Patented Oct. 14, 1941 2,258,619

UNITED STATES PATENT OFFICE

2,258,619

METHOD OF PRESERVING SOAP AND RESULTING PRODUCT

Bernard L. Maxwell, Reading, Mass., assignor to Lever Brothers Company, a corporation of Maine

No Drawing. Application February 6, 1940, Serial No. 317,522

8 Claims. (Cl. 260—398.5)

This invention relates to improvements in soap compositions, and has particular reference to the stabilization of soaps against rancidity and discoloration, and the method of accomplishing the same.

The tendency of animal and vegetable fatty oils and fats, particularly unsaturated oils and fats, to undergo partial decomposition or become rancid in the presence of atmospheric oxygen, is well known. The tendency toward rancidity carries over even when the fats and oils are converted to soaps. It is known that the combining of atmospheric oxygen with soaps formed from oils and fats is accelerated by the presence of catalytic agents in the soap such as the cations of iron, copper, and other metals ordinarily present in small amounts. Oxidation products formed in the soaps appear to exercise a similar action. The undesirable effects resulting from the reaction of the soap with atmospheric oxygen are indicated by the development of rancidity, usually accompanied by an undesirable odor and streaking or discoloration of the soap. Such streaking or discoloration results from rancidity and may gradually appear in a bar of soap under ordinary conditions. Rancidification may be detected in its early stages by the loss of the natural soap order.

Soaps formed of fats and oils containing material proportions of unsaturated fatty acids are more particularly susceptible to rancidification because of their increased proportions of unsaturates. It has been a common practice to hydrogenate a soap stock for the purpose of reducing the proportion of unsaturated components and thus increase the stability of the soap stock. However, stabilization of the soap stock by hydrogenation is not always practiced as it may undesirably increase the time and cost of manufacture. Another factor limiting the use of hydrogenation as a solution for the problem of rancidity is that as the proportion of saturated components is increased the desirable solubility of the soap is decreased.

The incorporation of various tin compounds in soaps has been suggested heretofore as a means of inhibiting rancidity and discoloration. It has been found, however, that the inhibiting properties of presently used tin compounds are not satisfactory with all types of soaps, particularly as to effectiveness and duration.

For example, in the utilization of soap stocks having a greater tendency to dissolve in water, there is a difficult problem in obtaining a soap of the desired stability. The present trend toward more rapidly soluble soaps may make desirable a product containing material proportions of potassium soaps. These are known to be more soluble than the usual corresponding sodium soaps. However, with respect to the potassium soap, it has been found that the usual soap preservatives ordinarily have a negligible stabilizing effect. For example, the usual tin preservatives previously used with sodium soap I have found only temporarily arrest the oxidation of the potassium soaps, and are generally unsatisfactory for the production of a stable potassium soap or a blend of such soap, free from rancidity with accompanying streaking or discoloration.

It is an object of the present invention to inhibit rancidity in soaps and prevent loss of natural odor and discoloration of the soap.

A further object is to stabilize relatively unstable soaps such as soaps formed of unsaturated fatty acids and potassium soaps or soap compositions containing potassium soaps.

Other objects and advantages will appear from the following description.

In accordance with the present invention, it has been discovered that alpha-stannic acid exhibits unexpected properties as an inhibitor and stabilizer for use with soap compositions. When added to soaps in relatively small amounts I have found that alpha-stannic acid prevents rancidification of even the most unstable soaps, and at the same time tends to stabilize the color ingredients of bleached soaps against the development of undesirable discoloration which customarily accompanies rancidification. The presence of alpha-stannic acid in colored soaps tends to inhibit undesirable changes in color cast or brilliance of the soap upon storage, apparently indefinitely.

The mechanics of the action embraced in the unexpected preservative properties of alpha-stannic acid are not fully understood. It may be, however, that the unexpected stabilizing action involves the property of alpha-stannic acid of maintaining a finely dispersed colloidal form in the presence of moisture, and its property of forming very stable adsorption complexes with oxidation catalysts such as the heavy metal salts and hydrated oxides ordinarily present in small amounts in soaps. These salts and oxides act to accelerate the oxidation of soap and cause it to lose any brilliance of color it may have had.

Alpha-stannic acid is particularly effective when used with potassium soaps or mixtures of soaps including potassium soaps. Potassium soaps are relatively more susceptible to spoilage

upon standing than the corresponding sodium soaps and this characteristic is undesirably intensified if soft, low-titre stocks are used. Soap manufacturers have for some time had difficulty with this problem and have attempted without success to find a satisfactory preservative capable of inhibiting rancidification. I have now found that alpha-stannic acid is effective as a preservative for potassium soaps. In fact, as to all soaps, its action is completely unexpected in its effectiveness and radically exceeds in inhibiting and stabilizing effect such commonly used agents as stannic chloride. For example, in carrying out actual preservation tests on a soap containing 75% sodium tallow soap and 25% potassium cocoanut oil soap, a stock containing .2% alpha-stannic acid remained unaffected after 21 days of heating at between 115° F. to 125° F., while the same stock containing .2 stannic chloride and treated under identical conditions turned rancid after 4 days. Similarly, a stock containing .2% stannous chloride turned rancid after 1 day of the same treatment.

The amount of alpha-stannic acid to be added to the soap will necessarily be controlled in accordance with the amount of components in the soap stock tending to oxidize or become rancid, the danger of any such contamination of the soap, and other possible factors leading to increased oxidation of the soap constituents upon standing. It has been found that relatively small amounts of alpha-stannic acid are effective and that any reasonable amount of alpha-stannic acid may be used. Under ordinary conditions, amounts ranging from 0.1% to 1.0% of the soap stock, and preferably from 0.2% to 0.4% may be used. The use of larger amounts of alpha-stannic acid gives an even greater improvement in the stability of the soap stock, but generally in an amount insufficient to merit the additional cost. While smaller amounts of the alpha-stannic acid are effective in most instances with relatively pure soaps, it is desirable to use amounts within the range specified to provide a reserve of complex-forming material effective to maintain the soap stable irrespective of any subsequent conditions which might also tend to promote oxidation.

In the manufacture of framed soaps, the alpha-stannic acid may be added to the soap in the crutcher. With milled soaps, the agent preferably is added to the soap mixture before the milling operation. Generally, however, the alpha-stannic acid may be added to the soap at any convenient step in the manufacture where the stabilizing agent may be dispersed in intimate admixture throughout the soap, to obtain the desired uniformity of product. I have found that incorporation of the alpha-stannic acid in the soap in the form of a jelly provides a most intimate dispersion there of the agent throughout the soap mixture. However, the addition may be made to the soap in other forms with generally satisfactory results. Perfume, coloring material and other ingredients of the soap may be added as desired.

Alpha stannic acid is a relatively non-corrosive material, as compared with stannic chloride and others of the tin compounds used as soap preservatives up to the present time. This characteristic of alpha-stannic acid facilitates handling of the material, and eliminates corrosive attack on the soap manufacturing apparatus. For instance, in the manufacture of milled soaps, it has been found that the stannic chloride soap preservative exerts undesirable corrosive action on the milling rolls, necessitating replacement and repair. This is not the case with alpha-stannic acid.

The alpha-stannic acid of the present invention differs from the usual preservatives and inhibitors used in soap manufacture, in that it capably stabilizes relatively unstable soaps against rancidity and the usual discoloration. Moreover, the stabilizing properties of alpha-stannic acid persist relatively permanently over long periods of time under conditions adverse to the retention of sweetness and color brilliance by the soap, contrasting in this regard with anti-oxidants and inhibitors presently in use.

The proportions of alpha-stannic acid and suggested manner of use herein set forth are not to be regarded as limiting the invention, being included herein as illustrative or preferred adaptations only. All equivalents falling within the spirit of the invention are to be regarded as within the scope of the following claims.

I claim:

1. The method of stabilizing a soap composition having as a constituent a material proportion of a potassium soap, which comprises incorporating in the soap composition a small amount of alpha-stannic acid.

2. The method of preserving soap against rancidity comprising incorporating a small amount of alpha-stannic acid therein.

3. The method of stabilizing soap comprising incorporating between 0.1% and 1.0% of alpha-stannic acid therein.

4. The method of stabilizing soap comprising incorporating between 0.2% and 0.4% alpha-stannic acid therein.

5. A stable soap product comprising soap and a small proportion of alpha-stannic acid incorporated therein.

6. A stable soap product comprising soap and between 0.1% and 1.0% of alpha-stannic acid incorporated therein.

7. A stable soap product comprising soap and between 0.2% and 0.4% of alpha-stannic acid incorporated therein.

8. A stable soap composition having as a constituent a material proportion of potassium soap, and having a small amount of alpha-stannic acid incorporated therein.

BERNARD L. MAXWELL.