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(54) Title: USE OF DISHWASHING LIQUIDS FOR MALODOR REDUCTION

(57) Abstract: The use of a dishwashing liquid with fragrance to reduce kitchen malodor is described. The kitchen malodor is associated with fish, onions, garlic and/or burning oil.



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USE OF DISHWASHING LIQUIDS FOR MALODOR REDUCTION

FIELD OF THE INVENTION

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This invention relates to the use of liquid dishwashing compositions to reduce kitchen malodor, and, especially to liquid dishwashing products which contain a fragrance.

BACKGROUND OF THE INVENTION

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Air freshening products which neutralize malodors or which overpower unpleasant odors with pleasing odors are popular commercial products. These type products are sold in diverse forms, such as, sprays, heated dispensers of fragrance oil, candles and solid blocks.

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Malodors have long been recognized as a problem in the household, particularly in the kitchen. Kitchen odors can be due to garbage pail odors, in-sink disposal odors, and decaying food in the refrigerator. However, most commonly the odors in a kitchen are odors that are due to cooking. These odors, which are inoffensive while cooking and eating are taking place, become offensive after the meal is over. These include such well known odors as garlic, onion, fish, and burnt cooking oil. For kitchen type malodors, including cooking malodors, a variety of approaches have been taken to eliminate and/or remove the malodor.

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Air fresheners of various types have been used. Specific dishwashing products which contain fragrances containing blooming ingredients which are able to develop intense odors to overpower residual malodors are also described in the literature. However, the presence of fragrances in most commercial dishwashing liquids are intended for two primary reasons: first, the odor of the dishwashing base itself can be unpleasant, hence the incorporation of a fragrance makes the product more aesthetically pleasing. Second, the presence of a fragrance emanating from the product itself or the product diluted with water makes the task of dishwashing more pleasant. Thus, the main recognized benefits of the fragrance in a dishwashing liquid were understood to apply directly to the aesthetics of the product itself; to the immediate dishwashing task; and to a lesser extent to the lingering of the fragrance in the kitchen environment after the dishwashing task is completed.

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SUMMARY OF THE INVENTION

This invention relates to the discovery that fragrances when delivered from a dishwashing liquid during the dishwashing process are capable of counteracting kitchen malodors such as, those due to garlic, onion, fish and burnt cooking oil to a measurable degree. The effectiveness of this malodor reduction varies depending on the specific fragrance and the particular type of detergent system used. The present invention therefore provides the use of a dishwashing liquid with fragrance to reduce kitchen type malodor.

DETAILED DESCRIPTION OF THE INVENTION

The use of a dishwashing liquid with fragrance provides an improved way to control malodor on kitchen surfaces, such as, sinks and counters, on dishwashing implements, such as sponges and towels, and in the surrounding air, especially malodor associated with cooking fish, onions, garlic, etc. or malodor associated with cooking odors such as burning cooking oil.

The fragrance ingredients that are useful in a dishwashing liquid to provide malodor reduction include all fragrance ingredients commonly used by perfumers to fragrance dishwashing, personal and home care products. Such fragrances are typically ingredients or mixtures of ingredients of current use in perfumery, and which the perfumer puts together in a harmonious manner so as to achieve the desired perfuming and hedonic effect.

The dishwashing liquids may be based on formulations known in the art or as more particularly described herein.

For example, the dishwashing liquid may comprise a mixture of ionic and nonionic surfactants, e.g., a dishwashing liquid comprising

- (i) At least two surfactants selected from the group consisting of
 - a. cationic surfactants such as quaternary ammonium surfactant, e.g., dialkyl dimethyl ammonium chloride;
 - b. nonionic surfactants such alkylpolyglucosides, or polyoxyethylenated alcohols such as those in the Neodol® surfactant line; ,
 - c. C₈-C₁₈ linear alkyl benzene sulfonate salt, e.g., sodium salt, magnesium salt or combinations thereof;

- d. sulfated alcohol ethoxylates, e.g., a C₈-C₁₈ ethoxylated alkyl ether sulfate e.g, the sodium salt, the ammonium salt or combinations thereof;
- e. amine oxide surfactant e.g., a C₁₂/C₁₄alkyl amido propyl dimethyl amine oxide

5 f. amphoteric surfactants, e.g. a trialkyl glycine surfactant, for example cocobetaine,

- (ii) Fragrance comprising the malodor reducing fragrance as described above; and
- (iii) Water.

10 In one embodiment, the invention provides a dishwashing liquid which comprises by weight:

(i) 5% to 45% of combined magnesium and sodium salts of a C₈-C₁₈ linear alkyl sulfonate surfactant, where the sodium salt can vary between 0% and 20%, and the magnesium salt can vary between 0% and 35%;

15 (ii) 1% to 10% of a C₁₂/C₁₄ alkyl amido propyl dimethyl amine oxide surfactant,;

(iii) 0.35% to 3 wt. %, more preferably 0.4% to 2.5%, especially 0.6 to 0.9% of a fragrance component comprising;

(iv) 5% to 35% of a C₈-C₁₈ ethoxylated alkyl ether sulfate; and

(v) water.

20 The dishwashing liquid may also employ normal and conventional adjuvants, provided they do not adversely affect the properties of the detergent. Thus, there may be used such ingredients as various coloring agents and perfumes; ultraviolet light absorbers such as the Uvinuls, which are products of GAF Corporation; salts such as sodium chloride or

25 magnesium sulfate heptahydrate; hydrotropes such as sodium cumene sulfonate or preferably sodium xylene sulfonate; chelators or sequestering agents, e.g., EDTA, HEDTA, or preferably pentasodium DTPA (Dissolvine), in an amount of from 0.25-1% ; pH modifiers, e.g. sodium hydroxide or sulfuric acid; etc. The proportion of such adjuvant materials, in total will

30 normally not exceed 15% by weight of the detergent composition, and the percentages of most of such individual components will be a maximum of 5% by weight and preferably less than 2% by weight. Antibacterial agents, for example triclosan, may also be included.

The total of components of the dishwashing liquid other than water and fragrance (sometime referred to as the Active Ingredient or AI fraction) in the dishwashing liquids of

the invention is generally from 20% to 40% by weight, e.g., 30 to 36%. For example, in one preferred embodiment, the AI fraction is 36% and the fragrance level is 0.9%. The dishwashing liquid may be conveniently provided in a plastic squeeze bottle with a small orifice in the cap to permit the liquid to be dispensed. The optimal diameter of the orifice may vary depending on the viscosity and other properties of the dishwashing liquid, but is typically 3-5mm.

The dishwashing liquids of the invention may be readily made by simple mixing methods from widely available components, in combination with the fragrances of the invention, which, on storage, do not adversely affect the entire composition. Solubilizing agents such as ethanol, and/or sodium cumene or sodium xylene sulfonate and mixtures thereof may be used at a concentration of 0.5 wt. % to 8 wt. % to assist in solubilizing the surfactants. The viscosity of the composition desirably will be at least 100 centipoises (cps) at room temperature, but may be up to 2,000 centipoises as measured with a Brookfield Viscometer using a number 21 spindle rotating at 20 rpm. The viscosity of the liquid composition may approximate those of commercially acceptable light duty liquid compositions now on the market. The viscosity of the light duty liquid composition and the light duty liquid composition itself remain stable on storage for lengthy periods of time, without color changes or settling out of any insoluble materials. The pH of the composition is substantially neutral to skin, e.g., 2.5 to 9 and preferably 4.5 to 8 and more preferably 5.0 to 7.0. The pH of the composition can be adjusted by the addition of NaOH (caustic soda) or sulfuric or hydrochloric acid to the composition.

EXAMPLES

The following examples are offered as illustrative of the invention and are not to be construed as limitations thereon. In the examples and elsewhere in the description of the invention, chemical symbols and terminology have their usual and customary meanings. Temperatures are in degrees C unless otherwise indicated. The amounts of the components are in weight percents based on the standard described; if no other standard is described then the total weight of the compositions is to be inferred.

Example 1

The malodor control evaluation tests were carried out pursuant to the following described protocol.

Test Area

5 Fragrance Evaluation Booths (each 4-ft. wide x 4-ft. deep x 8-ft. high)

Before use: "Acclimate Mode" before test for 30 min. (set temperature at 22°C and humidity at 22% winter, 70%, summer)

During use: "Static mode" (no airflow)

10 After use: "Purge Mode" after test for minimum of 30 min. (flush out odorous air and replace with clean air)

Equipment

- 10 qt. Plastic Dishpan
- 30 ml Plastic Beakers
- 15 • Tap Water (41°C)
- Cellulose pad (1.60 g weight; 2in. wide x 2in. long x 0.1in. thick)
- Round aluminum container with top (1.6in. in diameter x 1in. height)
- Overhead Stirrer (IKA Works, RW 20 DZM.n) with Digital Readout and 4 blade paddle
- Kitchen Malodor = Onion, Fish in Cooked Vegetable Oil

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Kitchen Malodor Formula			
	Parts	%	wt.
Onion	0.45	0.045	0.0225
Fish	5.00	0.500	0.25
Burned Vegetable Oil	994.550	99.455	49.728
TOTAL	1000.0	100.0	50.0

- Cook vegetable oil (200C).
- Allow vegetable oil to stand at room temperature until needed.
- Fish and onion should always be refrigerated.
- Malodor should be prepared the day needed to ensure freshness.

Preparation

1. Put cellulose pad in aluminum container. Place 7.00 g of kitchen malodor on pad.
2. Seal with top. Prepare five kitchen malodor samples as indicated above.

3. Open container and put on the counter in each booth for 5 minutes.
4. Fill four 30 ml plastic beakers with a 7.00 g sample of dish wash liquid containing 0.6% of test Perfume. Fill a fifth plastic beaker with 7.00 g of unfragranced dish wash liquid.
5. Add 3.5 L of warm water (41°C) to each dishpan.
- 5 6. Place one dishpan of warm water $\frac{3}{4}$ of the way in each booth on the counter.
7. Add a DWL sample to each dishpan (dilution: 0.2% dish wash liquid in tap water). Rinse each plastic beaker with warm water in dishpan to remove residual dish wash liquid.
8. Center each dishpan on counter.

Evaluation

- 10 Evaluation is done by trained experts. The average results of these evaluations are summarized in the Table hereafter, wherein the values indicated correspond to the following scale, and the malodor reduction percentage is calculated according to the equation
- $$(10 - \text{test score}) \times 100 = \% \text{ Malodor Reduction}''$$

15	<u>Score</u>	<u>Malodor</u>
	10	Overpowering
	9	Very Strong
	8	Strong
	7	Reasonably Strong
20	6	Moderate to Reasonably Strong
	5	Moderate
	4	Weak to Moderate
	3	Weak
	2	Very Weak
25	1	Barely Detectable
	0	None

Five commercial dishwashing liquids with fragrance were tested having the following compositions.

Formulas Tested:

Ingredient	Formula 1	Formula 2	Formula 3	Formula 4	Formula 5
AEOS (1.3 mole)	14.7	14.7	11.5	0	0
AEOS (2 EO)	0	0	0	6.1	6.1
Magnesium LAS	11.5	11.5	0	0	0
Na LAS	3.8	3.8	7.5	0	0
Paraffin sulfonate	0	0	0	24.4	24.4
Amine Oxide	6.9	6.9	1.0	0	0
APG	0	0	4.0	0	0
PEG-6 (polyethylene glycol)			0	1.0	1.0
SXS	3.9	3.9	0.6	0	0
Alcohol	5.6	5.6	3.4	0	0
Fragrance	0.4	0.5	0.25	0.37	0.40
Pentasodium pentetate (chelant)	0.12	0.12	0.08	0	0
Sodium iminodisuccinate (chelant)	0	0	0	0.08	0
Tetrasodium EDTA	0	0	0	0	0.06
Triclosan	0.12	0.0	0	0	0
Sodium bisulfite	0.11	0.11	0.04	0	0
Magnesium sulfate heptahydrate	0	0	0.5	0.4	0.4
Citric acid	0	0		0.03	0.03
Preservative	0.11	0.11	0.11	0.025	0.021
Water, color, salts, pH adjustment	Q.S.	Q.S.	Q.S.	Q.S.	Q.S.

In the table above:

-APG refers to alkyl polyglucoside.

5 -NaLAS and Mg LAS refer to the sodium and magnesium salts resp. of linear C₁₂₋₁₄ alkyl benzene sulfonates.

-NH₄AEOS-1.3EO refers to C₈-C₁₈ alcohol ethoxylate compounds with an average of 1.3 ethoxy groups

-Amine oxide refers to C₁₂₋₁₄ alkylamido propyl dimethyl amine oxide.

10 -SXS refers to sodium xylene sulfonate.

All of the formulas tested decreased the perception of malodor as shown below.

Formula	Malodor Reduction (%)
Formula 1	37.5
Formula 2	26.8
Formula 3	28.1
Formula 4	40.0
Formula 5	30.0

What we claim is :

1. Use of a dishwashing liquid with fragrance to reduce kitchen malodor.

5 2. The use according to claim 1 wherein the kitchen malodor is associated with a malodor selected from the group consisting of cooking fish, onions, garlic and burning cooking oil.

INTERNATIONAL SEARCH REPORT

PCT/US2005/004735

A. CLASSIFICATION OF SUBJECT MATTER
IPC 7 C11D3/50 A61L9/01

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

IPC 7 C11D A61L

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)

EPO-Internal, WPI Data, PAJ

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category °	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	WO 02/05772 A (THE PROCTER & GAMBLE COMPANY) 24 January 2002 (2002-01-24) page 21, line 1 - line 28; claims; examples	1,2
X	US 2004/248762 A1 (MCGEE THOMAS ET AL) 9 December 2004 (2004-12-09) paragraphs '0002!', '0005!', '0051!', '0055!; claims	1,2
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☒ Further documents are listed in the continuation of box C.

☒ Patent family members are listed in annex.

° Special categories of cited documents :

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C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
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