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DEODORANT

John W. Orelup, Summit, and Ernst Ohlsson, Short Hills, N. J.

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5 Claims. (Cl. 167—90)

This invention relates to anti-oxidants or preservatives and more particularly to novel applications and uses of such agents as deodorants.

It also relates to new compounds which are members of the general class of alkyl substituted dihydroxy benzenes, particularly alkyl substituted hydroquinones.

It is known that fatty or vegetable oils, if allowed to stand without preserving agents, will become rancid and useless in a relatively short time. It is also known that this result is caused by oxidation which these compounds undergo.

A comparable condition occurs in the glandular excretions from the human body in the form of perspiration which contain fatty compounds; on reaching the surface of the body, these compounds and protein substances become rancid and develop characteristic unpleasant odors, resulting not only from oxidation of the fats and oils, but also from decomposition of the various proteins.

Various compositions have been proposed and are in use which may be applied to combat this condition on the surface of the body. These compositions comprise largely mineral salts as aluminum chloride in substantial concentrations, which, while more or less effective in reducing odors, do so by inhibiting perspiration and thus creating an unhealthy condition. In addition such mineral compounds may have a highly poisonous effect upon the skin of the body.

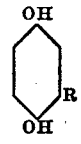
It is an object of this invention to apply anti-oxidants as deodorants for use on the surface of the human body to prevent rancidity and consequent odor of perspiration.

It is also an object of this invention to apply the class of compounds comprising the alkyl substituted dihydroxy benzenes, particularly the alkyl substituted hydroquinones as anti-oxidants and preservatives for fatty and vegetable oils including the use of such compounds as deodorants.

While many compounds of the class of alkyl substituted derivatives of dihydroxy benzenes having the general formula

$$C_6H_3(OH)_2R$$

where R is an alkyl radical, are effective as anti-oxidants and preservatives, we prefer the alkyl substituted derivatives of hydroquinone having the general formula



where R is an alkyl radical, because we have found them particularly effective, as for example tertiary butyl hydroquinone.

These compounds have been found to be effective in extremely minute quantities of the order of one part of alkyl dihydroxy benzene in 1000 parts of vegetable oil.

As an example of the effectiveness of these agents, the following experimental data have been obtained: A mixture consisting of one part of tertiary butyl hydroquinone dissolved in 1000 parts of cottonseed oil (previously deodorized with charcoal) was left in an open container for over six months without becoming rancid, whereas an untreated sample (deodorized only with charcoal) had a decided odor within three weeks.

Other experiments showed that a solution of tertiary butyl hydroquinone and neutral linseed oil in the proportion of one part to 1000 could be kept in an open dish for more than five months without drying out or becoming rancid, whereas the untreated sample of oil became solid and developed a strong paint odor inside of two weeks.

This use of the alkyl substituted hydroquinones has been found generally applicable to fatty or vegetable oils. It has particular application in such preparations as cold creams, lotions, soaps, deodorants, and the like.

When used as a body deodorant, we have found that a solution of from one to five parts of alkyl substituted hydroquinone in one thousand parts of ethyl alcohol with the addition of a suitable crystallization inhibitor such as .1% of phosphoric acid or aluminum chloride applied directly to the skin, is an effective, safe and non-poisonous agent, inhibiting the decomposition of the fats, oils and proteins in perspiration and preventing objectionable odor. Since these compounds are insoluble in water, one application will often retain its effectiveness for several days.

The fact of solubility in oil and insolubility in water gives these compounds a general usefulness in preserving emulsions made from fatty oils and water, using any of the usual emulsifiers such as borax or triethanolamine stearate.

The alkyl hydroquinones may be synthesized by various known methods. While we have found that the compounds containing normal alkyl chains are more difficult to obtain, compounds such as iso propyl, iso, secondary, and tertiary butyl, secondary and tertiary amyl, methyl iso butyl carbinol hydroquinones and others can be made by direct condensation of the respective alcohols to hydroquinones by dilute sulphuric or phosphoric acids, with or without the use of a catalyst, giving practically quantitative yields of alkyl hydroquinones. This condensation can also be carried out by condensing hydroquinone to the chlorides of aliphatic alcohols, using metallic chlorides such as zinc or iron chloride as catalysts. These products are insoluble in water, in dilute solutions of alkalies, but soluble in varying quantities of most of the organic solvents such as alcohol, benzol, ether, oils, and fats.

As an example, molecular amounts of hydroquinone and tertiary butyl alcohol can be condensed together, eliminating one molecule of water, by treatment for several hours with about eight times the quantity of seventy per cent sulphuric acid in water at a temperature of about 60° C. A white fluffy powder is formed which can readily be purified by sublimation.

While we have described in detail certain preferred forms of our invention, it is to be understood that changes may be made therein and the invention applied to other substances. We do not, therefore, desire to limit ourselves to the specific examples disclosed but intend to cover our invention broadly in whatever form its principle may be utilized.

We claim:

1. A composition of matter for use in deodorizing the human body comprising a small amount of an alkyl substituted hydroquinone in alcohol.

2. A composition of matter for use in deodorizing the human body comprising a small amount of tertiary butyl hydroquinone in alcohol.

3. A composition of matter for use in deodorizing the human body comprising .1% to .5% of tertiary butyl hydroquinone in alcohol.

4. A composition of matter for use in deodorizing the human body without inhibition of normal perspiration containing as its active ingredient a substantially water insoluble alkyl substituted hydroquinone in a quantity sufficient to have substantial anti-oxidant effect, but insufficient to render the composition toxic, in a neutral non-toxic carrier having no deleterious action on the skin, said composition being adapted to be applied directly to the body to deodorize the same.

5. A composition of matter as claimed in claim 4 in which the active ingredient is tertiary butyl hydroquinone.

JOHN W. ORELUP.
ERNST OHLSSON.