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SOLUTIONS OF ORGANIC CHLORINE COMPOUNDS

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5 Claims. (Cl. 167-17)

This invention relates to solutions and articles embodying solutions of organic compounds containing available chlorine of the N-chloro type, such as NN'-dichloro-azodicarbonamidine, N-chloro-succinimid, chloraminé-T and di-chloramine-T. The chief use of such compounds is as disinfectants.

Great difficulty has been experienced in finding solvents for such compounds which will give solutions which will remain stable for any considerable length of time. Decomposition of the N-chloro compounds not only reduces the disinfecting power of their solutions, but also brings about the production of hydrochloric acid and/or other substances having an irritating or other objectionable action on skin or tissue.

Another difficulty in the application of N-chloro compounds to wounds and the like is that aqueous solutions are not only unstable and very dilute on account of the low solubility of such compounds in water, but are also disadvantageous, as they rapidly dry out.

Hence, while the principal object of the present invention is to provide a stable solution of an N-chloro compound, a secondary object is to provide a stable solution in a relatively non-volatile solvent, and antiseptic dressings prepared therewith.

After testing a large number of organic solvents we have found that a limited group of compounds gives solutions which remain stable for a reasonable length of time and at the same time are not objectionable on the ground of toxicity, odor, etc. This group comprises the esters produced by completely esterifying glycerol, glycol, ethyl, propyl, or to a lesser extent butyl alcohol, with acetic or propionic acid. The stability decreases markedly if, instead of ethyl or propyl alcohol, the lower alcohol, methyl, or higher alcohols, such as amyl, are used. Butyl alcohol is not as satisfactory as propyl. The same is true on the acid side, formates and butyrates being much more unstable than the acetates and propionates. The butyl radical appears to be less satisfactory on the acid side than on the alcohol side, so butyrates have been omitted from the above group. Solutions made with the esters of unsaturated alcohols and/or acids are likewise less stable than those made with the esters of saturated alcohols and acids.

Of the above group of esters the ethyl compounds are somewhat more stable than the propyl ones, and similarly the acetates are more stable than the propionates. The preferred sol-

vents are, therefore, glycerol triacetate, glycol diacetate and ethyl acetate. Of these three the most satisfactory on the whole is glycerol triacetate, or triacetin.

While solutions of N-chloro disinfectants in triacetin or the like are referred to as stable, they are stable only in the substantial absence of light.

NN'-dichloro-azodicarbonamidine is not highly soluble in any of the named group of solvents. It is, however, sufficiently soluble to make 0.2% solutions, which is the concentration in which it is used most.

One of the chief intended uses of the solutions is the preparation of antiseptic dressings for wounds. For such purpose it is desirable that the solvent be relatively non-volatile, that is, have a boiling point not below 150° C. Triacetin having a boiling point of 258° C. is highly satisfactory. Ethyl acetate having a boiling point of 77° C. is not suitable. Glycol diacetate with a boiling point of 186° C. is suitable although not as good as triacetin.

The solutions forming the subject matter of the present invention are also well adapted for making aqueous solutions of N-chloro compounds for sterilizing utensils and for addition to liquids to be sterilized other than those intended for food. The present solutions are more stable than aqueous solutions, which latter have to be prepared shortly before use. It is easier to make aqueous solutions of N-chloro compounds by adding the present solutions to water than by adding the dry compounds, since almost all N-chloro compounds not only have a slight solubility in water but in addition are not readily wet thereby.

What is claimed is:

1. A solution of an organic N-chloro compound containing available chlorine in an ester formed by completely esterifying an alcohol of the group consisting of glycerol, glycol, ethyl alcohol, propyl alcohol and butyl alcohol with an acid of the group consisting of acetic and propionic acids.
2. A solution of NN'-dichloro-azodicarbonamidine in glycerol triacetate.
3. A solution of an organic N-chloro compound containing available chlorine in glycerol triacetate.
4. A solution of an organic N-chloro compound containing available chlorine in glycol diacetate.
5. A solution of an organic N-chloro compound containing available chlorine in ethyl acetate.

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