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(54) **Detergent compositions comprising cationic surfactant and process for making the composition**

Kationisches Tensid enthaltende Waschmittelzusammensetzungen sowie deren Herstellungsverfahren

Compositions détergentes contenant un agent tensioactif cationique et procédé pour leur fabrication

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EP-A- 0 234 717 EP-A- 0 547 722
DE-A- 2 449 354 GB-A- 2 168 995

• **CHEMICAL ABSTRACTS**, vol. 98, no. 14, 4 April
1983 Columbus, Ohio, US; abstract no. 109309,
page 109; & **JP-A-57 137 397 (KAO SOAP)**

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EP 0 714 976 B1

Description

[0001] The invention relates to granular detergent compositions comprising cationic surfactant and anionic surfactant and/or anionic hydrotrope.

[0002] Water-soluble cationic surfactants are commercially available as aqueous solutions, typically up to 35% or 40% active (by weight). However any attempts to granulate these aqueous solutions result in granular components having low cationic surfactant content.

[0003] DE 2449354 discloses dishwashing compositions containing cationic surfactants and anionic suds suppressors. EP 234717 also discloses suds controllers containing cationic compounds, whereby anionic surfactants can be present in the composition. JP 57137397 discloses powders made by blending anionic soaps into a molten cationic softener.

[0004] EP-A 000 225, published on 10th January 1979, discloses compositions comprising water-soluble cationic surfactant and anionic surfactant. The surfactants are combined together with other detergent ingredients, such as builders, in a crutcher mix and spray-dried. It is an essential feature that there is a molar excess of anionic surfactant over cationic surfactant. The examples disclose up to a maximum of about 8% by weight of cationic surfactant in the spray dried component.

[0005] EP 547722 discloses spray-dried compositions containing cationic softeners and high levels of urea and additional surfactant.

[0006] Attempts to increase cationic surfactant content of granular compositions by first concentrating the aqueous solution have proved very difficult because viscous gel phases of concentrated cationic surfactant make further processing extremely difficult on a commercial scale.

[0007] The present invention aims to provide granular detergent components or compositions having a higher level of water-soluble cationic surfactant than prior art components.

[0008] This is achieved by mixing small amounts of anionic surfactant with the aqueous solution of the cationic surfactant, and subsequently drying and granulating, either simultaneously or sequentially. The addition of the anionic surfactant permit more concentrated cationic solutions to be processed without entering a viscous gel phase. Consequently more concentrated granular surfactant components or compositions can be produced.

Summary of the Invention

[0009] The present invention concerns a granular detergent composition or component comprising anionic surfactant and/or anionic hydrotrope, preferably anionic surfactant, at least 20% by weight of water-soluble cationic surfactant, and less than 10% by weight of anionic polymer wherein the molar ratio of anionic surfactant and/or anionic hydrotrope to cationic surfactant is less than 1:1, preferably less than 0.5:1, and comprising from 10% to 69% by weight of a detergent builder selected from the group consisting of aluminosilicate, silicate, carbonate, citrate, phosphate or mixtures thereof provided that the composition or component is free of monoalkylesters of phosphoric acid.

[0010] The granular detergent composition or component preferably comprises the cationic surfactant at a level of at least 30% by weight of the composition or component, and the anionic surfactant at a level of from 1% to 20% by weight the composition or component.

[0011] A highly preferred granular detergent composition or component is substantially free of anionic polymer, and comprises:

- (a) from 35% to 50% by weight of water-soluble cationic surfactant;
- (b) from 1% to 5% by weight of anionic surfactant; and
- (c) from 40% to 60% by weight of sodium aluminosilicate.

[0012] Another aspect of the present invention is a process for making the composition or component comprising the steps of

- (i) mixing an aqueous solution comprising water-soluble cationic surfactant, anionic surfactant and/or anionic hydrotrope preferably anionic surfactant, and less than 10% by weight of anionic polymer;
- (ii) drying the mixture to form a concentrated solution having a solids level of at least 50% by weight, and
- (iii) granulating the concentrated solution; wherein the cationic surfactant is at a level of at least 20% by weight of the composition or component and the molar ratio of anionic surfactant to cationic surfactant is less than 1:1, and whereby the composition or component comprises from 10% to 69% by weight of a detergent builder selected from the group consisting of aluminosilicate, silicate, carbonate, citrate, phosphate or mixtures thereof, provided that the composition or component is free of monoalkylesters of phosphoric acid.

[0013] Hereby, the granulating step may be subsequently carried out and comprises the step of mixing the concentrated solution with a detergent builder selected from the group consisting of aluminosilicate, silicate, carbonate, citrate, phosphate or mixtures thereof.

[0014] Optionally a suds suppressing agent is added to the mixing step (i).

5 **[0015]** The drying step may be carried out by means of an evaporation step.

[0016] Alternatively the drying and granulating steps may be carried out simultaneously, preferably by means of spray drying.

Detailed Description of the Invention

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[0017] The cationic surfactant component of the composition is water-soluble. By water solubility we refer in this context to the solubility of cationic surfactant in monomeric form, the limit of solubility being determined by the onset of micellisation and measured in terms of the critical micelle concentration (CMC). The cationic surfactant should thus have a CMC for the pure material greater than about 200ppm and preferably greater than about 500ppm, specified at 15 30°C and in distilled water (Critical Micelle Concentrations of Aqueous Surfactant Systems, P. Mukerjee and K.J. Mysels, NSRDS-NBS, (1971)).

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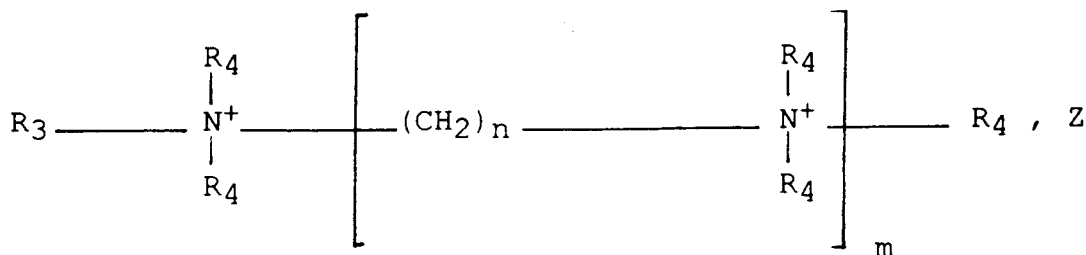
[0018] Useful cationic surfactants include water-soluble quaternary ammonium compounds of the form $R_1R_2R_3R_4N^+X^-$, wherein R_1 is alkyl having from 10 to 20, preferably from 12-18 carbon atoms, and R_2 , R_3 and R_4 are each C_1 to C_7 alkyl, or hydroxyalkyl, preferably methyl; X^- is an anion, e.g. chloride. Examples of such quaternary ammonium compounds include C_{12-14} alkyl trimethyl ammonium chloride, C_{12-14} alkyl dimethyl ethoxy ammonium chloride and cocalkyl trimethyl ammonium methosulfate. Other useful cationic surfactants are described in US Pat No. 4,222,905, Cockrell, issued Sept 16, 1990 and in US Pat No 4,239,659, Murphy, issued Dec. 16, 1980.

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[0019] Another group of useful cationic compounds are the polyammonium salts of the general formula :

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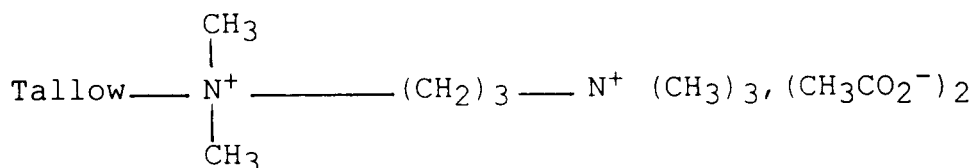
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wherein R_3 is selected from C_8 to C_{20} alkyl, alkenyl and alkaryl groups; each R_4 is C_1 - C_4 alkyl; n is from 1 to 6; and m is from 1 to 3.

[0020] A specific example of a material in this group is :

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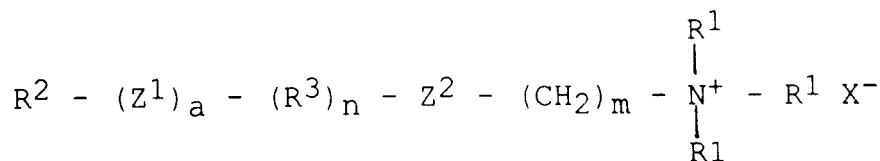
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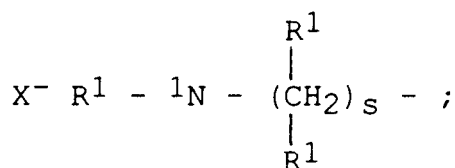
[0021] A further preferred type of cationic component, has the formula :

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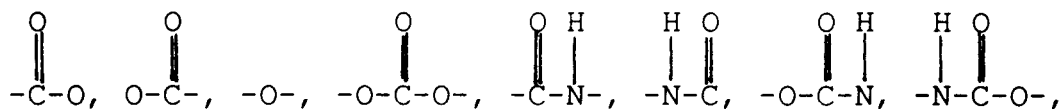
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wherein R¹ is C₁ to C₄ alkyl; R² is C₅ to C₃₀ straight or branched chain alkyl or alkenyl, alkyl benzene, or



wherein s is from 0 to 5, R³ is C₁ to C₂₀ alkyl or alkenyl; a is 0 or 1; n is 0 or 1; m is from 1 to 5; Z- and Z₂ are each selected from the group consisting of :

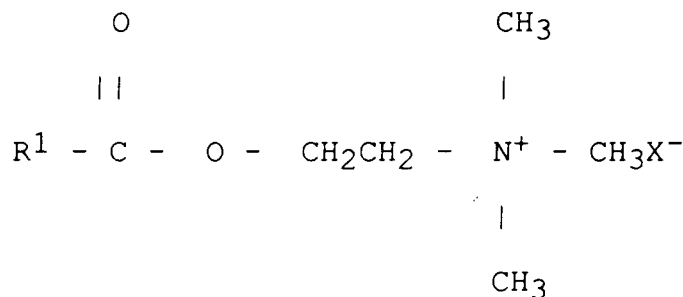


and wherein at least one of said groups is selected from the group consisting of ester, reverse ester, amide and reverse amide; and X is an anion which makes the compound water-soluble, preferably selected from the group consisting of amide, methyl sulfate, hydroxide, and nitrate preferably chloride, bromide or iodine.

[0022] In addition to the advantages of the other cationic surfactants disclosed herein, this particular cationic component is environmentally desirable, since it is biodegradable, both in terms of its long alkyl chain and its nitrogen containing segment.

Choline esters :

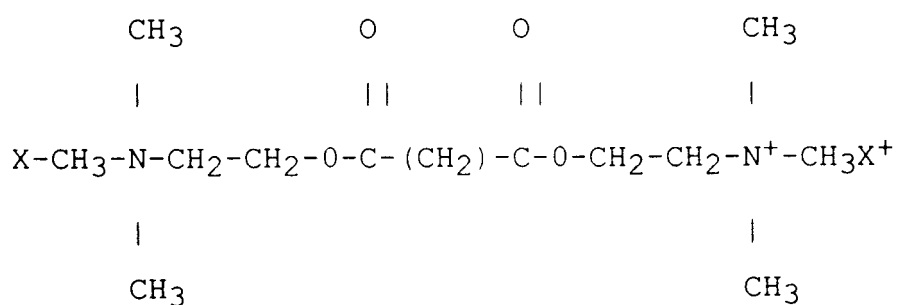
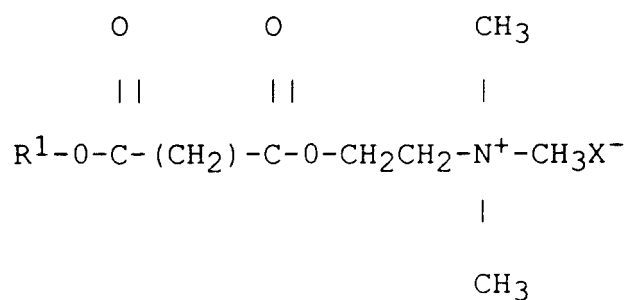
[0023] Preferred choline ester derivatives having the following formula :



wherein R is a C₅ to C₃₀ straight chain or branched chain alkyl or alkenyl, group and X is an anion, which makes the compound at least water-dispersible, preferably selected from the group consisting of halide, methyl sulfate, sulfate, and nitrate, preferably methyl sulfate, chloride, bromide or iodide, as well as those wherein the ester linkage in the above formula is replaced with a reverse ester, amide or reverse amide linkage.

[0024] Particularly preferred examples of this type of cationic surfactant include stearyl choline ester quaternary ammonium halides (R¹=C₁₇ alkyl), palmitoyl choline ester quaternary ammonium halides (R¹=C₁₅ alkyl), myristoyl choline ester quaternary ammonium halides (R¹=C₁₃ alkyl), lauroyl choline ester ammonium halides (R¹=C₁₁ alkyl), as well as coconut and tallow choline ester quaternary ammonium halides (R¹=C₁₅-C₁₇ alkyl and C₁₉-C₁₃ alkyl, respectively).

[0025] Additional preferred cationic components of the choline ester variety are given by the structural formulas below, wherein p may be from 0 to 20.

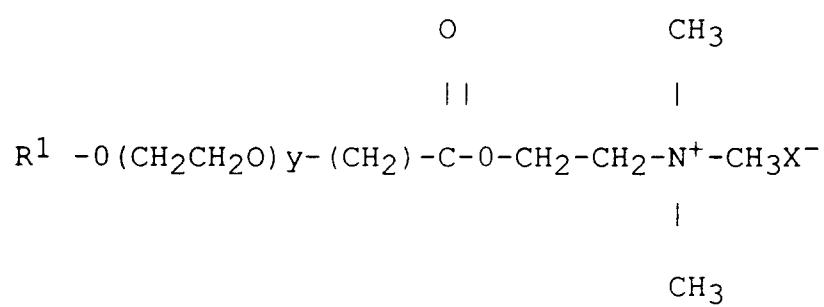


[0026] The preferred choline-derivative cationic substances, discussed above, may be prepared by the direct esterification of a fatty acid of the desired chain length with dimethylaminoethanol, in the presence of an acid catalyst. The reaction product is then quaternized with a methyl halide, forming the desired cationic material.

[0027] The choline-derived cationic materials may also be prepared by the direct esterification of a long chain fatty acid of the desired chain length together with 2-haloethanol, in the presence of an acid catalyst material. The reaction product is then used to quaternize.

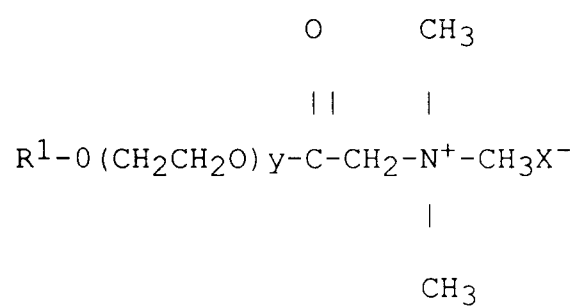
[0028] Trimethylamine, forming the desired cationic component. Other suitable choline esters for use herein have the formula:

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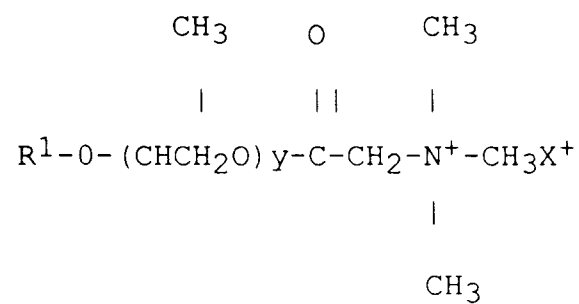
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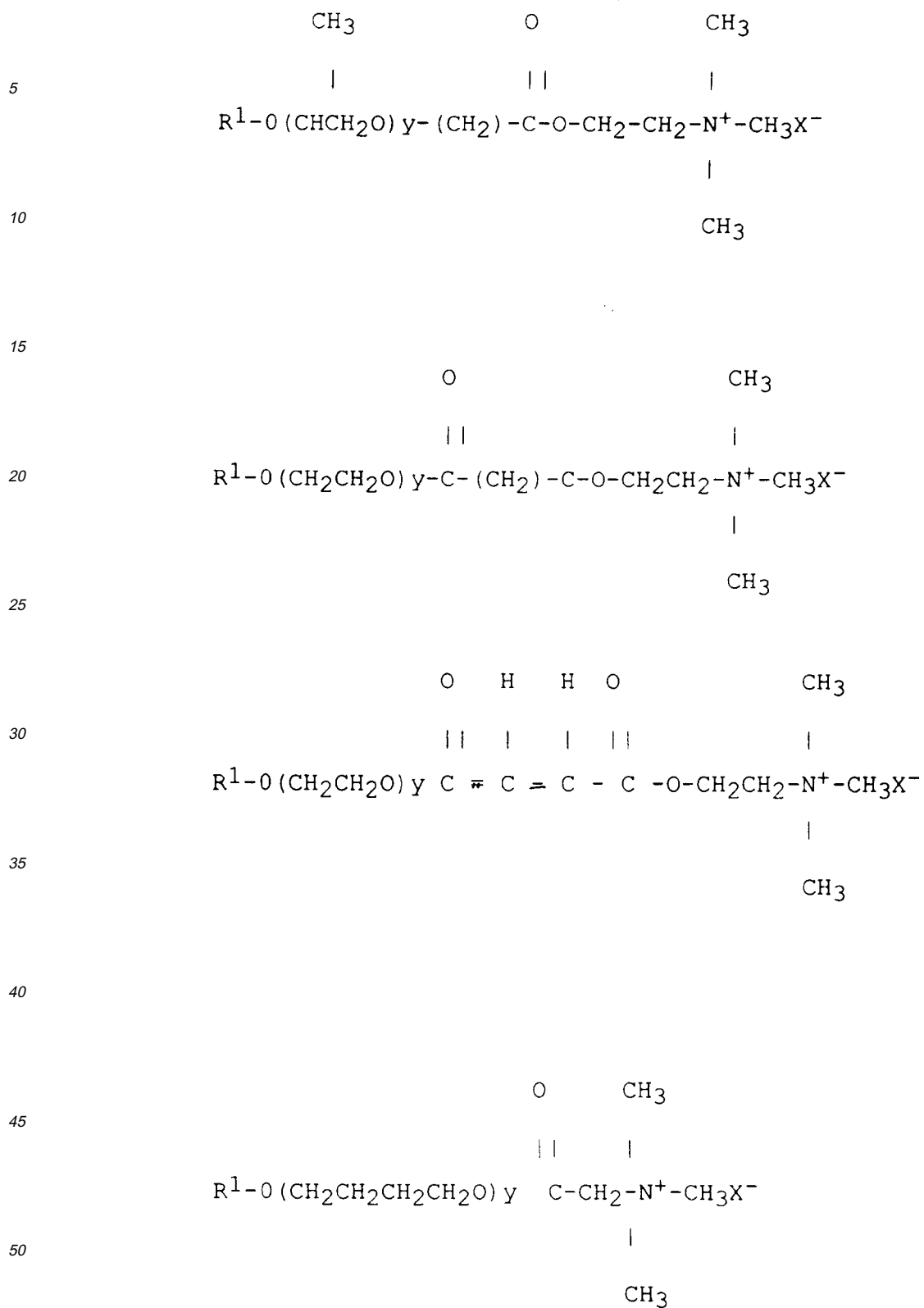
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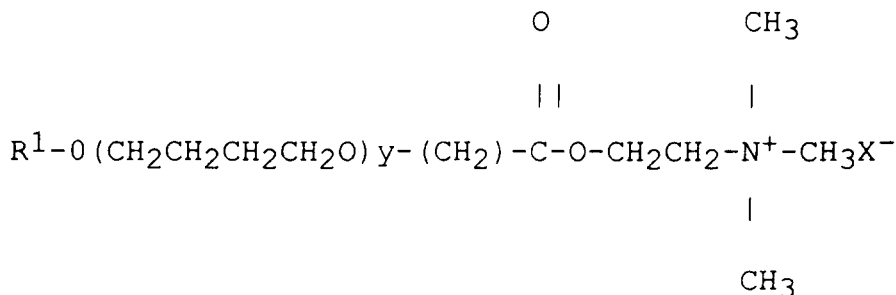
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wherein t is 0 or 1, y is from 1 to 20, and R and X are as defined above.

Anionic Surfactant

[0029] The anionic surfactant component of the present invention include water-soluble salts of the higher fatty acids, i.e., "soaps". This includes alkali metal soaps such as the sodium, potassium, ammonium, and alkylammonium salts of higher fatty acids containing from 8 to 24 carbon atoms, and preferably from 12 to 18 carbon atoms. Soaps can be made by direct saponification of fats and oils or by the neutralization of free fatty acids. Particularly useful are the sodium and potassium salts of the mixtures of fatty acids derived from coconut oil and tallow, i.e., sodium or potassium tallow and coconut soap.

[0030] Useful anionic surfactants also include the water-soluble salts, preferably the alkali metal, ammonium and alkylammonium salts, of organic sulfuric reaction products having in their molecular structure an alkyl group containing from 10 to 20 carbon atoms and a sulfonic acid or sulfuric acid ester group. (Included in the term "alkyl" is the alkyl portion of acyl groups.) Examples of this group of synthetic surfactants are the sodium and potassium alkyl sulfates, especially those obtained by sulfating the higher alcohols (C₈-C₁₈ carbon atoms) such as those produced by reducing the glycerides of tallow or coconut oil; and the sodium and potassium alkyl benzene sulfonates in which the alkyl group contains from 9 to 15 carbon atoms, in straight or branched chain configuration, e.g., those of the type described in U.S. Pat. Nos. 2,220,099 and 2,477,383. Especially valuable are linear straight chain alkyl benzene sulfonates in which the average number of carbon atoms in the alkyl group is from 11 to 13, abbreviated as C₁₁-C₁₃ LAS.

[0031] Other useful anionic surfactants herein include the water-soluble salts of esters of alpha-sulfonated fatty acids containing from 6 to 20 carbon atoms in the fatty acid group and from 1 to 10 carbon atoms in the ester group; water-soluble salts of 2-acyloxy-alkane-1-sulfonic acids containing from 2 to 9 carbon atoms in the acyl group and from 9 to 23 carbon atoms in the alkane moiety; alkyl ether sulfates containing from 10 to 20 carbon atoms in the alkyl group and from 1 to 30 moles of ethylene oxide; watersoluble salts of olefin sulfonates containing from 12 to 24 carbon atoms; and beta-alkyloxy alkane sulfonates containing from 1 to 3 carbon atoms in the alkyl group and from 8 to 20 carbon atoms in the alkane moiety.

[0032] Also considered as anionic surfactants useful in the present invention are hydrotropes such as aryl sulphonates. Preferred are sodium or potassium salts of benzene, toluene, xylene or cumene sulphonate.

Suds Suppressing Agent

[0033] A suds suppressing agent is useful in the present invention as a process aid, to control suds at the stage of mixing the cationic surfactant solution with the anionic surfactant.

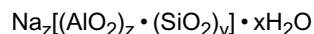
[0034] A wide variety of materials may be used as suds suppressing agents such as monocarboxylic fatty acids and their soluble salts, high molecular weight hydrocarbons such as paraffin, fatty acid esters, fatty acid esters of monovalent alcohols, aliphatic C₁-C₄₀ ketones, N-alkoxylated amino triazines, propylene oxide, and monstearyl phosphates and phosphate esters. Another preferred category of suds suppressing agents comprises silicone suds suppressors.

[0035] This category includes the use of polyorganosiloxane oils, such as polydimethyl siloxane, dispersions or emulsions of polyorganosiloxane oils or resins, and combinations of polyorganosiloxane with silica particles wherein the polyorganosiloxane is chemisorbed or fused onto the silica. Silicone suds suppressors are well-known in the art and are, for example, disclosed in US-A-4 265 779, issued May 5th 1981. Other silicone suds suppressors are disclosed in US-A-3 455 839 and German Patent Application DE-A-21 24 526.

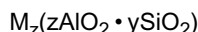
Powders

[0036] Many powders are suitable for use in the granulation step of the present process. The powders for use in the process and compositions of the present invention include at least one or more builders selected from the group consisting of aluminosilicate, silicate, carbonate, citrate, phosphate or mixtures thereof, compatible detergency builder or combination of builders or powder.

[0037] The detergent compositions herein can contain crystalline aluminosilicate ion exchange material of the formula



wherein z and y are at least 6, the molar ratio of z to y is from 1.0 to 0.4 and z is from 10 to 264. Amorphous hydrated aluminosilicate materials useful herein have the empirical formula

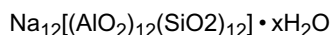


wherein M is sodium, potassium, ammonium or substituted ammonium, z is from 0.5 to 2 and y is 1, said material having a magnesium ion exchange capacity of at least 50 milligram equivalents of CaCO_3 hardness per gram of anhydrous aluminosilicate. Hydrated sodium Zeolite A with a particle size of from 1 to 10 microns is preferred.

[0038] The aluminosilicate ion exchange builder materials herein are in hydrated form and contain from 10% to 28% of water by weight if crystalline, and potentially even higher amounts of water if amorphous. Highly preferred crystalline aluminosilicate ion exchange materials contain from 18% to 22% water in their crystal matrix. The crystalline aluminosilicate ion exchange materials are further characterized by a particle size diameter of from 0.1 micrometer to 10 micrometers. Amorphous materials are often smaller, e.g., down to less than 0.01 micrometer. Preferred ion exchange materials have a particle size diameter of from 0.2 micrometer to 4 micrometers. The term "particle size diameter" herein represents the average particle size diameter by weight of a given ion exchange material as determined by conventional analytical techniques such as, for example, microscopic determination utilizing a scanning electron microscope. The crystalline aluminosilicate ion exchange materials herein are usually further characterized by their calcium ion exchange capacity, which is at least 200 mg equivalent of CaCO_3 water hardness/g of aluminosilicate, calculated on an anhydrous basis, and which generally is in the range of from 300 mg eq./g to 352 mg eq./g.

[0039] The amorphous aluminosilicate ion exchange materials usually have a Mg^{++} exchange of at least 50 mg eq. CaCO_3/g (12 mg Mg^{++}/g). Amorphous materials do not exhibit an observable diffraction pattern when examined by Cu radiation (1.54 Angstrom Units).

[0040] Aluminosilicate ion exchange materials useful in the practice of this invention are commercially available. The aluminosilicates useful in this invention can be crystalline or amorphous in structure and can be naturally occurring aluminosilicates or synthetically derived. A method for producing aluminosilicate ion exchange materials is discussed in U.S. Pat. No. 3,985,669, Krummel et al., issued Oct. 12, 1976. Preferred synthetic crystalline aluminosilicate ion exchange materials useful herein are available under the designations Zeolite A, Zeolite B, Zeolite P, Zeolite MAP and Zeolite X. In an especially preferred embodiment, the crystalline aluminosilicate ion exchange material has the formula



wherein x is from 20 to 30, especially 27 and has a particle size generally less than 5 μm .

[0041] The granular detergents of the present invention can contain neutral or alkaline salts which have a pH in solution of seven or greater, and can be either organic or inorganic in nature. The builder salt assists in providing the desired density and bulk to the detergent granules herein. While some of the salts are inert, many of them also function as detergency builder materials in the laundering solution.

[0042] Examples of neutral water-soluble salts include the alkali metal, ammonium or substituted ammonium chlorides, fluorides and sulfates. The alkali metal, and especially sodium, salts of the above are preferred. Sodium sulfate is typically used in detergent granules and is a particularly preferred salt. Citric acid and, in general, any other organic or inorganic acid may be incorporated into the granular detergents of the present invention as long as it is chemically compatible with the rest of the agglomerate composition.

[0043] Other useful water-soluble salts include the compounds commonly known as detergent builder materials. Builders are generally selected from the various water-soluble, alkali metal, ammonium or substituted ammonium phosphates, polyphosphates, phosphonates, polyphosphonates, carbonates, silicates, borates, citrates, silicas and polyhydroxysulfonates. Preferred are the alkali metal, especially sodium, salts of the above.

[0044] Specific examples of inorganic phosphate builders are sodium and potassium tripolyphosphate, pyrophosphate, polymeric metaphosphate having a degree of polymerization of from 6 to 21, and orthophosphate. Examples of

polyphosphonate builders are the sodium and potassium salts of ethylene diphosphonic acid, the sodium and potassium salts of ethane 1-hydroxy-1,1-diphosphonic acid and the sodium and potassium salts of ethane, 1,1,2-triphosphonic acid. Other phosphorus builder compounds are disclosed in U.S. Pat. Nos. 3,159,581; 3,213,030; 3,422,021; 3,422,137; 3,400,176 and 3,400,148.

- 5 **[0045]** Examples of nonphosphorus, inorganic builders are sodium and potassium carbonate, bicarbonate, sesquicarbonate, tetraborate decahydrate, and silicate having a molar ratio of SiO_2 to alkali metal oxide of from 0.5 to 4.0, preferably from 1.0 to 2.4. The compositions made by the process of the present invention does not require excess carbonate for processing, and preferably does not contain over 2% finely divided calcium carbonate as disclosed in U.S. Pat. No. 4,196,093, Clarke et al., issued Apr. 1, 1980, and is preferably free of the latter.

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Softening Clay

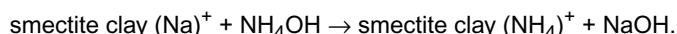
- [0046]** Softening clay is a particularly useful component which may be optionally incorporated into the compositions of the present invention. When used, the clay may be incorporated into the cationic surfactant containing particle of the present invention, however it is preferred that the clay is incorporated into a particle separate from the cationic surfactant. The cationic surfactant containing particles and the clay containing particles may then be mixed together, usually with other particulate components comprising conventional detergent ingredients to give a finished commercial laundry detergent product.

- 15 **[0047]** Softening clays may be either unmodified or organically modified. Those clays which are not organically modified can be described as expandable, three-layered clays, i.e., aluminosilicates and magnesium silicates, having an ion exchange capacity of at least 50 meq/100g. of clay and preferably at least 60 meq/100 g. of clay. The starting clays for the organically modified clays can be similarly described. The term "expandable" as used to describe clays relates to the ability of the layered clay structure to be swollen, or expanded, on contact with water. The three-layer expandable clays used herein are those materials classified geologically as smectites.

- 20 **[0048]** There are two distinct classes of smectite-type clays that can be broadly differentiated on the basis of the numbers of octahedral metal-oxygen arrangements in the central layer for a given number of silicon-oxygen atoms in outer layers. A more complete description of clay minerals is given in "Clay Colloid Chemistry" by H. van Olphen, John Wiley & Sons (Interscience Publishers), New York, 1963. Chapter 6, especially pages 66-69.

- [0049]** The family of smectite (or montmorillonoid) clays includes the following trioctahedral minerals: talc; hectorite; saponite; sauconite; vermiculite; and the following dioctahedral minerals: prophyllite; montmorillonite; volchonskoite and nontronite.

- 25 **[0050]** The clays employed in these compositions contain cationic counterions such as protons, sodium ions, potassium ions, calcium ions, and lithium ions. It is customary to distinguish between clays on the basis of one cation predominantly or exclusively absorbed. For example, a sodium clay is one in which the absorbed cation is predominantly sodium. Such absorbed cations can become involved in exchange reactions with cations present in aqueous solutions. A typical exchange reaction involving a smectite-type clay is expressed by the following equation :



- 40 Since in the foregoing equilibrium reaction, an equivalent weight of ammonium ion replaces an equivalent weight of sodium, it is customary to measure cation exchange capacity (sometimes termed "base exchange capacity") in terms of milliequivalents per 100 g. of clay (meq/100g). The cation exchange capacity of clays can be measured in several ways, including by electrodialysis, by exchange with ammonium ion followed by titration, or by a methylene blue procedure, all as fully set forth in Grimshaw, "The Chemistry and Physics of Clays", pp. 264-265, Interscience (1971).

- 45 **[0051]** The cation exchange capacity of a clay material relates to such factors as the expandable properties of the clay, the charge of the clay (which in turn is determined at least in part by the lattice structure), and the like. The ion exchange capacity of clays varies widely in the range from 2 meq/100 g. of kaolinites to 150 meq/100 g., and greater, for certain smectite clays.

- [0052]** Preferred smectite-type clays are sodium montmorillonite, potassium montmorillonite, sodium hectorite and potassium hectorite. The clays used herein have a particle size range of up to 1 μm .

- [0053]** Any of the clays used herein may be either naturally or synthetically derived.

Examples

- 55 **[0054]** In the following examples

Cationic surfactant is C12-14 alkyl dimethyl hydroxyethyl ammonium chloride Sodium (C12-14) alkyl ether (3) sulphate is the sodium salt of a C12-14 ethoxylated alcohol

having an average of 3 moles of ether per mole.

Suds Suppressing Agent is poly dimethyl siloxane (85%) and hydrophobic silica (15%)

[0055] The following composition was made :

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	% by weight
Cationic Surfactant	40
Sodium (C12-14) alkyl sulphate	1.6
Sodium (C12-14) alkyl ether (3) sulphate	0.4
Zeolite A (hydrated)	54.9
Suds Suppressing Agent	0.1
Water	3

20 Example 1

[0056] The above composition was prepared by mixing a 40% aqueous solution of the cationic surfactant with a 79% aqueous paste of the mixture of anionic surfactants, and with the antifoam. The mixture was then evaporated to form a 60% cationic surfactant active paste. The paste was fed into a high shear mixer (a Loedige CB[®]) where it was granulated with the Zeolite A. The resulting granules were further treated in a low shear mixer (a Loedige KM[®]) and subsequently dried in a fluid bed dryer to a moisture level of 3% (free) water.

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Example 2

[0057] The above composition was prepared by mixing a 40% aqueous solution of the cationic surfactant with a 79% aqueous paste of the mixture of anionic surfactants. The Zeolite A was also added to the mixture and a homogeneous crutcher mix formed. The crutcher mix was then spray dried using hot air in a conventional counter-current spray dry tower to give the finished granular composition.

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35 Comparative Example A

[0058] A 40% aqueous solution of the cationic surfactant was fed into a high shear-mixer (Loedige CB[®]) and agglomerated with a fixed amount of Zeolite A powder. The feed was stopped just before over-agglomeration occurred (the point where the liquid level exceeds the capacity of the powder, leading to the formation of an un-processable 'dough'). The resultant wet agglomerate was then dried in a fluid-bed dryer giving a product with the following composition :-

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	% by weight
Cationic Surfactant	15
Sodium (C12-14) alkyl sulphate	-
Sodium (C12-14) alkyl ether (3) sulphate	-
Zeolite A (hydrated)	82
Water	3

[0059] This particle is not suitable for inclusion in 'compact-type' products due to the low cationic surfactant activity.

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Comparative Example B

[0060] A 40% aqueous solution of the cationic surfactant was dried by evaporation to form a 60% cationic surfactant active paste. The paste became a highly viscous gel and no further useful processing was possible.

Claims

1. A granular detergent composition or component comprising anionic surfactant and/or anionic hydrotrope, water-soluble cationic surfactant having in its pure form a CMC (critical micelle concentration) of greater than 200 ppm, at 30°C in distilled water, and less than 10% by weight of anionic polymer characterised in that the cationic surfactant is at a level of at least 20% by weight of the composition or component and the molar ratio of anionic surfactant and/or anionic hydrotrope to cationic surfactant is less than 1:1, and the composition or component comprises from 10% to 69% by weight of a detergent builder selected from the group consisting of aluminosilicate, silicate, carbonate, citrate, phosphate or mixtures thereof, provided that the composition or component is free of monoalkylesters of orthophosphoric acid.
2. A granular detergent composition or component according to claim 1 wherein the cationic surfactant is at a level of at least 30% by weight of the composition or component, and the anionic surfactant is at a level of from 1% to 20% by weight the composition or component and the molar ratio of anionic surfactant to cationic surfactant is less than 0.5:1.
3. A granular detergent composition or component according to claim 3, which is substantially free of anionic polymer, comprising:
 - (a) from 35% to 50% by weight of water-soluble cationic surfactant;
 - (b) from 1% to 5% by weight of anionic surfactant; and
 - (c) from 40% to 60% by weight of sodium aluminosilicate.
4. A process for making the composition or component comprising the steps of
 - (i) mixing an aqueous solution comprising water-soluble cationic surfactant having in its pure form a CMC (critical micelle concentration) of greater than 200 ppm, at 30°C in distilled water, anionic surfactant and/or anionic hydrotrope preferably an anionic surface, and less than 10% by weight of anionic polymer
 - (ii) drying the mixture to form a concentrated solution having a solids level of at least 50% by weight, and
 - (iii) granulating the concentrated solution;
 characterised in that the cationic surfactant is at a level of at least 20% by weight of the composition or component and the molar ratio of anionic surfactant and/or anionic hydrotrope to cationic surfactant is less than 1:1, and the composition or component comprises from 10% to 69% by weight of a detergent builder selected from the group consisting of aluminosilicate, silicate, carbonate, citrate, phosphate or mixtures thereof, provided that the composition or component is free of monoalkylesters of orthophosphoric acid.
5. A process according to claim 5 wherein a suds suppressing agent is added to the mixing step (i).
6. A process according to either of claims 5 or 6 wherein the drying step is carried out by means of an evaporation step, and that the granulating step is subsequently carried out by mixing the concentrated solution with a detergent builder selected from the group consisting of aluminosilicate, silicate, carbonate, citrate, phosphate or mixtures thereof.
7. A process according to claim 5 wherein the drying and granulating steps are carried out simultaneously, preferably by means of spray drying.

Patentansprüche

1. Granuläre Reinigungsmittelzusammensetzung oder -komponente, umfassend anionisches Tensid und/oder anionisches Hydrotrop, wasserlösliches, kationisches Tensid, das in seiner reinen Form eine CMC (kritische Micellenkonzentration) von mehr als 200 ppm, bei 30°C in destilliertem Wasser, aufweist, und weniger als 10 Gew.-%

anionisches Polymer, dadurch gekennzeichnet, daß das kationische Tensid in einem Anteil von mindestens 20 Gew.-% der Zusammensetzung oder Komponente vorliegt und das Molverhältnis von anionischem Tensid und/oder anionischem Hydrotrop zu kationischem Tensid Weniger als 1:1 beträgt, und daß die Zusammensetzung oder Komponente 10 bis 69 Gew.-% eines Waschmittelbuilders umfaßt, gewählt aus der Gruppe, bestehend aus Aluminosilicat, Silicat, Carbonat, Citrat, Phosphat oder Mischungen hiervon, mit der Maßgabe, daß die Zusammensetzung oder Komponente keine Monoalkylester von Orthophosphorsäure enthält.

2. Granuläre Reinigungsmittelzusammensetzung oder -komponente nach Anspruch 1, wobei das kationische Tensid in einem Anteil von mindestens 30 Gew.-% der Zusammensetzung oder Komponente vorliegt, und das anionische Tensid in einem Anteil von 1 bis 20 Gew.-% der Zusammensetzung oder Komponente vorliegt, und das Molverhältnis von anionischem Tensid zu kationischem Tensid weniger als 0,5:1 beträgt.

3. Granuläre Reinigungsmittelzusammensetzung oder -komponente nach Anspruch 1, welche im wesentlichen frei ist an anionischem Polymer, umfassend:

- (a) 35 bis 50 Gew.-% wasserlösliches, kationisches Tensid;
- (b) 1 bis 5 Gew.-% anionisches Tensid; und
- (c) 40 bis 60 Gew.-% Natriumaluminosilicat.

4. Verfahren zur Herstellung der Zusammensetzung oder Komponente, umfassend die Schritte

(i) Mischen einer wäßrigen Lösung, umfassend ein wasserlösliches, kationisches Tensid, das in seiner reinen Form eine CMC (kritische Micellenkonzentration) von mehr als 200 ppm, bei 30°C in destilliertem Wasser, aufweist, anionisches Tensid und/oder anionisches Hydrotrop, vorzugsweise anionisches Tensid, und weniger als 10 Gew.-% anionisches Polymer;

(ii) Trocknen der Mischung unter Bildung einer konzentrierten Lösung mit einem Feststoffanteil von mindestens 50 Gew.-%; und

(iii) Granulieren der konzentrierten Lösung;

dadurch gekennzeichnet, daß das kationische Tensid in einem Anteil von mindestens 20 Gew.-% der Zusammensetzung oder Komponente vorliegt und das Molverhältnis von anionischem Tensid und/oder anionischem Hydrotrop zu kationischem Tensid weniger als 1:1 beträgt, und die Zusammensetzung oder Komponente 10 bis 69 Gew.-% eines Waschmittelbuilders umfaßt, gewählt aus der Gruppe, bestehend aus Aluminosilicat, Silicat, Carbonat, Citrat, Phosphat oder Mischungen hiervon, mit der Maßgabe, daß die Zusammensetzung oder Komponente keine Monoalkylester von Orthophosphorsäure enthält.

5. Verfahren nach Anspruch 4, wobei ein Schaumunterdrückungsmittel beim Mischschritt (i) zugesetzt wird.

6. Verfahren nach Anspruch 4 und/oder 5, wobei der Trocknungsschritt mittels eines Verdampfungsschrittes durchgeführt wird, und wobei der Granulierungsschritt anschließend durchgeführt wird durch Mischen der konzentrierten Lösung mit einem Waschmittelbuilder, gewählt aus der Gruppe, bestehend aus Aluminosilicat, Silicat, Carbonat, Citrat, Phosphat oder Mischungen hiervon.

7. Verfahren nach Anspruch 4, wobei die Trocknungs- und Granulierungsschritte gleichzeitig durchgeführt werden, vorzugsweise mittels Sprühtrocknung.

Revendications

1. Composition ou composant détergent(e) granulaire comprenant un agent tensioactif anionique et/ou un hydrotrope anionique, un agent tensioactif cationique soluble dans l'eau ayant dans sa forme pure une CMC (concentration critique en micelles) de plus de 200 ppm à 30°C dans de l'eau distillée, et moins de 10% en poids d'un polymère anionique, caractérisé(e) en ce que l'agent tensioactif cationique est présent à un niveau d'au moins 20% en poids de la composition ou du composant et le rapport molaire de l'agent tensioactif anionique et/ou de l'hydrotrope anionique à l'agent tensioactif cationique est inférieur à 1:1, et la composition ou le composant comprend 10% à 69% en poids d'un adjuvant détergent choisi dans le groupe constitué d'un aluminosilicate, d'un silicate, d'un carbonate, d'un citrate, d'un phosphate ou de leurs mélanges, pourvu que la composition ou le composant soit exempt(e) de monoalkylesters de l'acide orthophosphorique.

2. Composition ou composant détergent(e) granulaire selon la revendication 1, dans laquelle ou lequel l'agent ten-

sioactif cationique est présent à un niveau d'au moins 30% en poids de la composition ou du composant et l'agent tensioactif anionique est présent à un niveau de 1% à 20% en poids de la composition ou du composant et le rapport molaire de l'agent tensioactif anionique à l'agent tensioactif cationique est inférieur à 0,5:1.

- 5 3. Composition ou composant détergent(e) granulaire selon la revendication 3, qui est sensiblement exempt(e) d'un polymère anionique, comprenant :
 - (a) 35% à 50% en poids d'un agent tensioactif cationique soluble dans l'eau,
 - (b) 1% à 5% en poids d'un agent tensioactif anionique, et
 - 10 (c) 40% à 60% en poids d'aluminosilicate de sodium.
4. Procédé de préparation de la composition ou du composant, comprenant les étapes consistant :
 - (i) à mélanger une solution aqueuse comprenant un agent tensioactif cationique soluble dans l'eau ayant dans sa forme pure une CMC (concentration critique en micelles) de plus de 200 ppm à 30°C dans de l'eau distillée, un agent tensioactif anionique et/ou un hydrotrope anionique, de préférence un agent tensioactif anionique, et moins de 10% en poids d'un polymère anionique,
 - (ii) à sécher le mélange pour former une solution concentrée ayant une teneur en solides d'au moins 50% en poids, et
 - 20 (iii) à granuler le solution concentrée, caractérisé en ce que l'agent tensioactif cationique est présent à un niveau d'au moins 20% en poids de la composition ou du composant et le rapport molaire de l'agent tensioactif anionique et/ou de l'hydrotrope anionique à l'agent tensioactif cationique est inférieur à 1:1, et la composition ou le composant comprend 10% à 69% en poids d'un adjuvant détergent choisi dans le groupe constitué d'un aluminosilicate, d'un silicate, d'un carbonate, d'un citrate, d'un phosphate ou de leurs mélanges, pourvu que la composition ou le composant soit exempt(e) de monoalkylesters de l'acide orthophosphorique.
 - 25 5. Procédé selon la revendication 4, dans lequel un agent supprimeur de mousse est ajouté à l'étape de mélange (i).
 - 30 6. Procédé selon l'une quelconque des revendications 4 et 5, dans lequel l'étape de séchage est effectuée au moyen d'une étape d'évaporation et l'étape de granulation est ensuite effectuée en mélangeant la solution concentrée avec un adjuvant détergent choisi dans le groupe constitué d'un aluminosilicate, d'un silicate, d'un carbonate, d'un citrate, d'un phosphate ou de leurs mélanges.
 - 35 7. Procédé selon la revendication 5, dans lequel les étapes de séchage et de granulation sont effectuées simultanément, de préférence par séchage par pulvérisation.

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