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(54) **Particulate, soap-containing detergent composition.**

(57) A particulate soap-containing detergent composition with effective building, detergency and solubility properties is obtained if the soap component is substantially free from lauric soaps, and contains a certain level of sodium linoleate, either alone or in admixture with certain levels of sodium soaps of C_{16}-C_{24} saturated and/or C_{16}-C_{24} monounsaturated fatty acids.

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PARTICULATE, SOAP-CONTAINING DETERGENT COMPOSITION

The present invention relates to a particulate, soap-containing detergent composition.

Such compositions are well known in the art; they are either based on soap as the sole detergent-active material, or they contain soap in admixture with non-soap synthetic detergents, such as anionic, nonionic, cationic, zwitterionic or amphoteric synthetic detergents and mixtures thereof.

Normally, the soap component used in these compositions is a soap derived from palm oil, tallow, coconut oil and the like, as well as mixtures thereof. However, part of these soaps, especially of sodium coconut soap, does not effectively contribute to the water-softening and detergency of the soap component; the major part of sodium coconut soap serves only a solubilization purpose, but does not itself contribute effectively to the overall detergency of the soap component.

It has now been found that if the soap component in particulate, soap-based detergent compositions is substantially free (i.e. less than 5%, preferably less than 3%) of a sodium soap of a C_{12} or C_{14} saturated fatty acid, and contains a certain level (hereafter to be more precisely defined) of a sodium soap of linoleic acid, the overall detergency performance of such soap-based compositions is improved, as well as the solubility of the soap component. The present invention therefore in its broadest sense relates to a

particulate, soap-containing detergent composition in which the soap is substantially free from sodium soaps of C_{12} or C_{14} saturated fatty acids, and in which the soap is or comprises a sodium linoleate.

The soap component in the detergent composition may consist solely of sodium linoleate, or it may contain, besides the sodium linoleate, a soap of C_{16}-C_{24} monounsaturated fatty acid, such as e.g. sodium oleate. The sodium linoleate improves the solubility of such soap blends, These soap blends may further contain up to 30, e.g. up to 25% by weight of a sodium soap of saturated C_{16}-C_{24} fatty acids, without impairment of the benefits of the invention.

The soap component therefore consists of 10-100% sodium linoleate, 0-90% sodium soap of C_{16}-C_{24} monounsaturated fatty acids, and 0-30% of C_{16}-C_{24} saturated fatty acids, the total of the three types of soap being 100%.

The soap component may be prepared by admixing the separately prepared soap constituents, or by neutralizing a mixture of the respective fatty acids. Such a mixture may be made up separately, or it may be obtained from a natural source which contains these respective fatty acids. Such sources are e.g. soapstock fatty acids, tall oil fatty acids, and several natural fats and oils, such as groundnut oil, grapeseed oil, mustard oil, maize oil, soybean oil, chufa oil, rapeseed oil, sesame oil, sunflower oil etc. In particular, sodium soaps of rapeseed oil, tall oil fatty acids, soybean and sunflower oil are preferred sources of the required fatty acids to obtain the maximum benefit of the invention. The soap component of the invention is used in a particulate composition in an amount of 0.5-99% by weight. The higher part of this range, i.e. from 30-70% relates to compositions wherein the soap is used as the sole detergent active material, e.g. in soap powders, together with adjuvants such as builders, bleaching agents, alkaline salts, sequestering agents and the like. The range from 70-99% relates to compositions primarily consisting of the soap, e.g.in flake, ribbon, noodle and similar discrete-shaped form, in powder form, etc, with

minor amounts of adjuvants.

The lower range of 1-30% relates to compositions in which the soap is used together with other, synthetic detergent active materials in particulate detergent compositions.

Such compositions normally include from about 2% to about 30%, preferably about 10% to about 25%, by weight of a synthetic anionic, nonionic, cationic, amphoteric or zwitterionic detergent compound or mixture thereof. Many suitable detergent compounds are commercially available and are fully described in the literature, for example in "Surface Active Agents and Detergents", Volumes I and II, by Schwartz, Perry and Berch.

The preferred detergent compounds which can be used are synthetic anionic and nonionic compounds. The former are usually water-soluble alkali metal salts of organic sulphates and sulphonates having alkyl groups 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 sulphates, especially those obtained by sulphating higher (C_8-C_{18}) 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 glyceryl 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 acid monoglyceride sulphates and sulphonates; sulphonated fatty acids and esters thereof; sodium and potassium salts of sulphuric acid esters of higher (C_9-C_{18}) 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 monosulphates such as those derived by reacting alpha-olefins (C_8-C_{20}) with sodium bisulphite and those derived by 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_{15}) alkyl benzene sulphonates and sodium (C_{16}-C_{18}) alkyl sulphates.

Examples of suitable nonionic detergent compounds which may be used include in particular the reaction products of alkylene oxides, usually ethylene oxide, with alkyl (C_6-C_{22}) phenols, generally 5 to 25 EO, i.e. 5 to 25 units of ethylene oxide per molecule; the condensation products of aliphatic (C_8-C_{18}) primary or secondary linear or branched alcohols with ethylene oxide, generally 6 to 30 EO, and products made by condensation of ethylene oxide with the reaction products of propylene oxide and ethylene diamine. Other so-called nonionic detergent compounds include long chain tertiary amine oxides, long chain tertiary phosphine oxides and dialkyl sulphoxides.

Mixtures of detergent compounds, for example mixed anionic or mixed anionic (anionic-including soaps) and nonionic compounds may be used in the detergent compositions, particularly in the latter case to provide controlled low sudsing properties. This is beneficial for compositions intended for use in suds-intolerant automatic washing machines.

Amounts of amphoteric or zwitterionic detergent compounds can also be used in the compositions of the invention instead of part or all of the nonionics, such as sulphobetaines, amidobetaines, alkylamino acids and the like. Cationics may also be used, such as cetyltrimethylammoniumbromide.

Apart from the detergent compounds, the detergent compositions of the invention can contain any of the conventional additives in the amounts in which such materials are normally employed in fabric-washing detergent compositions. Examples of these additives include lather boosters such as alkanolamides, particularly the monoethanolamides derived from palm kernel fatty acids and coconut fatty acids, lather depressants such as

alkyl phosphates and silicones, anti-redeposition agents such as sodium carboxymethylcellulose and polyvinyl pyrrolidone, oxygen-releasing bleaching agents such as sodium perborate and sodium percarbonate, per-acid bleach precursors such as TAED, chlorine-releasing bleaching agents such as trichloroisocyanuric acid and alkali metal salts of dichloroisocyanuric acid, fabric-softening agents, inorganic salts such as sodium sulphate, sodium carbonate and magnesium silicate, and, usually present in very minor amounts, fluorescent agents, perfumes, enzymes such as proteases and amylases, germicides, colourants, and scum dispersants.

It is also possible to include one or more anti-deposition agents in the detergent compositions of the invention, to decrease any tendency to form inorganic deposits on washed fabrics. The amount of any such anti-deposition agents is normally from about 0.1% to about 5% by weight, preferably from about 0.2% to about 2% by weight of the compositions. The preferred anti-deposition agents are homo- and co-polymers of acrylic acid or substituted acrylic acids, such as sodium polyacrylate, the sodium salt of copolymethylacrylamide/acrylic acid and sodium poly-alpha-hydroxyacrylate, salts of copolymers of maleic anhydride with ethylene, vinylmethylether or styrene, especially 1:1 copolymers, and optionally with partial esterification of the carboxyl groups especially in the case of the styrene-maleic anhydride copolymers. Such copolymers preferably have relatively low molecular weights, e.g. in the range of about 5,000 to 50,000. Other anti-deposition agents include the sodium salts of polymaleic acid and polyitaconic acid, phosphate esters of ethylated aliphatic alcohols, polyethylene glycol phosphate esters, and certain phosphonates such as sodium ethane-1-hydroxy-1,1-diphosphonate, sodium ethylene diamine tetramethylene phosphonate, and sodium 2-phosphonobutane tricarboxylate. Mixtures of organic phosphonic acids or substituted acrylic acids or their salts with protective colloids such as gelatin as described in our Netherlands application 7602082 may also be used. The most preferred anti-deposition agent is sodium polyacrylate having a MW of about 10,000 to 50,000, for example about 27,000.

The compositions of the invention may also contain builder salts, such as alkali metal ortho-, pyro- and polyphosphates, alkali metal carbonates, carboxymethyloxysuccinates, alkali metal citrates in amounts of up to 50%. Where it is desired to increase detergency whilst using particularly low levels of phosphate builders, so as to achieve low or no phosphorus contents in the detergent compositions, non-phosphate detergency builders such as amine carboxylates, e.g. sodium nitrilotriacetate, sodium aluminosilicate ion-exchange materials, sodium carbonate and sodium citrate are preferred. However, builder materials are not essential and it is a particular benefit of the compositions of the invention that satisfactory detergency and water-softening properties can be achieved with the presence of the particular soap component of the invention.

It is also possible to include in the compositions for fabric washing purposes an amount of an alkali metal silicate, particularly sodium ortho-, meta- or preferably neutral or alkaline silicate. The presence of such alkali metal silicates at levels of at least about 5%, and preferably from about 15% to about 30% by weight of the composition, is advantageous in decreasing the corrosion of metal parts in washing machines, as well as giving processing benefits and generally improved powder properties. In combination with non-phosphate builders there is the additional benefit of improved magnesium inactivation. For industrial laundering higher amounts of silicates can be included, e.g. up to 90% of meta-silicate. Often sodium carbonate can also be included (up to 50%) as further source of alkalinity in industrial laundering products.

The compositions of the invention may be prepared by any suitable process for preparing particulate compositions, such as spray-drying, spray-cooling, dry-mixing, granulation, flaking, noodling and the like, the soap being added direct or via the slurry.

The invention will be further illustrated by way of example.

EXAMPLE

Two soap-based powders were prepared, having the following compositions:

	% by weight	
	A	B
sodium oleate	25	25
sodium linoleate	25	-
sodium cocosoap	-	25
sodium silicate (Na_2O : SiO_2 1:2.2)	7	7
sodium metaborate	14	14
inert adjuvants, moisture etc.	bal.	bal.

Tests were carried out in a Tergotometer at 80°C, at a water hardness of 26° French hardness, at 4, 5.5 and 7 g/l product concentration, using three different standard soiled test-pieces. The following ΔR results were obtained.

		ΔR Conc.		
Test piece/product		4	5.5	7 g/l
EMPA 104	A	14	27	29
	B	12	25	27
WFK	A	10	19	20
	B	10	14	19
ERTC 41A	A	8	27	29
	B	4	21	28

C L A I M S

1. A particulate, soap-containing detergent composition, not containing more than 5% by weight of sodium laurate or sodium myristate, comprising 0.5 - 99% by weight of a soap component which consists of 10 - 100% of sodium linoleate, 0 - 90% of a sodium soap of C_{16}-C_{24} monounsaturated fatty acids and 0 - 30% of a sodium soap of C_{16}-C_{24} saturated fatty acids, the total of the three types of soap being 100%.

2. A composition according to claim 1, comprising 1 - 30% by weight of the soap component and 2 - 30% by weight of a synthetic detergent active material.

3. A composition according to claim 1, further comprising up to 50% by weight of a builder salt.

4. A composition according to claim 1, further comprising 5 - 30% by weight of an alkali metal silicate.

European Patent Office

EUROPEAN SEARCH REPORT

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Application number

EP 81 20 0668

DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim
	FR - A - 1 077 641 (UNILEVER) * Whole document * --	1,3
	FR - A - 835 274 (LEVER) * Whole document * --	1,3
A	US - A - 4 065 398 (H.W. BROUWER) * Whole document * ----	1-3

CLASSIFICATION OF THE APPLICATION (Int Cl.³)

C 11 D 9/02
10/04

TECHNICAL FIELDS SEARCHED (Int Cl.³)

C 11 D 9/00
9/02
10/04

CATEGORY OF CITED DOCUMENTS

X: particularly relevant
A: technological background
O: non-written disclosure
P: intermediate document
T: theory or principle underlying the invention
E. conflicting application
D: document cited in the application
L: citation for other reasons

&. member of the same patent family, corresponding document

The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
The Hague	13-07-1981	GOLLER

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