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(54) LIQUID DETERGENT COMPOSITION

FLÜSSIGES REINIGUNGSMITTEL

COMPOSITION DE DETERGENT LIQUIDE

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EP-A- 0 120 533	**EP-A- 0 151 884**
EP-A- 0 256 354	**EP-A- 0 301 884**
EP-A- 0 346 995	**US-A- 4 206 070**

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Description

[0001] The present invention is concerned with liquid detergent compositions of the kind containing a structure formed from detergent active material, the detergent-active structure existing as a separate phase dispersed within a predominantly aqueous phase. This aqueous phase usually contains dissolved electrolyte. In particular the present invention relates to liquid detergent-active structured compositions containing significant levels of nonionic detergent materials.

[0002] The present invention is concerned with liquid detergent compositions which are "internally structured" in that the structure is formed by primary detergent active ingredients.

[0003] Such structuring is very well known in the art and may be deliberately brought about to endow properties such as consumer preferred flow properties and/or turbid appearance. Many detergent-active structured liquids are also capable of suspending particulate solids such as detergency builders and abrasive particles.

[0004] Some of the different kinds of detergent-active structuring which are possible are described in the reference H.A. Barnes, "Detergents", Ch.2. in K. Wallers (Ed), "Rheometry; Industrial Applications", J. Wiley & Sons, Letchworth 1980. In general, the degree of ordering of such systems increases with increasing surfactant and/or electrolyte concentrations. At very low concentrations, the surfactant can exist as a molecular solution, or as a solution of spherical micelles, both of these being isotropic. With the addition of further surfactant and/or electrolyte, structured (anisotropic) systems can form. They are referred to respectively, by various terms such as rod-micelles, planar lamellar structures, lamellar droplets and liquid crystalline phases. Often, different workers have used different terminology to refer to the detergent-active structures which are really the same. For instance, in European patent specification EP-A-151 884, lamellar droplets are called "spherulites". The presence and identity of a surfactant structuring system in a liquid may be determined by means known to those skilled in the art for example, optical techniques, various rheometrical measurements, x-ray or neutron diffraction, and sometimes, electron microscopy.

[0005] Electrolyte may be only dissolved 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.

[0006] Three common product forms in this type are liquids for heavy duty fabrics washing and liquid abrasive 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.

[0007] Compositions of the first kind are described in for example our patent specification EP-A-38,101 whilst examples of those in the second category are described in our specification EP-104,452. Those in the third category are for example, described in US 4,244,840.

[0008] The dispersed detergent-active structure in these liquids is generally believed to consist of an onion-like configuration comprising concentric bilayers of detergent active molecules, between which is trapped water (aqueous phase). These configurations of detergent-active material are sometimes referred to as lamellar droplets. It is believed that the close-packing of these droplets enables the solid materials to be kept in suspension. The lamellar droplets are themselves a sub-set of lamellar structures which are capable of being formed in detergent active/aqueous electrolyte systems. Lamellar droplet systems, are a preferred category of structures which can exist in detergent liquids and are essential to the present invention.

[0009] The present invention is related to detergent-active structured detergent compositions comprising a significant level of nonionic surfactants.

[0010] It has been suggested in GB 2 123 846 (Albright and Wilson) examples 49 to 55, to formulate detergent-active structured detergent compositions with high levels of nonionic materials. It is however believed that the compositions suggested in these examples are not satisfactory In that they suffer from instability.

[0011] US-A-4,206,070 discloses ethoxylated alcohols in combination with monoglyceryl ethers. EP-A-0 256 354 discloses ethoxylated alcohols in combination with polyol fatty acid esters. EP-A-0 047 404 discloses polyoxyethylene alkyl ethers in combination with fatty acid sucrose ester.

[0012] The present invention defines a composition defined by claim 1.

[0013] Suitable first nonionic materials having an HLB of more than 12 include in particular the reaction products of compounds having a hydrophobic group and a reactive hydrogen atom, for example aliphatic alcohols, acids, amides or alkyl phenols with alkylene oxides, especially ethylene oxide either alone or with propylene oxide. The number of alkylene oxide groups together with the chain length of the hydrophobic groups are selected to provide an HLB of above 12.0.

[0014] Examples of nonionic materials having an HLB value above 12 are given in table 1. From this table it is clear that nonlonic materials of an HLB above 12.0 generally are characterised by the presence of relative high numbers of alkoxy groups. For the purpose of this Invention preferably high HLB nonionics are used which comprise between 5 and 15, more preferred between 6 and 12 EO groups. The HLB of the first nonionic material is preferably between 12.0 and 18.0, more preferred between 12.0 and 16.0, especially preferred between 12.0 and 14.0.

table 1

COMPOUND	HLB VALUE
stearyl alcohol 10 EO	12.4
tridecyl alcohol 8 EO	12.7
cetyl alcohol 10 EO	12.9
nonylphenol 10 EO	13.3
tallow fatty acid 15 EO	13.4
lanolin alcohols 16 EO	15.0
propylene glycol monostearate 25 EO	16.0
stearic acid 40 EO	16.9

[0015] The second nonionic material as defined in claim 1, for use in compositions according to the present invention, generally comprises a relatively long hydrophobic group in combination with no or a relatively small hydrophilic group. For the purpose of the present invention these nonionic materials are selected from fatty alcohols, alkoxylated compounds comprising from 1 to 3 alkoxy groups, glycerol terminated nonionic compounds comprising from 1-3 alkoxy groups, and esters of fatty acids and short chain polyols or reducing hexose or pentose sugars.

[0016] Suitable fatty alcohols include the C_6-C_{20} aliphatic alcohols, such as primary or secondary, linear or branched alcohols. Preferably linear, primary alcohols are used. Preferably the C_{10}-C_{16} alcohols are used, especially the C_{12}-C_{16} alcohols are preferred, these alcohols have been found to enhance the cleaning performance of detergent compositions according to the present invention. Particularly preferred is the use of dodecanol. Also, polyhydric alcohols such as fatty alcohol diols, preferably dodecanediol may be used.

[0017] Suitable alkoxylated materials which may be used are the reaction products of a hydrophobic group such as a C_8-C_{24} fatty acid, or fatty amide with 1-3 alkylene oxide groups, especially ethylene oxide eventually in combination with propylene oxide.

[0018] Glycerol terminated nonionic materials may be prepared by optionally subjecting a C_9-C_{26} higher alcohol to an addition reaction with alkylene oxide, especially ethylene oxide followed by epichlorhydrin or glycerol in an inert atmosphere using an acid or alkali catalyst. In the case of epichlorin, the alcohol is ethoxylated with 1 to 3 moles of ethylene oxide per molecule according to well-known methods. The product is subsequently reacted with 1 to 1.5 moles of epichlorohydrin in the presence of an acid catalyst and the product is treated with potassium hydroxide acetylated and hydrolysed.

[0019] Alternatively, after eventual ethoxylation of the alcohol as already described, the ethoxylate is treated with 1 to 1.5 moles of glycidol in the presence of either an alkaline or acidic catalyst After the reaction the catalyst is neutralised, dehydrated in vacuum and solids produced by neutralisation filtered off to leave the desired nonionic.

[0020] When an acid catalyst is used, this may be sodium hydroxide, potassium hydroxide, sodium or potassium metal or sodium methoxide, the reaction temperature being between 30°C and 90°C.

[0021] Preferably glycerol terminated nonionics are used which comprise 1 or 2 alkoxy groups and one glycerol group.

[0022] Preferred fatty acid esters of polyols are mono- or diglycerides of C10-20 fatty acids. Preferred fatty acid esters of reducing hexose or pentose sugars are described In WO 89/01480 (NOVO INDUSTRI) and are of the formula:

$$R\text{-}COO\text{-}X\text{-}OR^1$$

wherein R is an alkyl or alkenyl group having from 7 to 18 carbon atoms, R^1 is hydrogen or an alkyl group having from 1 to 4 carbon atoms and X is a carbohydrate moiety containing one hexose or pentose unit.

[0023] Also mixtures of the nonionic materials listed above may be used.

[0024] Preferably the weight ratio of the first nonionic material to the second nonionic material is between 10:1 to 1: 10, more preferred from 10:1 to 1:1, especially preferred from 8:1 to 2:1, most preferred from 6:1 to 3:1.

[0025] Preferably the level of the first nonionic material is more than 1% by weight, more preferred more than 5%, especially preferred more than 10%. Typical levels are from 1-35 %, more preferred 5-25% by weight, especially from 10 to 15%.

[0026] The level of the second nonionic material is by weight, more than 3%. Typical levels are from 3 to 8% by weight.

[0027] The total level of nonionic surfactant materials in the composition is from 10 to 35%, especially preferred from 10 to 25 % by weight.

[0028] It has been found advantageous to use combinations of nonionic materials containing materials of which the hydrophobic chain length is about the same. Preferably the ratio of the number of carbon atoms in the hydrophobic group of the first nonionic material to the number of carbon atoms in the hydrophobic group of the second nonionisc material is between 1.5:1 and 1:1.5, more preferred between 1.2:1 and 1:1.2.

[0029] Compositions according to the invention may optionally comprise small amounts of anionic materials. These materials when present are included at a level of less than 50% by weight of the total of surfactant active materials, more preferably less than 40%, especially preferred less than 30%. Particularly preferred are formulations which contain less than 10% on active of anionic surfactants, most preferred are compositions comprising substantially no anionic surfactants.

[0030] Suitable anionic surfactants are usually water-soluble alkali metal salts of organic sulphates and sulphonates having alkyl radicals containing from about 8 to about 22 carbon atoms, the term alkyl being used to include the alkyl portion of higher acyl radicals. Examples of suitable synthetic anionic detergent compounds are sodium and potassium alkyl sulphales, especially those obtained by sulphating higher (C_8-C_{16}) alcohols produced for example from tallow or coconut oil, sodium and potassium alkyl (C_9-C_{20}) benzene sulphonates, particularly sodium linear secondary alkyl (C_{10}-C_{15}) benzene sulphonates; sodium alkyl glycaryl ether sulphates, especially those ethers of the higher alcohols derived from tallow or coconut oil and synthetic alcohols derived from petroleum; sodium coconut oil fatty monoglyceride sulphates and sulphonates; sodium and potassium salts of sulphuric acid esters of higher (C_8-C_{16}) fatty alcohol-alkylene oxide, particularly ethylene oxide, reaction products; the reaction products of fatty acids such as coconut fatty acids esterified with isethionic acid and neutralised with sodium hydroxide; sodium and potassium salts of fatty acid amides of methyl taurine; alkane monosulphonates such as those derived by reacting alpha-olefins (C_8-C_{20}) with sodium bisulphite and those derived from reacting paraffins with SO_2 and Cl_2 and then hydrolysing with a base to produce a random sulphonate; and olefin sulphonates, which term is used to describe the material made by reacting olefins, particularly C_{10}-C_{20} alpha-olefins, with SO_3 and then neutralising and hydrolysing the reaction product The preferred anionic detergent compounds are sodium (C_{11}-C_{16}) alkyl benzene sulphonates and primary sodium or potassium (C_{18}-C_{18}) alkyl sulphates.

[0031] It is also possible, and sometimes preferred, to include other anionic materials in the composition such as alkali metal soaps of a fatty acid, especially a soap of an acid having from 12 to 18 carbon atoms, for example oleic acid, ricinoleic acid, and fatty acids derived from castor oil, rapeseed oil, groundnut oil, coconut oil, palm-kernel oil or mixtures thereof. The sodium or potassium soaps of these acids can be used.

[0032] In many (but not all) cases, the total detergent active material may be present at from 2% to 60% by weight of the total composition, for example from 5% to 40% and typically from 10% to 30% by weight.

[0033] The liquid compositions according to the present invention preferably have a pH of above 7.0, more preferred from 7.5 to 12.0, ideally between 8.5 and 11.0 at 25 °C,

[0034] Compositions according to the invention are preferably physically stable in that they yield no more than 2% by volume phase separation when stored at 25°C for 21 days from the time of preparation.

[0035] The viscosity of compositions according to the present is preferably less than 2500 mPas, more preferred less than 1500 mPas, especially preferred between 30 and 1000 mPas at 21 s^{-1}.

[0036] One way of regulating the viscosity and stability of compositions according to the present invention is to include viscosity regulating polymeric materials.

[0037] Viscosity and/or stability regulating polymers which are essential for incorporation in compositions according to the invention are deflocculating polymers having a hydrophilic backbone and at least one hydrophobic side chain. Such polymers are for instance described in our copending European application 346 995.

[0038] Deflocculation polymers for use in detergent formulations according to the present invention may be of anionic, nonionic or cationic nature. Nonionic deflocculation polymers are preferred.

[0039] The hydrophilic backbone of the polymer is typically a homo-, co- or ter-polymer containing carboxylic acid groups (or more preferably) salt forms thereof), e.g. maleate or acrylate polymers or co-polymers of these together or with other monomer units such as vinyl ethers, styrene etc. The hydrophobic chain or chains typically are selected from saturated and unsaturated alkyl chains, e.g. having from 5 to 24 carbon atoms and are optionally bonded to the backbone via an alkoxylene or polyalkoxylene linkage, for example a polyethoxy, polypropoxy or butyloxy (or mixtures of same) linkage having from 1 to 50 alkoxylene groups. Thus, in some forms, the side chain(s) will essentially have the character of a nonionic surfactant. Preferred polymers are disclosed in our copending European patent application 346 995.

[0040] Preferably the amount of viscosity regulating polymer is from 0.1 to 5% by weight of the total composition. more preferred from 0,2 to 2%.

[0041] In many cases it is preferred for the aqueous continuous phase to contain dissolved eleotrolyte. As used herein, the term electrolyte means any ionic water soluble material. However, in lamellar droplet dispersions, not all the electrolyte Is necessarily dissolved but may be suspended as particles of solid because the total electrolyte concentration of the liquid is higher than the solubility limit of the electrolyte. Mixtures of electrolytes also may be used, with one or more of the electrolytes being in the dissolved aqueous phase and one or more being substantially only in the suspended solid phase. Two or more electrolytes may also be distributed approximately proportionally, between these two phases. In part, this may depend on processing, e.g. the order of addition of components. On the other hand, the term "salts" includes all organic and inorganic materials which may be included, otherthan surfactants and water, whether or not they are ionic, and this term encompasses the sub-set of the electrolytes (water soluble materials).

[0042] The only restriction on the total amount of detergent active material and electrolyte (if any) is that in the lamellar droplet compositions embraced in the present invention, together they must result in formation of an aqueous dispersion of lamellar droplets. Thus, within the ambit of the present invention, a very wide variation in surfactant types and levels is possible. The selection of surfactant types and their proportions, in order to obtain a stable liquid with the required structure will be fully within the capability of those skilled in the art. However, it can be mentioned that an important subclass of useful compositions is those where the detergent active material comprises blends of different surfactant types.

[0043] In the case of blends of surfactants, the precise proportions of each component which will result in such stability and viscosity will depend on the type(s) and amount(s) of the electrolytes, as is the case with conventional detergent-active structured liquids.

[0044] The compositions optionally also contain electrolyte in an amount sufficient to bring about structuring of the detergent active material. Preferably though, the compositions contain from 1% to 60%, especially from 10 to 45% of a salting-out electrolyte. Salting-out electrolyte has the meaning ascribed to in specification EP-A-79 646, that is all electrolytes having a lyotropic number of less than 9.5. Optionally, some salting-in electrolyte (as defined in the latter specification) may also be included, provided it is of a kind and in an amount compatible with the other components and the composition is still in accordance with the definition of the invention claimed herein. Some or all of the electrolyte (whether salting-in or salting-out), or any substantially water insoluble salt which may be present, may have detergency builder properties. In any event, it is preferred that compositions according to the present invention include detergency builder material, some or all of which may be electrolyte. The builder material is any capable of reducing the level of free calcium ions in the wash liquor and will preferably provide the composition with other beneficial properties such as the generation of an alkaline pH, the suspension of soil removed from the fabric and the dispersion of the fabric softening clay material.

[0045] 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, phosphates and hexametaphosphates. Phosphonate sequestrant builders may also be used.

[0046] Examples of non-phosphorus-containing inorganic detergency builders, when present, include water-soluble alkali metal carbonates, bicarbonates, silicates and crystalline and amorphous aluminosilicates. Specific examples include sodium carbonate (with or without calcite seeds), potassium carbonate, sodium and potassium bicarbonates, silicates and zeolites.

[0047] In the context of inorganic builders, we prefer to include electrolytes which promote the solubility of other electrolytes, for example use of potassium salts to promote the solubility of sodium salts. Thereby, the amount of dissolved electrolyte can be increased considerably (crystal dissolution) as described in UK patent specification GB 1 302 543.

[0048] Examples of organic detergency builders, when present, include the alkaline 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, nitrilitriacetic acid, oxydisuccinic acid, CMOS, melitic acid, benzene polycarboxylic acids and citric acid.

[0049] Preferably the levl of non-soap builder material is from 0-50 %, more preferably 2-40 %, most preferably 5-30 % by weight of the composition.

[0050] In the context of organic builders, it is also desirable to incorporate polymers which are only partly dissolved, in the aqueous continuous phase as described in EP 301.882. This allows a viscosity reduction (due to the polymer which is dissolved) whilst incorporating a sufficiently high amount to achieve a secondary benefit, especially building, because the part which is not dissolved does not bring about the instability that would occur if substantially all were dissolved. Typical amounts are from 0.5 to 4.5% by weight.

[0051] It is further possible to include in the compositions of the present invention, alternatively, or in addition to the partly dissolved polymer, yet another polymer which is substantially totally soluble in the aqueous phase and has an electrolyte resistance of more than 5 grams sodium nitrilotriacetate in 100ml of a 5% by weight aqueous solution of the polymer, said second polymer also having a vapour pressure in 20% aqueous solution, equal to or less than the vapour pressure of a reference 2% by weight or greater aqueous solution of polyethylene glycol having an average molecular weight of 6000; said second polymer having a molecular weight of at least 1000. Use of such polymers is generally described in our EP 301,883.

[0052] The incorporation of the soluble polymer permits formulation with improved physical stability at the same viscosity (relative to the composition without the soluble polymer) or lower viscosity with the same stability. The soluble polymer can also reduce viscosity drift, even when it also brings about a viscosity reduction. Here, improved stability and lower viscosity mean over and above any such effects brought about by the deflocculating polymer.

[0053] It is especially preferred to incorporate the soluble polymer with a partly dissolved polymer which has a large insoluble component. That is because although the building capacity of the partly dissolved polymer will be good (since relatively high quantities can be stably incorporated), the viscosity reduction will not be optimum (since little will be dissolved). Thus, the soluble polymer can usefully function to reduce the viscosity further, to an ideal level. The soluble polymer can, for example, be incorporated at from 0.05 to 20% by weight, although usually, from 0.1 to 2.5% by weight of the total composition is sufficient, and especially from 0.2 to 1.5 by weight. Often, levels above these can cause instability.

[0054] Although it is possible to incorporate minor amounts of hydrotropes other than water-miscible solvents, we prefer that the compositions of the present invention are substantially free from hydrotropes. By hydrotrope is meant any water soluble agent which tends to enhance the solubility of surfactants in aqueous solution.

[0055] Apart from the ingredients already mentioned, a number of optional ingredients may also be present, for example lather boosters such as alkanolamides, particularly the monoethanolamides derived from palm kernel fatty acids and coconut fatty acids, fabric softeners such as clays, amines and amine oxides, lather depressants, inorganic salts such as sodium sulphate, and, usually present in very minor amounts, fluorescent agents, perfumes, enzymes such as proteases, amylases and lipases (including Lipolase® ex Novo), germicides and colourants.

[0056] Amongst these optional ingredients, as mentioned previously, are agents to which lamellar dispersions without deflocculating polymer are highly stability-sensitive and by virtue of the present invention, can be incorporated in higher, more useful amounts. These agents cause a problem because they tend to promote flocculation of the lamellar droplets. Examples of such agents are fluorescers like Blankophor® RKH, Tinopal® LMS, and Tinopal® DMS-X and Blankophor® BBM as well as metal chelating agents, especially of the phosphonate type, for example the Dequest® range sold by Monsanto.

[0057] The compositions according to the invention may be prepared by methods well known in the art. A particularly preferred method for preparing the compositions involves the formation of a non-aqueous pre-mix comprising at least the two nonionic materials, followed by dispersing this premix in water. This method is particularly advantageous in that it avoids difficulties in dissolving the second less watersoluble nonionic material,

[0058] The invention will now be illustrated by way of the following Examples. In all Examples, unless stated to the contrary, all percentages are by weight.

EXAMPLE 1

[0059] The following composition was prepared by premixing the active materials followed by dispersing the mix in water containing the electrolyte.

INGREDIENT	%(wt)
Synperonic A7®	12.9
Dodecanol	3.2
LAS (Marlon® AS-3)	10.7
NaOH	1.4
sodiumcitrate.$2H_2O$	9.0
silicone (DB100)	0.2
polymer(a)	0.5
water	balance

(a) deflocculating polymer being a copolymer of acrylic acid and laurylmethacrylic acid in a ratio of 25 :1, and a molecular weight of from 3,000 to 4,000.

- EXAMPLE 2

[0060] The following composition was prepared as described hereabove:

INGREDIENT	%(WT)
Synperonic A7®	19.5
LAS (Marlon® AS-3)	3.2
Oleic acid	7.4
Dobanol-2EO-Glycerol	4.9
Glycerol	4.9
Borax	3.4
sodium citrate.$2H_2O$	9.9
NaOH	1.4
polymer (a)	1.0
water	balance

[0061] This composition was of acceptable stability and had a pH of 9.3.

Example 3

[0062] The following composition was made as in example 1

Component	% wt
Glycerol	5.0
borax	3.5
Na-citrate.2aq	10.0
MaOH	2.3
LAS (Marlon AS-3)®	18.7
polymer[1])	1.0
Synperonic A7®	8.0
dodecanediol	12.0
water	balance

[1]) deflocculating polymer being a copolymer of acrylic acid and laurylmethacrylic acid in a ratio of 25 :1, and a molecular weight of from 3,000 to 4,000.

Claims

1. An aqueous detergent-active structured liquid detergent composition in the form of an aqueous dispersion of lamellar droplets, comprising:

(a) a first nonionic surfactant having an HLB of 12.0 or more;
(b) a second nonionic material at a level of more than 3% by weight selected from:

(i) C_6-C_{20} aliphatic alcohols;
(ii) alkoxylated C_8-C_{24} fatty acids or fatty amides containing from 1-3 alkoxy groups of 2-4 C atoms;
(iii)nonionics of the following formula:

$$RO(C_nH_{2n}O)_x(CH_2CH(OH)CH_2O)_yH$$

wherein R is an alkyl or alkenyl group having from 9 to 25 carbon atoms, n is 2 to 4, x is from 1 to 3, y is from 1-3, the alkylene oxide and glycerol groups are arranged in random or block formation. preferably the molecule is terminated with at least one glycerol group;
(iv) esters of fatty acids with reducing hexose or pentose sugars of the formula:

$$R\text{-}COO\text{-}X\text{-}OR^1$$

wherein R is an alkyl or alkenyl group, R^1 is an alkyl group having from 1 to 4 carbon atoms and X is a carbohydrate moiety containing one hexose or pentose unit

or mixtures thereof;
the total amount of nonionic surfactant being from 10 to 35% by weight
(c) optionally an anionic surfactant material up to a level of 50 weight % of the total of components a, b and c the composition further containing deflocculating polymers having a hydrophilic backbone and at least one hydrophobic side chain.

2. Composition according to claim 1, wherein the weight ratio of the first nonionic material to the second nonionic material is between 10:1 to 1:10.

3. Composition according to claim 1 or 2, wherein the level of the first nonionic material is more than 5% by weight.

4. Composition according to one or more of the preceding claims wherein the ratio of the number of carbon atoms in the hydrophobic group of the first nonionic material to the number of carbon atoms in the hydrophobic group of the second nonionic material is between 1.5:1 and 1:1.5.

5. Composition according to one or more of the preceding claims, containing less than 10% by weight on active of anionic surfactants.

6. Composition according to one or more of the preceding claims, yielding no more than 2% by volume phase separation when stored at 25°C for 21 days from the time of preparation.

7. Composition according to any preceding claim, containing from 0.2 to 2.0% by weight of deflocculating polymer.

Patentansprüche

1. Wäßrige waschmittelaktiv-strukturierte flüssige Waschmittel-Zusammensetzung in Form einer wässrigen Dispersion lamellarer Tröpfchen enthaltend:

a) ein erstes nichtionisches Tensid mit einem HLB-Wert von 12.0 oder größer;
b) ein zweites nichtionisches Material mit einem Gehalt größer als 3 Gew.% ausgewählt aus:

(i) aliphatischen C_8-C_{20}-Alkoholen;
(ii) alkoxylierten C_8-C_{24}-Fettsäuren oder Fettsäureamiden mit 1-3 Alkoxygruppen mit 2-4 C-Atomen;
(iii)nichtionischen Stoffen der folgenden Formel:

$$RO(C_nH_{2n}O)_x(CH_2CH(OH)CH_2O)_yH$$

worin R eine Alkyl- oder Alkenylgruppe mit 9 bis 25 Kohlenstoffatomen bedeutet und n für 2 bis 4, x für 1 bis 3 und y für 1-3 stehen, die Alkylenoxid- und Glyceringruppen in Zufalls- oder Blockformation angeordnet sind und das Molekül vorzugsweise mit mindestens einer Glyceringruppe endet;
(iv) Estern von Fettsäuren mit reduzierenden Hexoseoder Pentosezuckern der Formel

$$R\text{-}COO\text{-}X\text{-}OR^1$$

worin R eine Alkyl- oder Alkenylgruppe, R^1 eine Alkylgruppe mit 1 bis 4 Kohlenstoffatomen und X einen Kohlenhydratrest mit einer Hexose- oder Pentoseeinheit bedeuten; oder Mischungen davon; wobei die Gesamtmenge des nichtionischen Tensids von 10 bis 35 Gew.% liegt

c) gegebenenfalls ein anionisches Tensidmaterial bis zu einem Gehalt von 50 Gew.% der Gesamtheit der Bestandteile a, b und c, wobei die Zusammensetzung außerdem die Ausflockung hemmende Polymere mit einem hydrophilen Gerüst und mindestens einer hydrophoben Seitenkette enthält.

2. Zusammensetzung nach Anspruch 1, worin das Gewichtsverhältnis des ersten nichtionischen Materials zum zweiten nichtionischen Material zwischen 10:1 und 1:10 liegt.

3. Zusammensetzung nach Anspruch 1 oder 2, worin der Gehalt an erstem nichtionischen Material mehr als 5 Gew. % beträgt.

4. Zusammensetzung nach einem oder mehreren der vorhergehenden Ansprüche, worin das Verhältnis der Zahl der Kohlenstoffatome in der hydrophoben Gruppe des ersten nichtionischen Materials zur Zahl der Kohlenstoffatome in der hydrophoben Gruppe des zweiten nichtionischen Materials zwischen 1.5:1 und 1:1.5 liegt.

5. Zusammensetzung nach einem oder mehreren der vorhergehenden Ansprüche, enthaltend weniger als 10 Gew. % aktive anionische Tenside.

6. Zusammensetzung nach einem oder mehreren der vorhergehenden Ansprüche, die bei der Lagerung bei 25°C während 21 Tagen ab Herstellungszeitpunkt nicht mehr als 2 Vol.% Phasentrennung ergibt.

7. Zusammensetzung nach jedem der vorhergehenden Ansprüche enthaltend 0.2 bis 2.0 Gew.% die Ausflockung hemmendes Polymer.

Revendications

1. Composition aqueuse détergente liquide structurée d'un détergent actif en forme d'une dispersion aqueuse de gouttelettes lamellaires, comprenant :

(a) un premier tensioactif non ionique ayant un indice d'amphipathie de 12,0 ou plus ;
(b) une seconde matière non ionique à un niveau de plus de 3 % en poids choisie parmi :

(i) des alcools aliphatiques en C-$_{6-20}$;
(ii) des acides gras alcoxylés en C_{6-24} ou amides gras contenant de 1 à 3 groupes alcoxy de 2 à 4 atomes de carbone ;
(iii) des composés non ioniques de formule suivante :

$$RO\ (C_nH_{2n}O)_x(CH_2CH(OH)CH_2O)_yH$$

dans laquelle R est un radical alkyle ou alcényle de 9 à 25 atomes de carbone, n est un nombre de 2 à 4, x est un nombre de 1 à 3, y est un nombre de 1 à 3, les groupes oxyde d'alkylène et glycérol sont groupés sur le mode statistique ou séquencé, la molécule étant de préférence terminée par au moins un groupe glycérol ;
(iv) des esters d'acides gras comportant des sucres réducteurs hexose ou pentose de formule :

$$R\text{-}COO\text{-}X\text{-}OR^1$$

dans laquelle R est un radical alkyle ou alcényle, R^1 est un radical alkyle de 1 à 4 atomes de carbone et X est un fragment d'hydrate de carbone contenant un motif hexose ou pentose,

ou des mélanges de ceux-ci ;
le montant total de tensioactif non ionique étant de 10 à 35 % en poids.
(c) facultativement, une matière tensioactive anionique jusqu'à un maximum de 50 % en poids du total des composants (a), (b) et (c), la composition contenant en plus des polymères défloculants ayant un squelette hydrophile et au moins une chaîne latérale hydrophobe.

2. Composition selon la revendication 1, dans laquelle le rapport pondéral de la première matière non ionique à la seconde matière non ionique est compris entre 10 :1 et 1 :10.

3. Composition selon la revendication 1 ou 2, dans laquelle la quantité de la première matière non ionique est supérieure à 5 % en poids.

4. Composition selon l'une quelconque des revendications précédentes, dans laquelle le rapport du nombre d'atomes de carbone dans le groupe hydrophobe de la première matière non ionique au nombre d'atomes de carbone dans le groupe hydrophobe de la seconde matière non ionique est compris entre 1,5 :1 et 1 :1,5.

5. Composition selon l'une quelconque des revendications précédentes, qui contient moins de 10 % en poids de composants actifs des tensioactifs anioniques.

6. Composition selon l'une quelconque des revendications précédentes, n'assurant pas plus de 2 % en volume de séparation de phase quand on l'emmagasine à 25°C pendant 21 jours depuis le moment de sa préparation.

7. Composition selon l'une des revendications précédentes, qui contient de 0,2 à 2,0 % en poids de polymère défloculant.