



- (51) International Patent Classification:
C11D 3/00 (2006.01)
- (21) International Application Number:
PCT/GB2014/051793
- (22) International Filing Date:
11 June 2014 (11.06.2014)
- (25) Filing Language: English
- (26) Publication Language: English
- (30) Priority Data:
1310507.7 13 June 2013 (13.06.2013) GB
- (71) Applicant: **RECKITT BENCKISER (BRANDS) LIMITED** [GB/GB]; 103-105 Bath Road, Slough Berkshire SL1 3UH (GB).
- (72) Inventors: **BALDAN, Silvia**; Reckitt Benckiser Italia, Piazza S. Nicolò 12/3, Mira, I-30034 Venice (IT). **SCOMPARIN, Elisa**; Reckitt Benckiser Italia, Piazza S. Nicolò 12/3, Mira, I-VE 30034 Venice (IT). **ZAMUNER, Dora**; Reckitt Benckiser Italia, Piazza S. Nicolò 12/3, Mira, I-VE 30034 Venice (IT). **MONTI, Luca**; Reckitt Benckiser Italia, Piazza S. Nicolò 12/3, Mira, I-VE 30034 Venice (IT).
- (74) Agents: **BOWERS, Craig** et al.; Dansom Lane, Hull Humberside HU8 7DS (GB).

(81) Designated States (unless otherwise indicated, for every kind of national protection available): AE, AG, AL, AM, AO, AT, AU, AZ, BA, BB, BG, BH, BN, BR, BW, BY, BZ, CA, CH, CL, CN, CO, CR, CU, CZ, DE, DK, DM, DO, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, GT, HN, HR, HU, ID, IL, IN, IR, IS, JP, KE, KG, KN, KP, KR, KZ, LA, LC, LK, LR, LS, LT, LU, LY, MA, MD, ME, MG, MK, MN, MW, MX, MY, MZ, NA, NG, NI, NO, NZ, OM, PA, PE, PG, PH, PL, PT, QA, RO, RS, RU, RW, SA, SC, SD, SE, SG, SK, SL, SM, ST, SV, SY, TH, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, ZA, ZM, ZW.

(84) Designated States (unless otherwise indicated, for every kind of regional protection available): ARIPO (BW, GH, GM, KE, LR, LS, MW, MZ, NA, RW, SD, SL, SZ, TZ, UG, ZM, ZW), Eurasian (AM, AZ, BY, KG, KZ, RU, TJ, TM), European (AL, AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HR, HU, IE, IS, IT, LT, LU, LV, MC, MK, MT, NL, NO, PL, PT, RO, RS, SE, SI, SK, SM, TR), OAPI (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, KM, ML, MR, NE, SN, TD, TG).

Published:

— without international search report and to be republished upon receipt of that report (Rule 48.2(g))

(54) Title: PRODUCT

(57) Abstract: A process of producing a fabric treatment agent in the form of a foam comprises admixing / mixing a particulate composition with a liquid composition and agitating.



WO 2014/199151 A2

Product

This invention relates to a process of producing a treatment agent in the form of a foam and cleaning compositions (and to devices used for preparing same).

Foam-form detergents and cleaning compositions, hereinafter referred to as detergents, have advantages insofar as they are easy to handle and, in terms of equipment, are relatively easy to produce, another advantage being that their ingredients may be selected from a relatively broad range so that their composition may largely be adapted to meet specific washing requirements.

Foams are particularly useful in the pre-treatment of stains (e.g. on fabric / clothing) as they can be easily applied to stains (in comparison to, for example, solid / powder formulations).

According to a first aspect of the invention there is provided a process of producing a fabric treatment agent in the form of a foam comprising admixing / mixing a particulate composition with a liquid composition and agitating.

Preferably said admixing / mixing of said detergent composition comprises the use of a mixing unit, preferably in the form of a container. Preferably the admixture is retained within the container during the mixing process.

By the use of the mixing unit it has been found that a final foam form detergent can be prepared by an end user, wherein the end product and its application all show excellent properties. Namely, from the production perspective, the process is able to yield a stable product wherein the process precludes the use of expensive and complex manufacturing techniques and convoluted packaging. Additionally with the mixing unit it has been found that a consumer is protected from (over) exposure to any harmful chemicals in the detergent product.

Furthermore it has been found that with the use of the mixing unit it is straightforward for a consumer to avoid skin contact with the detergent material (as part of the mixing device can be used to transfer the created foam to the garment/stain – no further element is necessarily required). Additionally it has been observed that the *in-situ* formation of a foam and transfer of same allows the formation of a highly effective detergent / stain treatment formulation.

Optionally the container comprises a section for accommodating a portion of particulate formulation (preferably detergent) and a section for accommodating a portion of liquid formulation (preferably detergent). Most preferably the sections are kept separate until mixing (and subsequent use) is intended.

Generally a rupturable / removable separation means is in place (which can be ruptured / removed by a user at the point / time of use), to allow for mixing of the particulate formulation and liquid formulation. Preferably the separation means is rupturable. Normally the separation means is ruptured (at the point of use) by a user applying pressure to a portion of the container

Preferably the container comprises a plastics material. Generally the container comprises a plurality of sheets of material which are sealed to together to form an enclosed volume. The sheets may be of different thicknesses. A thicker sheet may be used to provide extra resilience / form to a portion, e.g. the base of the container. A thinner sheet may be used for sealing the container. The volume is divided into a plurality [preferably 2] sub-volumes for separately containing the particular formulation (preferably detergent) and liquid formulation (preferably detergent). Usually the sachet comprises a removable / rupturable separation means between the particulate formulation and liquid formulation. Preferably the container comprises a pre-formed weak spot, e.g. such as a pre-formed tear or notch (e.g. for scissors) for opening (once the separation means has been removed / ruptured and at least partial mixing of the particulate detergent and liquid has occurred). The container may comprise a removable / re-

placeable lid or cap, which may be removed by a screwing and / or pulling motion.

In a preferred embodiment the container comprises a sachet or bottle

In further preferred embodiment the container is in the form of a bottle, which has a removable / replaceable lid. Generally the bottle comprises a plastics material, such as polyethylene, polypropylene or polyethylene terephthalate. It is preferred that the bottle is small enough to be held in a hand of a user for the agitation operation.

Preferably the final formulation is a detergent formulation. Most preferably the detergent is a pre-treatment formulation, intended to be applied to a portion of a garment / fabric before a more intensive washing process. As such it is preferred that a portion of the container may be used as an applicator of the formulated foam to apply said foam to the garment / fabric being treated. The container may include a rubbing means.

The particulate formulation preferably comprises a substance that is activated when mixed with the liquid.

Preferably there are at least 2 ingredients in the detergent composition (one or both of the particulate and / or liquid formulations) that when activated react with each other. Such ingredients can be a source of peroxide (e.g. percarbonate, hydrogen peroxide), a bleach activator (e.g. TAED, DOBA, NOBS) and enzymes.

Such ingredients may give rise to an increase in temperature of the foam (over the temperature of the liquid and particulate composition before mixing). This temperature rise can give rise to a greater activity of the final detergent formulation in, for example, addressing a stain.

The mixing of the particulate and liquid formulations preferably develops a gas (e.g. oxygen) as the foam is being formed / after formation.

Certain agents in the detergent formulation are relatively hydrophobic, e.g. such as DOBA (decanoyl-oxybenzoic acid). These are believed to give rise to an increased stability of the bubbles in the foam.

Preferably the liquid formulation comprises water.

The final detergent formulation to be used is ideally in unit dose form, wherein an amount of detergent is packaged, which is sufficient for one treatment operation. Ideally the package contains 0.1-100g of particulate detergent formulation, more preferably 0.1 to 50g, more preferably 0.1 to 20g, more preferably 0.1 to 10g and most preferably 0.1 to 5g. Ideally the package contains 0.1-100g of liquid, more preferably 0.1 to 50g, more preferably 10 to 30g, and most preferably about 20g,

Preferably the packaging is robust enough to provide a barrier in transportation and storage but is facile enough for a consumer to open when required. Preferred packaging materials comprise plastics materials.

According to a second aspect of the invention there is provided a method of treating a garment / fabric comprising a process of producing a foam-form, detergent composition comprising admixing / mixing a particulate detergent formulation with a liquid detergent formulation with / within a mixing unit and applying an amount of the admixture (preferably a foam) produced to a garment / fabric and then washing said a garment / fabric in or with an automatic washing machine or hand washing process.

Generally the method involves the use of a container (discussed above). Preferably the container is operated by a consumer using one or more of the following steps.

- The liquid and particulate formulation are mixed by a user. (This preferably involves rupture of a dividing seal between the two formulations, e.g. by application of pressure to a portion of the container).
- The container is agitated, e.g. by shaking to prepare a foam admixture. [This procedure may be aided by the container having one or more transparent windows for a consumer to assess mixing / foam generation].
- The container is opened and the admixture / foam is applied to a garment, preferably in a stained area.
- A conventional laundry washing cycle is operated.

Preferably the automatic washing machine comprises an automatic laundry machine. Alternatively the automatic washing machine comprises a carpet cleaning device.

Optionally the process comprises washing the device together with the garment in the laundry process.

The application of the foam may be achieved by pouring from the mixing unit (e.g. after/upon removal of the cap). In a further alternative the mixing unit may include a removable cap / lid which permits formation of the foam without leakage from the mixing unit but then allows application of the foam through an aperture in the mixing unit.

Generally the liquid formulation comprises water. Optionally the liquid formulation comprises one or more detergent materials such as from those discussed in the following paragraphs. Preferred materials include surfactant, pH modifier, fragrance, stabiliser (e.g. peroxide stabilizer) and bleach/bleach precursor.

Preferably the pH of the liquid formulation is from 2-11.

Preferably the particulate detergent formulation comprises a bleach/bleach precursor, e.g. percarbonate, compound in an amount of greater than 20wt%, preferably greater than 35%.

As well as the percarbonate other bleaches may be present in the particulate detergent formulation. Examples of bleaches that may be used are oxygen bleaches.

Peroxygen bleaching actives are: perborates, peroxides, peroxyhydrates, persulfates. A preferred compound is sodium percarbonate and especially the coated grades that have better stability. The percarbonate can be coated with silicates, borates, waxes, sodium sulfate, sodium carbonate and surfactants solid at room temperature.

Optionally, one or both of the particulate and / or liquid formulations may additionally comprise from 0.01 to 30 %wt, preferably from 2 to 20 %wt of bleach precursors. Suitable bleach precursors are peracid precursors, i.e. compounds that upon reaction with hydrogen peroxide produce peroxyacids. Examples of peracid precursors suitable for use can be found among the classes of anhydrides, amides, imides and esters such as acetyl triethyl citrate (ATC), tetra acetyl ethylene diamine (TAED), succinic or maleic anhydrides.

When a surfactant is present in the final composition, it may be present in an amount of, for example, from 0.01 to 50 %wt, ideally 0.1 to 30 %wt and preferably 0.5 to 10 %wt of the final composition.

Suitable surfactants that may be employed include anionic or non-ionic surfactants or mixture thereof. The non-ionic surfactant is preferably a surfactant hav-

ing a formula $\text{RO}(\text{CH}_2\text{CH}_2\text{O})_n\text{H}$ wherein R is a mixture of linear, even carbon-number hydrocarbon chains ranging from $\text{C}_{12}\text{H}_{25}$ to $\text{C}_{16}\text{H}_{33}$ and n represents the number of repeating units and is a number of from about 1 to about 12. Examples of other non-ionic surfactants include higher aliphatic primary alcohol containing about twelve to about 16 carbon atoms which are condensed with about three to thirteen moles of ethylene oxide per mole of alcohol (i.e. equivalents).

Other examples of non-ionic surfactants include primary alcohol ethoxylates (available under the Neodol tradename from Shell Co.), such as C_{11} alkanol condensed with 9 equivalents of ethylene oxide (Neodol 1-9), C_{12-13} alkanol condensed with 6.5 equivalents ethylene oxide (Neodol 23-6.5), C_{12-13} alkanol with 9 equivalents of ethylene oxide (Neodol 23-9), C_{12-15} alkanol condensed with 7 or 3 equivalents ethylene oxide (Neodol 25-7 or Neodol 25-3), C_{14-15} alkanol condensed with 13 equivalents ethylene oxide (Neodol 45-13), C_{9-11} linear ethoxylated alcohol, averaging 8 moles of ethylene oxide per mole of alcohol, C_{9-11} linear ethoxylated alcohol, averaging 2.5 moles of ethylene oxide per mole of alcohol (Neodol 91-2.5), and the like.

Other examples of non-ionic surfactants suitable for use include ethylene oxide condensate products of secondary aliphatic alcohols containing 11 to 18 carbon atoms in a straight or branched chain configuration condensed with 5 to 30 equivalents of ethylene oxide.

Octylphenoxy polyethoxyethanol type non-ionic surfactants, for example, Triton X-100, as well as amine oxides can also be used as a non-ionic surfactant.

Other non-ionic surfactants are amine oxides, alkyl amide oxide surfactants.

Preferred anionic surfactants are frequently provided as alkali metal salts, ammonium salts, amine salts, aminoalcohol salts or magnesium salts. Contemplated as useful are one or more sulfate or sulfonate compounds including: alkyl

benzene sulfates, alkyl sulfates, alkyl ether sulfates, alkylamidoether sulfates, alkylaryl polyether sulfates, monoglyceride sulfates, alkylsulfonates, alkylamide sulfonates, alkylarylsulfonates, olefinsulfonates, paraffin sulfonates, alkyl sulfosuccinates, alkyl ether sulfosuccinates, alkylamide sulfosuccinates, alkyl sulfosuccinamate, alkyl sulfoacetates, alkyl phosphates, alkyl ether phosphates, acyl sarconsinates, acyl isethionates, and N-acyl taurates. Generally, the alkyl or acyl radical in these various compounds comprises a carbon chain containing 12 to 20 carbon atoms.

Other surfactants which may be used are amphoteric surfactants,, alkyl naphthalene sulfonates and oleoyl sarcosinates and mixtures thereof.

Prteferably a soil catcher is present in the final composition.

Suitable soil catchers include polymers, such as acrylic polymers, polyesters and polyvinylpyrrolidone (PVP). The polymers may be crosslinked, examples of which include crosslinked acrylic polymers and crosslinked PVP.

Other important polymers are ethylidene norbene polymers, ethylidene norbene/ethylene copolymers, ethylidene norbene/propylene/ethylidene terpolymers. Inorganic materials may also be employed. Examples include zeolites, talc, bentonites and active carbon. The latter may be used to absorb and/or degrade coloured parts of stain and/or absorb odours. Alginates, carrageaneans and chitosan may also be used. Preferred water insoluble agents are selected from at least one of acrylic polymer, polyester, polyvinylpyrrolidone (PVP), silica, silicate, zeolite, talc, bentonites, active carbon, alginates, carrageaneans, ethylidene norbene/propylene/ethylidene ter-polymers and chitosan in the manufacture of a detergent composition as an active agent for binding soil. Preferably the detergent composition is a laundry cleaning composition or stain-removing composition.

The final composition advantageously additionally comprises cleaning agents selected from the group consisting of, fillers, builders, chelating agents, activators, fragrances, enzymes or a mixture thereof. These active agents are generally water soluble, so dissolve during the wash. Thus the additional active agents are released over a period of time when exposed to water in the laundry washing machine.

Suitable fillers include bicarbonates and carbonates of metals, such as alkali metals and alkaline earth metals. Examples include sodium carbonate, sodium bicarbonate, calcium carbonate, calcium bicarbonate, magnesium carbonate, magnesium bicarbonate and sesqui-carbonates of sodium, calcium and/or magnesium. Other examples include metal carboxy glycine and metal glycine carbonate. Sulfates, such as sodium sulfate, calcium sulfate and magnesium sulfate, may also be employed.

The filler may be present in an amount of 0.1 to 80 %wt, preferably 1 to 60 %wt.

The final composition may comprise at least one builder or a combination of them, for example in an amount of from 0.01 to 80%wt, preferably from 0.1 to 50%wt. Builders may be used as chelating agents for metals, as anti-redeposition agents and/or as alkalis.

Examples of builders are described below:

- the parent acids of the monomeric or oligomeric polycarboxylate chelating agents or mixtures thereof with their salts, e.g. citric acid or citrate/citric acid mixtures are also contemplated as useful builder components.
- borate builders, as well as builders containing borate-forming materials than can produce borate under detergent storage or wash conditions can also be used.
- iminosuccinic acid metal salts.

- polyaspartic acid metal salts.
- ethylene diamino tetra acetic acid and salt forms.
- water-soluble phosphonate and phosphate builders are useful. Examples of phosphate builders are the alkali metal tripolyphosphates, sodium potassium and ammonium pyrophosphate, sodium and potassium and ammonium pyrophosphate, sodium and potassium orthophosphate sodium polymeta/phosphate in which the degree of polymerisation ranges from 6 to 21, and salts of phytic acid. Specific examples of water-soluble phosphate builders are the alkali metal tripolyphosphates, sodium, potassium and ammonium pyrophosphate, sodium, potassium and ammonium pyrophosphate, sodium and potassium orthophosphate, sodium polymeta/phosphate in which the degree of polymerization ranges from 6 to 21, and salts of phytic acid. Such polymers include polycarboxylates containing two carboxy groups, water-soluble salts of succinic acid, malonic acid, (ethylenedioxy)diacetic acid, maleic acid, diglycolic acid, tartaric acid, tartronic acid and fumaric acid, as well as the ether carboxylates and the sulfinyl carboxylates.

Polycarboxylates containing three carboxy groups include, in particular, water-soluble citrates, aconitrates and citraconates as well as succinate derivatives such as the carboxymethoxysuccinates described in GB-A-1,379,241, lactoxysuccinates described in GB-A-1,389,732, and aminosuccinates described in NL-A-7205873, and the oxypolycarboxylate materials such as 2-oxa-1,1,3-propane tricarboxylates described in GB-A-1,387,447.

Polycarboxylate containing four carboxy groups include oxydisuccinates disclosed in GB-A-1,261,829, 1,1,2,2-ethane tetracarboxylates, 1,1,3,3-propane tetracarboxylates and 1,1,2,3-propane tetracarboxylates. Polycarboxylates containing sulfo substituents include the sulfosuccinate derivatives disclosed in GB-A-1,398,421, GB-A-1,398,422 and US-A-3,936,448, and the sulfonated pyrolysed citrates described in GB-A-1,439,000.

Alicyclic and heterocyclic polycarboxylates include cyclopentane-cis,cis,cis-tetracarboxylates, cyclopentadienide pentacarboxylates, 2,3,4,5,6-hexane – hexacarboxylates and carboxymethyl derivatives of polyhydric alcohols such as sorbitol, mannitol and xylitol. Aromatic polycarboxylates include mellitic acid, pyromellitic acid and the phthalic acid derivatives disclosed in GB-A-1,425,343.

Of the above, the preferred polycarboxylates are hydroxycarboxylates containing up to three carboxy groups per molecule, more particularly citrates.

Suitable polymer water-soluble compounds include the water soluble monomeric polycarboxylates, or their acid forms, homo or copolymeric polycarboxylic acids or their salts in which the polycarboxylic acid comprises at least two carboxylic radicals separated from each other by not more than two carbon atoms, carbonates, bicarbonates, borates, phosphates, and mixtures of any of the foregoing.

The carboxylate or polycarboxylate builder can be monomeric or oligomeric in type although monomeric polycarboxylates are generally preferred for reasons of cost and performance.

Suitable carboxylates containing one carboxy group include the water soluble salts of lactic acid, glycolic acid and ether derivatives thereof. Polycarboxylates containing two carboxy groups include the water-soluble salts of succinic acid, malonic acid, (ethylenedioxy) diacetic acid, maleic acid, diglycolic acid, tartaric acid, tartronic acid and fumaric acid, as well as the ether carboxylates and the sulfinyl carboxylates. Polycarboxylates containing three carboxy groups include, in particular, water-soluble citrates, aconitrates and citraconates as well as succinate derivatives such as the carboxymethoxysuccinates described in GB-A-1,379,241, lactoxysuccinates described in GB-A-1,389,732, and aminosuccin-

ates described in NL-A-7205873, and the oxypolycarboxylate materials such as 2-oxa-1,1,3-propane tricarboxylates described in GB-A-1,387,447.

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Alicyclic and heterocyclic polycarboxylates include cyclopentane-cis,cis,cis-tetracarboxylates, cyclopentadienide pentacarboxylates, 2,3,4,5,6-hexane – hexacarboxylates and carboxymethyl derivatives of polyhydric alcohols such as sorbitol, mannitol and xylitol. Aromatic polycarboxylates include mellitic acid, pyromellitic acid and the phthalic acid derivatives disclosed in GB-A-1,425,343.

Of the above, the preferred polycarboxylates are hydroxycarboxylates containing up to three carboxy groups per molecule, more particularly citrates.

More preferred polymers are homopolymers, copolymers and multiple polymers of acrylic, fluorinated acrylic, sulfonated styrene, maleic anhydride, methacrylic, iso-butylene, styrene and ester monomers.

Examples of these polymers are Acusol supplied from Rohm & Haas, Syntran supplied from Interpolymer and the Versa and Alcosperse series supplied from Alco Chemical, a National Starch & Chemical Company.

The parent acids of the monomeric or oligomeric polycarboxylate chelating agents or mixtures thereof with their salts, e.g. citric acid or citrate/citric acid mixtures are also contemplated as useful builder components.

Examples of bicarbonate and carbonate builders are the alkaline earth and the alkali metal carbonates, including sodium and calcium carbonate and sesquicarbonate and mixtures thereof. Other examples of carbonate type builders are the metal carboxy glycine and metal glycine carbonates.

In the context of the present application it will be appreciated that builders are compounds that sequester metal ions associated with the hardness of water, e.g. calcium and magnesium, whereas chelating agents are compounds that sequester transition metal ions capable of catalysing the degradation of oxygen bleach systems. However, certain compounds may have the ability to do perform both functions.

Suitable chelating agents to be used herein include chelating agents selected from the group of phosphonate chelating agents, amino carboxylate chelating agents, polyfunctionally-substituted aromatic chelating agents, and further chelating agents like glycine, salicylic acid, aspartic acid, glutamic acid, malonic acid, or mixtures thereof. Chelating agents when used, are typically present herein in amounts ranging from 0.01 to 50 %wt of the total composition and preferably from 0.05 to 10 %wt.

Suitable phosphonate chelating agents to be used herein may include ethydronic acid as well as amino phosphonate compounds, including amino alkylene poly(alkylene phosphonate), alkali metal ethane 1-hydroxy diphosphonates, nitrilo trimethylene phosphonates, ethylene diamine tetra methylene phosphonates, and diethylene triamine penta methylene phosphonates. The phosphonate compounds may be present either in their acid form or as salts of different cations on some or all of their acid functionalities. Preferred phosphonate chelating agents to be used herein are diethylene triamine penta methylene phosphonates. Such phosphonate chelating agents are commercially available from Monsanto under the trade name DEQUEST™ and DEQUEST 2010 CUBLENK.

Polyfunctionally-substituted aromatic chelating agents may also be useful in the compositions herein. See U.S. patent 3,812,044, issued May 21, 1974, to Connor et al. Preferred compounds of this type in acid form are dihydroxydisulfobenzenes such as 1,2-dihydroxy -3,5-disulfobenzene.

A preferred biodegradable chelating agent for use herein is ethylene diamine N,N'-disuccinic acid, or alkali metal, or alkaline earth, ammonium or substituted ammonium salts thereof or mixtures thereof. Ethylenediamine N,N'-disuccinic acids, especially the (S,S) isomer have been extensively described in US patent 4,704,233, November 3, 1987, to Hartman and Perkins. Ethylenediamine N,N'-disuccinic acid is, for instance, commercially available under the tradename ssEDDS TM from Palmer Research Laboratories.

Suitable amino carboxylates to be used herein include ethylene diamine tetraacetates, diethylene triamine pentaacetates, diethylene triamine pentaacetate (DTPA), N-hydroxyethylethylenediamine triacetates, nitrilotri-acetates, ethylenediamine tetrapropionates, triethylenetetraaminehexa-acetates, ethanol-diglycines, propylene diamine tetracetic acid (PDTA) and methyl glycine diacetic acid (MGDA), both in their acid form, or in their alkali metal, ammonium, and substituted ammonium salt forms. Particularly suitable amino carboxylates to be used herein are diethylene triamine penta acetic acid, propylene diamine tetracetic acid (PDTA) which is, for instance, commercially available from BASF under the trade name Trilon FS TM and methyl glycine di-acetic acid (MGDA).

The final composition may comprise a solvent. Solvents can be used in amounts from 0.01 to 30 %wt, preferably in amounts of 0.1 to 3 %wt. The solvent constituent may include one or more alcohol, glycol, acetate, ether acetate, glycerol, polyethylene glycol with molecular weights ranging from 200 to 1000, silicones or glycol ethers. Exemplary alcohols useful in the compositions in-

clude C₂₋₈ primary and secondary alcohols which may be straight chained or branched, preferably pentanol and hexanol.

Preferred solvents are glycol ethers. Examples include those glycol ethers having the general structure R_a-O-[CH₂-CH(R)-(CH₂-O)]_n-H, wherein R_a is C₁₋₂₀ alkyl or alkenyl, or a cyclic alkane group of at least 6 carbon atoms, which may be fully or partially unsaturated or aromatic; n is an integer from 1 to 10, preferably from 1 to 5; and each R is selected from H or CH₃. Specific and preferred solvents are selected from propylene glycol methyl ether, dipropylene glycol methyl ether, tripropylene glycol methyl ether, propylene glycol n-propyl ether, ethylene glycol n-butyl ether, diethylene glycol n-butyl ether, diethylene glycol methyl ether, propylene glycol, ethylene glycol, isopropanol, ethanol, methanol, diethylene glycol monoethyl ether acetate, and, especially, propylene glycol phenyl ether, ethylene glycol hexyl ether and diethylene glycol hexyl ether.

The final composition may, for example, comprise one enzyme or a combination of them, for example in an amount of from 0.01 to 10 %wt, preferably from 0.1 to 2 %wt. Enzymes in granular form (in the particulate formulation) are preferred. Examples of suitable enzymes are proteases, modified proteases stable in oxidisable conditions, amylases, lipases and cellulases.

Most preferably the final detergent composition comprises the following admixture:-

55wt% sodium percarbonate

28wt% sodium carbonate

5.5wt% anionic surfactant

0.5wt% non-ionic surfactant

10wt% Bleach Activator (preferably comprising an admixture of hydrophilic and hydrophobic activators such as TAED and DOBA respectively)

0.1wt% fragrance.

Rest – water and minors

The particulate detergent composition is preferably in the form of a powder. By "powder" it is meant any solid, flowable composition. Thus the powder may, for example, be in the form of granules or agglomerated particles. It may, however, be in the form of a loose agglomeration of particles. The d_{50} particle size of the particles may range from $0.001\mu\text{m}$ to 10 mm , preferably from $0.01\mu\text{m}$ to 2 mm , and more preferably from $0.1\mu\text{m}$ to 2 mm , for example $1\mu\text{m}$ to 1 mm .

Preferably the container is filled with the liquid and particulate formulation in a Vertical Form Fill Seal (VFFS) process.

Further Examples are as follows.

Examples 1-3

Particulate Formulation

Component	Wt.%
SODIUM CARBONATE	30-33
SODIUM PERCARBONATE	55
DOBA/TAED COGRANULE	10
GRANULAR LAYERED SILICATE	0.5
SODIUM ALKYL BENZENE SULPHONATE	0-2
ALKYL SULPHONATE	1.5
NONIONIC SURFACTANTS	0.3
SODIUM XYLENE SULPHONATE	0.3
FRAGRANCE	0.05

Liquid Formulation

Water +/- preservative (0.2%wt). pH 7.

Examples 4-5

Particulate Formulation

Component	Wt. %
SODIUM CARBONATE	35
SODIUM PERCARBONATE	55
DOBA/TAED COGRANULE	10

Liquid Formulation

pH 7.

Component	Wt. %
WATER	95.5-97.5
NAOH	1
SULPHONIC ACID	3.5

Example 6Particulate Formulation

Component	Wt. %
DOBA/TAED COGRANULE	100

Liquid Formulation

pH 7.

Component	Wt. %
Water	78.35
NAOH	1
SULPHONIC ACID	3.5
H ₂ O ₂ STABILIZER	0.012
H ₂ O ₂	7.15

Example 7Particulate Formulation

Component	Wt. %
DOBA/TAED COGRANULE	30.3
SODIUM ALKYL BENZENE SULPHONATE	69.7

Liquid Formulation

pH 7.

Component	Wt. %
WATER	82.85
H ₂ O ₂ STABILIZER	0.012
H ₂ O ₂	7.15

Examples 8-17 (use example 2)Particulate Formulation

Component	Wt. %
DOBA/TAED COGRANULE**	50-72
GRANULAR LAYERED SILICATE	27-50
Enzyme	0-4

Liquid Formulation

pH 4-8.

Component	Wt. %
WATER	78-99
NAOH	0.5-1
SURFACTANTS	0.5-3.5*
H ₂ O ₂ STABILIZER	0.2
H ₂ O ₂	1.5-7.15

*anionic and / or nonionic

** may be replaced by NOBS (Sodium Nonanoyl Oxy Benzene Sulfonate); LOBS (Sodium Lauroyl Oxy Benzene Sulfonate); DECOBS (Decanoic acid, sul-fophenoxy carbonyl oxy ethyl ester); Sodium 4 (Sulphophenyl Octyl) Carbonate.

Example 18 (use example 1)

Particulate Formulation

Component	Wt. %
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SODIUM CARBONATE	28.35
SODIUM PERCARBONATE	55.00
DOBA/TAED COGRAN- ULE**	10
GRANULAR LAYERED SIL- ICATE	0.50
SODIUM ALKYL BENZENE SULPHONATE	3.50
ALKYL SULPHONATE	2.00
NONIONIC SURFACTANTS	0.30
SODIUM XYLENE SUL- PHONATE	0.30
FRAGRANCE	0.05

**40.6wt% DOBA – 45wt% TAED.

Liquid Formulation

pH 4-8.

Water +/- preservative (0.2%wt). pH 7.

Use example 1

5g of the above particulate was mixed with 35g of water in a shaker, which comprised a volume in the shape of a bottle. The bottle was shaken for 1 minute to form a detergent foam. The foam was applied to stained areas of fabric material which for 5 minutes and then washed in a conventional laundry washing machine

The washing conditions were as follows:

Water hardness: 15°F

Temperature: 30°C in washing machine

Washing machine: LG WFT7516HN - Indian Washing Machine

Cycle: deep cleaning program, water in main wash: 65 l, time of main wash: 30min.

Load and condition: 2,5 kg clean, wet cotton ballast

Replications:4

Instr. Evaluation: Datacolor 650 spectrophotometer

Drying and ironing: Test swatches were air dried and ironed with a domestic iron

The results of the washing (y-values) are shown below (Surf Excel blue was used as the washing detergent).

Stain	Y-Value	
	Without Foam Pre-Treatment	With Foam Pre-Treatment
Chicken Bhuna	52.6	68.2
Chicken Curry	63.4	74.6
Fish Curry	70.2	80.5
Tikka Masala w/Sunflower oil	63.4	74.2
Thai Green Curry w/Peanut oil	73.3	85.3
Grass	52.8	78.9
CFT BC02 / coffee	57.2	68.8
CFT BC03 / tea	46	68.5
Fresh baby food	69,8	88
CFT CH017 / gravy	73.6	81.4
Spaghetti sauce	68.3	73.8

Clearly with the use of the foam washing performance on all stains was significantly better.

Use example 2

0.4g of the above particulate was mixed with 20g of water in a shaker, which comprised a volume in the shape of a bottle. The bottle was shaken for 30 seconds to form a detergent foam. The obtained preparation was applied to stained areas of fabric material which for 5 minutes and then washed in a conventional laundry washing machine.

The washing condition is the same of example 1:

Stain	Y-Value	
	Without Foam Pre-Treatment	With Foam Pre-Treatment
Grass	67.0	81.6
Blueberry juice	60.8	82.9
Tea	50.6	85.9
Tea green	51.8	86.7
Red Wine	55.6	85
Gravy	64.2	74.7
Chicken Curry	72.6	86.6
Fish Curry	70.6	83
Kimchi	78.9	89.5
Thai green curry	73.2	83.4

CLAIMS

1. A process of producing a fabric treatment agent in the form of a foam comprising admixing / mixing a particulate composition with a liquid composition and agitating.
2. A process according to claim 1, wherein the process comprises the use of a container for use in a process of producing a foam-form, detergent composition comprising admixing / mixing a particulate detergent composition with a liquid.
3. A process according to claim 2, wherein the container is in the form of a bottle, which has a removable / replaceable lid.
4. A process according to claim 3, wherein the container is small enough to be held in a hand of a user.
5. A process according to any one of claims 1 to 4, wherein the process comprises the use of 0.1 to 10g of particulate detergent composition and 0.1 to 1000ml of a liquid.
6. A according to any one of claims 1 to 5, wherein the detergent is packaged in a unit dose format.
7. A method of pre-treating a garment / fabric comprising a process of producing a foam-form, detergent composition comprising admixing / mixing a particulate detergent composition with a liquid in a container and applying an amount of the foam produced to a garment / fabric and then washing said a garment / fabric in or with an automatic washing machine.

8. A method according to claim 7, wherein the method involves the following steps.

- (i) The container is arranged such that it contains an amount of a liquid and a particulate detergent agent.
- (ii) The container is sealed.
- (iii) The container is agitated, e.g. by shaking to prepare foam admixture.
The container is opened and the foam is applied to a garment, preferably in a stained area.
- (iv) A conventional laundry washing cycle is operated.

9. A method according to claim 7, wherein the method involves the following steps.

- (i) A separation means on the container is removed / ruptured such that the container contains an amount of a liquid and a particulate detergent agent.
- (ii) The container is agitated, e.g. by shaking to prepare foam admixture.
- (iii) The container is opened and the foam is applied to a garment, preferably in a stained area.
- (iv) A conventional laundry washing cycle is operated.

10. A method according to claim 8 or 9, wherein the automatic washing machine comprises an automatic laundry machine.