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(54) **A COMPOSITION AND METHOD FOR TREATING SUBSTRATES**

ZUSAMMENSETZUNG UND VERFAHREN ZUR BEHANDLUNG VON SUBSTRATEN

COMPOSITION ET PROCÉDE POUR TRAITER DES SUBSTRATS

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(56) References cited:
WO-A1-98/00498 **WO-A1-98/00503**
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Description**Field of the invention**

5 [0001] The present invention relates to a composition and a method for treating substrates, such as fabrics; particularly for stain removal across all kinds of stains.

Background of the invention

10 [0002] Fabric stains run the gamut from food spills to household substances and can be of different types; mainly aqueous, oily, particulate and bleachable. Stains are something that people try to avoid, yet they are unavoidable. Nonetheless, people still prefer to wear clothes with fewer stains or no stains at all. In fact, people prefer to avoid stains not just on clothes but in general in kitchens, bathrooms and also on various household surfaces.

15 [0003] Consequently, improved stain removal is one of the constant goals of the detergent industry. There is always an interest to improve the detergency effect, especially on fabric stains. The products that target stain removal usually target not more than two or three types of stains. In fact, a single product that works across all the different kind of stains is still desired.

20 [0004] WO98/00498 A1 (the Procter and Gamble Company) discloses liquid cleaning compositions and shampoos based on a dianionic surfactant in combination with one or more co-surfactants. The dianionic surfactant might be alkoxyated, having at least five carbon atoms to which two anionic substituent groups separated by at least three carbon atoms are attached. Also, amongst the two anionic substituents, one group is a sulfate or an alkoxy-linked sulfate and the other anionic substituent can be either sulfate or sulfonate.

25 [0005] WO98/00503 A1 (the Procter and Gamble Company) also discloses a similar cleaning composition based on dianionic surfactants (0.1 to 50 % by wt.) disclosed in WO98/00498 in combination with bleaching agents (0.1 to 50% by wt.) such as perborates and/or percarbonates.

[0006] US 2006/100122 A1 (Diversey Inc) discloses Cleaning and disinfectant compositions for hard surfaces. The compositions include hydrogen peroxide and an acid or salt thereof which is resistant to oxidation other than phosphorous based acids. Replacement of phosphorous based acids with acids results in improved hydrogen peroxide stability while maintaining or increasing the efficacy of cleaning and antimicrobial activity of the compositions.

30 [0007] WO2013/075913 A1 (Unilever) discloses liquid crystal ternary lamellar phase detergent compositions for use in laundry and/or household cleaning. It is found that a detergent composition comprising a surfactant selected from non-ionic and anionic surfactants at a ratio of non-ionic:anionic surfactant between 5:1 and 1:1; having a fat solubilising oil and water provides an effective solution that removes soils and/or stains of solid or solidified fatty material; is stable at normal storage and washing conditions and may be delivered as a pourable liquid.

35 [0008] WO2014/016134 A1 (Unilever) discloses liquid crystal ternary lamellar phase detergent compositions comprising a surfactant selected from non-ionic and anionic in a ratio of non-ionic:anionic between 3:1 and 1:4 and having HLB value of not less than 15; a fat solubilising oil and water. The composition is stable at normal storage and washing conditions and may be delivered as a pourable liquid.

[0009] However, single detergent composition that can target a wide range of stains remains to be desired.

40 [0010] It is therefore an object of the present invention to provide a composition for aqueous/bleachable, oily, particulate and enzymatic stain removal.

[0011] It is a further object of the present invention to provide a single product that works across different kinds of stains.

[0012] It is yet another object of the invention to provide a laundry pre-treatment composition for stain removal.

45 [0013] Surprisingly, it has been found that aqueous/bleachable, oily, particulate and enzymatic stain removal from fabric can be achieved by a composition comprising a surfactant system of an anionic and dianionic surfactants, a fat solubilizing oil and hydrogen peroxide.

Summary of the invention

50 [0014] Accordingly, in a first aspect, the invention provides a composition for treating a substrate, the said composition comprising: 10 to 25 % by weight of a surfactant system comprising an anionic and a dianionic surfactant where said anionic surfactant is selected from the group of alkyl alkoxyated sulfates and said dianionic surfactant is chosen from the group of diphenyl oxide disulfonate having a carbon chain length ranging from C6 to C18; 1 to 15 % by weight of a fat solubilizing oil, having a Hansen solubility parameter (δ HSP) that ranges from 14 to 22 MPa^{0.5} (at 25°C), and wherein the Hansen polar component (δ P) is in the range of 0.5 to 10 MPa^{0.5} (at 25°C), the dispersion component (δ H) is in the range of 3 to 10 MPa^{0.5} (at 25°C) and the hydrogen bond component (δ D) is in the range of 13 to 18 MPa^{0.5} (at 25°C); 2 to 12 % by weight of hydrogen peroxide and water.

[0015] In a second aspect, the invention provides a method for treating a substrate comprising the steps in sequence

of: applying the composition according to the invention onto the substrate; washing the substrate with a detergent and allowing the substrate to dry.

[0016] In a third aspect, the invention provides use of the composition according to the invention for superior stain removal.

[0017] These and other aspects, features and advantages will become apparent to those of ordinary skill in the art from a reading of the following detailed description and the appended claims. For the avoidance of doubt, any feature of one aspect of the present invention may be utilised in any other aspect of the invention. The word "comprising" is intended to mean "including" but not necessarily "consisting of" or "composed of." In other words, the listed steps or options need not be exhaustive. It is noted that the examples given in the description below are intended to clarify the invention and are not intended to limit the invention to those examples per se. Similarly, all percentages are weight/weight percentages unless otherwise indicated. Except in the operating and comparative examples, or where otherwise explicitly indicated, all numbers in this description indicating amounts of material or conditions of reaction, physical properties of materials and/or use are to be understood as modified by the word "about". Numerical ranges expressed in the format "from x to y" are understood to include x and y. When for a specific feature multiple preferred ranges are described in the format "from x to y", it is understood that all ranges combining the different endpoints are also contemplated.

Detailed description of the invention

[0018] The present invention provides a composition for treating a substrate, comprising a surfactant system comprising an anionic and a dianionic surfactant, a fat solubilizing oil and hydrogen peroxide. The balance of the composition is made up to 100% by weight with water.

Surfactant system

[0019] The composition of the present invention comprises a surfactant system essentially comprising an anionic surfactant and a dianionic surfactant where the anionic surfactant is selected from the group of alkyl alkoxyated sulfates and said dianionic surfactant is chosen from the group of diphenyl oxide disulfonate having a carbon chain length ranging from C6 to C18.

[0020] Particularly preferred anionic surfactants is sodium lauryl ether sulfate (SLES), preferably having 2 to 30 ethylene oxide groups and about 8 to 18 carbon atoms in the alkyl group.

[0021] The dianionic surfactants are chosen from the group of diphenyl oxide disulfonate having a carbon chain length ranging from C6 to C18.

[0022] Non-limiting examples of the dianionic surfactants include surfactants chosen from the group of diphenyl oxide disulfonate having a carbon chain length ranging from C6 to C18, preferably C8 to C16, more preferably C10 to C14. A commercially available example is Dowfax® 8390 (ex Dow).

[0023] In the composition of the present invention, the surfactant system is present in a concentration of 10 to 25 %, preferably at least 12 %, more preferably at least 15 %, still more preferably at least 17 % but typically not more than 24 %, preferably not more than 22 %, more preferably not more than 20 % by weight of the composition.

[0024] The anionic surfactant and the dianionic surfactant is present in the surfactant system is a ratio of 4:1 to 20:1, preferably in a ratio of 4:1 to 19:1, more preferably in a ratio of 5:1 to 15:1, still more preferably in the ratio of 7:1 to 10:1

Fat solubilizing oil

[0025] The composition of the present invention comprises a fat solubilizing oil having a Hansen solubility parameter (δ HSP) that ranges from 14 to 22 MPa^{0.5} (at 25 °C), and wherein the Hansen polar component (δ P) is in the range of 0.5 to 10 MPa^{0.5} (at 25 °C), the dispersion component (δ H) is in the range of 3 to 10 MPa^{0.5} (at 25 °C) and the hydrogen bond component (δ D) is in the range of 13 to 18 MPa^{0.5} (at 25 °C).

[0026] Hansen solubility parameter is preferably calculated using a software called HSPiP Version 3.1 (<http://hspip.software.informer.com/3.1/>). The input given to the software is in the form of SMILES (Simplified Molecular Input Line Entry Specification) of the structure of proposed oil. The preferred fat solubilizer is an ester of a fatty acid having the general formula RCOOR', where R is an alkyl hydrocarbon chain length ranging from C₆ to C₁₄ and R' = CH₃ (methyl) or C₂H₅ (ethyl) group. The particularly preferred fat solubilizing oil is methyl laurate. Another preferred oil is methyl octanoate or methyl dodecanoate.

[0027] Fat solubilizing oil is present in the composition of the present invention in a concentration of 1 to 15 %, preferably not more than 12 %, still more preferably not more than 10 %, even more preferably not more than 8 % but typically not less than 1.5 %, preferably not less than 3%, more preferably not less than 6 % by weight of the composition.

Hydrogen peroxide

5 [0028] The composition of the present invention comprises hydrogen peroxide. Hydrogen peroxide is the simplest peroxide (a compound with an oxygen-oxygen single bond) and finds use as a strong oxidizer, bleaching agent and disinfectant.

[0029] Hydrogen peroxide is present in the composition of the present invention in a concentration of 2 to 12 %, preferably not more than 10 %, more preferably not more than 8%, still more preferably not more than 7 % but typically not less than 3 %, preferably not less than 4 %, more preferably not less than 5 % by weight of the composition.

10 [0030] Without wishing to be bound by theory, it is thought that hydrogen peroxide acts as the oxidizing agent in the composition and is primarily responsible for the bleaching action, but the superior removal of other stains is achieved by the synergistic effect of hydrogen peroxide in combination with the fat solubilizing oil.

Water

15 [0031] The composition of the present invention is an aqueous composition comprising water. The composition is made up to 100 percent by adding water. The composition preferably comprises 45 to 90 % by weight of water.

Optional ingredients

20 [0032] The composition may further comprise softening agents as commonly used in fabric softening compositions, bleach stable enzymes, antimicrobial agents, silicone oils and cosolvents like 2-phenoxyethanol (commercially available as ex Dow Chemicals as Dowanol® EP- trademark) to improve stability and dispersibility, hydrotropes, preservatives and fragrance.

25 Process for treating a fabric

[0033] In a second aspect, the invention relates to a method for treating a substrate comprising the steps in sequence of applying the composition according to the invention onto a substrate, washing the substrate with a detergent and allowing the substrate to dry.

30 [0034] The composition may be applied by any known method such as by using wipes, spray, including spray guns, atomizers, or other direct application.

[0035] It is preferred that the surface is rinsed after washing the substrate and before drying.

Use of the composition

35 [0036] In a third aspect, the invention relates to the use of the composition according to the invention for superior stain removal

Product Format

40 [0037] The product is typically packed in a bottle, preferably a plastic bottle at volumes of between 250 ml and 5 L, more preferably between 250 ml and 1.5 L. Common supermarket size bottles are 250 ml, 500 ml, 750ml, 1 L and 1.5 L. The bottles may optionally have a measuring cup attached, or a measuring scale indicator in the cap, to enable the consumer to dose the right amount.

45 [0038] Also considered in the context of the present invention for the purpose of direct application, such as direct application onto a fabric, is a product packed in the a bottle with a trigger spray dispenser comprising the composition according to the invention. Trigger spray dispenser bottles typically have a volume of between 250 ml and 1.5 L. Common volumes include 400 ml, 500 ml, 750 ml, and 1 L.

[0039] Larger containers for industrial scale use are also included the scope of this invention.

50 [0040] The invention will now be illustrated by means of the following non-limiting examples.

Examples

Materials

55 [0041]

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Anionic Surfactant: SLES paste (70 %)-Sodium lauryl ether sulfate (ex Galaxy LES 70 2EO)
Dianionic surfactant: Diphenyl oxide disulfonate 35 % solution (ex Dow Chemicals) DOWFAX® 8390
Hydrogen peroxide: Hydrogen peroxide -30% solution (ex Merck India)
Fat solubilizing oil: Methyl dodecanoate (ex KLK Oleo, Malaysia)
Deionized water:

Preparation of the composition:

[0042] Each ingredient was added to a plastic container in the appropriate amount and was mixed using Silversion™ Mixer. Process conditions used were as below:

Mixer type: Silversion™ Mixer

RPM: 1500 to 2500

Mixer Blade Diameter: 4 cm

Mixer blade type: Two Flat blades at 90 degree attached to a SS rod which was fitted to the motor

Mixing time: 30 minutes for a 1 kg batch size

Temperature: 25 °C (Lab temp.)

Stain sets

[0043] Standard multi-stain monitors procured from SUV-TUV South East Asia Pvt limited were used. Two types of multi-stain monitors, namely, ICSS1 and ICSS2 were used in the study. Both the stain monitors were made of knitted cotton fabric, having multiple stains (total 40 stains, 4 stain classes: oily/fatty, bleachable, enzymatic, and particulate; for ICSS1 and ICSS2). Staining was done under controlled and repeatable conditions.

Fabric treatment protocol:

[0044] 0.3 to 1.5 ml of the composition was applied on each stain with the help of a graduated dropper. After 2 to 10 minutes of application of the composition, the treated fabrics were washed.

Washing Protocol:

[0045] The treated standard stained monitors were washed in a standard 5 kg household vertical axis top-loader washing machine. Total wash load was 2.5 kg comprising of both the stained monitors and ballast shirts. Washing was done with 60 grams Surf® Excel Matic Top Load (ex. Hindustan Unilever Ltd, India) at 24° FH. A typical wash cycle comprised of soak, wash and two rinses. After washing was completed, the swatches were removed and then line-dried overnight.

Evaluation of fabrics:

[0046] SRI (stain removal index) was used to evaluate the efficacy of each composition. SRI was measured for each stain using ArtixScan® F1 (Innotech Scanner). The SRI values are calculated from the L^* , a^* , b^* values of blank and stained fabrics as follows:

For Blank (unstained) fabrics: L_B , a_B , b_B

For stained fabrics: L_S , a_S , b_S

$$\Delta E = \sqrt{(L_S - L_B)^2 + (a_S - a_B)^2 + (b_S - b_B)^2}$$

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$$\text{SRI} = 100 - \text{Delta E}$$

$$\text{Delta SRI} = \text{SRI}(\text{Expt}) - \text{SRI}(\text{Control})$$

[0047] Higher (more positive) the Delta SRI values, the more efficacious was the formulation for stain removal.

[0048] Experiments were done with a marketed stain remover as control. It is in the scope of the present invention to identify compositions, which will provide more positive Delta SRI values across all stains in comparison to the marketed stain remover.

Example 1: Effect of each component of the composition on stain removal

[0049] In this example, the composition according to the invention (Ex 1) was compared with comparative, (i.e., outside the invention) compositions (Comp A to Comp F) with at least one of the components of the composition missing.

[0050] Each of the compositions in the following Table 1 were treated on various stains and their Delta (Δ) SRI values were calculated. The compositions were prepared by the method as described above.

Table 1

Ingredients		wt% in formulation (100%)						
		Ex 1	Comp A	Comp B	Comp C	Comp D	Comp E	Comp F
Hydrogen peroxide		10	10	0	0	10	10	0
Surfactants	SLES	15	0	15	0	15	0	15
	Dowfax®	2	0	2	0	2	0	2
Fat solubilizing oil		10	0	0	10	0	10	10
Note: The balance in each composition was water.								

[0051] The results (stain removal in terms of Delta (Δ) SRI) are tabulated in Table 2.

Table 2

Stains	MSR	Ex 1	Comp A	Comp B	Comp C	Comp D	Comp E	Comp F
Mechanical grease	4.49	10.10	1.56	3.62	5.25	1.22	4.76	5.21
Dende oil	8.42	14.87	8.74	9.73	6.65	10.47	9.00	7.97
Dirty motor oil	0.41	3.08	1.14	1.49	-0.97	1.15	0.37	1.18
Fountain pen ink	1.76	3.79	1.95	1.82	-5.19	2.10	-0.14	0.08
Garden soil	6.30	11.41	1.36	3.94	-1.74	4.31	-1.37	2.69
Yellow pottery clay	2.37	7.27	1.48	1.25	-2.27	1.01	-2.09	-0.21
Black coffee	4.76	10.19	5.11	4.13	-0.23	5.72	3.59	4.65
Blackcurrent juice	4.72	13.76	7.02	4.12	2.14	6.76	3.61	5.76
White tea (with milk)	7.95	11.51	1.23	-0.28	-0.07	3.83	1.79	1.37
Blood	0.04	9.85	2.62	2.03	-0.13	4.85	1.30	0.88
Chocolate ice cream	3.86	11.78	6.94	7.79	2.95	8.47	1.48	3.77
Cocoa milk	2.56	13.74	-1.01	-1.82	-0.46	-1.06	-1.00	1.18
Note: MSR means Marketed stain remover								

[0052] The above table shows that superior stain removal (higher Delta SRI value) over the control across all the different types of stains is observed only with the composition according to the invention (Ex 1) which comprises all the

components of the composition.

Example 2: Effect of concentration of hydrogen peroxide on stain removal

5 **[0053]** This example demonstrates the effect of concentration of hydrogen peroxide on stain removal. The example compositions Ex 2 to Ex 4 were compared with the comparative examples Comp F to Comp G comprising hydrogen peroxide in a concentration outside the scope of the invention.

[0054] Each of the compositions in the following table 3 were tested against various stains and their Delta SRI values were calculated. The compositions were prepared by the method as described above.

Table 3

Ingredients		wt% in formulation (100%)				
		Comp G	Comp H	Ex 2	Ex 3	Ex 4
Hydrogen peroxide		0	1.5	2.5	8	10
Surfactant	SLES	15	15	15	15	15
	Dowfax®	2	2	2	2	2
Fat solubilizing oil		10	10	10	10	10

[0055] The balance is water.

[0056] The observations ((Delta (Δ) SRI) are tabulated below in Table 4.

Table 4

Stains	MSR	Comp G	Comp H	Ex 2	Ex 3	Ex 4
Mechanical grease	4.49	5.21	6.12	7.95	9.58	10.10
Dende oil	8.42	7.97	8.55	11.12	13.96	14.87
Dirty motor oil	0.41	1.18	1.01	2.22	3.26	3.08
Fountain pen ink	1.76	0.08	1.55	2.21	4.02	3.79
Garden soil	6.30	2.69	4.11	8.23	10.57	11.41
Yellow pottery clay	2.37	-0.21	1.78	3.87	6.85	7.27
Black coffee	4.76	4.65	5.66	7.89	10.09	10.19
Blackcurrent juice	4.72	5.76	6.77	9.62	12.77	13.76
White tea (with milk)	7.95	1.37	4.11	9.12	11.66	11.51
Blood	0.04	0.88	1.23	3.05	9.18	9.85
Chocolate ice cream	3.86	3.77	4.15	6.12	10.34	11.78
Cocoa milk	2.56	1.18	2.34	8.22	12.79	13.74

[0057] The data presented in Table 4 shows that best results are obtained when the amount of hydrogen peroxide is within the scope of the present invention.

Example 3: Effect of concentration of the fat solubilizing oil on stain removal

50 **[0058]** In this example, compositions according to the invention comprising varying amounts of the fat solubilizing oil (Ex 5 to Ex 7) were compared with comparative compositions having the fat solubilizing oil at amounts outside the scope of the present invention labelled as (Comp I to Comp K).

55 **[0059]** Each of the compositions in the following Table 5 were contacted with various stains, and the resulting Delta SRI values were calculated. The compositions were prepared by the method described above.

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Table 5

Ingredients		wt% in formulation (100%)					
		Comp I	Comp J	Ex 5	Ex 6	Ex 7	Comp K
Hydrogen peroxide		10	10	10	10	10	10
Surfactant	SLES	15	15	15	15	15	15
	Dowfax®	2	2	2	2	2	2
Fat solubilizing oil		0	0.5	1.5	6	10	16

[0060] The balance in each composition was water.

[0061] The observations ((Delta (Δ) SRI) are tabulated below in Table 6.

Table 6

Stains	MSR	Comp I	Comp J	Ex 5	Ex 6	Ex 7	Comp K
Mechanical grease	4.49	1.22	2.12	6.12	9.87	10.10	3.87
Dende oil	8.42	10.47	9.98	12.23	14.55	14.87	8.12
Dirty motor oil	0.41	1.15	1.11	2.56	3.12	3.08	1.05
Fountain pen ink	1.76	2.10	2.13	3.14	4.16	3.79	2.11
Garden soil	6.30	4.31	6.22	8.79	10.98	11.41	5.43
Yellow pottery clay	2.37	1.01	2.45	4.35	6.97	7.27	2.45
Black coffee	4.76	5.72	5.65	7.75	9.79	10.19	5.53
Blackcurrent juice	4.72	6.76	6.68	10.21	12.86	13.76	5.43
White tea (with milk)	7.95	3.83	4.23	8.99	11.23	11.51	5.67
Blood	0.04	4.85	5.12	7.78	9.65	9.85	4.13
Chocolate ice cream	3.86	8.47	8.76	10.13	11.28	11.78	5.87
Cocoa milk	2.56	-1.06	1.79	6.89	10.75	13.74	2.13

[0062] The data in the Table 6 above indicates optimal stain removal when the amount of fat solubilizing oil is within the scope of the present invention.

[0063] **Example 4:** Effect of concentration of the surfactant system on stain removal This example demonstrates the effect of concentration of surfactant system on stain removal. The example compositions Ex 8 and Ex 9 are compared with comparative examples Comp L to Comp N comprising surfactants in amounts outside the scope of the invention.

[0064] Each of the compositions of Table 7 were contacted with various stains, and their Delta SRI values were calculated and recorded. The compositions were prepared by the method as described above.

Table 7

Ingredients		wt% in formulation (100%)				
		Comp L	Comp M	Ex 8	Ex 9	Comp N
Hydrogen peroxide		10	10	10	10	10
Surfactant	SLES + Dowfax®	0	9 (8+1)	12 (10.5+1.5)	17 (15+2)	28 (24.7+3.3)
Fat solubilizing oil		10	10	10	10	10

[0065] The balance in each composition was water.

[0066] The observations ((Delta (Δ) SRI) are tabulated below in Table 8.

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Table 8

Stains	MSR	Comp L	Comp M	Ex 8	Ex 9	Comp N
Mechanical grease	4.49	4.76	5.51	8.65	10.10	Paste
Dende oil	8.42	9.00	9.88	12.76	14.87	
Dirty motor oil	0.41	0.37	0.66	1.78	3.08	
Fountain pen ink	1.76	-0.14	1.45	3.54	3.79	
Garden soil	6.30	-1.37	4.32	9.12	11.41	
Yellow pottery clay	2.37	-2.09	1.87	5.12	7.27	
Black coffee	4.76	3.59	4.55	8.04	10.19	
Blackcurrent juice	4.72	3.61	4.98	11.21	13.76	
White tea (with milk)	7.95	1.79	6.54	9.54	11.51	
Blood	0.04	1.30	3.10	6.21	9.85	
Chocolate ice cream	3.86	1.48	3.77	8.22	11.78	
Cocoa milk	2.56	-1.00	2.12	6.43	13.74	

[0067] It can be inferred from the data presented in the above Table that a stable composition with superior stain removal can be obtained when the surfactant system is according to the invention.

Example 5: Effect of ratio of anionic to dianionic surfactant on stain removal

[0068] In this example, different ratios of the amount of the anionic surfactant to the dianionic surfactant were compared. Ex 10 to Ex 14 are example compositions according to the present invention and they are compared with Comp O and Comp P (Comparative examples) having ratios outside the scope of the present invention.

Table 9

Ingredients		wt% in formulation (100%)						
		Comp O	Ex 10	Ex 11	Ex 12	Ex 13	Ex 14	Comp P
H2O2		10	10	10	10	10	10	10
Surfactant	Concentration	17	17	17	17	17	17	17
	Ratio (SLES: Dowfax®)	3.5:1	4:1	7.5:1	10:1	15:1	19:1	24:1
Fat solubilizing oil		10	10	10	10	10	10	10

[0069] The balance was water.

[0070] Each composition in the following table was treated with various stains and the Delta SRI values were calculated. The compositions were prepared by the method as described above.

[0071] The observations ((Delta (Δ) SRI) are tabulated below in 10.

Table 10

Stains	MSR	Comp O	Ex 10	Ex 11	Ex 12	Ex 13	Ex 14	Comp M
Mechanical grease	4.49	Paste N/A	12.21	10.10	8.21	7.56	5.97	4.42
Dende oil	8.42		15.65	14.87	12.24	10.38	9.12	7.88
Dirty motor oil	0.41		5.12	3.08	3.11	3.51	2.69	2.5
Fountain pen ink	1.76		4.32	3.79	2.55	2.43	2.02	1.88
Garden soil	6.30		12.34	11.41	11.83	11.21	11.33	10.57
Yellow pottery clay	2.37		7.67	7.27	7.65	7.87	7.59	7.41
Black coffee	4.76		11.43	10.19	9.54	8.66	6.43	4.13
Blackcurrent juice	4.72		14.59	13.76	11.21	9.53	7.03	4.2
White tea (with milk)	7.95		13.03	11.51	10.14	9.54	8.22	7.12
Blood	0.04		10.21	9.85	9.21	9.76	8.97	8.77
Chocolate ice cream	3.86		12.24	11.78	11.93	11.32	11.43	10.51
Cocoa milk	2.56		13.97	13.74	13.21	13.22	12.87	12.67

[0072] The table 10 indicates that best results for stain removal is obtained at an anionic to dianionic ratio according to the invention.

Claims

1. A composition for treating a substrate comprising:

- a) 10 to 25% by weight of a surfactant system comprising an anionic and a dianionic surfactant where said anionic surfactant is selected from the group of alkyl alkoxyated sulfates and said dianionic surfactant is chosen from the group of diphenyl oxide disulfonate having a carbon chain length ranging from C6 to C18;
- b) 1 to 15% by weight of a fat solubilizing oil, having Hansen solubility parameter (δ HSP) that ranges from 14 to 22 MPa^{0.5} (at 25°C), and wherein the Hansen polar component (δ P) is in the range of 0.5 to 10 MPa^{0.5} (at 25°C), the dispersion component (δ H) is in the range of 3 to 10 MPa^{0.5} (at 25°C) and the hydrogen bond component (δ D) is in the range of 13 to 18 MPa^{0.5} (at 25°C);
- c) 2 to 12% by weight of hydrogen peroxide; and
- d) water.

2. A composition as claimed in claim 1 wherein the δ HSP is calculated using HSPiP Version 3.1 software.

3. A composition according to claim 1 or 2 wherein the anionic and dianionic surfactant is in the ratio of 4:1 to 20:1.

4. A composition according to any of claims 1 to 3 wherein the fat solubilizing oil is methyl laurate.

5. A composition according to any one of the preceding claims comprising 45 to 90% by weight of water.

6. A method for treating a substrate comprising the steps in sequence of:

- a) applying the composition according to any of claims 1 to 5 onto the substrate;
- b) washing the substrate with a detergent; and
- c) allowing the substrate to dry.

7. Use of the composition according to any of claims 1 to 5 for stain removal.

8. Use of the composition according to claim 7 for removal of aqueous/bleachable, oily, particulate and enzymatic stains from fabric.

Patentansprüche

1. Zusammensetzung zur Behandlung eines Substrats, umfassend:

- 5 a) 10 bis 25 Gewichts-% eines Tensidsystems, umfassend ein anionisches und ein dianionisches Tensid, wobei das anionische Tensid aus der Gruppe von alkylalkoxylierten Sulfaten ausgewählt ist und das dianionische Tensid aus der Gruppe von Diphenyloxiddisulfonat, das eine Kohlenstoffkette aufweist, die von C₆ bis C₁₈ reicht, ausgewählt ist;
- 10 b) 1 bis 15 Gewichts-% eines Fett löslich machenden Öls, das einen Hansen-Löslichkeitsparameter (δ HSP) aufweist, der von 14 bis 22 MPa^{0,5} (bei 25°C) reicht, und wobei die Hansen-Polarkomponente (δ P) in dem Bereich von 0,5 bis 10 MPa^{0,5} (bei 25°C) liegt, die Dispersionskomponente (δ H) in dem Bereich von 3 bis 10 MPa^{0,5} (bei 25°C) liegt und die Wasserstoffbrückenkomponente (δ D) in dem Bereich von 13 bis 18 MPa^{0,5} (bei 25°C) liegt;
- 15 c) 2 bis 12 Gewichts-% Wasserstoffperoxid und
d) Wasser.

2. Zusammensetzung, wie im Anspruch 1 beansprucht, wobei der δ HSP unter Verwendung einer HSPiP-Version 3.1-Software berechnet wird.

20 3. Zusammensetzung nach Anspruch 1 oder 2, wobei das anionische und das dianionische Tensid in dem Verhältnis von 4:1 bis 20:1 vorliegen.

4. Zusammensetzung nach irgendeinem der Ansprüche 1 bis 3, wobei das Fett löslich machende Öl Methylaurat ist.

25 5. Zusammensetzung nach irgendeinem der vorhergehenden Ansprüche, umfassend 45 bis 90 Gewichts-% Wasser.

6. Verfahren zur Behandlung eines Substrats, umfassend die Schritte in der Folge von:

- 30 a) Aufbringen der Zusammensetzung nach irgendeinem der Ansprüche 1 bis 5 auf das Substrat;
b) Waschen des Substrats mit einem Reinigungsmittel und
c) Trockenlassen des Substrats.

7. Verwendung der Zusammensetzung nach irgendeinem der Ansprüche 1 bis 5 zur Fleckenentfernung.

35 8. Verwendung der Zusammensetzung nach Anspruch 7 zur Entfernung von wässrigen/bleichbaren, öligen, teilchenförmigen und enzymatischen Flecken aus Textilien.

Revendications

40 1. Composition pour le traitement d'un substrat comprenant :

- 45 a) de 10 à 25 % en masse d'un système de tensioactif comprenant un tensioactif anionique et un dianionique où ledit tensioactif anionique est choisi dans le groupe de sulfates d'alkyle alcoylés et ledit tensioactif dianionique est choisi dans le groupe de disulfonate d'oxyde de diphenyle ayant une longueur de chaîne carbonée de C₆ à C₁₈ ;
- 50 b) de 1 à 15 % en masse d'une huile de solubilisation de graisse, présentant un paramètre de solubilité Hansen (δ HSP) qui est de 14 à 22 MPa^{0,5} (à 25°C), et dans laquelle le constituant polaire Hansen (δ P) se trouve dans l'intervalle de 0,5 à 10 MPa^{0,5} (à 25°C), le constituant de dispersion (δ H) se trouve dans l'intervalle de 3 à 10 MPa^{0,5} (à 25°C) et le constituant de liaison hydrogène (δ D) se trouve dans l'intervalle de 13 à 18 MPa^{0,5} (à 25°C) ;
- c) de 2 à 12 % en masse de peroxyde d'hydrogène : et
d) de l'eau.

55 2. Composition selon la revendication 1, dans laquelle le δ HSP est calculé en utilisant le logiciel HSPiP Version 3.1.

3. Composition selon la revendication 1 ou 2, dans laquelle les tensioactifs anionique et dianionique sont présents dans le rapport de 4:1 à 20:1.

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4. Composition selon l'une quelconque des revendications 1 à 3, dans laquelle l'huile de solubilisation de graisse est le laurate de méthyle.

5. Composition selon l'une quelconque des revendications précédentes comprenant de 45 à 90 % en masse d'eau.

6. Procédé de traitement d'un substrat comprenant les étapes successives de :

a) application de la composition selon l'une quelconque des revendications 1 à 5 sur le substrat ;

b) lavage du substrat avec un détergent ; et,

c) laisser le substrat séché.

7. Utilisation de la composition selon l'une quelconque des revendications 1 à 5 pour l'élimination de taches.

8. Utilisation de la composition selon la revendication 7 pour l'élimination de taches aqueuses/blanchissables, huileuses, particulaires et enzymatiques à partir d'un textile.

REFERENCES CITED IN THE DESCRIPTION

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Patent documents cited in the description

- WO 9800498 A1 [0004]
- WO 9800503 A1 [0005]
- WO 9800498 A [0005]
- US 2006100122 A1 [0006]
- WO 2013075913 A1 [0007]
- WO 2014016134 A1 [0008]