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ANTISEPTIC COMPOSITION

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This invention relates to a composition of matter.

Iodin is well recognized as one of the most efficacious of antiseptic media. However, its use is accompanied usually by some undesirable manifestations, as, for instance, discoloration of large areas where only possibly minute portions of an area may require the action of the bacteria-destroying iodine. In such cases, also, reactions such as uncomfortable heating and even burning of the skin may accompany such an application.

It is an object of the invention to provide a medium for use in effecting the antiseptic action of iodine while eliminating such undesirable factors as discoloration of markedly appreciable areas, heating, blistering or burning of the skin, and especially of areas not actually requiring the antiseptic action of the iodine, and so to limit the action of the medium that it is effective and active only upon those specific areas which are infected, and remains dormant wherever an infecting agent is not active.

It is an object of the invention to provide a medium for effecting antiseptic action wherein such medium will, only when utilized and brought into chemical relation to a bacteria-infected region of the skin or body, and not until then, release iodine substantially in the nascent state, whereupon antiseptic action may occur instantaneously, for all practical purposes.

It is an object of the invention to provide a medium, for effecting antiseptic action of the type hereinbefore set forth, which normally is colorless, and will not stain ordinary fabrics.

It is an object of the invention to provide a medium for effecting antiseptic action wherein the medium normally remains dormant until it is in contact with or is acted upon or affected by the pH, or hydrogen ion concentration, of bacteria, whereupon a controlled reaction of such medium will occur, with instantaneous liberation of iodine in amounts determined by the amounts of bacteria present, and, therefore, the resultant pH or hydrogen ion concentration, with consequent destruction of the bacteria and disappearance of the hydrogen ion concentration set up by such bacteria.

It is an object of the invention to provide a medium for effecting antiseptic action by presenting iodine substantially instantaneously upon being brought into contact with bacteria infecting an area of the body, where the medium normally is colorless and non-reactive, and capable of continuing in that condition, and will produce

no injurious effect upon the skin, the membranes of the body at which bacteria is not present and to which the medium is not present.

It is an object of the invention to provide a medium for effecting antiseptic action of the character indicated, wherein the medium is applicable for treatment, as, for instance, for instillation, of bandages, tooth brushes, appliances or devices, used in the operation of prevention or treatment of disease, such as bandages, appliances or devices, to insure that such bandages or devices thereafter shall continue sterile substantially under all conditions.

It is an object of the invention to provide a medium for effecting antiseptic action of the character indicated, wherein the medium is applicable for treatment, as, for instance, for instillation, of bandages, tooth brushes, appliances or devices, to insure that such bandages, appliances or devices thereafter continue sterile substantially under all conditions, but wherein the sterility-controlling medium is bonded to bandage, device or appliance, and not removed from its combination with the bandage, device or appliance as hot water or the like.

Other objects of this invention will hereinafter, or will be apparent from the description wherein certain embodiments of the invention are exemplified.

The invention, however, is not restricted to any particular composition, particular proportion, or any particular combination of any such composition or proportion, or any particular process of preparation, of operation, or use, or any of the details thereof, even where specifically described, as the same may be modified in various particulars or may be applied in many variations without departing from the spirit of the claimed invention, of which the embodiments, herein described, are intended to be illustrative, and only for the purpose of illustrating the requirements of the invention. The disclosure of an operative embodiment is to demonstrate all the various modifications in which the invention might be embodied.

It has been discovered that certain combinations which include iodine as a combined element, when brought together into solution, release iodine from infected areas of the body to liberate iodine by means of certain controls, the liberation of iodine may be governed so that it occurs at the time the solution has actually come into and is intimate contact with the a-

iodin will be liberated only in will be required by the amount destroyed, and, therefore, by the n. The constituents of the so-
 5 hat the solution, under normal rless, substantially no iodin in then being present.

erved that, at an area infected inite pH or hydrogen ion con-
 10 servable, and that the pH or centration is in direct propor-
 e of infection. It, therefore, that the pH or hydrogen ion a function of the amount of
 possibly because of metabolic 15 eria. The controls of the solu-
 ut the solution remains in the n just mentioned until the solu-
 the pH, or hydrogen ion con- 20 by a bacterium, or, in the
 by the hydrogen ion concen- infected by bacteria. A chem-
 ensue when the solution and cing the pH or hydrogen ion
 ide, and that chemical reaction 25 ion of just sufficient iodin to
 ia, and, thereby, their hydro- effect. When this stage in
 ched, no further iodin is liber- 30 e free or nascent iodin has been
 become combined by the steri- e solution remains substantially
 e to combat any further bac-

nd that by bringing a soluble 35 le iodate in certain proportions
 lizing the relationship of these o each other, and fixing the
 lide and iodate to the stabiliz- e solution will be and remain
 40 le, and colorless until affected concentration. Such solution,
 infected area, as, for instance, lesion, is found to be affected
 and instantaneous reaction 45 in quantities automatically
 degree of infection, or, in other ber of bacteria present and to
 the sterilizing medium. The , is nascent, and in condition, 50
 liberation, instantaneously, and to react upon and destroy the
 used its liberation. The reac- n, on the other hand, is fol-
 55 il combination of the iodin, onger exists in the free state,
 substantial degree, can effect abrics or the like with which
 o which the solution has been into contact.

pplication of the invention, the droiodic acid and of iodic acid, dide and sodium iodate, were
 60 ive and stabilized reaction was n iodate and iodide were pres-
 ship of one molecule of iodate of iodide. A mixture of the
 its, in these proportions, could the other hand, the medium
 in the form of a solution in 70 iodide would be present in the
 relationship. In either case, nce herein, this relationship
 e, that is, of one molecule of cules of iodide, will be termed, 75

"iodin mixture." When the term, "iodin mixture," is used, reference is intended only to the ingredients in this relationship, and not to any degree of concentration in solution.

It has been determined that certain ingre-
 5 dients must be associated with the iodin mixture to go into solution at the same time as the in-
 ingredients of the iodin mixture in order to stabi-
 10 lize the reaction, and to assure that iodin shall not be liberated unless the solution containing
 the iodin mixture be in contact with an area to be made antiseptic, and then only if there be
 present in that area bacteria which would destroy the sterility or aseptic condition of the area. The
 15 soluble salt of orthophosphoric acid has been found effective for this purpose, and, especially,
 disodium orthophosphate. It was found that a desired control for the reaction of such a solu-
 tion resulted when a relationship existed in which the disodium orthophosphate could be varied be-
 20 tween 3 and 4 parts while the amount of the iodin mixture could be varied between 3.7 to 4.2
 parts. The application of these variables can be determined from experience by the one who
 makes up the solution, or the powdered material with which the solution will be prepared. For
 instance, the proportion of the stabilizing ingre-
 25 dient to the iodin mixture will be higher during the warmer seasons of the year because of
 the normally higher acidic condition of the skin of the body arising from the higher rate of per-
 spiration.

Another ingredient capable of functioning to stabilize the reaction is a soluble acid carbonate.
 35 In this particular instance, sodium bicarbonate was found to be peculiarly effective. The sodium
 bicarbonate was found to be effective between the limits of 0.4 to 0.666 part to between 3.7 to 4.2
 parts of the iodin mixture. Either the disodium orthophosphate or the sodium bicarbonate, or
 40 both, will function to slow down the reaction of the ingredients of the iodin mixture whereby the
 nascent iodin is liberated. Increase of the disodium orthophosphate or the sodium bicarbonate
 in ratio to the iodin mixture will increase the function in slowing down the liberation of iodin;
 on the other hand, reduction of the disodium orthophosphate or the sodium bicarbonate in
 45 ratio to the iodin mixture will increase the speed of separation of iodin when a proper pH or hy-
 drogen ion concentration is met.

In treating certain conditions where bleeding is present as a factor, as, for instance, a cut at
 the outside surface of the body, coagulation of the blood flowing from the wound may follow
 55 rapidly, and may close the opening through which the antiseptic medium here considered is to op-
 erate, presenting a consequent and effectual barrier against the action of the iodin mixture in
 destroying bacteria thus enclosed within the wound. Therefore, it has been found desirable
 to slow up the process of coagulation. For this purpose, there may be added to the dry ingre-
 60 dients of the iodin mixture or to the solution in which they are present, a soluble salt such as,
 sodium chloride. The salt has been found to be effective when, in the solution, it is present in
 quantity sufficient to attain substantially the same concentration as the concentration of salt
 65 in the blood. Such concentration in the solution has been found to impede or slow down the pro-
 cess of coagulation so that the iodin mixture may be reacted by the hydrogen ion concentration of
 the bacteria at the wound, with resultant separation of the sterilizing nascent iodin. A suitable

concentration has been effected by using between 4 and 5 parts of sodium chloride in relation to between 3.7 to 4.2 parts of the iodine mixture.

A tabulation of these proportions for the dry ingredients, in which the proportions are given in parts by weight, reads as follows:

	Parts
Iodine mixture -----	3.7-4.2
Sodium chloride -----	4 -5
Disodium orthophosphate -----	3 -4
Sodium bicarbonate -----	0.4-0.666

The solution may be made up by taking ten parts by weight of the mixture of all the dry ingredients, and dissolving such dry ingredients in ninety parts by weight of water. The solution prepared in this manner may be used for antiseptic purposes without danger in relationship to any part of the body. The solution is colorless, will not stain fabrics, and does not harm the skin.

Many other changes could be effected in the particular composition, and in the proportions thereof, hereinbefore set forth, and in the method of preparation and use set forth, and in specific details thereof, without substantially departing from the invention defined in the claims, the specific description being merely of embodiments capable of illustrating certain principles of the invention.

What is claimed as new and useful is:

1. An antiseptic composition for the liberation of iodine in accordance with the presence of bacteria, the composition including a water soluble iodide, a water soluble iodate, and means for stabilizing the iodine-liberating reaction of iodide and iodate, including a water soluble orthophosphate which does not have an acid reaction, and a water soluble acid carbonate, all in quantities such as to produce a substantially neutral composition.

2. A composition for use as an antiseptic to produce nascent iodine in the presence of bacteria, the composition including a water soluble iodide, a water soluble iodate, and means for controlling the speed of formation of iodine by the reaction of iodide and iodate including a water soluble orthophosphate which does not have an acid reaction, all in quantities such as to produce a substantially neutral composition.

3. A composition for use as an antiseptic to produce nascent iodine in the presence of bacteria, the composition including a water soluble iodide, a water soluble iodate, and means for controlling the speed of formation of iodine by the reaction of iodide and iodate including disodium orthophosphate in quantities such as to produce a substantially neutral composition.

4. A composition for use as an antiseptic to produce nascent iodine in the presence of bacteria, the composition including a water soluble iodide, a water soluble iodate, a water soluble orthophos-

phate, a water soluble acid carbonate, and a soluble chloride, all in quantities such as to produce a substantially neutral composition.

5. A composition for use as an antiseptic to produce nascent iodine in the presence of bacteria, the composition including sodium iodide and sodium iodate in the proportion of five molecules of iodide to one molecule of iodate in such concentration in solution that the hydrogen ion concentration of a bacterial presence at a point to be treated will cause nascent iodine to be separated in proportion to the hydrogen ion concentration, and disodium orthophosphate in the proportion of between 3 to 4 parts of disodium orthophosphate to 3.7 to 4.2 parts of the mixture of sodium iodide and sodium iodate.

6. A composition for use as an antiseptic to produce nascent iodine in the presence of bacteria, the composition including sodium iodide and sodium iodate in balanced proportions, the iodide and the iodate being present in such quantities that a state of unstable equilibrium in the reaction to liberate nascent iodine for antiseptic purposes exists when the composition is in water solution so that nascent iodine will be separated by and in proportion to the hydrogen ion concentration of a bacterial presence, and disodium orthophosphate and sodium bicarbonate in the proportion of between 3 to 4 parts of disodium orthophosphate to between 0.4 to 0.666 parts of sodium bicarbonate.

7. A solution for use as an antiseptic to produce nascent iodine in the presence of bacteria, the solution including sodium iodide and sodium iodate in solution in the proportion of five molecules of iodide to one molecule of iodate, disodium orthophosphate in the proportion of between 3 to 4 parts of disodium orthophosphate to between 3.7 to 4.2 parts of the mixture of sodium iodide and sodium iodate, and sodium chloride, water for the solution being present in the amount of ninety parts by weight to ten parts by weight of solute.

8. A solution for use as an antiseptic to produce nascent iodine in the presence of bacteria, the solution including sodium iodide and sodium iodate in solution in the proportion of five molecules of iodide to one molecule of iodate, and disodium orthophosphate and sodium bicarbonate in the proportion of between 3 to 4 parts of disodium orthophosphate to between 0.4 to 0.666 parts of sodium bicarbonate, and between 3 to 4 parts of disodium orthophosphate to between 3.7 to 4.2 parts of the mixture of sodium iodide and sodium iodate, water for the solution in the amount of ninety parts by weight to ten parts by weight of solute, and sodium chloride in the solution substantially in the same concentration in the solution as salt in the blood.

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