrilotriacetic acid, oxydisuccinic acid, melitic acid, benzene polycarboxylic acids and citric acid. Further pos-

sibilities are tartrate monosuccinates, tartrate disuccinates, dipicolinic acid, cheledamic acid, carboxymethyloxysuccinate and hydroxyethyl imino diacetic acid.

Examples of other optional ingredients which may be present in the composition are polymers containing carboxylic or sulphonic acid groups in acid form or wholly or partially neutralised to sodium or potassium salts, the sodium salts being preferred. Preferred polymers are homopolymers and copolymers of acrylic acid and/or maleic acid or maleic anhydride. Of especial iterest are polyacrylates, polyalphahydroxyacrylates, acrylic/maleic acid copolymers, and acrylic phosphinates. Other polymers which are especially preferred for use in liquid detergent compositions are deflocculating polymers such as for example disclosed in EP 346 995A (Unilever).

The molecular weights of homopolymers and copolymers are generally 1000 to 150 000, preferably 1500 to 100 000. The amount of any polymer may lie in the range from 0.5 to 5% by weight of the composition. Other suitable polymeric materials are cellulose ethers such as carboxy methyl cellulose, methyl cellulose, hydroxy alkyl celluloses, and mixed ethers, such as methyl hydroxy ethyl cellulose, methyl hydroxy propyl cellulose, and methyl carboxy methyl cellulose. Mixtures of different cellulose ethers, particularly mixtures of carboxy methyl cellulose and methyl cellulose, are suitable.

Polyethylene glycol of molecular weight from 400 to 50 000, preferably from 1000 to 10 000, and copolymers of polyethylene oxide with polypropylene oxide are suitable as also are copolymers of polyacrylate with polyethylene glycol. Polyvinyl pyrrolidone of molecular weight of 10 000 to 60 000 preferably of 30 000 to 50 000 and copolymers of polyvinyl pyrrolidone with other poly pyrrolidones are suitable. Polyacrylic phosphinates and related copolymers of molecular weight 1000 to 100 000, in particular 3000 to 30 000 are also suitable.

Further examples of other ingredients which may be present in the composition include fabric softening agents such as fatty amines, fabric softening clay materials, lather boosters such as alkanolamides, particularly the monoethanolamides derived from palm kernel fatty acids and coconut fatty acids, lather depressants, oxygen-releasing bleaching agents such as sodium perborate and sodium percarbonate, typically accompanied by peracid bleach precursors, organic peracids, chlorine-releasing bleaching agents such as trichloroisocyanuric acid, inorganic salts such as sodium sulphate, and, usually present in very minor amounts, fluorescent agents, perfumes including deodorant perfumes, enzymes such as cellulases, proteases, lipases and amylases, germicides and colourants.

Product forms

The detergent compositions according to the invention may be in any suitable form including powders, bars, liquids and pastes. For example suitable liquid compositions may be non-aqueous or aqueous, the latter being either isotropic or lamellar structured. The compositions may be prepared by a number of different methods according to their physical form. In the case of granular products they may be prepared by dry-mixing, coagglomeration, spray-drying from an aqueous slurry or any combination of these methods.

One preferred physical form is a granule incorporating a detergency builder salt. This may be prepared by conventional granulation techniques or spray drying.

Another preferred physical form is a lamellar structured aqueous liquid. Structuring a liquid by means of surfactant is well known and may be utilised to provide consumer-preferred flow properties, and/or turbid appearance. Also many liquids in which the surfactant mixture provides structure are capable of suspending particulate solids such as detergency builders and abrasives. For such forms, alkyl polyglycosides which are particularly suitable have a HLB of at least 12.0 and in the formula

$$RO\ (R'O)_t(G)_x$$

t is zero or 1 to 3, preferably zero, while
x is 1 to 3, especially 1 to 1.8.

The aqueous continuous phase will usually contain some dissolved electrolyte. Electrolyte may be dissolved only in the aqueous continuous phase or may also be present as suspended solid particles. Particles of solid materials which are insoluble in the aqueous phase may be suspended alternatively or in addition to any solid electrolyte particles.

Although structured liquids require some electrolyte to be present in the continuous phase, the amount which is present generally has to be limited for the sake of stability. When the present invention takes the form of a structured liquid, an advantage is that the structuring conferred by the surfactant mixture of the invention will tolerate a substantial amount of electrolyte.

Three common product forms which are of the structured liquid types are liquids for heavy duty fabrics washing, liquid abrasives and general purpose cleaners.

In the first class, the suspended solid can comprise suspended solids which are substantially the same as the

dissolved electrolyte, being an excess of same beyond the solubility limit. This solid is usually present as a detergency builder, i.e. to counteract the effects of calcium ion water hardness in the wash.

In the second class, the suspended solid usually comprises a particulate abrasive, insoluble in the system. In that case the electrolyte, present to contribute to the structuring of the active material in the dispersed phase, is generally different from the abrasive compounds. In certain cases, the abrasive can however comprise partially soluble salts which dissolve when the product is diluted.

In the third class, the structure is usually used for thickening the product to give consumer- preferred flow properties, and sometimes to suspend pigment particles.

The invention will now be further illustrated by the following non-limiting Examples, in which parts and percentages are by weight unless otherwise stated.

EXAMPLES

Example 1

Aqueous wash liquors were prepared containing the following materials in deionised water.

Alkyl polyglycoside)	
)	**1 g/litre**
Decyl monoglyceryl ether)	
Sodium metaborate	**0.05 molar**

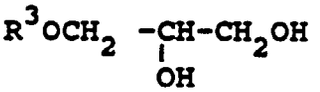
These quantities would be typical of using 6 g/litre of a particulate detergent product containing 16.7 % by weight surfactant. The wash liquors had pH of about 10, resulting from the presence of the metaborate.

The alkylpolyglycoside was APG 300 from Horizon Chemical Co. This was of the formula

$$RO(G)_x$$

where R is a 9 to 11 carbon alkyl chain, G is glucose and x has an average value of 1.4.

The decyl monoglyceryl ether was from Unichema. Its formula was



where R^3 was C_{10} alkyl.

Wash liquors were prepared with various ratios of the two surfactants and used to wash polyester test cloths soiled with radiolabelled triolein. Washing was carried out at 40°C for 20 minutes in a Tergotometer.

The removal of triolein was determined and the results are set out in Table 1 below.

Example 2

Example 1 was repeated using a different alkylpolyglycoside. APG 500 from Horizon was used. This has the formula

$$R(G)_x$$

where R is C_{12} and C_{13} alkyl, G is glucose and x is 1.4.

Results are set out in Table 2 below.

TABLE 1

Ratio APG 300/Cosurfactant	% Triolein removal
	Example 1
100/0	58.9
80/20	62.4
60/40	41.5
40/60	8.3
20/80	4.5
0/100	4.2

TABLE 2

Ratio APG 500/Cosurfactant	% Triolein removal
	Example 2
100/0	45.3
80/20	57.3
60/40	46.9
40/60	12.1
20/80	4.3
0/100	4.2

It can be seen from the tables that in every example there is a mixture of surfactants which gives better triolein removal than either individual surfactant.

Examples 3 and 4

Structured liquid compositions were prepared with the formulations given below. In each case the formulations were prepared by mixing the nonionic surfactants together and then dispersing this premix into a mixture of water and the other ingredients.

The alkylpolyglycoside was APG 600 from Horizon which has the formula

$$RO(G)_x$$

where R is derived from coconut, and is C_{12} to C_{16}, predominantly C_{12} and C_{14}, G is glucose and x has an average value of 1.4.

The monoglyceryl ether was the same as used in Example 1.

Synperonic A7 is C_{13}-C_{15} alcohol ethoxylated with an average of 7 ethylene oxide residues. HLB value is 11.7.

The formulations were:

	%	
	3	4
APG 600	9.1	10.8
Monoglyceryl ether	5.5	4.6
Synperonic A7	3.6	-
Sodium citrate dihydrate	9.1	23.1
Deionised water	--- balance ---	

The compositions were stable and showed no phase separation on storage for at least one week at ambient temperatures.

The pH of the compositions was approximately 7.5.

Example 5

A structured liquid composition was prepared by adding the ingredients in the following order: Water, fluorescer, zeolite, APG (as 50% active material in water), citrate, citric acid, glycerol, borax, a premix of Synperonic A7 and the glyceryl ether, then remaining ingredients. The formulation was:

	%
APG 600	6.6
Synperonic A7	2.6
Glyceryl ether	3.9
Borax decahydrate	2.3
Sodiumcitrate dihydrate	2.1
Citric acid	0.9
Zeolite 4A (80%)	24.0
Narlex LD31	0.2
DB 100	0.2
Tinopal CBS-X	0.1
Alcalase 2.34 L	0.5
Water	balance

The glyceryl ether was the same material as used in Examples 1 and 3.

Narlex LD31 is a polyacrylate having a molecular weight of about 4000, ex National Starch;

DB 100 is a silicone antifoam material ex Dow Corning.

Tinopal CBS-X is a fluorescer material.

The composition did not show any phase separation upon storage for 2 months at ambient temperature, the viscosity of the product was 830 mPas at 21 s^{-1}, the pH of the product was 8.1.

Examples 6 and 7

Two suitable formulations for a granular detergent composition are as follows:

	%	
	6	7
(i) alkylpolyglycoside)) (ii) specified nonionic surfactant)	13	21
Sodium silicate	0.8	0.8
Zeolite (builder)	24	32
Copolymer of acrylic and maleic acids	4	6
Sodium carbonate	12	15
Sodium carboxymethyl cellulose	0.5	0.5
Sodium perborate monohydrate	8	8
Tetraacetyl ethylene diamine	2.0	2.0
Perfume, fluorescer	<1	<1
Sodium sulphate	20	Nil
Water	balance to 100%.	

The granular compositions may be prepared by agglomeration of the ingredients into granules using a pan granulator, or can be produced by conventional spray drying and post dosing.

Example 8, Comparative Example A

Wash liquors were prepared containing 5 g/l each of the formulations given below, typical of granular detergent compositions free of sodium sulphate, in 24°FH water. Radio-labelled triolein removal was monitored in a 20-minute wash at 40°C as described in Example 1.

	%	
	8	A
APG 600	10.2	17.0
C_{10} glycerol monoether	6.8	-
Zeolite	32.0	32.0
Sokalan CP5	4.0	4.0
Sodium silicate	0.5	0.5
Sodium carboxymethyl cellulose	0.5	0.5
Sodium carbonate	14.5	14.5
Sodium perborate monohydrate	12.0	12.0
TAED (83% granules)	7.8	7.8

(continued)

	%	
	8	A
Triolein removal (%)	57.5	54.5

The glyceryl ether was the same material as used in Example 1.

The APG 600 was a similar material to that used in Example 3, but obtained from Henkel Chemical Company.

Sokalan (Trade Mark) CP5 is an acrylic/maleic copolymer ex BASF.

The system containing the low-HLB cosurfactant clearly gave the better cleaning.

Example 9, Comparative Example B

The procedure of Examples 8 and A was repeated using wash liquors containing the formulations given below, containing sodium sulphate and a lower surfactant level, at concentrations of 6 g/l.

	%	
	9	B
APG 600	7.8	13.0
C_{10} glycerol monoether	5.2	-
Zeolite	24.0	24.0
Sokalan CP5	4.0	4.0
Sodium silicate	0.5	0.5
Sodium carboxymethyl cellulose	0.5	0.5
Sodium carbonate	14.5	14.5
Sodium perborate monohydrate	8.0	8.0
TAED (83% granules)	2.4	2.4
Sodium sulphate	25.0	25.0
Triolein removal (%)	59.5	57.2

Again, the system containing the low-HLB cosurfactant gave the better cleaning.

Example 10, Comparative Examples C to E

In this Example, the combination of APG 600 (as used in Examples 8 and 9) with C_{10} monoglyceryl ether was compared with combinations of APG 600 with ethoxylated C_{10} monoglyceryl ethers. The methodology was as in Example 1, the surfactant systems being dissolved to a total concentration of 1 g/l in 0.05M sodium metaborate at 40°C in demineralised water.

The cosurfactants used were as follows:

Example 10: C_{10} glyceryl monoether (as Example 1)

Example C: C_{10} $(EO)_2$ glyceryl monoether

Example D: C_{10} $(EO)_4$ glyceryl monoether

Example E: C_{10} $(EO)_6$ glyceryl monoether

The results are shown in Table 3, where the asterisked figures represent the highest detergency attained with each combination.

TABLE 3

Ratio APG 600: cosurfactant	% Triolein removal			
	10	C (2EO)	D (4EO)	E (6EO)
100/0	49.1 ± 0.3	49.1 ± 0.3	49.1 ± 0.3	49.1 ± 0.3
90/10	55.1 ± 0.5	50.5 ± 2.4	51.1	49.5 ± 2.1
80/20	52.8 ± 0.6	59.4 ± 1.2	55.1	53.6 ± 0.6*
60/40	62.6 ± 2.1*	60.2 ± 2.4	55.7	48.6 ± 0.9
40/60	33.7 ± 5.9	69.4 ± 0.1	64.9	50.8 ± 0.1
20/80	6.2 ± 0.8	70.9 ± 0.6	65.0*	45.9 ± 0.7
0/100	3.6 ± 0.5	71.6 ± 0.6*	61.9	28.0 ± 0.5

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Alone, all the ethoxylated glyceryl ethers were clearly better surfactants than the unethoxylated material, the 2EO glyceryl ether being the best and detergency then deteriorating with increasing degree of ethoxylation; the 2EO and 4EO materials being superior to APG 600 alone, while the 6EO material was inferior.

As expected, combination of APG 600 with the 2EO material gave no advantage but simply reduced the detergency towards the lower value shown by the APG alone. With the 4EO material, a small synergistic benefit was found but the effect of the cosurfactant clearly predominated, the maximum detergency being observed at 20% APG/80% co-surfactant and being only slightly higher than that of the cosurfactant alone. With the 6EO material, the converse was true: a very small synergistic effect was possibly present but the effect of the APG clearly predominated, the maximum detergency being observed at 80% APG/20% cosurfactant and being only slightly higher than that of the APG alone.

The unethoxylated material, however, which on its own showed very poor detergency, exhibited very strong synergy with the APG and the maximum detergency, at 60% APG/40% cosurfactant, was substantially higher than that of the APG alone and only slightly lower than that obtained from the combination of APG with the much more efficient 4EO material.

Claims

1. A detergent composition having a surfactant mixture consisting of:

(i) an alkylpolyglycoside of the general formula

$$RO(R'O)_t\,(G)_x$$

in which R is a linear or branched alkyl, alkenyl, hydroxyalkyl or hydroxyalkenyl group, or an aryl, alkyl-aryl, alkenyl-aryl or hydroxy alkyl-aryl group, R containing from 8 to 20 carbon atoms, R' is an alkylene group containing from 2 to 4 carbon atoms, G is a saccharide residue containing 5 or 6 carbon atoms, t is in the range of from 0 to 25 and x is in the range of from 1 to 10;

(ii) an unethoxylated nonionic surfactant which is an ether of the formula

$$R^3OZ$$

wherein R^3 is an organic hydrophobic residue having from 7 to 20 carbon atoms and Z denotes part of a polyhydric alcohol whose formula is HOZ and which has 2 to 4 carbon atoms,
the total amount of (i) and (ii) constituting from 75 to 100% by weight of the surfactant mixture, and the ratio of (i) to (ii) being within the range of from 4:1 to 3:2;

(iii) optionally a further nonionic surfactant having an HLB value greater than 10.5, in an amount not exceeding 25 wt% of the total surfactant mixture.

2. A detergent composition according to claim 1 wherein the alkylpolyglycoside (i) has a value of t which is zero so that it is of the general formula

$$RO(G)_x$$

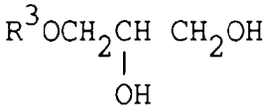
3. A detergent composition according to claim 1, characterised in that the alkylpolyglycoside (i) has an average value of x in the range from 1 to 1.8.

4. A detergent composition according to claim 3, characterised in that the alkylpolyglycoside (i) has an average value of x in the range from 1 to 1.4.

5. A detergent composition according to claim 3, characterised in that the alkylpolyglycoside (i) has an average value of x in the range from 1.3 to 1.8.

6. A detergent composition according to claim 1, characterised in that the nonionic surfactant (ii) is a monoglyceryl

ether of formula



wherein R^3 is an alkyl or alkenyl group having from 8 to 16 carbon atoms.

7. A detergent composition according to any preceding claim, characterised in that it comprises 1 to 60% by weight of the surfactant mixture, the composition also containing other ingredients and/or water.

8. A detergent composition according to claim 7, characterised in that it comprises 7 to 70% by weight of detergency builder.

9. A detergent composition according to any preceding claim, characterised in that it is a structured aqueous liquid.

10. A method of cleaning which comprises contacting fabrics or other inanimate surface to be cleaned with a composition according to claim 1, or a wash liquor comprising water and a composition according to claim 1, added to the water in a quantity lying in a range from 0.5 to 50 grams per litre of water.

Patentansprüche

1. Detergenszusammensetzung mit einer Mischung oberflächenaktiver Materialien, bestehend aus:

(i) einem Alkylpolyglycosid der allgemeinen Formel

$$RO(R'O)_t\,(G)_x$$

worin R eine lineare oder verzweigte Alkyl-, Alkenyl-, Hydroxyalkyl- oder Hydroxyalkenylgruppe oder eine Aryl-, Alkylaryl-, Alkenylaryl- oder Hydroxyalkylarylgruppe ist, wobei R von 8 bis 20 Kohlenstoffatome enthält, R' eine Alkylengruppe ist, die von 2 bis 4 Kohlenstoffatome enthält, G ein Saccharidrest ist, der 5 oder 6 Kohlenstoffatome enthält, t im Bereich von 0 bis 25 ist und x im Bereich von 1 bis 10 ist;

(ii) einem nichtethoxylierten, nichtionischen oberflächenaktiven Material, das ein Ether der Formel

$$R^3OZ$$

ist, worin R^3 ein organischer, hydrophober Rest mit von 7 bis 20 Kohlenstoffatomen ist und Z einen Teil eines mehrwertigen Alkohols bezeichnet, dessen Formel HOZ ist und der 2 bis 4 Kohlenstoffatome hat,
wobei die Gesamtmenge von (i) und (ii) von 75 bis 100 Gew.-% der Mischung oberflächenaktiver Materialien ausmacht und das Verhältnis von (i) zu (ii) innerhalb des Bereichs von 4:1 bis 3:2 ist;

(iii) wahlweise einem weiteren nichtionischen oberflächenaktiven Material mit einem HLG-Wert von größer als 10,5, in einer Menge, die 25 Gew.-% der gesamten Mischung oberflächenaktiver Materialien nicht übersteigt.

2. Detergenszusammensetzung nach Anspruch 1, worin das Alkylpolyglycosid (i) einen Wert von t hat, der null ist, so daß es die allgemeine Formel

$$RO(G)_x$$

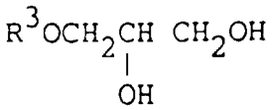
hat.

3. Detergenszusammensetzung nach Anspruch 1, dadurch gekennzeichnet, daß das Alkylpolyglycosid (i) einen mittleren Wert von x im Bereich von 1 bis 1,8 hat.

4. Detergenszusammensetzung nach Anspruch 3, dadurch gekennzeichnet, daß das Alkylpolyglycosid (i) einen mittleren Wert von x im Bereich von 1 bis 1,4 hat.

5. Detergenszusammensetzung nach Anspruch 3, dadurch gekennzeichnet, daß das Alkylpolyglycosid (i) einen mittleren Wert von x im Bereich von 1,3 bis 1,8 hat.

6. Detergenszusammensetzung nach Anspruch 1, dadurch gekennzeichnet, daß das nichtionische oberflächenaktive Material (ii) ein Monoglycerylether der Formel



ist, worin R^3 eine Alkyl- oder Alkenylgruppe ist, die von 8 bis 16 Kohlenstoffatomen hat.

7. Detergenszusammensetzung nach einem der vorhergehenden Ansprüchen, dadurch gekennzeichnet, daß sie 1 bis 60 Gew.-% der Mischung oberflächenaktiver Materialien umfaßt, wobei die Zusammensetzung auch andere Bestandteile und/oder Wasser enthält.

8. Detergenszusammensetzung nach Anspruch 7, dadurch gekennzeichnet, daß sie 7 bis 70 Gew.-% Gerüststoff umfaßt.

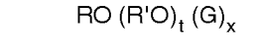
9. Detergenszusammensetzung nach einem der vorhergehenden Ansprüchen, dadurch gekennzeichnet, daß sie eine strukturierte, wäßrige Flüssigkeit ist.

10. Verfahren zum Reinigen, umfassend das in Kontakt Bringe von zu reinigenden Geweben oder einer anderen unbelebten Oberfläche mit einer Zusammensetzung nach Anspruch 1 oder einer Waschlauge, die Wasser und eine Zusammensetzung nach Anspruch 1 umfaßt, die zu dem Wasser in einer Menge zugegeben ist, die in einem Bereich von 0,5 bis 50 Gramm pro Liter Wasser liegt.

Revendications

1. Une composition détergente ayant un mélange d'agents tensioactifs composé de :

(i) un polyalkylglycoside ayant la formule générale suivante :



dans laquelle R est un groupe alkyle, alkényle, hydroxyalkyle ou hydroxyalkényle ramifié contenant de 10 à 20 atomes de carbone, R' est un groupe alkylène contenant de 2 à 4 atomes de carbone, G est un résidu saccharide contenant 5 ou 6 atomes de carbone, t est compris dans la gamme allant de 0 à 25 et x est compris dans la gamme allant de 1 à 10.

(ii) un agent tensioactif non ionique non éthoxylé qui est un éther ayant la formule suivante :



dans laquelle R^3 est un résidu hydrophobe organique ayant de 7 à 20 atomes de carbone et dans laquelle Z représente une partie d'un alcool polyhydrique dont la formule est HOZ et ayant 2 à 4 atomes de carbone,

la quantité totale de (i) et (ii) constituant de 75 à 100 % en masse du mélange d'agents tensioactifs, et le rapport entre (i) et (ii) étant compris dans la gamme allant de 4 pour 1 à 3 pour 2 ;

(iii) de façon optionnelle, un agent tensioactif non ionique supplémentaire ayant une valeur HLB supérieure à 10,5, dans une quantité ne dépassant pas 25% en masse du mélange d'agents tensioactifs total.

2. Une composition détergente selon la revendication 1, dans laquelle le polyalkylglycoside (i) a une valeur de t qui est zéro de telle sorte que la formule générale soit :

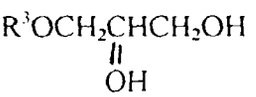
$$RO(G)_x$$

3. Une composition détergente selon la revendication 1, caractérisée en ce que l'alkylpolyglycoside (i) a une valeur moyenne de x comprise dans la gamme allant de 1 à 1,8.

4. Une composition détergente selon la revendication 3, caractérisée en ce que l'alkylpolyglycoside (i) a une valeur moyenne de x comprise dans la gamme allant de 1 à 1,4.

5. Une composition détergente selon la revendication 3, caractérisée en ce que l'alkylpolyglycoside (i) a une valeur moyenne de x comprise dans la gamme allant de 1,3 à 1,8.

6. Une composition détergente selon la revendication 1, caractérisée en ce que l'agent tensioactif non ionique (ii) est un éther monoglycérylique ayant la formule suivante :



dans laquelle R^3 est un groupe alkyle ou alkényle ayant de 8 à 16 atomes de carbone.

7. Une composition détergente selon l'une des revendications précédentes, caractérisée en ce qu'elle comprend de 1 à 60 % en masse du mélange d'agents tensioactifs, la composition contenant également d'autres ingrédients et/ou de l'eau.

8. Une composition détergente selon la revendication 7, caractérisée en ce qu'elle comprend de 7 à 70 % en masse d'édificateur de détergence.

9. Une composition détergente selon l'une des revendications précédentes, caractérisée en ce quelle est un liquide aqueux structuré.

10. Un procédé de nettoyage comprenant le fait de mettre en contact des tissus ou toute autre surface inanimée devant être lavée, avec une composition en accord avec la revendication 1, ou avec une liqueur de lavage comprenant de l'eau et une composition selon la revendication 1, ajoutée à l'eau dans une quantité comprise dans une gamme allant de 0,5 à 50 grammes par litre d'eau.