

SPECIFICATION

Deodorant detergent composition

5 This invention relates to deodorant detergent products for use in suppressing human body malodour. It has long been recognised that the development of body malodour is largely due to bacterial action on the products of the sweat glands. Washing the skin with a detergent, for instance in the form of a personal washing detergent bar, removes malodorous products and reduces the concentration of bacteria on the skin. Likewise, washing soiled clothing with a fabric washing detergent product, for instance in the form of a powder or liquid detergent product, removes malodorous products and bacteria derived from the skin.

It has been customary to incorporate germicides into detergent products, particularly those designed for personal washing, in the belief that growth of those skin microflora that contribute to body malodour can be inhibited and the production of malodorous substances suppressed. Germicides are at least partly effective in reducing or retarding the development of body malodour, but they do not completely solve the problem, possibly because there are other causes of malodour development on the skin which are unrelated to the proliferation of bacteria.

It has now been discovered that certain combinations of substances other than germicides, hereinafter referred to as "deodorant compositions", when incorporated into detergent products for personal washing provide a more effective means for inhibiting malodour development on the skin than the use of the conventional germicides. Likewise, it has also been discovered that deodorant compositions, when incorporated into a fabric washing detergent product, can be deposited onto the fabric of a garment washed with the product, so that the fabric of the garment has the property of reducing body malodour when the garment is subsequently worn or otherwise applied in contact with the skin.

In the course of attempts to characterise this new principle, many hundreds of substances and blends of substances have been screened for evidence of their deodorant activity.

In its widest aspect, the invention provides a deodorant detergent product comprising a non-soap detergent active compound, and a deodorant composition having a deodorant value of from 0.50 to 3.5 as measured by the Deodorant Value Test, the deodorant composition comprising substances that depress the partial vapour pressure of morpholine by at least 10% more than that required by Raoult's Law.

The invention also provides a process for preparing a deodorant detergent product which process comprises blending a non-soap detergent active compound and a deodorant composition as herein defined to provide a deodorant detergent product.

The invention furthermore provides a method for suppressing human body malodour which comprises contacting the skin with a fabric treated with a deodorant detergent product as herein defined.

It is a preferred property of the deodorant detergent product of the invention that it should comprise a deodorant composition which satisfies a deodorancy test when applied to the skin of human subjects. The average amount by which body malodour should be reduced is expressed in terms of the deodorant value of the deodorant composition contained in the detergent product. Products of the invention accordingly comprise a deodorant composition having a deodorant value of from 0.50 to 3.5. Products in which the deodorant composition has a deodorant value of below 0.50 are outside the scope of this invention and are considered to be incapable of reducing body malodour to a significant extent.

The Deodorant Value Test

In this test the deodorant value of a deodorant composition is measured by assessing its effectiveness, when contained in a standard soap bar at a standard concentration, in reducing body malodour when the standard soap bar is used to wash the axillae (armpits) of a panel of human subjects.

The choice of a soap base is not critical to the performance of the test but as illustrative of the conduct of the test in this respect the procedure followed in the preparation of the base employed in many of the tests referred to later in this specification is included in the description of the test.

Standard soap bars are prepared as follows, all amounts given being by weight.

As a soap base there is used a neutral wet sodium soap containing 63% of total fatty matter of which 82% is tallow fatty acid and 18% is coconut oil fatty acid. To a homogeneous mixture of 9000 parts of this soap base and 340 parts of free coconut oil fatty acid at 80°C are added with mixing, 9.4 parts of a 20% aqueous solution of tetrasodium ethylenediamine tetraacetate, 2.2 parts of a 60% aqueous solution of 1 - hydroxyethane - 1, 1 - diphosphonic acid and 7.2 parts of butylated hydroxy toluene (BHT) antioxidant dissolved in a little methylated spirits and the temperature of the mass is raised to 140°C under superatmospheric pressure. The mass is then sprayed at about 30 mm of mercury, to produce a dried soap composition which is collected and extruded at 30°C as noodles of about 12% moisture content.

9,770 parts of the soap noodles thus obtained are mixed at ambient temperature with 150 parts of the deodorant composition to be tested, together with 30 parts of a titanium dioxide opacifier and 50 parts of a colourant suspension. The resulting mixture is milled and plodded in conventional equipment, cut into billets and stamped into bars. The deodorant composition to be tested is therefore present at the standard level of 1.5%. These bars are described as 80/20/5 soap base and consist of 80 parts tallow soap and 20 parts coconut soap, 5 parts of this soap mixture being free fatty acids expressed as coconut oil fatty acid.

Control soap bars are prepared in a similar manner except that the deodorant composition is omitted. In other respects, the control bar should only contain those additives conventionally present in personal washing products and for the purpose in

the amount conventionally used in the art. For example, it is permissible as indicated in the foregoing description to include antioxidants in the control bar, but these should be present only in the amount required to stabilise the soap base.

The test is conducted in a manner based on that devised by Whitehouse & Carter as published in "The Proceedings of the Scientific Section of the Toilet Goods Association", No 18, December 1967, at pages 31 to 37, under the title "Evaluation of Deodorant Toilet Bars".

The test described in that publication was modified in three ways: firstly, the standard soap bar containing 1.5% by weight of a deodorant composition instead of germicides was employed, secondly, a 0 to 5 instead of a 0 to 10 grading scale was employed as a basis for determining the deodorant value, and thirdly, grading of odour intensity was performed 5 hours instead of 24 hours after treatment. This test is referred to herein as the Deodorant Value test.

Although the invention in its widest aspect provides deodorant detergent products comprising deodorant compositions having a deodorant value of from 0.50 to 3.5, preferred deodorant detergent products are those comprising deodorant compositions which have a deodorant value of at least 0.60, or 0.70, or 0.80, or 0.90, or 1.00, or 1.20, the higher the minimum value, the more effective is the product as a deodorant detergent product.

Non-soap Detergent Active Compound

Non-soap detergent active compounds suitable for use in deodorant detergent products of the invention can be non-soap anionic or nonionic or cationic or amphoteric or Zwitterionic in character. Typical non-soap anionic detergent-active compounds include water-soluble salts, particularly the alkali metal, ammonium and alkanolammonium salts, of organic sulphuric reaction products having in their molecular structure an alkyl group containing from about 8 to about 22 carbon atoms and a sulphuric acid or sulphuric acid ester group. (Included in the term "alkyl" is the alkyl portion of acyl groups). Examples of this group of non-soap detergents which can be used are the sodium and potassium alkyl sulphates, especially those obtained by sulphating the higher alcohols ($C_8 - C_{18}$ carbon atoms) produced by reducing the glycerides of tallow or coconut oil; and sodium and potassium alkyl benzene sulphonates, in which the alkyl group contains from about 9 to about 15 carbon atoms in straight chain or branched chain configuration.

Other non-soap anionic detergent-active compounds include the sodium alkyl glycerol ether sulphonates, especially those ethers or higher alcohols derived from tallow and coconut oil; sodium coconut oil fatty acid monoglyceride sulphonates and sulphates; and sodium or potassium salts of alkyl phenol ethylene oxide ether sulphate containing about 1 to about 10 units of ethylene oxide per molecule and wherein the alkyl groups contain about 8 to about 12 carbon atoms.

Other useful non-soap anionic detergent-active compounds include the water-soluble salts of esters of α -sulphonated fatty acids containing from about 6

to 20 carbon atoms in the ester group; water-soluble salts of 2 - acyloxy - alkane - 1 - sulphonic acids containing from about 2 to 9 carbon atoms in the acyl group and from about 9 to about 23 carbon atoms in the alkane moiety; alkyl ether sulphates containing from about 10 to 20 carbon atoms in the alkyl group and from about 1 to 30 moles of ethylene oxide; water-soluble salts of olefin sulphonates containing from about 12 to 24 carbon atoms; and 6 - alkyloxy alkane sulphonates containing from about 1 to 3 carbon atoms in the alkyl group and from about 8 to 20 carbon atoms in the alkane moiety.

Preferred water-soluble non-soap anionic detergent-active compounds include linear alkyl benzene sulphonates containing from about 11 to 14 carbon atoms in the alkyl group: the tallow range (C_{12-20}) alkyl sulphates; the coconut range alkyl glyceryl sulphonates; and alkyl ether sulphates wherein the alkyl moiety contains from about 14 to 18 carbon atoms and wherein the average degree of ethoxylation varies between 1 and 6.

Specific preferred non-soap anionic detergent-active compounds include: sodium linear $C_{10}-C_{12}$ alkyl benzene sulphonate triethanolamine $C_{10}-C_{12}$ alkyl benzene sulphonate; sodium tallow alkylsulphate; and sodium coconut alkyl glyceryl ether sulphonate; and the sodium salt of a sulphated condensation product of tallow alcohol with from about 3 to about 10 moles of ethylene oxide.

It is to be understood that any of the foregoing anionic detergent-active compounds can be used separately or as mixtures.

Examples of suitable nonionic detergent-active compounds are condensates of linear and branched chain aliphatic alcohols or carboxylic acids of from 8 to 18 carbon atoms with ethylene oxide, for instance a coconut alcohol-ethylene oxide condensate of 6 to 30 moles of ethylene oxide per mole of coconut alcohol; condensates of alkylphenols whose alkyl group contains from 6 to 12 carbon atoms with 5 to 25 moles of ethylene oxide per mole of alkylphenol; condensates of the reaction product of ethylenediamine and propylene oxide with ethylene oxide, the condensates containing from 40 to 80% of polyoxyethylene radicals by weight and having a molecular weight of from 5,000 to 11,000; tertiary amine oxides of structure R_3NO , where one group R is an alkyl group of 8 to 18 carbon atoms and the others are each methyl, ethyl or hydroxyethyl groups, for instance dimethyldodecylamine oxide; tertiary phosphine oxides of structure R_3PO , where one group R is an alkyl group of from 10 to 18 carbon atoms, and the others are each alkyl or hydroxyalkyl groups of 1 to 3 carbon atoms, for instance dimethyldodecylphosphine oxide; and dialkyl sulfoxides of structure R_2SO where the group R is an alkyl group of from 10 to 18 carbon atoms and the other is methyl or ethyl, for instance methyltetradecyl sulfoxide.

Suitable cationic detergent-active compounds are quaternary ammonium salts having an aliphatic radical of from 8 to 18 carbon atoms, for instance cetyltrimethyl ammonium bromide.

Examples of suitable amphoteric detergent-active compounds are derivatives of aliphatic secondary

and tertiary amines containing an alkyl group of 8 to 18 carbon atoms and an aliphatic radical substituted by an anionic water-solubilising group, for instance sodium 3 - dodecylaminopropionate, sodium 3 - dodecylaminopropane sulphonate and sodium N - 2 - hydroxydodecyl - N - methyltaurate.

- Suitable zwitterionic detergent-active compounds are derivatives of aliphatic quaternary ammonium, sulphonium and phosphonium compounds having an aliphatic radical of from 8 to 18 carbon atoms and an aliphatic radical substituted by an anionic water-solubilising group, for instance 3 - (N, N - dimethyl - N - hexadecylammonium) propane - 1 - sulphonate betaine, 3 - (dodecylmethyl sulphonium) propane - 1 - sulphonate betaine and 3 - (cetylmethylphosphonium) ethane sulphonate betaine.

- In addition to any of the above non-soap detergent-active compounds, soaps can optionally also be present. Soaps are salts of fatty acids and include alkali metal soaps such as the sodium, potassium, ammonium and alkanol ammonium salts of higher fatty acids containing from about 8 to about 24 carbon atoms, and preferably from about 10 to about 20 carbon atoms. Particularly useful are the sodium and potassium and mono-, di- and triethanolamine salts of the mixtures of fatty acids derived from coconut oil and tallow.

- Further examples of detergent-active compounds are compounds commonly used as surface-active agents given in the well-known textbooks "Surface Active Agents", Volume 1 by Schwartz and Perry and "Surface Active Agents and Detergents", Volume II by Schwartz, Perry and Berch.

- The amount of non-soap detergent-active compound that can be incorporated into deodorant detergent products according to the invention is from 0.5 to 99.99% by weight. The preferred amount will depend on the nature of the product (i.e. whether it is liquid or solid and whether it comprises only non-soap detergents or both soap and non-soap detergents).

- It can be stated generally that the preferred amount of non-soap detergent active compound to be employed for solid products is within the range of from 5 to 95% by weight and for liquid products is within the range of from 5 to 80% by weight.

- The essential substances required for the formulation of deodorant compositions having a deodorant value of from 0.50 to 3.5 are those that depress the partial vapour pressure of morpholine by at least 10% more than that required by Raoult's Law, as determined by the following test, which is designated "The Morpholine Test".

- In this test the capacity of a substance to depress the partial vapour pressure of morpholine more than that required by Raoult's Law is measured. Substances that undergo chemical reaction with morpholine are to be regarded as excluded from the test, even though they will generally depress the partial vapour pressure of morpholine by at least the defined amount, since not all such substances are operative according to the new principle. It is to be understood, however, that such substances can be included in the formulation of the deodorant composition, provided that, when included, the composi-

tion has the ability to reduce odour intensity by at least 0.50 as herein defined.

The morpholine test is carried out in the following manner:

- Into a sample bottle of capacity 20 ml is introduced morpholine (1g) the bottle fitted with a serum cap and then maintained at 37°C for 30 minutes for equilibrium to be reached. The gas in the headspace of the bottle is analysed by piercing the serum cap with a capillary needle through which nitrogen at 37°C is passed to increase the pressure in the bottle by a standard amount and then allowing the excess pressure to inject a sample from the headspace into gas chromatograph apparatus, which analyses it and provides a chromatographic trace curve with a peak due to morpholine, the area under which is proportional to the amount of morpholine in the sample.

- The procedure is repeated under exactly the same conditions using instead of morpholine alone, morpholine (0.25g) and the substance to be tested (1g); and also using the substance (1g) without the morpholine to check whether it gives an interference with the morpholine peak (which is unusual).

- The procedure is repeated until reproducible results are obtained. The areas under the morpholine peaks are measured and any necessary correction due to interference by the substance is made.

- A suitable apparatus for carrying out the above procedure is a Perkin-Elmer Automatic GC Multifrac F40 for Head Space Analysis. Further details of this method are described by Kolb in "CZ-Chemie-Technik", Volume 1, No 2, 87-91 (1972) and by Jentzsch et al in "Z.Anal.Chem." 236, 96-118 (1968).

- The measured areas representing the morpholine concentration are proportional to the partial vapour pressure of the morpholine in the bottle headspace. If A is the area under the morpholine peak when only morpholine is tested and A' is the area due to morpholine when a substance is present, the relative lowering of partial vapour pressure of morpholine by the substance is given by $1 - A'/A$.

- According to Raoult's Law, if at a given temperature the partial vapour pressure of morpholine in equilibrium with air above liquid morpholine is p, the partial vapour pressure of p' exerted by morpholine in a homogeneous liquid mixture of morpholine and the substance at the same temperature is $pM/(M+PC)$, where M and PC are the molar concentrations of morpholine and the substance. Hence, according to Raoult's Law the relative lowering of morpholine partial vapour pressure $(p-p')/p$, is given by $1 - M/(M+PC)$, which under the circumstances of the test is $87/(87 + m/4)$, where m is the molecular weight of the substance.

- The extent to which the behaviour of the mixture departs from Raoult's Law is given by the ratio

$$\frac{1 - A'/A}{87/(87 + m/4)}$$

- The above ratio, which will be referred to as the Raoult Variance Ratio, is calculated from the test results. Where a substance is a mixture of compounds, a calculated or experimentally determined average molecular weight is used for m. A substance that depresses the partial vapour pressure of mor-

pholine by at least 10% more than that required by Raoult's Law is one in which the Raoult Variance Ratio is at least 1.1.

Deodorant compositions can be incorporated in deodorant detergent compositions according to the invention, at a concentration of from 0.01 to about 10%.

When the detergent composition is intended for personal washing, then the concentration of the deodorant composition is preferably from 0.5 to 5%, most preferably from 1 to 3% by weight.

When the detergent composition is intended for fabric washing, when the concentration of the deodorant composition is preferably from 0.05 to 3%, most preferably from 0.1 to 1% by weight.

It is apparent that if less than 0.01% of a deodorant composition is employed, then use of the detergent product is unlikely to provide a significant reduction in body malodour intensity. If more than 10% of a deodorant composition is employed, then use of the detergent product is unlikely to further reduce body malodour intensity beyond that observed at the 10% level.

Detergent Adjuncts

Deodorant detergent products of the invention can contain other detergent composition ingredients (adjuncts) for instance sequestrants, builders, soil release agents, antiredeposition agents, superfatting agents such as free long-chain fatty acids, lather boosters such as coconut monoethanolamide, lather controllers; inorganic salts such as sodium and magnesium sulphates; moisturisers; plasticisers and thickeners; opacifiers, colourants, fluorescers, bleaching agents, perfumes, germicides and other deodorant materials such as zinc ricinoleate. The product can also contain water.

The total amount of detergent adjuncts that can be incorporated into the deodorant detergent product according to the invention will normally form the balance of the product after accounting for the deodorant composition and the detergent-active compound. The detergent adjuncts will accordingly form from 0 to 99.49% by weight of the product.

Product Types and Formulations

The deodorant detergent product can be formulated as a solid product, for example in the form of a bar such as a personal washing bar or laundry bar, or a powder which can be used for personal washing or for fabric washing.

Alternatively, the product can take the form of a liquid product for use in personal or fabric washing or for use as a shampoo or foam bath product.

As a further alternative, the composition can take the form of a gelled product for use in personal washing, for example as a shower gel, or for fabric washing.

It is to be understood that the foregoing products are examples of forms which the deodorant detergent product can take: other product forms within the purview of the art are to be included within the scope of monopoly claimed.

The invention is further illustrated by the following examples of detergent product formulations which can be used as a basis for incorporating deodorant compositions at a concentration of from 0.01 to 10%

by weight to form deodorant detergent products according to the invention.

Examples of the detergent bars containing non-soap detergents which can be employed as a basis for incorporation of a deodorant composition to provide deodorant detergent products according to the invention are as follows:

<i>Detergent Personal Washing Bar A</i>	%w/w
Sodium acylisethionate	48.6
Sodium dodecylbenzene sulphonate	2.0
Sodium soap	11.0
Coconut oil fatty acid	3.0
Stearic acid	21.7
Other ingredients including inorganic salts, titanium dioxide, colouring matter	8.5
Water	to 100

<i>Detergent Personal Washing Bar B</i>	%w/w
Sodium C ₁₁ -C ₁₄ alkane sulphonate	22.1
Sodium C ₁₅ -C ₁₈ alkane sulphonate	29.4
Sodium C ₁₆ -C ₁₈ olefin sulphonate	22.1
Myristyl alcohol	6.3
Cetyl alcohol	5.0
Stearyl alcohol	5.0
Other ingredients including inorganic salts, titanium dioxide, colouring matter	5.2
Water	to 100

<i>Detergent Personal Washing Bar C</i>	% w/w
Disodium salt of a sulphonated hardened tallow fatty acid	27.6
Disodium salt of a sulphonated coconut oil fatty acid	14.6
Sodium C ₁₁ -C ₁₅ alkyl sulphate	28.1
Myristyl alcohol	11.1
Other ingredients including inorganic salts, titanium dioxide, colouring matter	7.3
Water	to 100

<i>Laundry Bar D</i>	% w/w
C ₆ -C ₁₆ alkyl benzene sulphonate	28
Sodium tripolyphosphate	23
Calcium carbonate	23.9
Sodium carbonate	10
Sodium carboxymethylcellulose	1.42
Water	6.5
Other ingredients including titanium dioxide, fluorescer, colouring matter and inorganic salts	to 100

<i>Laundry Bar E</i>	% w/w
C ₆ -C ₁₆ alkyl benzene sulphonate	15
Sodium tripolyphosphate	15
Calcium carbonate	37
Starch	7
Sodium carbonate	10
Sodium carboxymethylcellulose	0.71
Water	11
Other ingredients including titanium dioxide, fluorescer, colouring matter and inorganic salts	to 100

<i>Laundry Bar F</i>	% w/w
C ₆ -C ₁₆ alkyl benzene sulphonate	32
Sodium pyrophosphate	10
Calcium carbonate	40
Sodium carbonate	5
Water	4
Other ingredients including titanium dioxide, fluorescer, colouring matter and inorganic salts	to 100

An example of a liquid product which can be employed as a basis for incorporation of a deodorant composition to provide a deodorant detergent product according to the invention is as follows:

<i>Liquid Detergent Product</i>	% w/w
Sodium lauryl ether sulphate (28% AD)	30.0
Sodium N-lauroyl sarcosinate (97% AD)	4.0
Sodium lauryl polyglycol ether oxyacetic acid	4.0
Stearic acid polyglycol ester	2.0
Polyethylene glycol 400	1.0
Cetyl alcohol	1.0
Vinyl pyrrolidone/styrene copolymer	3.0
Water	to 100

Examples of foam bath products which can be employed as a basis for incorporation of a deodorant composition to provide deodorant detergent products according to the invention are as follows:

<i>Foam Bath A</i>	% w/w
Diethylamine and monobutylethanolamine salt of lauryl ether sulphate ($C_{12}:C_{14} = 70:30, 2, 2EO$) 100% AD	20
Monolaurin	5
Ethoxylated (5EO) copra monoethanolamide	3
Colour, water	to 100

<i>Foam Bath B</i>	% w/w
Sodium lauryl ether sulphate (28% AD)	54
Monolaurin	5
A mixture of ethoxylated (8 to 10 EO) C_8-C_{12} glycerides	6
Carbitol	3
Colour, Water	to 100

<i>Foam Bath C</i>	% w/w
Triethanolamine salt of lauryl sulphate (42% AD)	24
Diethylamine and monobutylethanolamine salt of lauryl ether sulphate ($C_{12}:C_{14} = 70:30, 2.2EO$) 100% AD	10
Monolaurin	5
Ethoxylated (5EO) copra monoethanolamide	3
Colour	0.15
Water	to 100

<i>Foam Bath D</i>	% w/w
Lauryl (poly - 1 - oxapropene) oxaethane carboxylic acid (100% AD)	35
Diethylamine and monobutylethanolamine salt of lauryl ether sulphate ($C_{12}:C_{14} = 78:30; 2.2EO$) (100% AD)	12
Triglyceride C_8-C_{12} fatty acids	35
Ethoxylated (5EO) copra monoethanolamide	8
Copra diethanolamide	5
Colour	0.5
Water	to 100

Foam Bath E	% w/w
Lauryl (poly - 1 - oxapropene) oxaethane carboxylic acid (100% AD)	35
Diethylamine and monobutylethanolamine salt of lauryl ether sulphate C ₁₂ -C ₁₄ 70:30, 2.2EO) (100% AD)	12
Paraffin oil	35
Ethoxylated (5EO) copra monoethanolamide	8
Copra diethanolamide	5
Colour	0.5
Water	to 100

Foam Bath F	% w/w
C ₁₂ -C ₁₄ dimethylamine oxide (30% AD)	50
Lauryl (poly - 1 - oxapropene) oxaethane carboxylic acid (90% AD)	5.5
Polymer JR 400	1
Ethoxylated (5EO) copra monoethanolamide	2
Colour	0.5
Water	to 100

Foam Bath G	% w/w
Sodium lauryl ether sulphate (3EO) (28% AD)	71.50
Ethoxylated (5EO) copra monoethanolamide (100% AD)	2
Polymer JR 400	1
Colour	0.5
Water	to 100

Foam Bath H	% w/w
Sodium lauryl ether sulphate 3EO (28% AD)	36
C ₁₂ -C ₁₄ dimethylamine oxide (30% AD)	16.5
Lauryl (poly - 1 - oxapropene) oxaethane carboxylic acid (90% AD)	5.5
Polymer JR 400	1
Ethoxylated (5EO) copra monoethanolamide	2
Carbitol	3
Water	to 100

Foam Bath I	% w/w
Lauryl (poly - 1 - oxapropane) oxaethane carboxylic monobutylethanolamine salt (90% AD)	20
Monolaurin	5
Ethoxylated (5EO) copra monethanolamide	3
Colour, water	to 100

Examples of shower gels which can be employed as a basis for incorporation of a deodorant composition to provide deodorant detergent products according to the invention are as follows:

Shower Gel A	% w/w
Triethanolamine salt of lauryl sulphate	40
Diethylamine and monobutylethanolamine salt of lauryl ether sulphate (C ₁₂ -C ₁₄ 70:30, 2.2EO) 100% AD	10
Monolaurin	8
Colour	0.15
Water	to 100

<i>Shower Gel B</i>	% w/w
Monoethanolamine soap of C ₁₂ -C ₁₈ fatty acids	16.7
C ₁₂ -C ₁₈ fatty acids	1.5
Sodium acyl isethionate	1.0
Coconut diethanolamide	3.0
Glycerol	0.5
Distilled water	to 100

The shower gel has a pH value of 8.5-9.0 and a viscosity of 2000-6000cps.

<i>Shower Gel C</i>	% w/w
Sodium myristyl lauryl ether sulphate	
3EO (C ₁₂ -C ₁₄ = 35:65) - 27% AD	60.0
Coconut diethanolamide	2.0
Formaldehyde (30%)	0.2
Sodium hexametaphosphate	1.0
Citric acid	0.12
Sodium chloride	1.15
Water, colourant	to 100

An example of a shampoo employed as a basis for incorporation of a deodorant composition to provide a deodorant detergent product according to the invention is as follows:

<i>Shampoo</i>	% w/w
Sodium salt of triethoxylated lauryl/	
myristyl sulphate	12
Lauryl/myristyl dimethyl betaine	2
Coconut diethanolamide	1
Sodium chloride	2.20
Formaldehyde (40% aqueous solution)	0.08
Water	to 100

pH adjusted to 7.4 with lactic acid.

This shampoo has a viscosity of about 500 centipoise (Brookfield Viscometer, spindle No. 2 at 20 rpm at 25°C). The anionic detergent consisted of about 55% lauryl and 45% myristyl materials.

Examples of fabric washing powders which can be employed as a basis for incorporation of a deodorant composition to provide a deodorant detergent product according to the invention are as follows:

<i>Fabric Washing Powder A</i>	% w/w
Sodium C ₁₃ -C ₁₈ alkane sulphonate	8.0
C ₁₆ -20 n-alcohol + 25 moles ethylene oxide	3.4
Sodium soap (containing 4 parts tallow fatty acid to 1 part coconut fatty acid)	3.4
Pentasodium tripolyphosphate	37.3
Sodium sulphate	6.7
Sodium carboxymethylcellulose	2.0
Ethylene diamine tetra acetic acid	1.0
Magnesium silicate	2.0
Fluorescer	0.3
Waterglass powder (Na ₂ O:SiO ₂ = 1:3.4)	5.9
Sodium carbonate	1.0
Sodium perborate monohydrate	19.0
Water	10.0

<i>Fabric Washing Powder B</i>	% w/w
C ₁₁₋₁₅ n-alcohol + 7 moles ethylene oxide	12
Pentasodium tripolyphosphate	37.3
Sodium sulphate	6.7
Sodium carboxymethylcellulose	2.0
Ethylenediamine tetra acetic acid	1.0
Magnesium silicate	2.0
Fluorescer	0.3
Water glass powder (Na ₂ O:SiO ₂ = 1:34)	5.9
Sodium carbonate	1.0
Sodium perborate monohydrate	19.0
Water	to 100

<i>Fabric Washing Powder C</i>	% w/w
Sodium dodecyl benzene sulphonate	14
Sodium tripolyphosphate	40
Sodium sulphate	2
Sodium carboxymethylcellulose	1
Ethylene diamine tetra acetic acid	1
Magnesium silicate	2
Fluorescer	0.3
Water glass powder (Na ₂ O:SiO ₂ = 1:3.4)	5.9
Sodium carbonate	1.0
Sodium perborate monohydrate	25
Water	to 100

<i>Fabric Washing Powder D</i>	% w/w
Sodium dodecyl benzene sulphonate	8
Tallow alcohol sulphate	6
Sodium tripolyphosphate	40
Sodium sulphate	2
Sodium carboxymethylcellulose	1
Ethylene diamine tetra acetic acid	1
Magnesium silicate	2
Fluorescer	0.3
Water glass powder (Na ₂ O:SiO ₂ = 1:3.4)	5.9
Sodium carbonate	1.0
Sodium perborate monohydrate	25
Water	to 100

<i>Fabric Washing Powder E</i>	% w/w
Sodium dodecyl benzene sulphonate	15
Tallow alcohol 18 EO	3
Tallow alcohol 12 EO	3
Sodium stearate (soap)	6
Sodium tripolyphosphate	40
Sodium silicate	5
Sodium carboxymethylcellulose	2
Fluorescer	0.2
EDTA	0.2
Enzyme	0.66
Sodium sulphate	14
Water	to 100

<i>Fabric Washing Powder F</i>	% w/w
Sodium dodecyl benzene sulphonate	15
Tallow alcohol 18 EO	2.5
Tallow alcohol 12 EO	2.5
Sodium tripolyphosphate	30
Sodium silicate	5
Sodium sulphate	25
Enzymes	0.66
EDTA	0.2
Fluorescer	0.2
Sodium carboxymethylcellulose	2
Water	to 100

Examples of fabric washing liquids which can be employed as a basis for incorporation of a deodorant composition to provide a deodorant detergent product according to the invention are as follows:

<i>Fabric Washing Liquid A</i>	% w/w
Condensation product containing 7 moles ethylene oxide with a synthetic C ₁₄₋₁₅ alcohol	40.0
Triethanolamine salt of alkyl benzene sulphonate	19.8
Triethanolamine	5.0
Ethanol	5.0
Potassium chloride	2.5
Fluorescer and colouring matter	0.9
Water	to 100

<i>Fabric Washing Liquid B</i>	% w/w
Alkyl C ₁₂ to C ₁₅ alcohol 9 EO	8
Sodium xylene sulphonate	2
Sodium pyrophosphate	2.8
Potassium pyrophosphate	22
Sodium silicate	3
Sodium carboxymethylcellulose	0.38
Fluorescer	0.1
Water	to 100

An example of a detergent based deodorant cream which can be employed as a basis for incorporation of a deodorant composition to provide a deodorant detergent product according to the invention is as follows:

<i>Deodorant Cream A</i>	% w/w
Sodium acylisethionate (IGEPO A) - 80% AD	10
Sucrose decyl glucosidic (C ₈ -C ₁₀ ester) (TRITON CG 110) - 70% AD	4
Monolaurin	3
Stearyl dimethylamine oxide (AMMONYX 50) - 25% AD	1
Sodium lactate (60%)	5
Bentone EW (gelling agent)	2.5
Colourant pearlescent agent	0.25
Water	to 100

(The words "Triton and "Ammonyx" are registered Trade Marks).

Process for Preparing Deodorant Detergent Products

- 5 The process for preparing deodorant detergent products thereby employing a deodorant composition as a means for inhibiting body malodour development comprises mixing non-soap detergent-active compounds, detergent adjuncts, if
- 10 present, and a deodorant composition to provide a deodorant detergent product, the deodorant composition having a deodorant value of at least 0.50. The selection of non-soap detergent active compounds and detergent adjuncts and their respective
- 15 amounts employed in the process of the invention will depend upon the nature of the required detergent product (e.g. solid or liquid) and the purpose for which it is required (e.g. for personal use or for fabric washing).
- 20 Usually it is convenient to add the deodorant

composition to the detergent product at a stage towards the end of its manufacture so that loss of any volatile ingredients such as may occur during a heating step is minimised.

- 25 It is furthermore usual to incorporate the deodorant composition in such a manner that it is thoroughly mixed with the other ingredients and is uniformly distributed throughout the detergent product. It is however also possible, particularly with
- 30 solid product such as marbled personal washing or laundry bars and speckled or spotted solid or liquid products, where the deodorant composition can be encapsulated to delay its subsequent release, to provide detergent products where the deodorant
- 35 composition is not uniformly and homogeneously mixed with the other ingredients of the detergent product, and is concentrated in the marbled bands of the speckled or spotted parts of such products.
- Method of Using the Deodorant Detergent Product*
- 40 The deodorant detergent product of the invention

is to be employed particularly for suppressing human body malodour, either by applying it directly to the skin in a personal washing mode or by laundering garments which are subsequently to be worn in contact with the skin. The deodorant detergent product is particularly effective when applied by either of these two modes to the regions of the human skin where apocrine sweat glands are most abundant, notably in the groin, axilla, anal and genital regions and in the aureola of the nipple.

In use, the deodorant detergent personal washing product can, for example, be employed according to the procedure described herein as the Deodorant Value Test. When the product is a liquid or gel intended for personal use, for example a shower gel, the product can first be lathered on a damp cloth and then applied to the skin and finally rinsed in a washing mode.

In use the deodorant detergent fabric washing product can, for example, be applied to a garment according to conventional laundering procedures involving water washing, rinsing and drying. It is apparent that sufficient of the deodorant composition is delivered to and remains on the fabric of laundered garments to subsequently enable the wearer to benefit from its deodorising effect by reduction of body malodour.

Specific Examples of the Invention

The invention is illustrated by the following Examples of detergent products.

It should be noted that each of these products was evaluated in a manner similar to that described for the Deodorant Value Test referred to hereinbefore. However, in view of the fact that testing the products involved the assessment of body malodour after wearing a shirt had been washed with such a product, or following washing the axillae with a product other than a soap bar (instead of by washing the axillae with a standard soap bar containing the deodorant composition previously described as the Deodorant Value Test) the effectiveness of each product was expressed in terms of "odour reduction value".

It should be recognised that if an odour reduction value of less than 0.50 is recorded following use of products of the invention, it is indicative that insufficient deodorant composition has been transferred to the skin of the axilla, rather than evidence that the product itself contains insufficient of a deodorant composition as herein defined.

Example 1

In this Example, the deodorant effectiveness of a non-soap detergent (NSD) fabric washing powder according to the invention was evaluated in terms of its odour reduction value in the following manner:

Polyester cotton coat style button through shirts were first prewashed in an automatic washing machine using a nonionic detergent fabric washing powder. This was to ensure that the shirts to be used in the test were all equally clean and free from dressing prior to washing in the deodorant fabric washing product.

The washed shirts were line dried and then washed again in the automatic washing machine. The test deodorant NSD fabric washing product was

then added to the wash liquor at a concentration of 0.4% by weight of the liquor. The ratio of shirt fabric (dry weight basis) to wash liquor was 40g fabric per litre wash liquor.

The shirts were agitated in the wash liquor for 10 minutes at a temperature of 50°C, then rinsed and spun to a moisture content of about 50% water and finally line dried to a moisture content of not greater than 10%.

A further batch of prewashed shirts which were to serve as control shirts were washed again and then dried under similar conditions except that deodorant composition was omitted from the fabric washing product added to the wash liquor.

The shirts were folded and stored overnight in polyethylene bags until required for testing by a panel of male subjects and assessing for odour by a panel of female assessors.

The above procedure was repeated on four consecutive days without prewashing, half of the subjects wearing shirts treated with the deodorant composition containing detergent product and half wearing control shirts without deodorant composition treatment.

Body odour transferred to the shirts in the region of the axillae was assessed by the trained female assessors in the manner described in the Deodorant Value Test, the odour of the shirt fabric being scored in each case rather than the axillae of the panel subjects and the results expressed as odour reduction value.

The formulation of the fabric washing product was that described hereinbefore as Fabric Washing Powder C.

Test fabric washing product was prepared by the addition of 0.2 parts of a deodorant composition to 99.8 parts of the above formulation.

The formulation of Deodorant Composition 1 was as follows:

<i>Deodorant Composition 1</i>	<i>Parts</i>
Amber AB 358	3.0
iso-Amyl salicylate	5.0
Benzyl salicylate	4.0
Bergamot AB 430	15.0
o - t - Butylcyclohexyl acetate	0.5
Cedar atlas oil	5.0
Citronellol	7.0
Citronella oil	16.1
Citronellyloxyacetaldehyde	0.5
Geranium base 76	4.0
1, 3, 4, 6, 7, 8-Hexahydro-4, 6, 6, 7, 8, 8-hexamethyl cyclopenta- α -2-benzopyran	10.0
Hexyl aldol	0.7
Jasmin AB 284	12.0
LRG 201	5.0
Nonanolide-1:4	0.2
Opoponax resinoid	1.7
Orange oil sweet	8.0
10-Undecen-1-al	0.30
Vetyvert oil	2.0
	100.00

Results of Odour Reduction Value Test 1 using NSD Powder

	<i>Control Powder</i>	<i>Test Powder</i>
Average scores	2.94	1.97
Odour reduction value	0.97	

Example 2

In this Example, the effect of a deodorant composition incorporated in a non-soap detergent (NSD) personal washing bar was evaluated by a procedure similar to that of the deodorant Value Test employing assessment of axillary odour by trained assessors as described herein. The results were, however, expressed in terms of Odour Reduction Value.

Personal washing bars for use as control bars and

also as a basis for incorporation of the deodorant composition had the formulation of Detergent Personal Washing Bar A as hereinbefore described.

Test personal washing bars were prepared by the addition of 1.5 parts of deodorant composition to 98.5 parts of the above formulation.

The formulation of Deodorant Composition 2 was as follows:

<i>Deodorant Composition 2</i>	<i>Parts</i>
6-Acetyl-1, 1, 3, 4, 4, 6-hexamethyl-tetrahydro naphthalate	3.00
Bergamot base 37	20.00
Carvacrol	3.50
Citronellyl acetate	5.00
Dipropylene glycol	4.75
Geranyl nitrile	1.50
Indole	1.00
Lemongrass oil	3.00
Lime AB 402	10.00
Lavandin oil	4.00
1-Menthol	8.00
3a-Methyl-dodecahydro-6, 6, 9a-trimethyl naphtho-2 (2, 1-b)-furan	0.25
β -Methyl naphthyl ketone	5.00
β -Naphthol methyl ether	9.00
Neroli base 78	6.00
Pomeransol AB 314	6.00
Petitgrain oil (terpeneless)	4.00
Orange oil sweet	5.00
Thyme oil red	1.00
	100.00

Results of Odour Reduction Value Test 2 using

	NSD Bar	
	Control bar	Test bar
Average scores	3.10	2.10
Odour reduction value	1.00	

Example 3

5 In this Example, the combined effect of a deodorant composition and the germicide, 2, 4, 4'-trichloro-2'-hydroxy-diphenylether, together incorporated in a non-soap detergent (NSD) personal washing bar prepared as described in Example 2 was evaluated in terms of the Odour Reduction Value by employing a procedure similar to that

10 described in the Deodorant Value Test. Test personal washing bars were prepared by the addition of 1.5 parts of Deodorant Composition 3 and 0.25 parts of 2, 4, 4'-trichloro-2'-hydroxydiphenylether to 97.75 parts of the detergent base formulation referred to in Example 2.

15 The formulation of Deodorant Composition 3 was as follows:

Deodorant Composition 3	Parts
p-t-Amylcyclohexanone	5.00
Benzoin Siam resinoid	5.00
Bergamot AB 430	15.00
Coumarin	4.00
Diethyl phthalate	4.35
Geranium oil	5.00
Hercolyn D	12.25
1,3,4,6,7,8-Hexahydro-4,6,6,7,8,8-hexamethyl cyclopenta- α -2-benzopyran	3.00
Lavandin oil	10.00
α -iso-Methyl ionone	12.00
Mousse de chene yugo	1.25
Musk ambrette	3.00
Pimento leaf oil	10.00
Rosenta AB 380	10.00
Rose-D-oxide	0.15
	100.00

Results of Odour Reduction Value Test 3

using NSD Bar

	Control bar	Test bar
Average scores	3.10	2.16
Odour reduction value	0.94	

Example 4

20 The procedure described in Example 1 was repeated using NSD Fabric Washing Powder B as hereinbefore described instead of Fabric Washing Powder C and using a different deodorant composition.

The formulation of Deodorant Composition 4 was as follows:

<i>Deodorant Composition 4</i>	<i>Parts</i>
Bergamot AB 430	8.00
p-t-Butylcyclohexyl acetate	4.30
Citronella oil	6.00
Diethyl phthalate	8.25
Ethyl vanillin	0.20
iso-Eugenol	5.00
Green Herbal AB 502	15.00
2-n-Heptylcyclopentanone	0.50
Indole	1.50
Inonyl formate	5.00
LRG 201	1.25
α -iso-Methyl ionone	5.00
β -Naphthol methylether	7.50
Nonanediol-1:3-diacetate	4.00
Patchouli oil	7.00
Phenylethyl phenyl acetate	5.00
Rosenta AB 380	6.00
Sandalone	4.00
Tetrahydro muguol	6.00
α -Undecalactone	0.50
	100.00

**Results of Odour Reduction Value Test 4
using NSD Powder**

	<i>Control powder</i>	<i>Test powder</i>
Average scores	2.69	1.62
Odour reduction value	1.07	

Example 5

In this Example, the effect of a deodorant composition incorporated in a non-soap detergent (NSD) shower gel was evaluated by a procedure similar to that of the Deodorant Value Test employing assessment of axillary odour by trained assessors as described herein. The test procedure was however modified in the following manner: instead of employing a standard soap bar, 4g of the shower gel were placed on a damp cloth, lathered by rubbing and then applied to the axilla for 15 seconds. The cloth was then thoroughly rinsed and used to wipe the axilla. To ensure that removal of excess shower gel was effective, a second clean wet cloth was used for a further rinse of the axilla. The axilla was then dried. The odour assessment scores obtained 5 hours later were expressed as odour reduction value.

The formulation of the shower gel was that described hereinbefore as Shower Gel B.

Test shower gel was prepared by addition of 1.5 parts of a deodorant composition to 98.5 parts of the above formulation.

The formulation of Deodorant Composition 5 was as follows:

<i>Deodorant Composition 5</i>		<i>Parts</i>
6-Acetyl-1, 1, 3:4, 4, 6-Hexamethyl tetrahydro naphthalate		2.5
p-t-Amylcyclohexanone		0.06
Benzyl salicylate		15.0
Bergamot AB 430		15.0
Cinnamic alcohol		5.0
Diethyl phthalate		8.04
Dimethyl benzyl carbinyl acetate		2.5
Dimyrcetol		16.0
Dipropylene glycol		14.25
Geraniol		5.0
Isobutyl phenyl acetate		5.0
3a - Methyl - dodecahydro - 6, 6, 9a - trimethyl - naphtho - 2 (2, 1-b) furan		0.75
Methyl salicylate		0.5
Mousse de chene Yugo		6.0
Nonanolide-1:4		0.2
Pelargene		4.0
Trichloromethyl phenyl carbinyl acetate		0.2

*Results of Odour Reduction Value Test 5 using
NSD Shower Gel*

	<i>Control gel</i>	<i>Test gel</i>
Average scores	2.97	1.62
Odour reduction value	1.35	

Example 6

The procedure described in Example 5 was repeated using NSD Shower Gel C as hereinbefore described instead of Shower Gel B and using a different deodorant composition.

The formulation of Deodorant Composition 6 was as follows:

	<i>Parts</i>
<i>Deodorant Composition 6</i>	
Benzyl propionate	4.0
Bergamot oil	15.0
o-t-Butylcyclohexyl acetate	2.0
p-t-Butyl- α -methyl hydrocinnamic aldehyde	15.0
Clove leaf oil	10.0
Diethyl phthalate	9.25
Dimethyl benzyl carbinyl acetate	5.0
Inonyl acetate	10.0
iso-Butyl benzoate	5.0
LRG-201	1.25
3a - Methyl - dodecahydro - 6, 6, 9a - trimethyl - naphtho - 2 (2, 1 - b) - furan	0.5
Neroli oil	3.0
Petitgrain oil	10.0
Phenyl ethyl alcohol	10.0

*Results of Odour Reduction Value Test 6 using
NSD Shower Gel*

	<i>Control gel</i>	<i>Test gel</i>
Average scores	3.33	1.88
Odour reduction value		1.45

Example 7

The procedure described in Example 1 was repeated

using NSD Fabric Washing Liquid C as hereinbefore described instead of Fabric Washing Powder C and using Deodorant Composition 3 as described in Example 3.

The results of Odour Reduction Value Test 7 (using NSD liquid plus Deodorant Composition 3) were as follows:

	<i>Control Liquid</i>	<i>Test liquid</i>
Average scores	2.64	2.14
Odour reduction value		0.50

Example 8

The procedure described in Example 1 was repeated using NSD Fabric Washing Powder D as hereinbefore described instead of Fabric Washing Powder C and using Deodorant Composition 2 as described in Example 2.

The results of Odour Reduction Value Test 8 (using NSD powder plus Deodorant Composition 2) were as follows:

	<i>Control Powder</i>	<i>Test powder</i>
Average scores	2.70	1.76
Odour reduction value		0.94

Example 9

The procedure described in Example 1 was repeated using NSD Fabric Washing Powder F as hereinbefore described instead of Fabric Washing Powder C and using Deodorant Composition 3 as described in Example 3.

The results of Odour Reduction Test 9 (using NSD powder plus Deodorant Composition 3) were as follows:

	Control powder	Test powder
Average scores	2.76	1.70
Odour reduction value		1.06

5 **Deodorant Value of Deodorant Compositions 1 to 6**

10 The deodorant value of each of the deodorant compositions illustrated in the foregoing Examples was determined by the Deodorant Value Test as described hereinbefore using the standard 80/20/5 soap base. The results were as follows:

Deodorant Composition	Average scores		Deodorant value
	Control bar	Test bar	
15 1	3.46	2.93	0.53
2	3.34	2.73	0.61
3	3.04	2.47	0.57
4	3.25	2.10	1.15
20 5	3.30	2.70	0.60
6	3.25	2.33	0.92

25 It can be seen from the above results that each of the Deodorant Compositions 1 to 6 had a deodorant value which was greater than 0.50, which defines the minimum deodorant value of a deodorant composition suitable for use in the deodorant detergent compositions of the invention.

APPENDIX

30 The following glossary provides further information, including the suppliers' names, which will aid identification of some of the aforementioned deodorant components and ingredients.

35 Dimyrcetol	:	Dimyrcetol (IFF)
Hercolyn D	:	Tetrahydro abietate + dihydro abietate (HP)
LRG 201	:	Oakmoss speciality (RB)
Pelargene	:	Pelargene (PPL)
40 Rose-D-Oxide	:	Rose oxide synthetic (PPL)
Sandalone	:	Sandalone (PPL)

Perfume Houses

45 HP	:	Hercules Powder Co.
IFF	:	International Flavour & Fragrances Inc.
RB	:	Roure Bertrand
PPL	:	Proprietary Perfumes Ltd

50

All materials which are classified by a name and number, such as those having the 'AB' notation, are obtainable from Proprietary Perfumes Limited.

CLAIMS

55 1. A deodorant detergent product comprising a non-soap detergent active compound and a deodorant composition having a deodorant value of from 0.50 to 3.5 as measured by the Deodorant Value Test, 60 the deodorant composition comprising substances that depress the partial vapour pressure of morpholine by at least 10% more than that required by Raoult's Law.

65 2. A product according to claim 1, in which the non-soap detergent active compound comprises

from 0.5 to 99.99% by weight of the product.

3. A product according to claims 1 and 2, in which the deodorant composition comprises from 0.01 to 10% by weight of the product.

70 4. A product according to claim 1, 2 or 3, further comprising a soap.

5. A product according to any preceding claim, further comprising a germicide or a zinc salt.

75 6. A product according to any preceding claim, in which the deodorant composition has a deodorant value of at least 0.70.

7. A product according to any one of claims 1 to 5, in which the deodorant composition has a value of at least 1.00.

80 8. A product according to any one of claims 1 to 5, in which the deodorant composition has a deodorant value of at least 1.20.

9. A product according to any preceding claim and substantially as described in any of the Examples.

85 10. A process for preparing a deodorant detergent product according to any preceding claim, which comprises mixing a non-soap detergent-active compound with a deodorant composition, as herein defined, having a deodorant value of from 0.50 to 3.5 as measured by the Deodorant Value Test to provide the deodorant detergent product.

90 11. A method for suppressing human body malodour which comprises applying to the skin the deodorant detergent product according to any of claims 1 to 9.

100 12. A method for suppressing human body malodour which comprises contacting the skin with a fabric treated with the deodorant detergent product according to any of claims 1 to 9.

Printed for Her Majesty's Stationery Office by The Tweeddale Press Ltd., Berwick-upon-Tweed, 1982.
Published at the Patent Office, 25 Southampton Buildings, London, WC2A 1AY, from which copies may be obtained.



	Control powder	Test powder
Average scores	2.76	1.70
Odour reduction value		1.06

5 Deodorant Value of Deodorant Compositions 1 to 6

The deodorant value of each of the deodorant compositions illustrated in the foregoing Examples was determined by the Deodorant Value Test as described hereinbefore using the standard 80/20/5 soap base. The results were as follows:

Deodorant Composition	Average scores	Deodorant value
	Control bar	Test bar
15 1	3.46	2.93
2	3.34	2.73
3	3.04	2.47
4	3.25	2.10
20 5	3.30	2.70
6	3.25	2.33

It can be seen from the above results that each of the Deodorant Compositions 1 to 6 had a deodorant value which was greater than 0.50, which defines the minimum deodorant value of a deodorant composition suitable for use in the deodorant detergent compositions of the invention.

APPENDIX

30 The following glossary provides further information, including the suppliers' names, which will aid identification of some of the aforementioned deodorant components and ingredients.

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Pelargene	:	Pelargene (PPL)
40 Rose-D-Oxide	:	Rose oxide synthetic (PPL)
Sandalone	:	Sandalone (PPL)

Perfume Houses

45 HP	:	Hercules Powder Co.
IFF	:	International Flavour & Fragrances Inc.
RB	:	Roure Bertrand
PPL	:	Proprietary Perfumes Ltd

50

All materials which are classified by a name and number, such as those having the 'AB' notation, are obtainable from Proprietary Perfumes Limited.

55 CLAIMS

1. A deodorant detergent product comprising a non-soap detergent active compound and a deodorant composition having a deodorant value of from 0.50 to 3.5 as measured by the Deodorant Value Test, the deodorant composition comprising substances that depress the partial vapour pressure of morpholine by at least 10% more than that required by Raoult's Law.

2. A product according to claim 1, in which the non-soap detergent active compound comprises

from 0.5 to 99.99% by weight of the product.

3. A product according to claims 1 and 2, in which the deodorant composition comprises from 0.01 to 10% by weight of the product.

70 4. A product according to claim 1, 2 or 3, further comprising a soap.

5. A product according to any preceding claim, further comprising a germicide or a zinc salt.

75 6. A product according to any preceding claim, in which the deodorant composition has a deodorant value of at least 0.70.

7. A product according to any one of claims 1 to 5, in which the deodorant composition has a value of at least 1.00.

80 8. A product according to any one of claims 1 to 5, in which the deodorant composition has a deodorant value of at least 1.20.

9. A product according to any preceding claim and substantially as described in any of the Examples.

10. A process for preparing a deodorant detergent product according to any preceding claim, which comprises mixing a non-soap detergent-active compound with a deodorant composition, as herein defined, having a deodorant value of from 0.50 to 3.5 as measured by the Deodorant Value Test to provide the deodorant detergent product.

11. A method for suppressing human body malodour which comprises applying to the skin the deodorant detergent product according to any of claims 1 to 9.

12. A method for suppressing human body malodour which comprises contacting the skin with a fabric treated with the deodorant detergent product according to any of claims 1 to 9.

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