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(54) **LIQUID WHITENING MAINTENANCE COMPOSITION**

FLÜSSIGE WEISSGRADERHALTUNGSZUSAMMENSETZUNG

COMPOSITION D'ENTRETIEN LIQUIDE POUR AZURAGE

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specification

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DescriptionFIELD OF INVENTION

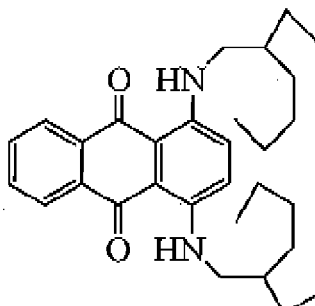
[0001] The present invention concerns azo dyes in a laundry liquid composition and reducing precipitation thereof.

BACKGROUND OF INVENTION

[0002] Since 1856 when the first synthetic dye was made by Perkin, several million different coloured compounds have been synthesized, see H.Zollinger, Color Chemistry, 3rd revised edition, Wiley-VCH, ISBN 3-906390-23-3. The dyes are diverse in structure and consequently diverse chemical and physical properties. For example, some dyes are cationic and precipitate with anionic compounds such as surfactants; some dyes are readily hydrolysed and decompose rapidly in water; some dyes readily aggregate and precipitate from solution, some dyes selectively bind to other organic and biological materials. There is also wide variance in the light stability of the dyes.

[0003] United States Patent 4,800,037 and 4,110,238 disclose that solvent blue 58 (1,4-bis(2-ethylhexylamino)-anthraquinone) may be used in a liquid formulation containing linear alkylbenzene sulphonate and non-ionic surfactants.

[0004] US 4,800,037 and US 4,110,238 disclose the use of solvent blue 58, a hydrophobic anthraquinone dye containing a C8 chain at levels of 0.005 to 0.025 wt % in a laundry liquid formulation. The long alkyl chain, i.e. the C8, helps to solubilise the dye in the liquid formulation. The long chain effectively interacts with the alkyl chains of the surfactant reducing precipitation of the dye over time. Additionally, the formulation also contains a hydrotrope to solubilise the dye. Solvent blue 58 is of the following structure:



[0005] Hydrophobic dyes, i.e. dyes which contain no charged solubilising groups, have extremely low water solubilities. These solubilities are not predictable. Such dyes are found in the groups of disperse and solvent dyes.

[0006] The water solubility of the mono-azo dye disperse blue 79:1 is reported to be 0,0052 mg/L at 25 °C, IUCLID data set 201-14540B. Therefore stabilising such compounds in domestic liquid detergent solutions at the high levels (>0.000001% which corresponding to 0.01mg/L. Even if the compound may be dissolved into the solution using surfactants, the solutions are typically unstable with time and the dye precipitates out of solution.

[0007] US 4 800 037 discloses a process for making a heavy duty liquid detergent composition comprising a dye.

SUMMARY OF THE INVENTION

[0008] The precipitation of hydrophobic dyes from surfactant mixtures is strongly structure dependent.

[0009] We have found that by formulating a liquid detergent with differing surfactants with specific ratios stabilise hydrophobic dyes in solution.

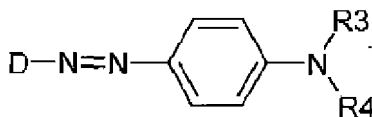
Shading dyes impart a colour to a textile. The dyes are substantive to the textile and preferably are blue or violet in order to give a perception of whiteness. This perception of whiteness is of importance as textile clothing ages. Hydrophobic dyes are used to shade synthetic garments.

[0010] For main wash liquid detergent formulations that contain shading dyes, the shading dye need to remain solubilised as best as possible in the liquid formulation from the time of production to the time of use in the home. Even in the presence of surfactants hydrophobic dyes precipitate from solution with time. The liquid formulations of the present invention reduce this precipitation. The present invention provides an aqueous laundry liquid detergent formulation comprising:

- (a) 0,000001 to 0.01 wt% of a blue or violet hydrophobic azo dye;
- (b) between 10 to 50 wt% of a surfactant mixture, the surfactant mixture comprising: (i) a non-ionic surfactant; and
- (ii) a anionic surfactant selected from the group consisting of: linear alkyl benzene sulphonate, alkyl sulphate, and

alkyl ethoxylated sulphate, and,
(c) that balance adjuncts to 100 wt %,

wherein the ratio of anionic surfactant to non-ionic surfactant is in the weight ratio range from 0,5 to 1.5:1 and one of the selected anionic surfactants is present in 85 wt% excess of the total anionic surfactant content, and the hydrophobic dye is an organic compound with a maximum extinction coefficient greater than 1000 L/mol/cm in the wavelength range of 400 to 750 nm and is uncharged in an aqueous solution at a pH in the range from 7 to 11, wherein the hydrophobic azo dye is selected from mono-azo dyes of the form:



wherein R3 is -CH₂CH₂R₅ and R4 is -CH₂CH₂R₆ and R5 and R6 are independently selected from the group consisting of: H, -CN, -OH, -C₆H₅, -OCOR₇ and -COOR₇, and R7 is independently selected from: aryl and alkyl, and D is an aromatic or heteroaromatic group.

[0011] Furthermore, it is disclosed a method of treating textile, comprising the steps of:

- a) diluting from 0.5 to 20 g of the liquid detergent formulation according to the present invention with 1 litre of water to form a diluted composition;
- b) treating the textile with the diluted composition;
- c) rinsing the textile with water; and
- d) drying the textile.

[0012] Treatment is preferably carried out in the domestic context, at temperature between 10 to 60 °C, preferably 15 to 40 °C.

DETAILED DESCRIPTION OF THE INVENTION

[0013] The water present in the aqueous laundry liquid detergent formulation is preferably at a level of at least 40 wt%.

[0014] Preferably the selected anionic surfactant is present in 99 wt% excess of the total anionic surfactant content.

[0015] Preferably ratio of anionic surfactant to non-ionic surfactant is in the range from 0.75 to 1:1.

[0016] Preferably the dye level is in the range from 0.0002 to 0.004%.

[0017] All percentages and ratios are expressed with respect to weight.

SURFACTANT

[0018] The liquid composition of the invention comprises from 10 to 50 wt%, preferably from 12 to 25 % by weight of a surfactant mixture.

[0019] **Linear alkyl benzene sulphonates salts** (LAS), particularly C₁₁-C₁₈ alkylbenzene sulphonates in the form of the sodium salt.

[0020] **Alkyl sulphate** surfactants are either primary or secondary. Alkyl sulphates have the general formula ROSO₃M wherein R is preferably a C₁₀-C₂₄ hydrocarbyl, preferably an alkyl straight or branched chain or hydroxyalkyl having a C₁₀-C₂₀ alkyl component, more preferably a C₁₂-C₁₈ alkyl or hydroxyalkyl, and M is hydrogen or a water soluble cation, e.g., an alkali metal cation (e.g., sodium potassium, lithium). Particularly preferred is sodium dodecyl sulphate (SDS).

[0021] **Alkyl ethoxylated sulphate** surfactants are another category of preferred anionic surfactant. These surfactants are water soluble salts or acids typically of the formula RO(A)_mSO₃M wherein R is an unsubstituted C₁₀-C₂₄ alkyl or hydroxyalkyl group having a C₁₀-C₂₄ alkyl component, preferably a C₁₂-C₂₀ alkyl or hydroxyalkyl, more preferably C₁₂-C₁₈ alkyl or hydroxyalkyl, A is an ethoxy, m is greater than zero, typically between about 1 and 6, more preferably between 1 and 3, and M is hydrogen or a water soluble cation which can be, for example, a metal cation (e.g., sodium, potassium, lithium, calcium, magnesium, etc.), ammonium or substituted-ammonium cation. Exemplary surfactants are C₁₂-C₁₈ alkyl polyethoxylate (1.0) sulphate, C₁₂-C₁₈ alkyl polyethoxylate (2.25) sulphate, C₁₂-C₁₈ alkyl polyethoxylate (3.0) sulphate, and C₁₂-C₁₈ alkyl polyethoxylate (4.0) sulphate wherein M is conveniently selected from sodium and potassium. With respect to the above, propoxylated sulphates may also be used. Sodium lauryl ether sulphates are most preferred with one to three ethoxy groups.

[0022] **Non-ionic surfactant**, particularly alcohol ethoxylates, R-(OCH₂CH₂)_nOH, where R is an alkyl chain typically C₁₀ to C₁₈, preferably C₁₂ to C₁₅, and n is 3 to 20, preferably 7 to 9, most preferred n = 9. Other non-ionic surfactant

may be selected from C₆-C₁₂ alkyl phenol alkoxylates (especially ethoxylates and mixed ethoxy/propoxy), block alkylene oxide condensate of C₆ to C₁₂ alkyl phenols, alkylene oxide condensates of C₉-C₂₂ alkanols and ethylene oxide/propylene oxide block polymers (Pluronic™-BASF Corp.).

[0023] Further minor surfactants may be added include cationics, soaps, betaines, alkylpolyglycosides, N-methyl glucamides. It is preferred that the minor surfactants are present at levels below 3 wt%.

THE MONO-AZO HYDROPHOBIC DYE

[0024] Typical dye suppliers may be found in the colour index, and include Clariant, Dystar, Ciba & BASF.

[0025] Hydrophobic dyes are defined as organic compounds with a maximum extinction coefficient greater than 1000 L/mol/cm in the wavelength range of 400 to 750 nm and that are uncharged in aqueous solution at a pH in the range from 7 to 11. The hydrophobic dyes are devoid of polar solubilising groups. In particular the hydrophobic dye does not contain any sulphonic acid, carboxylic acid, or quaternary ammonium groups.

[0026] Many examples of hydrophobic dyes are found in the classes of solvent and disperse dyes.

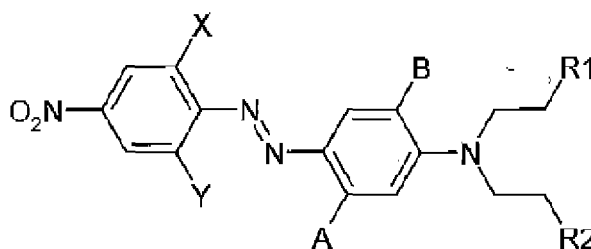
[0027] Shading of white garments may be done with any colour depending on consumer preference. Blue and Violet are particularly preferred shades and consequently preferred dyes or mixtures of dyes are ones that give a blue or violet shade on white polyester.

[0028] It is preferred that the dye(s) have a peak absorption wavelength of from 550nm to 650nm, preferably from 570nm to 630nm.

[0029] Preferably D is selected from the group consisting of: azothiophenes, azobenzothiazoles and azopyridones.

[0030] Preferred aryl are -C₆H₅ and C₁₀H₇.

[0031] The following is an example of a preferred class of mono-azo dyes:



where X and Y are independently selected, from the group consisting of: -H, -Cl, -Br, -CN, -NO₂, and -SO₂CH₃;

A is selected -H, -CH₃, -Cl, and -NHCOR;

B is selected -H, -OCH₃, -OC₂H₅, and -Cl;

R¹ and R² are independently selected from the group consisting of: -H, -CN, -OH, -OCOR, -COOR, -aryl; and

R is C₁-C₈-alkyl.

[0032] The composition may also comprise between 0.0001 to 0.1 wt % of one or more other dyes selected from cotton substantive shading dyes of group consisting of: hydrolysed reactive dye; acid dye; and direct dye. Example of preferred acid dyes are: acid blue 62, 40 and 290.

BALANCE ADJUNCTS OF THE LIQUID FORMULATION

[0033] Preferably the aqueous liquid detergent formulation has a pH-value between 6 and 12, more preferably between 7 and 10, even more preferably between 7.5 and 9.5. When the pH-value of the detergent composition of the invention is below 7.5, the presence of a pH jump system, i.e. a system that increase the pH-value to above 7.5 on dilution with water, is beneficial for the cleaning performance of said composition.

[0034] The liquid detergent composition of the invention may additionally comprise builders, solvents, perfumes, sequestrants, polymers, preservatives, fluorescers, dyes, biocides, buffers, salts.

[0035] Suitable detergency builders as optional, but preferred, ingredients may also be present, as found in WO-00/34427. One salt of particular interest is citrate, because of its additional builder and bleaching characteristics.

[0036] The following are also preferred adjuncts.

PERFUMES

[0037] The liquid formulation of the present invention preferably comprises between 0.001 to 3% by weight of a perfume composition, more preferably between 0.1 to 2% by weight of a perfume composition. Said perfume composition pref-

erably comprises at least 0.01% by weight based on the liquid composition of a perfume component selected from terpenes, ketones, aldehydes and mixtures thereof. The perfume composition may fully consist of the perfume component but generally the perfume composition is a complex mixture of perfumes of various differing perfume classifications. In this regard, the perfume composition preferably comprises 0.1 to 2% by weight of the perfume component.

ANTIOXIDANT

[0038] The liquid detergent composition of the invention preferably comprise between 0.001 to 2% by weight of an antioxidant. Preferably, the antioxidant is present at a concentration in the range 0.01 to 0.08% by weight. Anti-oxidants are substances as described in Kirk-Othmers (Vol 3, pg 424) and in Uhlmanns Encyclopedia (Vol 3, pg 91). An example of a preferred antioxidant is BHT.

FLUORESCENT AGENT

[0039] The laundry treatment composition most preferably comprises a fluorescent agent(optical brightener). Fluorescent agents are well known and many such fluorescent agents are available commercially. Usually, these fluorescent agents are supplied and used in the form of their alkali metal salts, for example, the sodium salts. The total amount of the fluorescent agent or agents used in laundry treatment composition is generally from 0.005 to 2 wt %, more preferably 0.01 to 0.1 wt %. Preferred classes of fluorescer are: Di-styryl biphenyl compounds, e.g. Tinopal (Trade Mark) CBS-X, Di-amine stilbene di-sulphonic acid compounds, e.g. Tinopal DMS pure Xtra and Blankophor (Trade Mark) HRH, and Pyrazoline compounds, e.g. Blankophor SN. Preferred fluorescers are: sodium 2 (4-styryl-3-sulfophenyl)-2*H*-naphthol [1, 2-*d*]triazole, disodium 4,4'-bis{[(4-anilino-6-(*N* methyl-*N*-2 hydroxyethyl) amino 1,3,5-Triazin-2-yl)]amino}stilbeno-2-2'-disulfonate, disodium 4,4'-bis[(4-anilino-6-morpholino-1,3, 5-triazin-2-yl) amino] stilbene-2-2' disulfonate, and disodium 4,4'-bis(2-sulfostyryl)blphenyl.

Example

[0040] Model Liquid detergent composition were created containing 15% total surfactant and 0.0004% of the dye disperse blue 79:1. The surfactants were chosen from LAS, SDS, SLES(IEO), SLES(3EO), and two non-ionic surfactants: non-ionic NI(7EO)- Neodol 25-7 which is a mixture of 12 to 15 carbon chain length alcohols with about 7 ethylene oxide groups per molecule and NI(9EO) - Neodol 25-9, a C12-13 mixture with about 9 moles of ethylene oxide.

[0041] The dye was added from a concentrated mix in the corresponding non-ionic of the formulation.

[0042] The detergents were left for 7 days then the UV-VIS spectrum measured using a 5cm cell. The optical density at 590nm was recorded (maximum of the dye) and 750nm where there is negligible absorbance from the dye. The base surfactant has negligible absorbance at 590 and 750nm. The 750nm was made to measure scattering from dye particles that were not fully dissolved. These measurements are referred to as day 0.

[0043] The formulations were left at room temperature in the dark for 8 days then the spectra re-recorded. The relative amount of dye that remain solubilised in solution compared to the initial measurement, %dye7, was calculated using the following equation:

$$\%dye7 = 100 * \frac{OD(590nm, day 7) - OD(750 nm, day 7)}{OD(590nm, day 0) - OD(750 nm, day 0)}$$

The 750nm subtraction corrects for scattering effects.

[0044] The results are summarised in the tables and discussions below.

[0045] The surfactant mixes created were

- (i) LAS:N(9EO):SLES(3EO) in the ratio 3:6:6 (COMPARATIVE)
- (ii) NI(9EO):SLES(3EO) in the ratio 1:1
- (iii) LAS:NI(9EO) in the ration 1:1

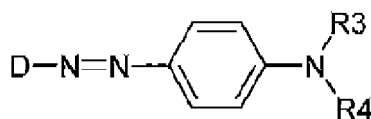
[0046] The UV-VIS spectra were measured on the day of creation and again after 7 days. Mix (ii) and (iii) were stable with 94 and 98% dye after 7 days whilst mix (i) was unstable with 85% dye after 7 days.

Claims

1. An aqueous laundry liquid detergent formulation comprising:

- (a) 0.000001 to 0.01 wt% of a blue or violet hydrophobic azo dye;
 (b) between 10 to 50 wt% of a surfactant mixture, the surfactant mixture comprising: (i) a non-ionic surfactant; and (ii) a anionic surfactant selected from the group consisting of: linear alkyl benzene sulphonate, alkyl sulphate, and alkyl ethoxylated sulphate, and,
 (c) that balance adjuncts to 100 wt %,

wherein the ratio of anionic surfactant to non-ionic surfactant is in the weight ratio range from 0.5 to 1.5:1 and one of the selected anionic surfactants is present in 85 wt% excess of the total anionic surfactant content, and the hydrophobic dye is an organic compound with a maximum extinction coefficient greater than 1000 L/mol/cm in the wavelength range of 400 to 750 nm and is uncharged in an aqueous solution at a pH in the range from 7 to 11, wherein the hydrophobic azo dye is selected from mono-azo dyes of the form:



wherein R3 is -CH₂CH₂R₅ and R4 is -CH₂CH₂R₆ and R₅ and R₆ are independently selected from the group consisting of: H, -CN, -OH, -C₆H₅, -OCOR₇ and -COOR₇, and R₇ is independently selected from: aryl and alkyl, and D is an aromatic or heteroaromatic group.

2. An aqueous laundry liquid detergent formulation according to claim 1, wherein with respect to the selected anionic surfactant is present in 99 wt% excess of the total anionic surfactant content.
3. An aqueous laundry liquid detergent formulation according to any one of the preceding claims, wherein the weight ratio of anionic surfactant to non-ionic surfactant is in the range from 0.75 to 1:1.
4. An aqueous laundry liquid detergent formulation according to any one of the preceding claims, wherein the non-ionic is an alcohol ethoxylate, the alkyl ethoxylated sulphate is a sodium lauryl ether sulphate, and the alkyl sulphate is sodium dodecyl sulphate.
5. An aqueous laundry liquid detergent formulation according to any preceding claim, wherein the non-ionic is selected from alcohol ethoxylate containing a carbon chain of 12 to 15 carbons and 7 to 9 ethylene oxide groups.
6. An aqueous laundry liquid detergent formulation according to any preceding claim, wherein the alcohol ethoxylate contains 9 ethylene oxide groups.
7. An aqueous laundry liquid detergent formulation according to any preceding claim, wherein the dye level is in the range from 0,0002 to 0.004 wt%.
8. An aqueous laundry liquid detergent formulation according to any preceding claim, wherein the surfactant mixture is present in the range 12 to 25 wt%.
9. An aqueous laundry liquid detergent formulation according to any preceding claim, wherein a surfactant other than defined in claim 1 is present at a levels of less than 3 wt%.

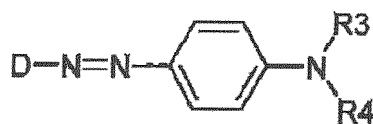
Patentansprüche

1. Flüssige wässrige Waschmittelformulierung, umfassend:

- (a) 0,000001 bis 0,01 Gew.-% eines blauen oder violetten hydrophoben Azofarbstoffs,
 (b) zwischen 10 und 50 Gew.-% einer Tensidmischung, wobei die Tensidmischung umfasst: (i) ein nicht-ionisches Tensid und (ii) ein anionisches Tensid, ausgewählt aus der Gruppe, die aus linearem Alkylbenzolsulfonat,

Alkylsulfat und Alkyl-ethoxyliertem Sulfat besteht, und
(c) der Rest zu 100 Gew.-% führt,

wobei das Verhältnis des anionischen Tensids zum nicht-ionischen Tensid in dem Gewichtsverhältnisbereich von 0,5 bis 1,5:1 liegt und eines der ausgewählten anionischen Tenside mit mehr als 85 Gew.-% des gesamten anionischen Tensidgehalts vorliegt und der hydrophobe Farbstoff eine organische Verbindung mit einem maximalen Extinktionskoeffizienten von mehr als 1000 l/mol/cm in dem Wellenlängenbereich von 400 bis 750 nm ist und in einer wässrigen Lösung bei einem pH in dem Bereich von 7 bis 11 ungeladen ist, wobei der hydrophobe Azofarbstoff unter Mono-Azofarbstoffen der Formel



ausgewählt ist,

wobei R3 -CH₂CH₂R₅ ist und R4 -CH₂CH₂R₆ ist und R₅ und R₆ unabhängig aus der Gruppe ausgewählt sind, die aus H, -CN, -OH, -C₆H₅, -OCOR₇ und -COOR₇ besteht, und wobei R₇ unabhängig aus Aryl und Alkyl ausgewählt ist und D eine aromatische oder heteroaromatische Gruppe ist.

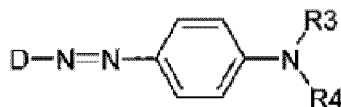
2. Flüssige wässrige Waschmittelformulierung nach Anspruch 1, wobei, was das ausgewählte anionische Tensid betrifft, dieses mit mehr als 99 Gew.-% des gesamten anionischen Tensidgehaltes vorliegt.
3. Flüssige wässrige Waschmittelformulierung nach irgendeinem der vorhergehenden Ansprüche, wobei das Gewichtsverhältnis des anionischen Tensids zum nicht-ionischen Tensid in dem Bereich von 0,75 bis 1:1 liegt.
4. Flüssige wässrige Waschmittelformulierung nach irgendeinem der vorhergehenden Ansprüche, wobei das nicht-ionische Tensid ein Alkoholethoxylat ist, das Alkyl-ethoxylierte Sulfat ein Natriumlaurylethersulfat ist und das Alkylsulfat Natriumdodecylsulfat ist.
5. Flüssige wässrige Waschmittelformulierung nach einem vorhergehenden Anspruch, wobei das nicht-ionische Tensid aus Alkoholethoxylat, das eine Kohlenstoffkette von 12 bis 15 Kohlenstoffatomen und 7 bis 9 Ethylenoxid-Gruppen enthält, ausgewählt ist.
6. Flüssige wässrige Waschmittelformulierung nach einem vorhergehenden Anspruch, wobei das Alkoholethoxylat 9 Ethylenoxid-Gruppen enthält.
7. Flüssige wässrige Waschmittelformulierung nach einem vorhergehenden Anspruch, wobei der Farbstoffgehalt in dem Bereich von 0,0002 bis 0,004 Gew.-% liegt.
8. Flüssige wässrige Waschmittelformulierung nach einem vorhergehenden Anspruch, wobei die Tensidmischung in dem Bereich von 12 bis 25 Gew.-% vorliegt.
9. Flüssige wässrige Waschmittelformulierung nach einem vorhergehenden Anspruch, wobei ein Tensid, anders als das im Anspruch 1 definierte, in einer Konzentration von weniger als 3 Gew.-% vorliegt.

Revendications

1. Formulation de détergent liquide de lessive aqueuse comprenant :

- (a) 0,000001 à 0,01 % en masse d'un colorant azo hydrophobe bleu ou violet ;
- (b) de 10 à 50 % en masse d'un mélange de tensioactifs, le mélange de tensioactifs comprenant : (i) un tensioactif non-ionique ; et (ii) un tensioactif anionique choisi dans le groupe consistant en : benzènesulfonate d'alkyle linéaire, sulfate d'alkyle, et sulfate éthoxylé d'alkyle, et ,
- (c) les auxiliaires de reste jusqu'à 100 % en masse,

dans laquelle le rapport de tensioactif anionique à tensioactif non-ionique se trouve dans l'intervalle de rapport massique de 0,5 à 1,5:1 et un des tensioactifs anioniques choisis est présent dans un excès de 85 % en masse de la teneur totale en tensioactif anionique, et le colorant hydrophobe est un composé organique avec un coefficient d'extinction maximum supérieur à 1 000 L/mol/cm dans l'intervalle de longueur d'onde de 400 à 750 nm et est non-chargé dans une solution aqueuse à un pH dans l'intervalle de 7 à 11, dans laquelle le colorant azo hydrophobe est choisi parmi des colorants mono-azo de la forme :



dans laquelle R3 est -CH₂CH₂R₅ et R4 est -CH₂CH₂R₆ et R5 et R6 sont indépendamment choisis dans le groupe consistant en : H, -CN, -OH, -C₆H₅, -OCOR₇ et -COOR₇, et R7 est indépendamment choisi parmi : un groupe aryle et alkyle, et D est un groupe aromatique ou hétéroaromatique.

2. Formulation de détergent liquide de lessive aqueuse selon la revendication 1, dans laquelle en ce qui concerne le tensioactif anionique choisi il est présent dans un excès de 99 % en masse de la teneur totale en tensioactif anionique.
3. Formulation de détergent liquide de lessive aqueuse selon l'une quelconque des revendications précédentes, dans laquelle le rapport massique de tensioactif anionique à tensioactif non-ionique se trouve dans l'intervalle de 0,75 à 1:1.
4. Formulation de détergent liquide de lessive aqueuse selon l'une quelconque des revendications précédentes, dans laquelle le non-ionique est un éthoxylate d'alcool, le sulfate éthoxylé d'alkyle est un lauryléthersulfate de sodium, et le sulfate d'alkyle est le dodécylsulfate de sodium.
5. Formulation de détergent liquide de lessive aqueuse selon l'une quelconque des revendications précédentes, dans laquelle le non-ionique est choisi parmi un éthoxylate d'alcool contenant une chaîne carbonée de 12 à 15 atomes de carbone et de 7 à 9 groupes oxyde d'éthylène.
6. Formulation de détergent liquide de lessive aqueuse selon l'une quelconque des revendications précédentes, dans laquelle l'éthoxylate d'alcool contient 9 groupes oxyde d'éthylène.
7. Formulation de détergent liquide de lessive aqueuse selon l'une quelconque des revendications précédentes, dans laquelle la teneur en colorant se trouve dans l'intervalle de 0,0002 à 0,004 % en masse.
8. Formulation de détergent liquide de lessive aqueuse selon l'une quelconque des revendications précédentes, dans laquelle le mélange de tensioactif est présent dans l'intervalle de 12 à 25 % en masse.
9. Formulation de détergent liquide de lessive aqueuse selon l'une quelconque des revendications précédentes, dans laquelle un tensioactif différent de celui défini dans la revendication 1 est présent à une teneur inférieure à 3 % en masse.

REFERENCES CITED IN THE DESCRIPTION

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