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JAMES JEFFRIES GOODWIN, OF LOUISVILLE, KENTUCKY, ASSIGNOR TO GOODWIN LABORATORIES, INC., OF LOUISVILLE, KENTUCKY, A CORPORATION OF KENTUCKY.

GERMICIDAL COMPOUND.

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This invention relates to compounds for making germicidal solutions having general application to medical, surgical, sanitary and household uses, and particularly to a compound of the class described having special application to the preparation of antiseptic washing solution for the glassware used at public soda fountains and for other similar uses.

The invention has for its principal objects the provision of a germicidal compound in which the germicidal properties of certain of the ingredients are accentuated, each by the presence of the other, and by the reaction incident to their going into solution; to provide a germicidal compound of ingredients, inherently germicidal, in which the germicidal strength is increased by the liberation of hydroxyl ions in the aqueous solution of the compound; to provide a germicidal solution of great potency which, on account of its ease of preparation, quickness of action, and non-poisonous nature, is admirably suited to medicinal, surgical, pharmaceutical, sanitary, and domestic uses; and in the provision of a compound of germicidal character, when in aqueous solution, having the power to quickly dissolve the fatty envelopes possessed by many bacteria, thus rendering them quickly susceptible to the action of the germicide.

Another object of the invention is to furnish the compound with a color index in the form of an ingredient that will lend a fugitive color to the solution while incomplete, the color disappearing when the solution becomes complete and ready for use, thus serving as an indication of the preparedness of the solution, said color being capable of being restored for testing purposes by the use of a suitable reagent, by means of which not only the strength but also the genuineness of the solution may be ascertained.

Other objects of the invention will appear as the following description of a preferred formula therefor proceeds.

The invention is carried out by preparing a mixture of a soap of both saturated and unsaturated fatty acids common to cocoanut oil and palm nut oil, preferably in their saturated condition, with a sodium salt capable of hydrolyzing in water, tri-sodium phosphate and sodium per borate being tried examples of this class of salts.

Both the saturated and unsaturated fatty acids of the above oils have inherent germicidal properties of high value not possessed by the glycerides of the fatty acids used in making ordinary cleansing soaps. When a soap thus prepared, consisting of the alkaline salts of the acids peculiar to cocoanut and palm nut oil, is mixed with an alkali salt capable of hydrolyzing in aqueous solution with the liberaton of free hydroxyl ions and buffer salts, these hydroxyl ions, being in a nascent state, greatly increase the inherent germicidal properties of the solution proper; thus an antiseptic solution of great potency is produced, which on account of its ease of preparation, quickness of action, and non-poisonous nature is admirably suited to the sterilization of drinking vessels and utensils in use at public fountains.

The use of the salts of the fatty acids resulting from saponification of the oils of cocoanut or palm nut plus tri-sodium phosphate (or other hydrolyzable salt) is particularly advantageous in that the alkali ions produced by the hydrolyzation attack and dissolve the fatty envelopes of certain bacteria thus allowing more positive germicidal action of the germicidal agent, namely, the acids which are present in the form of soap or sodium salts.

It has been found particularly advantageous to employ a color index for the solution, both for indicating its strength and the completion of the solution, as well as subsequently to permit of testing the solution for strength and genuineness. For this purpose, there is preferably added a minute quantity of some harmless coloring agent such as acid fuchsin which reacts red to a slightly acidulated solution, but becomes colorless in an alkaline solution. In the commercial preparation of the germicidal compound, this acid fuchsin is added as an ingredient. In subsequent testing of a solution, a preparation of acid is added, which shows the genuineness of the solution by bringing back the original color, the strength of the solution being indicated by the intensity of the color, which may be compared with a standard color chart.

The following example illustrates what has been found to be a preferred embodiment of the invention:—

A mixture of—

40% cocoanut oil soap (containing salts of capric, caprillic, caprioic, lauric, and myristic acids), and

60% of tri-sodium phosphate (Na_3PO_4), to which is added a trace of acid fuchsin.

When this mixture is put into aqueous solution, preferably at about 75° C., the reaction is at first acid and the solution has a red tinge imparted by the fuchsin. In a minute or two the solution becomes clear, due to its progressive alkalization by the liberated hydroxyl ions. In the course of the hydrolysis of the tri-sodium phosphate, some of the sodium combines with the fuchsin, while the tri-sodium phosphate is reduced to the acid di-sodium phosphate (Na_2HPO_4), which acts as a buffer, to prevent excess alkalinity of the solution.

Should extension of the solution from time to time be desired, in order to ascertain if the genuine solution is being used or one of the prescribed strength, a measured quantity of acid is mixed with a sample of the solution which is to be tested, the color of the fuchsin being thus restored and the strength of the solution being determined by the intensity of the color.

It is to be understood that other glycerides of fatty acids than those herein enumerated may be found suitable for the purpose of making a germicidal compound according to the present invention, and that other salts, aside from the tri-sodium phosphate and sodium borate, but which have a similar hydrolyzing action in water, may be substituted in place of the salts above mentioned in the making of the compound. Therefore, the invention is not to be construed as limited to the precise ingredients given or the precise properties indicated as being used, except where specifically limited by the express terms of the appended claims.

I claim:—

1. A germicidal compound for preparing germicidal aqueous solution, comprising a mixture of soap including salts of the fatty acids common to cocoanut oil and palm nut oil, and tri-sodium phosphate.

2. A germicidal compound for preparing germicidal aqueous solution, comprising a mixture of a soap including salts of the fatty acids common to cocoanut oil and palm nut oil, and tri-sodium phosphate, and a trace of a substance serving by its change of color when in solution to indicate acid and alkaline states of the solution of said compound.

3. A germicidal compound for preparing germicidal aqueous solution, comprising a mixture of cocoanut oil soap, and tri-sodium phosphate.

4. A germicidal compound for preparing germicidal aqueous solution, comprising a mixture of 40% of cocoanut oil soap and 60% of tri-sodium phosphate.

5. A germicidal compound for preparing germicidal aqueous solution comprising a mixture of 40% of cocoanut oil soap, 60% of tri-sodium phosphate, and a trace of a substance serving by its change of color when in solution to indicate acid and alkaline states of the solution of said compound.

6. A germicidal compound for preparing germicidal aqueous solution, comprising a mixture of 40% cocoanut oil soap, 60% tri-sodium phosphate, and a trace of acid fuchsin.

In testimony whereof I have hereunto set my hand.

JAMES JEFFRIES GOODWIN.