Detergent composition containing a polyamide softening agent.

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EP-A- 0 094 250
EP-A- 0 242 918
EP-A- 0 258 500

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Description

Technical Field

5 The present invention relates to softening detergent compositions containing a narrowly-defined polyamide softening agent.

The compositions herein, in addition to providing good cleaning performance, exhibit excellence through-the-wash softening properties, and provide additional fabric-care benefits such as anti-static, anti-wrinkling, ease-of-ironing, color fidelity and anti-felting of wool.

Background of the invention

Formulators of fabric treatment compositions have long sought means for simultaneously washing and softening fabrics. Among the various approaches suggested are methods employing clay softeners, or amine materials, or both ingredients in combination, such as described in e.g.: German Patents 24.39.541, 23.34.899 and European Patents 0 028 528 and 0 028 432.

Amines have been used in combination with soaps (U.K. patent 1 514 276), fatty acids (published E.P.A. 0 133 804) or phosphate esters (published E.P.A. 0 168 889) as through-the-wash softeners.

The formulation of the art through-the-wash softening detergent compositions can, however, be subject to flexibility problems which are often due to incompatibility between certain ingredients (between e.g. peroxyacid bleaching agents and softening agents).

Carboxy-amides have been used as antistatic agents in industrial textile treatment (German patent 30 43 618) and N-alkyl isostearamides as antistatic agents in laundry application (French patent 2,531,447). Japanese patent J5 8144-175-A discloses the industrial treatment of textile by cationic softening agents and ethoxylated fatty acid amides.


Alkoxylated fatty amides are known as surfactants (EP-A-0 000 595) and as viscosity control agents (EP-A-0 112 719).


None of the above documents discloses the use of the specific amides of the present invention in softening detergent compositions.

It is an object of the present invention to provide detergent compositions capable of providing excellent cleaning, softening, and fabric-care properties.

It is a further object of the invention to provide softening detergent compositions which can be formulated with increased flexibility, in particular in presence of peroxyacid bleaching compounds.

Indeed, it has now been discovered that the use of a narrowly-defined class of amides as softening agents in detergent compositions provides excellent results in both cleaning and softening of fabric, as well as other "fabric care" benefits, possibly in the presence of peroxyacid bleaching agents.

Summary of the invention

The present invention relates to detergent compositions, capable of giving through-the-wash fabric-care benefits inclusive of softness, containing detersive surfactants, a nitrogen-containing fabric softening agent and, if desired detersive additives, characterized in that the nitrogen-containing softening agent is selected from the group of:

i) diamides of the formula :
wherein \( R_1, R_2, R_3, R_4 \) are coconut alkyl or tallow alkyl groups

ii) diamides of the formula:

wherein \( R_1, R_2, R_3, R_4 \) are coconut alkyl or tallow alkyl groups;
\( R_5 \) is selected from the group of: alk(en)ylene groups containing from 1 to 10 carbon atoms; arylene groups, substituted arylene groups, heteroaromatic groups, substituted heteroaromatic groups, polyaromatic groups;
and \( R_5 \) possibly contains hydroxy groups, ester groups, and/or ether linkages.

iii) triamides of the formula:

wherein \( R_1, R_2, R_3, R_4 \) are selected independently from the group of: \( \text{C}_{12-22} \text{ alk(en)yl, aryl, or alkyl-aryl groups, possibly containing hydroxy groups, ester groups, and/or ether linkages; \( R_5 \) is selected from the group of: alk(en)ylene groups containing from 1 to 10 carbon atoms; arylene groups, substituted arylene groups, heteroaromatic groups, substituted heteroaromatic groups, polyaromatic groups; and \( R_5 \) possibly contains hydroxy groups, ester groups, and/or ether linkages.}

iv) sulfonamides corresponding to the amides described in ii) to iii).
Detailed Description of the Invention

The softening agent -

The softening agents for use in the present invention are selected from the amides or sulfonamides of the formulas i) to iv) disclosed hereinabove.

Preferably, R₁, R₂, R₃, R₄ in formula iii) or iv) are all selected from tallow and coconut alkyl groups.

Preferred compounds have the formula ii) with R₅ being either a C₁₋₅ alkylene or alkenylene group, or a phenylene or substituted phenylene group.

When R₅ is an alk(en)ylene group, preferred compounds include the tetra-coconut and tetra-tallow diamides derived from the following carboxylic acids: malonic, succinic, maleic, glutaric, adipic.

An especially preferred compound of above category is tetracoconut adipamide.

When R₅ is an aromatic group, the amide group bearing R₃ and R₄ chains can be in any of the ortho, meta, or para position with regard to the amide group bearing R₁ and R₂ chains.

When R₅ is a phenylene or substituted phenylene group, preferred compounds are tetra-tallow terephtalic diamide and tetracoconut terephtalic diamide.

A preferred polyaromatic group for R₅ is biphenylene.

The softening agent is generally used at levels of from 0.1% to 15% by weight, preferably from 1% to 10% by weight, most preferably from 3% to 6% by weight.

In a highly preferred embodiment, the softening agent is pre-mixed (predispersed) with a dispersing agent, and the resulting mixture is then added to the rest of the composition.

Any conventional dispersing agent can be used for that purpose. Examples of suitable dispersing agents include nonionic surfactants resulting from the condensation of primary or secondary aliphatic alcohols e.g. tallow alcohol or alkyl phenol, with from 5-12 ethylene oxide units; and phosphate esters as described in European patent application n° 0 168 889, having the formula:

R' - O(CH₂-CH₂O)ₘPO(OH)₂,

with R' = C₁₂₋₁₄ alkyl and m = 1-5, sold under the Trade Name "Servoxyl®VPAZ".

In a particularly preferred embodiment, fatty acids are used as dispersing agents for the amide softener. Fatty acids having from 10 to 20 carbon atoms in the alkyl chain like lauric, myristic, palmitic, stearic, oleic acids and mixtures thereof can advantageously be used in the present context. Especially preferred is a mixture of palmitic and stearic acids.

Fatty acid dispersing agents are used most preferably in a weight ratio of 1/1 to 10/1 of amide softening agent to fatty acid.

Detersive surfactants -

The compositions of this invention will typically contain organic surface-active agents ("surfactants") to provide the usual cleaning benefits associated with the use of such materials.

Detersive surfactants useful herein include well-known synthetic anionic, nonionic, amphoteric and zwitterionic surfactants. Typical of these are the alkyl benzene sulfonates, alkyl- and alkylether sulfates, paraffin sulfonates, olefin sulfonates, alkoxylated (especially ethoxylated) alcohols and alkyl phenols, amine oxides and alpha-sulfonates of fatty acids and of fatty acid esters, which are well-known from the detergency art. In general, such detersive surfactants contain an alkyl group in the C₉-C₁₈ range; the anionic detersive surfactants can be used in the form of their sodium, potassium or triethanolammonium salts; the nonionics generally contain from 5 to 17 ethylene oxide groups. U.S. Patent 4.111.855 contains detailed listings of such typical detersive surfactants. C₁₁₋₁₅ alkyl benzene sulfonates, C₁₂₋₁₈ paraffin-sulfonates and alkyl sulfates, and the ethoxylated alcohols and alkyl phenols are especially preferred in the compositions of the present type.

Also useful herein as the surfactant are the water-soluble soaps, e.g. the common sodium and potassium coconut or tallow soaps well-known in the art.

The surfactant component can comprise as little as 1% of the compositions herein, but preferably the compositions will contain 5% to 40%, preferably 10% to 30%, of surfactant. Mixtures of the ethoxylated nonionics with anions such as the alkyl benzene sulfonates, alkyl sulfates and paraffin sulfonates are preferred for through-the-wash cleansing of a broad spectrum of soils and stains from fabrics.

Detersive adjuncts -
The amide softening agent is preferably, without this being an essential requirement, used in combination with a detergent-compatible clay softener. Such clay softeners are well-known in the detergency art and are in broad commercial use, both in Europe and in the United States. Included among such clay softeners are various heat-treated kaolins and various multi-layer smectites. Preferred clay softeners are smectite softener clays that are described in German Patent Application 23 34 899 and in U.K. Patent 1.400.898. Softener clays are used in the preferred compositions at levels of at least 1%, generally 1-20%, preferably 2-10%.

The compositions herein can contain other ingredients which aid in their cleaning performance. For example, the compositions herein can advantageously contain a bleaching agent, especially a peroxyacid bleaching agent, without any prejudice to the stability and overall performance, thanks to the compatibility of the amide softening agents of the invention with peroxyacid bleaching agents. In the context of the present invention, the term peroxyacid bleaching agent encompasses both peroxyacids per se and systems which are able to yield peroxyacids in situ.

Peroxyacids per se are meant to include the alkaline and alkaline-earth metal salts thereof. Peroxyacids and diperoxyacids are commonly used; examples are diperoxydodecanoic acid (DPDA) or peroxyphthalic acid.

Systems capable of delivering peracids in situ consist of a peroxgeny bleaching agent and an activator thereof.

The peroxgeny bleaching agents are those capable of yielding hydrogen peroxide in an aqueous solution; those compounds are well-known in the art, and include hydrogen peroxide, alkali-metal peroxides, organic peroxy acid bleaching agents such as urea peroxide and inorganic persalt bleaching agents such as alkali metal perborates, percarbonates, persulfates or persilicates.

Preferred are sodium perborate, commercially available in the form of mono- and tetra-hydrates, sodium carbonate peroxyhydrate, sodium pyrophosphate peroxyhydrate and urea peroxyhydrate.

The liberated hydrogen peroxide reacts with the bleach activator to form the peroxyacid bleach. Classes of bleach activators include esters, imides, imidazoles, oximes, and carbonates. In those classes, preferred materials include methyl o-acetoxy benzoates; sodium-p-acetoxy benzene sulfonates such as sodium 4-nonanoyloxybenzene sulfonate; sodium-4-octanoyloxybenzene sulfonate, and sodium-4-decanoyloxybenzenesulfonate: bisphenol A diacetate; tetra acetyl ethylene diamine; tetra acetyl hexamethylene diamine: tetra acetyl methylene diamine.

Other highly preferred peroxyacid bleach activators which are disclosed in U.S. Patents 4.493.778 and 4.539.130, are alpha-substituted alkyl or alkenyl esters, such as sodium-4-(2-chlorooctanolyloxy)benzene sulfonate, sodium 4-(3,5,5-trimethyl hexanoyloxy)benzene sulfonate. Suitable peroxyacids are also peroxy- geny bleach activators such as described in published European Patent Application N° 0 166 571, i.e., compounds of the general type RXAOOH and RXAL, wherein R is a hydroxycarbonyl group, X is a heteroatom, A is a carbonyl bridging group and L is a leaving group, especially oxybenzenesulfonate.

The compositions herein may contain alternatively any other type of bleaching agent, conventionally used in detergent compositions. Also, it is highly preferred that through-the-wash detergent compositions contain a detergent builder and/or metal ion sequenstrant. Compounds classifiable and well-known in the art as detergent builders include the nitrilotriacetates, polycarboxylates, citrates, water-soluble phosphates such as tri-polyphosphate and sodium ortho- and pyro-phosphates, silicates, and mixtures thereof. Metal ion sequenstrants include all of the above, plus materials like ethylenediaminetetraacetate, the amino-polyphosphonates and phosphates (DEQUEST®) and a wide variety of other poly-functional organic acids and salts too numerous to mention in detail here. See U.S. Patent 3.579.454 for typical examples of the use of such materials in various cleaning compositions. In general, the builder/sequenstrant will comprise 0.5% to 45% of the composition. The 1-10 µm size zeolite (e.g. zeolite A) builders disclosed in German Patent 24 22 655 are especially preferred for use in low-phosphate or non-phosphate compositions.

The laundry compositions herein also preferably contain enzymes to enhance their through-the-wash cleaning performance on a variety of soils and stains, such as amylase, protease, cellulase enzymes. Amylase and protease enzymes suitable for use in detergents are well-known in the art and in commercially available liquid and granular detergents. Commercial deterutive enzymes (preferably a mixture of amylase and protease) are typically used at levels of 0.001% to 2%, and higher, in the present compositions. Other highly desirable detergent ingredients for use in the detergent compositions of the present invention are quaternary ammonium compounds of the form R+R- R+R- N- X−, wherein R+ is alkyl having from 10 to 20, preferably from 12-18 carbon atoms, and R- R- and R+ are each C1 to C4 alkyl preferably methyl: X− is an anion, e.g. chloride. Examples of such quaternary ammonium compounds include C12-C14 alkyl trimethyl ammonium chloride and cocoalkyl trimethyl ammonium methosulfate. The quaternary ammonium compounds can be used at levels from 0.5% to 5%, preferably from 1% to 3%.
Moreover, the compositions herein can contain, in addition to ingredients already mentioned, various other optional ingredients typically used in commercial products to provide aesthetic or additional product performance benefits. Typical ingredients include pH regulants, perfumes, dyes, optical brighteners, soil suspending agents, hydrotropes and gel-control agents, freeze-thaw stabilizers, bactericides, preservatives, suds control agents, bleach stabilizing agents.

In a through-the-wash mode, the compositions are typically used at a concentration of at least 500 ppm, preferably 0.10% to 1.5%, in an aqueous laundry bath at pH 7-11 to launder fabrics. The laundering can be carried out over the range from 5 °C to the boil, with excellent results.

Form and Preparation of the compositions -

The detergent compositions of this invention can be present in any suitable physical state inclusive of granular, liquid, pasty, or sheet-like form. They may be prepared in any way, as appropriate to their physical form, by mixing the components, co-agglomerating them, micro-encapsulating them, dispersing them in a liquid carrier, and releasably adsorbing or coating them onto a non-particulate substrate, such as a non-woven or paper sheet.

Preferably, the compositions are in granular form.

A preferred method of preparation of said granular compositions consists in preparing a melt of the dispersing agent and the amide, dispersing the molten mixture into a stirred, aqueous crutcher mix comprising the balance of the detersive ingredients, and spray-drying in standard fashion. In an equally preferred mode, the melt can be atomized onto the detergent granules. The compositions herein may also be sprayed onto particles of, e.g., sodium perborate mono or tetrahydrate, sodium sulfate, sodium carbonate, sodium silicate, sodium phosphate, or clay of the type described above.

Industrial Application

The following examples are typical of the preferred execution of the invention, but are not intended to limit the scope.

EXAMPLE 1

A mix of tetracoconut terephthalic diamide (total 5% of complete formulation after spray-on) and lauric acid (1.5% of complete formulation) are admixed, melted and stirred until homogeneity. A standard aqueous crutcher mix comprising the following ingredients is prepared (percentages listed relate to percent ingredients in the complete formulation after spray-drying).

<table>
<thead>
<tr>
<th>Ingredients</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>C_{11}-C_{12} alkyl benzene sulfonate</td>
<td>6.2</td>
</tr>
<tr>
<td>Tallow alcohol ethoxylate (EO11)</td>
<td>1.0</td>
</tr>
<tr>
<td>Sodium tripolyphosphate</td>
<td>24.0</td>
</tr>
<tr>
<td>Sodium sulfate</td>
<td>15.0</td>
</tr>
<tr>
<td>Sodium silicate</td>
<td>8.0</td>
</tr>
<tr>
<td>Smectite clay *</td>
<td>6.5</td>
</tr>
<tr>
<td>Carboxymethyl cellulose</td>
<td>0.4</td>
</tr>
<tr>
<td>Polyacrylate (soil suspender)</td>
<td>1.7</td>
</tr>
<tr>
<td>Enzymes</td>
<td>0.5</td>
</tr>
</tbody>
</table>
Optical brightener  0.23
Sulfonated zinc phthalocyanine **  25 ppm
EDTA  0.2
Perfume/copper salts/minors  0.5
C_{12}-C_{14} alkyl trimethylammonium chloride  1.9
Moisture  to 77%

The crutcher mix is then handled in entirely standard fashion, and spray-dried. After drying, sodium perborate (20%) and bleach activator (3% 3-5-5-trimethyl hexanoic acid, sulfaphenyl ester, sodium salt***) (3%) are dry-mixed with the granules.
The tetracoconut terephtalic diamide/lauric acid melt is then sprayed onto the finished product.

* Natural smectite: ion exchange capacity above
  50 meq/100 g clay

** U.S. Patent 3,927,967
*** U.S. Patents 4,483,778 & 4,539,130.

The composition of Example 1 was compared for through-the-wash softness vs. an identical composition which did not contain the tetracoconut terephtalic diamide/lauric acid premix (reference). The design of the test was such as to compare softness of textile pieces laundered 1 time (monocycle) and 4 times (multi-cycle) with invention and reference composition.
The testing conditions were as follows:
- automatic drum washing machine MIELE 423
- heating up from 15 °C to 90 °C; 50' at 90 °C
- 1% product concentration in wash liquor
- 18 grains/gallon (0.31g/l) water hardness (3:1 Ca/Mg ratio).
The washed and line dried swatches were compared by a panel of two expert judges, working independently, by a paired comparison technique using a 9-point Scheffe scale. Differences were recorded in panel score units (psu), positive being performance wise better and the least significant difference (LSD) at 95% confidence was also calculated.
The testing results were as follows:

<table>
<thead>
<tr>
<th>Softness (Ex. 1 vs. Reference)</th>
<th>1 cycle</th>
<th>4 cycles</th>
</tr>
</thead>
<tbody>
<tr>
<td>Terry fabric</td>
<td>+ 1.30 (0.49)*</td>
<td>+ 0.80 (0.44)</td>
</tr>
<tr>
<td>(12)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Polyester fabric</td>
<td>+ 1.0 (0.63)</td>
<td>+ 1.00 (0.00)</td>
</tr>
<tr>
<td>(12)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

* value between parentheses is LSD value (see text)

These results show the significant through-the-wash softness benefits derivable from the composition of the invention.

EXAMPLE 2

A low-P spray-dried detergent formulation is a follows:
<table>
<thead>
<tr>
<th>Ingredients</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Zeolite A (1-10 μm)</td>
<td>26.0</td>
</tr>
<tr>
<td>Sodium nitrilotriacetate</td>
<td>5.0</td>
</tr>
<tr>
<td>Smectite clay *</td>
<td>3.0</td>
</tr>
<tr>
<td>Tetracoconut adipamide/lauric acid (3:1 wt ratio)**</td>
<td>5.0</td>
</tr>
<tr>
<td>C_{11}-C_{12} alkyl benzene sulfonate</td>
<td>6.5</td>
</tr>
<tr>
<td>Tallow ethoxylate (EO 9-11)</td>
<td>0.5</td>
</tr>
<tr>
<td>Sodium perborate 4H₂O ***</td>
<td>20</td>
</tr>
<tr>
<td>Tetraacetyl ethylenediamine (TAED)***</td>
<td>3</td>
</tr>
<tr>
<td>Sodium silicate</td>
<td>8</td>
</tr>
<tr>
<td>CMC</td>
<td>1</td>
</tr>
<tr>
<td>Sodium sulfate</td>
<td>18</td>
</tr>
<tr>
<td>Enzymes (1:1 amylase/protease) ***</td>
<td>1.5</td>
</tr>
<tr>
<td>Optical brightener</td>
<td>0.5</td>
</tr>
<tr>
<td>Water, minors to 100</td>
<td></td>
</tr>
</tbody>
</table>

* As Gelwhite GP (TM): CaCO₃ ion exchange capacity 70Meq/100 g

** Prepared as in Example 1 and sprayed onto the finished product

*** Dry-mixed with composition.

The composition of Example 2 is prepared in the manner described for Example 1. The composition of Example 2 provides better softness than the composition wherein the amide/lauric acid complex has been replaced by additional sodium sulfate.

Claims

1. A detergent composition containing surfactant, a nitrogen-containing fabric softener and, if desired, detersive additives, characterized in that the nitrogen-containing softener is selected from the group of:
   i) diamides of the formula:
wherein \( R_1, R_2, R_3, R_4 \) are coconut alkyl or tallow alkyl groups

ii) diamides of the formula:

wherein \( R_1, R_2, R_3, R_4 \) are coconut alkyl or tallow alkyl groups;
\( R_5 \) is selected from the group of: alk(en)ylene groups containing from 1 to 10 carbon atoms, arylene groups, substituted arylene groups, heteroaromatic groups, substituted heteroaromatic groups, polyaromatic groups;
and \( R_5 \) possibly contains hydroxy groups, ester groups, and/or ether linkages.

iii) triamides of the formula:

wherein:
\( R_1, R_2, R_3, R_4 \) are selected independently from the group of: \( C_{12-22} \) alk(en)yl, aryl, or alkyl-aryl groups possibly containing hydroxy groups, ester groups and/or ether linkages;
\( R_5 \) is selected from the group of: alk(en)ylene groups containing from 1 to 10 carbon atoms, arylene groups, substituted arylene groups, heteroaromatic groups, substituted heteroaromatic groups, polyaromatic groups;
and \( R_5 \) possibly contains hydroxy groups, ester groups, and/or ether linkages.

iv) sulfonamides corresponding to the amides described in i) to iii).

2. A composition in accordance with Claim 1 wherein the amide softening agent is predispersed with a dispersing agent selected from:
- nonionic surfactants resulting from the condensation of primary or secondary aliphatic alcohols;
- phosphate esters having the formula
  \[ R'-(CH_2-CH_2O)_mPO(OH)_2, \]
  with \( R' = \text{C}_{12}-\text{C}_{14} \) alkyl and \( m = 1-5 \);
- fatty acids having from 10 to 20 carbon atoms in the alkyl chain.

3. A composition in accordance with Claim 2 wherein the dispersing agent is a fatty acid having from 10 to 20 carbon atoms in the alkyl chain and is present in a weight ratio of amide softening agent to fatty acid of from 1:1 to 10:1.

4. A composition in accordance with claims 1-3 wherein the nitrogen-containing softening agent is i) or ii) or has the formula iii) or iv) with \( R_1, R_2, R_3, R_4 \) being a coconut alkyl or tallow alkyl group.

5. A composition in accordance with Claims 1-4, wherein the nitrogen-containing softening agent has the formula ii), with \( R_5 \) being an alkylene group of from 1 to 5 carbon atoms.

6. A composition in accordance with claims 1-5 wherein the nitrogen-containing softening agent has the formula ii) with \( R_5 \) being a phenylene group or a substituted phenylene group.

7. A composition in accordance with Claim 6 wherein the nitrogen-containing softening agent is: tetratallow terephthalic diamide, or tetracocnut terephthalic diamide.

8. A composition in accordance with Claims 1 to 7 wherein the amount of nitrogen-containing softening agent is from 0.1% to 15% by weight.

9. A composition in accordance with Claims 1 to 8 which in addition contains a peroxyacid bleaching compound.

10. A composition in accordance with Claim 9 wherein the peroxyacid bleaching compound is comprised of a peroxygen bleaching compound and an activator therefor.

**Patentansprüche**

1. Detersgenszusammensetzung, welche ein grenzflächenaktives Mittel, einen Stickstoff enthaltenden Gewebeweichmacher und gewünschtenfalls detersive Zusätze enthält, dadurch gekennzeichnet, dass der Stickstoff enthaltende Weichmacher von der Gruppe ausgewählt ist, welche aus:
   i) Diamiden der Formel:

   \[
   \begin{array}{c}
   N \\
   \end{array}
   \begin{array}{c}
   C \\
   O \\
   \end{array}
   \begin{array}{c}
   O \\
   \end{array}
   \begin{array}{c}
   N \\
   \end{array}
   \begin{array}{c}
   C \\
   \end{array}
   \begin{array}{c}
   R_1 \\
   \end{array}
   \begin{array}{c}
   R_2 \\
   \end{array}
   \begin{array}{c}
   \end{array}
   \begin{array}{c}
   \end{array}
   \begin{array}{c}
   \end{array}
   \begin{array}{c}
   R_3 \\
   \end{array}
   \begin{array}{c}
   R_4 \\
   \end{array}
   \end{array}
   \]

   worin \( R_1, R_2, R_3, R_4 \) Kokosnußalkyl- oder Talgalkylgruppen darstellen;

   ii) Diamiden der Formel:
worin \( R_1, R_2, R_3, R_4 \) Kokosnußalkyl- oder Talgalkylgruppen darstellen, \( R_6 \) von der Gruppe ausgewählt ist, welche aus Alk(en)ylengruppen mit 1 bis 10 Kohlenstoffatomen, Arylengruppen, substituierten Arylengruppen, heteroaromatischen Gruppen, substituierten heteroaromatischen Gruppen, polyaromatischen Gruppen ausgewählt ist, und \( R_6 \) gegebenenfalls Hydroxygruppen, Estergruppen und/oder Etherbindungen aufweist; eng

iii) Triamiden der Formel:

\[
\begin{align*}
\text{N} & \quad \text{C} \quad \text{–} \quad \text{O} \\
\text{C} & \quad \text{=O} \\
\text{N} & \quad \text{–} \quad \text{C} \\
& \quad \text{R}_1 \quad \text{R}_2 \quad \text{R}_3 \\
& \quad \text{R}_4 \quad \text{R}_5
\end{align*}
\]

worin \( R_1, R_2, R_3, R_4 \), unabhangig voneinander von der Gruppe ausgewählt sind, welche aus \( C_{12-22}\)-Alk(en)yl-, Aryl- oder Alkyl-aryl-Gruppen besteht, welche gegebenenfalls Hydroxygruppen, Estergruppen und/oder Etherbindungen aufweisen, \( R_6 \) von der Gruppe ausgewählt ist, welche aus Alk(en)ylengruppen mit 1 bis 10 Kohlenstoffatomen, Arylengruppen, substituierten Arylengruppen, heteroaromatischen Gruppen, substituierten heteroaromatischen Gruppen, polyaromatischen Gruppen besteht, und \( R_6 \) gegebenenfalls Hydroxygruppen, Estergruppen und/oder Etherbindungen aufweist; eng

iv) Sulfonamiden, welche den in i) bis iii) beschriebenen Amiden entsprechen, besteht.

2. Zusammensetzung nach Anspruch 1, worin der Amidweichmacher mit einem Dispergiermittel vordispergiert wird, welches unter
- nichtionischen grenzflächenaktiven Mitteln, die aus der Kondensation primärer oder sekundärer aliphatischer Alkohole resultieren;
- Phosphatstern der Formel

\[ R^\prime-O(CH_2-CH_2O)_mPO(OH)_2, \]

worin \( R^\prime C_{12-14}\)-Alkyl bedeutet und \( m \) von 1 bis 5 beträgt,
- Fettsäuren mit 10 bis 20 Kohlenstoffatomen in der Alkylkette ist ausgewählt ist.

4. Zusammensetzung nach den Ansprüchen 1 bis 3, worin der Stickstoff enthaltende Weichmacher i) oder ii) ist oder die Formel iii) oder iv) besitzt, wobei R₁, R₂, R₃, R₄ eine Kokosnußalkyl- oder eine Talgalkylgruppe sind.

5. Zusammensetzung nach den Ansprüchen 1 bis 4, worin der Stickstoff enthaltende Weichmacher die Formel ii) besitzt, worin R₅ eine Alkylengruppe mit 1 bis 5 Kohlenstoffatomen ist.

6. Zusammensetzung nach den Ansprüchen 1 bis 5, worin der Stickstoff enthaltende Weichmacher die Formel ii) besitzt, worin R₅ eine Phenylengruppe oder eine substituierte Phenylengruppe ist.

7. Zusammensetzung nach Anspruch 6, worin der Stickstoff enthaltende Weichmacher Tetratalgtersphathsäurediamid oder Tetrakokosnußtersphathsäurediamid ist.

8. Zusammensetzung nach den Ansprüchen 1 bis 7, worin die Menge an Stickstoff enthaltendem Weichmacher von 0,1 Gew.-% bis 15 Gew.-% beträgt.

9. Zusammensetzung nach den Ansprüchen 1 bis 8, welche zusätzlich eine Peroxysäure-Bleichmittelverbindung enthält.


Reivendicatlons

1. Composition détergente contenant un tensioactif, un assouplissant azoté pour textiles et, si on le souhaite, des additifs détérsifs, caractérisée en ce que l'assouplissant azoté est choisi parmi l'ensemble comprenant :
   i) les diamides de formule :
   \[ \text{R}_1 \text{N} = \text{C} = \text{O} \quad \text{C} = \text{N} \quad \text{R}_2 \]
   dans laquelle \( \text{R}_1 \), \( \text{R}_2 \) représentent chacun un groupe alkyle dérivé du suif ou de l'huile de coprah,
   ii) les diamides de formule :
   \[ \text{R}_1 \text{N} = \text{C} = \text{O} \quad \text{C} = \text{N} \quad \text{R}_5 \]
   dans laquelle \( \text{R}_1 \), \( \text{R}_5 \), \( \text{R}_3 \), \( \text{R}_4 \) sont chacun un groupe alkyle dérivé du suif ou de l'huile de coprah ;
   \( \text{R}_5 \) est choisi parmi l'ensemble comprenant les groupes alkylène et alcénylène ayant de 1 à 10 atomes de carbone, les groupes alylène, les groupes alylène substitués, les groupes hétéroatomati ques, les groupes hétéroatomiques substitués, les groupes polyaromatiques ;
   et \( \text{R}_5 \) contient éventuellement des groupes hydroxy, des groupes ester et/ou des liaisons éther,
iii) les triamides de formule

\[
\begin{align*}
\text{R}_1 & \quad \text{O} \quad \text{N} \quad \text{C} \\
\text{R}_2 & \quad \text{R}_3 \\
\text{R}_4 & \quad \text{R}_5 \\
\text{C} & \quad \text{O}
\end{align*}
\]

dans laquelle :
- \(\text{R}_1, \text{R}_2, \text{R}_3, \text{R}_4\) sont, chacun indépendamment des autres, choisis parmi l’ensemble comprenant les radicaux alkylique ou alcénylique, aryle ou alkylarylique en C_{12}-C_{22} contenant éventuellement des groupes hydroxy, des groupes ester et/ou des liaisons éther ;
- \(\text{R}_5\) est choisi parmi l’ensemble comprenant les groupes alkyléne et alcénylène ayant de 1 à 10 atomes de carbone, les groupes arylique, les groupes aryléne substitués, les groupes hétérocycliques, les groupes polyarylés substitués, les groupes polyaromatiques ;
et \(\text{R}_5\) contient éventuellement des groupes hydroxy, des groupes ester et/ou des liaisons éther ;
iv) les sulfonamides correspondant aux amides décrits en i) à iii).

2. Composition selon la revendication 1, dans laquelle l’assouplissant amide est prédispersé avec un dispersant choisi parmi l’ensemble comprenant :
- les tensioactifs non-ioniques résultant de la condensation d’alcools aliphatiques primaires ou secondaires ;
- les esters phosphates ayant la formule

\[
\text{R}'-\text{O}(\text{CH}_2-\text{CH}_2\text{O})_m\text{PO(OH)}_2
\]

 où \(\text{R}'\) est un radical alkylique en C_{12}-C_{14} et \(m\) vaut de 1-5 ;
- les acides gras ayant de 10 à 20 atomes de carbone dans la chaîne alkylique.

3. Composition selon la revendication 2, dans laquelle le dispersant est un acide gras ayant de 10 à 20 atomes de carbone dans la chaîne alkylique et est présent selon une proportion pondérale de l’assouplissant amide à l’acide gras de 1:1 à 10:1.

4. Composition selon les revendications 1 à 3, dans laquelle l’assouplissant azoté est i) ou ii), ou encore a la formule iii) ou iv), \(\text{R}_1, \text{R}_2, \text{R}_3\) et \(\text{R}_4\) représentant chacun un groupe alkylique dérivé de l’huile de coprah ou du suif.

5. Composition selon les revendications 1 à 4, dans laquelle l’assouplissant azoté a la formule ii), \(\text{R}_5\) étant un groupe alkyléne ayant de 1 à 5 atomes de carbone.

6. Composition selon les revendications 1 à 5, dans laquelle l’assouplissant azoté a la formule ii), \(\text{R}_5\) étant un groupe phénylique ou un groupe phénylique substitué.

7. Composition selon la revendication 6, dans laquelle l’assouplissant azoté est le tétra(alkyle dérivé du suif)-téréphtaldiamide ou le tétra(alkyle dérivé de l’huile de coprah)-téréphtaldiamide.

8. Composition selon les revendications 1 à 7, dans laquelle la quantité d’assouplissant azoté est de 0,1 à 15 % en poids.
9. Composition selon les revendications 1 à 8, qui en outre contient un agent de blanchiment au peracide.

10. Composition selon la revendication 9, dans laquelle l'agent de blanchiment au peroxyde est constitué d'un agent de blanchiment peroxygéné et d'un activateur destiné à ce dernier.