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(54) **PROCEDE DE PRODUCTION D'UNE COMPOSITION  
DETERGENTE**

(54) **PROCESS FOR THE PRODUCTION OF A DETERGENT  
COMPOSITION**

(57) L'invention se rapporte à un procédé de production d'une composition détergente particulaire à haut volume de densité contenant un agent de fluorescence, ce procédé consistant à mélanger l'agent de fluorescence avec un composant liquide de la composition, afin de former un mélange contenant l'agent de fluorescence, que l'on mélange ensuite avec un composant solide de la composition, de préférence non séché par pulvérisation, produisant ainsi une composition détergente particulaire.

(57) A process for the production of a high bulk density particulate detergent composition containing a fluorescer which comprises mixing the fluorescer with a liquid component of the composition to form a fluorescer mixture and mixing the fluorescer mixture with a solid component, preferably non-spray-dried, of the composition whereby a particulate detergent composition is produced.





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<p>(21) International Application Number: PCT/GB94/02458</p> <p>(22) International Filing Date: 9 November 1994 (09.11.94)</p> <p>(30) Priority Data: 9323250.2 11 November 1993 (11.11.93) GB</p> <p>(71) Applicant (for AU BB CA GB IE KE LK MN MW NZ SD TT only): UNILEVER PLC [GB/GB]; Unilever House, Blackfriars, London EC4P 4BQ (GB).</p> <p>(71) Applicant (for all designated States except AU BB CA GB IE KE LK MN MW NZ SD TT): UNILEVER N.V. [NL/NL]; Weena 455, NL-3013 AL Rotterdam (NL).</p> <p>(72) Inventor: WILSON, Janette; 45 Grange Lane, Winsford, Cheshire CW7 2BS (GB).</p> <p>(74) Agent: FORD, Michael, Frederick; Mewburn Ellis, York House, 23 Kingsway, London WC2B 6HP (GB).</p>	<p>(81) Designated States: AM, AT, AU, BB, BG, BR, BY, CA, CH, CN, CZ, DE, DK, EE, ES, FI, GB, GE, HU, JP, KE, KG, KP, KR, KZ, LK, LR, LT, LU, LV, MD, MG, MN, MW, NL, NO, NZ, PL, PT, RO, RU, SD, SE, SI, SK, TJ, TT, UA, UZ, VN, European patent (AT, BE, CH, DE, DK, ES, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE), OAPI patent (BF, BJ, CF, CG, CI, CM, GA, GN, ML, MR, NE, SN, TD, TG), ARIPO patent (KE, MW, SD, SZ).</p> <p><b>Published</b> <i>With international search report.</i></p> <p style="text-align: center; font-size: 2em;"><b>2173445</b></p>	

(54) Title: PROCESS FOR THE PRODUCTION OF A DETERGENT COMPOSITION

## (57) Abstract

A process for the production of a high bulk density particulate detergent composition containing a fluorescer which comprises mixing the fluorescer with a liquid component of the composition to form a fluorescer mixture and mixing the fluorescer mixture with a solid component, preferably non-spray-dried, of the composition whereby a particulate detergent composition is produced.

PROCESS FOR THE PRODUCTION OF A DETERGENT COMPOSITION

5 This invention relates to a process for the production of a detergent composition. In particular this invention relates to a process for the production of a high bulk density detergent composition containing a fluorescer.

10 Detergent powders typically include components in addition to the detergent-active materials necessary for detergency which provide the powder with characteristics which may be viewed as desirable by the market for example perfume and fluorescer. Fluorescers have been used for many years in conventional spray-dried powders to give improved whiteners.

15 In the production of spray-dried powders, the fluorescer material is typically incorporated into the slurry of components which is to be spray-dried to produce the powder.

20 With the advent of high bulk density powders, for example having a bulk density in excess of 750g/l, new process routes have been proposed which involve subjecting a spray-dried powder to a "post-tower" mixing and densification process or mixing and densifying the components of the detergent  
25 composition without the use of a spray-drying step ("non-tower" process) for example as described in EP-A-367339 (Unilever).

30 Production of a detergent composition by a mixing process typically involves contacting and mixing the liquid components with the solid components of the composition so that the liquid binds the solid material thereby to form composition particles. With further mixing the particles increase in size to form granules. The ratio of liquids to

solids has to be sufficiently high to promote binding but not so high that discrete particles are not obtained.

5 In "non-tower" processes fluoescers have been incorporated into the powder as a solid material in the mixing/densification step. However fluoescers may have an undesirable colour. Incorporating such fluoescers in solid form may impair the colour quality of the final powder.

10 We have now found that high bulk density powders having excellent colour properties may be produced by incorporating a fluoescer into a liquid component of the detergent composition to produce a pre-mix of the fluoescer which is then combined with solid components in a mixing step to  
15 produce the particulate composition.

According to the invention there is provided a process for the production of a high bulk density particulate detergent composition or component thereof  
20 containing a fluoescer, which comprises mixing the fluoescer with a liquid component of the composition or component, said liquid component consisting essentially of a nonionic surfactant and water and/or fatty acid, to form a fluoescer mixture, and mixing the said fluoescer mixture with a solid  
25 component of the composition or component whereby a particulate detergent composition or component is produced.

High bulk density compositions having a bulk density of at least 750g/l may be produced by the present invention. The  
30 process of the present invention may be a continuous or a batch process as desired.

The components of the detergent composition will be selected to provide the desired characteristics and will generally  
35 include a surfactant and a builder in addition to the fluoescer.

The composition comprises at least one liquid component in order to bind the solid components together. The fluorescer is mixed with a liquid component, to form a fluorescer mixture which maybe a slurry, dispersion or suspension.

5 Agitation may be necessary in such cases to avoid undesirable sedimentation. It is especially preferred that the fluorescer mixture is a solution as particularly good powder colour may be secured.

10 It is preferred that the fluorescer mixture comprises a liquid nonionic surfactant. Further, the fluorescer mixture more preferably comprises a mixture of a fluorescer, a nonionic surfactant and water and optionally a fatty acid.

15 Suitable nonionic surfactants have an average degree of alkoxylation of 3 or more, preferably 5 or more, and desirably 20 or less. Desirably the fluorescer mixture is a solution to facilitate homogeneous dispersion of the fluorescer through the composition and the nonionic suitably

20 has an average degree of alkoxylation of 6 or more.

Ethoxylated alcohols are especially preferred. Suitable examples include SYNPERONIC™ A3, SYNPERONIC™ A7 ex ICI and coconut oil ethoxylates having an average degree of ethoxylation of 6.5. Examples of other liquid components

25 which may be employed with the nonionic surfactant include polyethylene glycols, for example PEG 1500, and glycerol.

The fluorescer may comprise a fluorescer known in the art, such as a biphenyl compound for example a distryl biphenyl

30 compound. An especially preferred fluorescer is TINOPAL™ CBS-

X ex Ciba Geigy. The fluoescer is suitably present in the composition in an amount of 0.001 to 1%, preferably 0.005 to 0.5%, more preferably 0.01% to 0.4%, especially 0.01 to 0.25% by weight based on the total composition.

5

The liquid component and fluoescer are suitably present in the fluoescer mixture in a ratio of 10:0.01 to 5 by weight preferably 10: 0.06 to 4 and more preferably 10:0.1 to 4. An especially preferred fluoescer mixture comprises a nonionic surfactant, for example SYNPERONIC A7 ex ICI, water and a fluoescer, for example TINOPAL CBS-X. Suitably the nonionic surfactant and water are present in a weight ratio of 50:1 to 1:10, preferably 20:1 to 3:8 and more preferably 10:1 to 3:8. Superior powder whiteness (lower 'b' value) is obtained at higher levels of nonionic in the fluoroescer mixture. The fluoescer suitably represents 1 to 25%, preferably 5 to 15% and more preferably 6 to 12% by weight of the fluoescer mixture.

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Higher levels of fluoescer may be employed to provide fabric whitening benefits but this advantage may be offset by a poorer powder colour at high levels of fluoescer where the fluoescer is coloured, for example, in excess of 0.5% by weight based on the total powder.

25

Suitably, other fluoescers are included in the composition to improve fabric whiteness, thus obviating the need for undesirably high levels of coloured fluoescer, for example TINOPAL CBS-X. Preferably a dimorpholino fluoescer is present in the composition together with the powder fluoescer.

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The fluoescer mixture water is suitably prepared by mixing the fluoescer with the liquid component with agitation to obtain preferably a solution. For nonionic/water/fluoescer

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systems it is preferred that the fluoescer is mixed with the nonionic surfactant and the water is then added subsequently, or the fluoescer is added to a mixture of nonionic and water. Preferably the fluoescer mixture is prepared such that sedimentation of the fluoescer and 'gelling' of the liquid at ambient temperature is avoided.

The solid component may comprise all of the components of the detergent composition excluding the fluoescer mixture or alternatively the solid component may comprise at least one of the said components and the other components may be incorporated into the composition during or subsequent to the mixing of the solid component and the fluoescer mixture.

The solid component of the composition may comprise solid particles of individual components or solid particles comprising a plurality of components hereinafter referred to as "adjuncts". Components of the detergent composition which are liquid (excluding the fluoescer mixture) may be added to the solid component during or subsequent to the mixing step or incorporated by means of an adjunct as desired.

The solid component may be spray-dried powder but preferably comprises materials which are not produced directly by spray-drying, especially if a high bulk density is required.

Accordingly, a second aspect of the invention provides a process for the production of a detergent composition or component containing a fluoescer which comprises mixing the fluoescer with a liquid component to form a fluoescer mixture, and mixing the said mixture with a solid component which is not the product of a spray-drying process, whereby a particulate detergent composition is produced.

Preferably the mixing of the fluorescer mixture and the non-spray-dried solid is effected in a high speed mixer with the fluorescer mixture being sprayed onto the solid. The particles obtained may be treated further as desired.

5

Optionally the particles may be passed directly to a cooling and/or drying step to produce finished base powder particles, to which other ingredients may then be post-mixed.

10

Alternatively, the particles may be passed to a second, preferably low speed, mixing step in order to increase the bulk density of the particles and optionally then cooled and/or dried as desired.

15

Where a continuous process is employed, the mixing and densification steps may be carried out simultaneously using a high speed mixer, suitable examples include a Shugi (trademark) Granulator, a Drais (trade mark) K-TTP 80 Granulator and the Lodige (trade mark) CB30 recycler. The residence time in the mixing step is suitably about 5 to 30 seconds and the rate of mixing in the apparatus is suitably in the range 100 to 2500rpm depending upon the degree of densification and the particle size required. The granulation step if present may be carried out using a lower speed mixer for example, the Drais (trade mark) K-T 160 and the Lodige (trade mark) KM300 mixer. The residence time in the granulation step is suitably about 1 to 10 minutes and the rate of mixing in the apparatus is about 40 to 160 rpm.

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A batch process may be employed in which the solid components of the composition are dosed into a mixer and the fluorescer mixture is suitably sprayed onto the solid component. Suitable mixers include the FUKAE™ range of mixers. Other materials may be added subsequently as desired. Residence time is selected according to the required degree of granulation for example 1 to 20 minutes.

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The fluorescer mixture is preferably sprayed onto the solid component of the composition to provide an even distribution of the mixture over the solid component.

5 We have found that a high bulk density detergent compositions having excellent colour properties may be secured by a process according to the first or second aspect of the invention.

10 A third aspect of the invention provides a detergent composition comprising a fluorescer which composition is obtainable by a process according to the first aspect of the invention.

15 A fourth aspect of the invention provides a detergent composition having a high bulk density and comprising a surfactant, detergency builder and a fluorescer which has a Delta R460 value of at least 3.5, preferably at least 5.5 and more preferably at least 6.5.

20 Preferably the fluorescer is incorporated into the composition by a process according to the first or second aspect of the invention.

25 Delta R460 values are determined by measuring the reflectance of light from the sample at 460 nm when irradiated with a tungsten lamp without a filter and measuring the reflectance, of the sample with a UV filter and calculating the difference between the two measurements. The sample analysed is a 355  
30 to 500  $\mu\text{m}$  fraction obtained by sieving. This method provides an indication of the contribution of the fluorescer to the reflectance of the sample.

35 Compositions produced according to the present invention will generally contain detergent-active compounds and detergency

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builders, and may optionally contain bleaching components and other active ingredients to enhance performance and properties. The detergent-active compounds (surfactants) may be chosen from soap and non-soap anionic, cationic, nonionic, amphoteric and zwitterionic detergent-active compounds, and mixtures thereof. Many suitable detergent-active compounds are available and are fully described in the literature, for example, in "Surface-Active Agents and Detergents", Volumes I and II, by Schwartz, Perry and Berch.

The preferred detergent-active compounds that can be used are soaps and synthetic non-soap anionic and nonionic compounds.

Anionic surfactants are well-known to those skilled in the art. Examples include alkylbenzene sulphonates, particularly linear alkylbenzene sulphonates having an alkyl chain length of C<sub>8</sub>-C<sub>15</sub>; primary and secondary alkyl sulphates, particularly C<sub>12</sub>-C<sub>15</sub> primary alkyl sulphates; alkyl ether sulphates; olefin sulphonates; alkyl xylene sulphonates; dialkyl sulphosuccinates; and fatty acid ester sulphonates. Sodium salts are generally preferred.

Nonionic surfactants may be included in any adjuncts employed in the composition in addition to that which may be present in the fluorescer mixture. Suitable nonionics include the primary and secondary alcohol ethoxylates, especially the C<sub>8</sub>-C<sub>20</sub> aliphatic alcohols ethoxylated with an average of from 1 to 20 moles of ethylene oxide per mole of alcohol, and more especially the C<sub>10</sub>-C<sub>15</sub> primary and secondary aliphatic alcohols ethoxylated with an average of from 1 to 10 moles of ethylene oxide per mole of alcohol. Non-ethoxylated nonionic surfactants include alkylpolyglycosides also glycerol monoethers, and polyhydroxyamides (glucamide).

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The choice of detergent-active compound (surfactant), and the amount present, will depend on the intended use of the detergent composition. For example, for machine dishwashing a relatively low level of a low-foaming nonionic surfactant is generally preferred. In fabric washing compositions, different surfactant systems may be chosen, as is well known to the skilled formulator, for handwashing products and for products intended for use in different types of washing machine.

The total amount of surfactant present will also depend on the intended end use and may be as low as 0.5 wt%, for example, in a machine dishwashing composition, or as high as 60 wt%, for example, in a composition for washing fabrics by hand. In compositions for machine washing of fabrics, an amount of from 5 to 40 wt% is generally appropriate.

Detergent compositions suitable for use in most automatic fabric washing machines generally contain anionic non-soap surfactant, or nonionic surfactant, or combinations of the two in any ratio, optionally together with soap.

The detergent compositions of the invention will generally also contain one or more detergency builders. The total amount of detergency builder in the compositions will suitably range from 10 to 80 wt%, preferably from 15 to 60 wt%.

Inorganic builders that may be present include sodium carbonate, if desired in combination with a crystallisation seed for calcium carbonate, as disclosed in GB 1 437 950 (Unilever); crystalline and amorphous aluminosilicates, for example, zeolites as disclosed in GB 1 473 201 (Henkel), amorphous aluminosilicates as disclosed in GB 1 473 202 (Henkel) and mixed crystalline/amorphous aluminosilicates as

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disclosed in GB 1 470 250 (Procter & Gamble); and layered silicates as disclosed in EP 164 514B (Hoechst). Inorganic phosphate builders, for example, sodium orthophosphate, pyrophosphate and tripolyphosphate, may also be present.

5

Zeolite builders may suitably be present in amounts of from 10 to 45 wt%, amounts of from 15 to 35 wt% being especially suitable for (machine) fabric washing compositions. The zeolite used in most commercial particulate detergent compositions is zeolite A. Advantageously, however, maximum aluminium zeolite P (zeolite MAP) described and claimed in EP 384 070A (Unilever) may be used. Zeolite MAP is an alkali metal aluminosilicate of the P type having a silicon to aluminium ratio not exceeding 1.33, preferably not exceeding 1.15, and more preferably not exceeding 1.07.

15

Organic builders that may be present include polycarboxylate polymers such as polyacrylates, acrylic/maleic copolymers, and acrylic phosphinates; monomeric polycarboxylates such as citrates, gluconates, oxydisuccinates, glycerol mono-, di- and trisuccinates, carboxymethyloxysuccinates, carboxymethyloxymalonates, dipicolinates, hydroxyethyliminodiacetates, alkyl- and alkenylmalonates and succinates; and sulphonated fatty acid salts. This list is not intended to be exhaustive.

25

Especially preferred organic builders are citrates, nitrolotriacetic acid and oxydisuccinate and are suitably used in amounts of from 5 to 30 wt%, preferably from 10 to 25 wt%; and acrylic polymers, more especially acrylic/maleic copolymers, suitably used in amounts of from 0.5 to 15 wt%, preferably from 1 to 10 wt%.

30

Builders, both inorganic and organic, are preferably present in alkali metal salt, especially sodium salt, form.

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Detergent compositions according to the invention may also suitably contain a bleach system. Machine dishwashing compositions may suitably contain a chlorine bleach system, while fabric washing compositions may more desirably contain peroxy bleach compounds, for example, inorganic persalts or organic peroxyacids, capable of yielding hydrogen peroxide in aqueous solution.

Suitable peroxy bleach compounds include organic peroxides such as urea peroxide, and inorganic persalts such as the alkali metal perborates, percarbonates, perphosphates, persilicates and persulphates. Preferred inorganic persalts are sodium perborate monohydrate and tetrahydrate, and sodium percarbonate.

Especially preferred is sodium percarbonate having a protective coating against destabilisation by moisture. Sodium percarbonate having a protective coating comprising sodium metaborate and sodium silicate is disclosed in GB 2 123 044B (Kao).

The peroxy bleach compound is suitably present in an amount of from 5 to 35 wt%, preferably from 10 to 25 wt%.

The peroxy bleach compound may be used in conjunction with a bleach activator (bleach precursor) to improve bleaching action at low wash temperatures. The bleach precursor is suitably present in an amount of from 1 to 8 wt%, preferably from 2 to 5 wt%.

Preferred bleach precursors are peroxycarboxylic acid precursors, more especially peracetic acid precursors and peroxybenzoic acid precursors; and peroxycarbonic acid precursors. An especially preferred bleach precursor

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suitable for use in the present invention is N,N,N',N'-tetracetyl ethylenediamine (TAED).

5 The novel quaternary ammonium and phosphonium bleach precursors disclosed in US 4 751 015 and US 4 818 426 (Lever Brothers Company) and EP 402 971A (Unilever) are also of great interest. Especially preferred are peroxydicarbonic acid precursors, in particular cholyl-4-sulphophenyl carbonate. Also of interest are peroxybenzoic acid  
10 precursors, in particular, N,N,N-trimethylammonium toluoyloxy benzene sulphonate; and the cationic bleach precursors disclosed in EP 284 292A and EP 303 520A (Kao).

15 A bleach stabiliser (heavy metal sequestrant) may also be present. Suitable bleach stabilisers include ethylenediamine tetraacetate (EDTA) and the polyphosphonates such as Dequest (Trade Mark), EDTMP.

20 An especially preferred bleach system comprises a peroxy bleach compound (preferably sodium percarbonate optionally together with a bleach activator), and a transition metal bleach catalyst as described and claimed in EP 458 397A, EP 458 398A and EP 509 787A (Unilever).

25 The compositions of the invention may contain alkali metal, preferably sodium, carbonate, in order to increase detergency and ease processing. Sodium carbonate may suitably be present in amounts ranging from 1 to 60 wt%, preferably from 2 to 40 wt%. However, compositions containing little or no  
30 sodium carbonate are also within the scope of the invention.

Powder flow may be improved by the incorporation of a small amount of a powder structurant, for example, a fatty acid (or fatty acid soap), a sugar, an acrylate or acrylate/maleate  
35 polymer, or sodium silicate.

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One preferred powder structurant is fatty acid soap, suitably present in an amount of from 1 to 5 wt%.

5 Other materials that may be present in detergent compositions of the invention include sodium silicate and sodium metasilicate; antiredeposition agents such as cellulosic polymers; inorganic salts such as sodium sulphate; lather control agents or lather boosters as appropriate; 10 proteolytic and lipolytic enzymes; dyes; coloured speckles; perfumes; foam controllers; and fabric softening compounds. This list is not intended to be exhaustive.

The invention is illustrated by the following non-limiting Examples. All figures in the Examples are parts by weight 15 unless otherwise stated.

#### Examples 1 to 6

20 Six compositions were produced by mixing a fluorescer mixture with the other composition components in a FUKAE FS-30 mixer to produce a granular detergent composition. The fluorescer mixture was varied for each Example as listed in Table 1 and the other composition components were as listed below:

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Na LAS	20
Sodium tripolyphosphate	25
Zeolite 4A	23
Sodium carbonate	19

5

The final composition had the following components:

TABLE 1

10

EXAMPLE	FLUORESCENT MIXTURE
1	0.02 TINOPAL CBS-X in 2 NI (suspension) (0.18 TINOPAL CBS-X added to mixer as solid)
2	0.2 TINOPAL CBS-X in 2 NI (suspension)
3	0.5 NI:0.05 TINOPAL CBS-X:0.05 water (solution) (1.5 NI) added to mixer as liquid)
4	1.0 NI:0.1 TINOPAL CBS-X:0.1 water (solution) (1.0 NI added to mixer as liquid)
5	1.5 NI:0.15 TINOPAL CBS-X:0.15 water (solution) (0.5 NI added to mixer as liquid)
6	2.0 NI:0.2 TINOPAL CBS-X:0.2 water solution

15

20

The nonionic used was SYNPERONIC A7 ex ICI.

25

The fluorescer mixtures were produced by mixing the TINOPAL CBS-X fluorescer and nonionic to form a suspension. Where present, water was then added to this suspension. The mixture was then stirred slowly (to avoid sedimentation) for 30 minutes and then allowed to stand for 1 hour.

30

The final product was sieved to provide a fraction having a particle size of 355 to 500 $\mu$ m. The reflectance of this fraction was measured at 460 $\mu$ m under UV light and UV excluded

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light from which the F value was calculated as described herein. The results are shown in Table 2.

Comparative Example A

5

A composition not according to the invention having the same components as listed for Examples 1 to 6 and solid fluorescer (0.2 parts) and non-active solid surfactant (2 parts) was produced by mixing under the same conditions as Examples 1 to 6.

10

The F value of this composition was calculated and the results are shown in Table 2.

15

TABLE 2

20

25

EXAMPLE	F VALUE
1	3.9
2	5.5
3	6.9
4	7.1
5	7.5
6	7.2
A	3.0

The above results demonstrate that by incorporating the fluorescer by way of a fluorescer mixture which is then mixed with the solid components, improved powder whiteness is secured as compared with the process of the prior art. Further, Examples 3 to 6 illustrate that further improved whiteness is secured if the fluorescer mixture is a solution.

35

Example 7 to 14

A series of powders were produced having a fixed level of CBS-X fluorescer which was introduced as a fluorescer mixture consisting of the fluorescer and varying ratios of SYNPERONIC A7, nonionic surfactant and water. The compositions contained the following components (parts by weight):

10	SODIUM CARBONATE	16
	SODIUM TRIPOLYPHOSPHATE	40
	ZEOLITE 4A	11
	Na LAS	27
	TINOPAL CBS-X	0.2
	SYNPERONIC A7	2
15	WATER	1.8
	MINORS	to 100

The solids (excluding fluorescer) were mixed together and dosed into a FUKAE FS-30 batch mixer. A fluorescer mixture containing 0.2 parts fluorescer having a nonionic/fluorescer/water ratio) as listed in Table 3 was then sprayed onto the solid with mixing and the Na LAS and any remaining nonionic and water was then dosed into the mixer.

25 Finally, the zeolite was added as a layering material.

TABLE 3.

EXAMPLE	NONIONIC	FLUORESCER	WATER
7	3	1	8
8	4	1	7
9	5	1	6
10	6	1	5
11	7	1	4
12	8	1	3
13	9	1	2
14	10	1	1

Results

The F value of the 350 to 500  $\mu$  fraction of the powders was determined for the fresh powder and after 2 weeks at ambient conditions. The results are shown in Table 4.

TABLE 4.

EXAMPLE	7	8	9	10	11	12	13	14
F Value (fresh)	4	4.8	5.0	4.9	7.8	8.5	7.8	8.5
F Value (2 weeks)	6.8	8.5	7.8	8.0	8.8	8.8	8.5	8.0

Powders produced in these Examples exhibit excellent colour characteristics both as a fresh powder and after 2 weeks. A higher proportion of nonionic in the fluorescer mixture was found to be advantageous in providing improved whiteness (lower 'b' value).

Example 15 to 18

5 Powders were produced by the same process and having the same composition as those of Examples 7 to 14 with fluoescer mixture compositions as follows:

<u>EXAMPLE</u>	<u>NONIONIC</u>	<u>FLUOESCER</u>	<u>WATER</u>
15	10	1	1
16	10	1	2
17	10	1	3
18	10	1	4

10  
15  
20 The F values of these powders (350 - 500  $\mu$  fraction) were determined and observed to be in excess of 8 both for the fresh powder and after 9 days. The 'b' values were also determined and found to be between 2.5 and 4 for fresh powder and between 4 and 5 after 9 days. The 'b' and F values illustrate that powders having excellent colour properties may be obtained by the process of the invention.

CLAIMS

1. A process for the production of a high bulk density particulate detergent composition or component thereof containing a fluorescer, which comprises mixing the fluorescer with a liquid component of the composition or component, said liquid component consisting essentially of a nonionic surfactant and water and/or fatty acid, to form a fluorescer mixture, and mixing the said fluorescer mixture with a solid component of the composition or component whereby a particulate detergent composition or component is produced.
2. A process according to claim 1 in which the fluorescer mixture is a solution.
3. A process according to claim 1 or claim 2 in which the liquid component consists essentially of a nonionic surfactant and water.
4. A process according to claim 1 or claim 2 in which the liquid component consists essentially of a nonionic surfactant, water and a fatty acid.
5. A process according to claim 2 in which the weight ratio of nonionic surfactant to water is in the range 50:1 to 1:10.
6. A process according to claim 1 in which the amount of fluorescer by weight in the fluorescer mixture is in the range 1 to 25%.
7. A process according to claim 1 in which the liquid component and fluorescer are present in a weight ratio of 10:0.01 to 5.



8. A process according to claim 1 in which the solid component comprises an anionic surfactant and/or a detergency builder as separate components and/or as an adjunct.
9. A process according to claim 1 in which the solid component is not the product of a spray-drying process.

