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COMPOSITIONS OF HYDROGEN PEROXIDE AND IRON SALTS AND METHOD OF STABILIZING THEM

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This invention relates particularly to compositions including hydrogen peroxide and salts of iron and especially the invention contemplates such compositions which are particularly adaptable for use in bleaching fur skins.

According to certain known methods of bleaching fur skins, the skins after being washed are soaked in a solution of ferrous or ferric sulphate for about eight to twelve hours and then rinsed and hydroextracted. Then the skins are immersed in a solution of hydrogen peroxide until they have been sufficiently decolorized. This method of bleaching requires handling of the skins in two different solutions, i. e. the ferrous sulphate and the hydrogen peroxide, and at two different times, so that the method requires a long period of time for completion and considerable labor. Other known methods of bleaching fur skins also require long periods of time, or are expensive or inconvenient, or fail to satisfactorily bleach the fur skins.

It is well known that hydrogen peroxide is a powerful oxidizing and bleaching agent and that iron salts when placed in solution with hydrogen peroxide cause rapid decomposition of the hydrogen peroxide and almost instantaneously liberate the oxygen so that such solutions heretofore known are unsuitable for bleaching fur skins or the like.

A prime object of my invention is to produce a novel and improved solution which shall include an iron salt and hydrogen peroxide and wherein the decomposition of the hydrogen peroxide shall be retarded or controlled, it being contemplated that such a composition or solution shall be especially adaptable to the bleaching of fur skins by brushing the solution on the hair of the skins or soaking the fur skins directly in the solution so that the skins can be bleached in one operation with a saving of time and expense.

Other objects and advantages of my invention will appear from the following description.

In carrying out my invention, I prepare an aqueous solution of any soluble iron salt, for example ferrous sulphate, ferric nitrate or ferric chloride, and before adding hydrogen peroxide to said aqueous solution, I introduce a substance which will retard the decomposition of the hydrogen peroxide by the iron salt. I have discovered that alkaline fluorides, such as potassium, ammonium and sodium fluorides, and bifluorides and hydrofluoric acid are admirably suited for this purpose. For example, when ten cubic centimeters (10 c.c.) of a thirty per cent (30%) solution of hydrogen peroxide is added to an aqueous solution of ten grams of ferrous sulphate in one liter of water, violent bubbling of the solution and liberation of oxygen occurs and the solution takes a heavy rust color, but I have found that when five grams of ammonium bifluoride is added to such an aqueous solution of ferrous sulphate, before addition of the peroxide, the solution does not become colored and is quiescent with practically no bubbling and apparently extremely slow liberation of oxygen. The addition of the ammonium bifluoride apparently changes the ferrous sulphate to a fluoride salt of iron.

Where the original iron salt utilized is a fluoride salt, the addition of other fluorides such as sodium, potassium or ammonium fluoride, is not necessary to retard decomposition of the hydrogen peroxide; the iron fluoride performs the function itself.

As above indicated, my discovery is especially applicable to the bleaching of fur skins and other fibers, although it may be used wherever it is desired to control or retard the decomposition of hydrogen peroxide or liberation of oxygen therefrom in a solution with an iron salt.

As a specific example of the use of the invention in bleaching fur skins, I first wash or kill the skins in a known solution generally used for that purpose, and then rinse the skins in clear water and hydroextract them. Then the skins are placed in my bleaching solution for a period of from eight to fifteen hours at a temperature of preferably about 80° F. This bleaching solution may consist of five grams of ferrous sulphate dissolved in one liter of water to which is added two grams of ammonium bifluoride and thereafter twenty-five cubic centimeters of a one hundred volume hydrogen peroxide solution. This solution efficiently bleaches or decolorizes the skins, and after they have been sufficiently bleached, the skins are washed out in running water for a period of about one-half hour, hydroextracted and then washed again for about one-half hour.

I have found the method and composition to be highly efficient, quick and economical and to satisfactorily bleach even dark colored skins, such as for example Australian rabbit, to a light tan or yellow color. Moreover, the method and composition do not in any way deleteriously affect the leather of the skins.

In some instances, especially where the iron salt used is ferrous sulphate, I may add to a solution as above described about five grams of am-

monium persulphate to oxidize the ferrous salt to a ferric salt before addition of the fluoride, which seems to enhance the bleaching operation.

The quantities and proportions of the ingredients of the composition may be widely varied to suit different types of fur skins and to retard or accelerate the bleaching action, as will be understood by those skilled in the art.

Instead of ferrous sulphate I may utilize other iron salts, and in place of ammonium bifluoride I may utilize sodium fluoride or other alkaline fluorides, or hydrofluoric acid, or other agents capable of retarding the decomposition of the hydrogen peroxide under the influence of the iron salts.

Hydrogen peroxide, or other bleaching substances such as sodium perborate or sodium peroxide which yield hydrogen peroxide in the presence of certain agents, particularly acids, are generally recognized as oxidizing and bleaching agents, and in my composition and method the iron salts appear to induce or accelerate decomposition of these oxidizing agents, while the fluorides act to retard or control such decomposition so that the full bleaching or oxidizing effect on the fur of the skins is obtained without any apparent deleterious effects on the fur or the leather. By varying the proportions of the iron salt, the oxidizing agent and the agent which controls the effect of the iron salt on the oxidizing agent, it is possible to increase or decrease the rate and degree of the bleaching operation.

If desired, after the skins have been bleached as above described, they may be dyed according to anq known process. My bleaching composition appears to place the skins in excellent condition for dyeing so that the fur takes the dyes uniformly and with high color quality.

Having thus described my invention, what I claim is:

1. The method of retarding the decomposing influence of an iron salt on hydrogen peroxide in an aqueous solution of an iron salt and hydrogen peroxide consisting in adding an alkaline fluoride to the solution.

2. The method of retarding the decomposing influence of an iron salt on hydrogen peroxide in an aqueous solution of an iron salt and hydrogen peroxide consisting in adding ammonium bifluoride to the solution.

3. The method of retarding the decomposing influence of an iron salt on hydrogen peroxide in an aqueous solution of an iron salt and hydrogen peroxide consisting in adding sodium fluoride to the solution.

4. The method of retarding the decomposing influence of an iron salt on hydrogen peroxide in an aqueous solution of an iron salt and hydrogen peroxide consisting in adding hydrofluoric acid to the solution.

5. The method of retarding the decomposing influence of ferrous sulphate on hydrogen peroxide in an aqueous solution of ferrous sulphate and hydrogen peroxide, consisting in adding ammonium bifluoride to the solution.

6. The method of retarding the decomposing influence of ferrous sulphate on hydrogen peroxide in an aqueous solution of ferrous sulphate and hydrogen peroxide, consisting in adding sodium fluoride to the solution.

7. The method of retarding the decomposing influence of ferric nitrate on hydrogen peroxide in an aqueous solution of ferric nitrate and hydrogen peroxide, consisting in adding alkaline fluoride to the solution.

8. The method of retarding the decomposing influence of ferric nitrate on hydrogen peroxide in an aqueous solution of ferric nitrate and hydrogen peroxide, consisting in adding ammonium bifluoride to the solution.

9. The method of retarding the decomposing influence of ferric nitrate on hydrogen peroxide in an aqueous solution of ferric nitrate and hydrogen peroxide, consisting in adding sodium fluoride to the solution.

10. A composition consisting of an aqueous solution of an iron salt, hydrogen peroxide, and an alkaline fluoride.

11. A composition comprising an aqueous solution of an iron slat, hydrogen peroxide and ammonium bifluoride.

12. A composition comprising an aqueous solution of a ferrous salt, hydrogen peroxide and an alkaline fluoride.

13. A composition comprising an aqueous solution of ferrous sulphate, hydrogen peroxide and an alkaline fluoride.

14. A composition comprising an aqueous solution of ferrous sulphate, hydrogen peroxide and ammonium bifluoride.

15. A composition comprising an aqueous solution of ferric nitrate, hydrogen peroxide and ammonium bifluoride.

16. A composition which consists of an aqueous solution of a fluoride of iron and hydrogen peroxide.

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