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(54) DEODORANT

(71) We, BEECHAM GROUP LIMITED, a British company of Beecham House, Great West Road, Brentford, Middlesex, do hereby declare the invention, for which we pray that a patent may be granted to us, and the method by which it is to be performed, to be particularly described in and by the following statement:—

This invention relates to personal deodorants comprising sodium or potassium bicarbonate and aqueous ethanol.

Most presently used deodorant compositions for personal hygiene contain an organic antimicrobial agent such as hexachlorophene, dichlorophenol, trichlorophenol, tetrachlorophenol, di(trichlorohydroxyphenyl) ether, a *p*-hydroxy-benzoic acid ester, *o*-phenylphenol, trichlorocarbaniide, a quaternary ammonium compound or 2,4,4'-trichloro-2'-hydroxydiphenyl ether. Such products are believed to function as deodorants because they prevent the growth of or destroy bacteria present on the human skin which break down apocrine perspiration into unpleasant smelling byproducts. However, there is a strong body of opinion which holds that it is undesirable to apply such strong organic antimicrobial agents routinely over a long period of time because of the danger of encouraging the growth of resistant strains of bacteria and generally altering undesirably the balance of microbial life on the skin.

One substance which has been used in deodorant compositions in the past in place of such organic antimicrobial agents is the simple inorganic substance sodium bicarbonate. Deodorant compositions based on sodium bicarbonate are sold, in the United States at least, in roll-on and aerosol packs. The roll-on formulation is an aqueous solution of sodium bicarbonate whereas the aerosol is a suspension of powdered sodium bicarbonate in propellant and emollient. Both products

contain minor amounts of conventional toiletries additives such as perfume.

The present invention is based on the discovery that the addition of ethanol improves the deodorant action of compositions containing sodium or potassium bicarbonate. According to the present invention, there is provided a personal deodorant comprising a solution of sodium or potassium bicarbonate in ethanol and water contained within a dispenser adapted to apply the composition to the skin.

The dispenser may be a can or bottle, equipped with an atomising nozzle, within which the composition in liquid form is either pressurised or capable of pressurisation; a roll-ball applicator for dispensing the composition as a thickened liquid or gel; a holder for a self-supporting stick composition; cellulose wadding or some other absorbent material such as paper tissues into which the liquid composition may be impregnated — or a squeezable pack for dispensing a liquid, cream or gel composition.

The upper limit to the proportion of sodium or potassium bicarbonate which may be present will be set by the limits of solubility in aqueous ethanol and/or operability of the dispenser and/or the desired feel of the composition on the skin before and after it has dried out. Thus excessive quantities of sodium or potassium bicarbonate may be difficult to dissolve and disperse from some types of dispenser and moreover, might feel unpleasantly gritty or powdery when dried on the skin.

Subject to the foregoing general limitation, the sodium or potassium bicarbonate may be present in amounts up to about 40% by weight of the total composition (excluding the dispenser of course). More usually, the proportion of sodium or potassium bicarbonate will not exceed about 20% by weight of the composition, and a figure below 10% by weight of the

composition would be most convenient.

Naturally, as the proportion of sodium or potassium bicarbonate is reduced to very low levels, so too is the deodorising action of the composition. Deodorising action is observed when 1% of the composition is sodium or potassium bicarbonate and about 40% by weight of the composition is ethanol. Usually the proportion of sodium or potassium bicarbonate present will be greater than 0.1% by weight.

The ethanol which is present in the deodorant of this invention may be toiletries grade ethanol, which may contain a few percent impurities. Government regulations may control the maximum permitted proportion of ethanol which may be present, but otherwise the upper limit to the proportion present will be set by the limits of operability of the dispenser and/or the desired drying characteristics of the composition on the skin. Since a true

solution of the sodium or potassium bicarbonate is desired, rather than a powder suspension, the water present in the composition will reduce the practical upper limit of ethanol content.

Subject to the foregoing general comments, the ethanol content of the deodorant of this invention will usually not exceed about 60% by weight and more commonly will not exceed about 45% by weight. The lower limit will generally be about 15% ethanol, more commonly about 25%.

The deodorants of the present invention may also contain such conventional toiletries additives as perfumes, thickening agents and the like, depending on the type of dispenser to be used and the desired aesthetic effect.

The following Examples illustrate the present invention:—

Example 1

Spray Deodorant

	Formula (a) wt. %	Formula (b) wt. %
Sodium bicarbonate	1.0	1.0
* Procetyl AWS	3.0	3.0
Perfume	q.s.	q.s.
Industrial methylated spirits	15.0	45.0
De-ionised water	to 100	to 100
Fill	80% above concentrate 20% Butane	
* Procetyl AWS - (Croda Chemicals Ltd.) - propoxylated cetyl alcohol - a perfume solubiliser and emollient		

Example 2

Roll-on-Deodorant

	Formula (a) wt. %	Formula (b) wt. %
** Natrosol 250J	4.0	4.0
Procetyl AWS	3.0	3.0
Sodium bicarbonate	1.0	1.0
Perfume	q.s.	q.s.
Industrial methylated spirits	15.0	45.0
De-ionised water	to 100	to 100
** Natrosol 250J — Hercules Powder Company - hydroxyethyl cellulose.		

To illustrate the improvement in deodorising activity obtained with the

compositions of this invention relative to compositions containing water and

sodium bicarbonate or water and ethanol two trials were conducted:—

The results of the two deodorant trials which compared 1% sodium bicarbonate dissolved in 40% aqueous alcohol with both 40% aqueous alcohol (Trial I) and 1% aqueous sodium bicarbonate (Trial II) are shown in Table 1.

Both trials were carried out in a double

blind fashion, with treatments randomised between right and left axillae. Trial I employed 5 male subjects and Trial II 7 male subjects. In each case there were 4 assessors for odour who scored on a 0–5½ scale both before application (initial) and periods after, up to 24 hours. The agents were applied twice in spray form to the axillae.

TABLE 1 — Mean Odour levels in axillae before and up to 24 hours following application.

TRIAL I	Mean Odour Levels					
	Initial	+ 1	2	4	7	24 hrs.
40% Alcohol	2.75	3.00	2.54	2.96	3.96	2.96
1% Sodium bicarbonate in 40% Alcohol	2.62	1.04	1.17	2.00	1.63	2.17
TRIAL II						
	Initial	1	3	5	24 hrs.	
1% Sodium bicarbonate in water	2.34	2.00	1.98	1.73	2.05	
1% sodium bicarbonate in 40% Alcohol	2.13	1.32	1.39	1.86	1.75	

It can be seen that in both cases odour was reduced in both trials following treatment with 1% sodium bicarbonate dissolved in 40% alcohol. The aqueous 1% sodium bicarbonate also appeared to reduce odour in trial 2 but was generally less effective than the alcoholic bicarbonate. In the case of the 40% alcohol treatment (Trial I) odour was not reduced and tended to increase throughout the day.

WHAT WE CLAIM IS:—

1. A personal deodorant comprising a solution of sodium or potassium bicarbonate in ethanol and water contained within a dispenser which is adapted to apply the composition to the skin.
2. A personal deodorant as claimed in claim 1 wherein sodium bicarbonate is present.
3. A personal deodorant as claimed in claim 1 or claim 2 wherein the sodium or potassium bicarbonate is present in an amount of from 0.1% to 20% by weight based on the total weight of sodium or potassium bicarbonate, ethanol and water.

4. A personal deodorant as claimed in claim 3 wherein the sodium or potassium bicarbonate is present in an amount of from 0.1% to 10% by weight based on said total weight.

5. A personal deodorant as claimed in any one of the preceding claims wherein the ethanol content is from 15% to 60% by weight based on the total weight of sodium or potassium bicarbonate, ethanol and water.

6. A personal deodorant as claimed in claim 5 wherein the ethanol content is from 25% to 45% by weight based on said total weight.

7. A personal deodorant as claimed in claim 1, substantially as hereinbefore described in Example 1 or Example 2.

8. A method of deodorising the human body comprising the application of a composition comprising a solution of sodium or potassium bicarbonate in water and ethanol.

A.J. Walls
Agent for the Applicants

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3. A personal deodorant as claimed in claim 1 or claim 2 wherein the sodium or potassium bicarbonate is present in an amount of from 0.1% to 20% by weight based on the total weight of sodium or potassium bicarbonate, ethanol and water.

4. A personal deodorant as claimed in claim 3 wherein the sodium or potassium bicarbonate is present in an amount of from 0.1% to 10% by weight based on said total weight.

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