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SOAP

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This invention relates to improved soaps, and to methods of manufacturing improved soaps. It relates more particularly to colored soaps, which owe their color either to the presence of natural coloring material occurring in the fats or oils from which the soap is made, such as the green coloring material of olive oil and the red coloring material of palm oil, or to which coloring material, such as synthetic dyestuffs, have been added, the color of the improved colored soaps of the present invention being stabilized by the inclusion in the soap of a small amount of a tin compound.

This application is in part a continuation of my prior application Serial No. 73,477, filed April 9, 1936.

Colored soaps, as heretofore produced, have had a decided tendency to change color on storage. For example, a toilet soap produced from bleached palm oil and olive oil, having a green color due to the chlorophyll in the olive oil, tends to lose the bright green color it has when freshly made on storage because of the recurrence of the red color originally present in the palm oil. Other colored soaps, such as red soap chips produced from unbleached palm oil, tend to lose their color on standing and to become whitish. In practically all colored soaps which depend for their color upon coloring matter naturally present in the fatty materials from which the soaps are made or to which synthetic dyestuffs have been added, an objectionable change in color takes place on storage.

In accordance with the present invention, this change in color on storage of soaps of this character is prevented or inhibited by the addition of a small amount of a tin compound to the soap. The invention includes both this new method of stabilizing the color of such soap, and the colored soaps containing a small amount of a tin compound and having a stabilized color.

A number of tin compounds have been tested, and found effective for the stabilization of color of colored soaps, including stannic chloride, stannic sulfate, stannic myristate, stannic phosphate, stannic stearate, stannic oxide, stannic ammonium chloride, stannous chloride, stannous phosphate, stannous oxalate, and others. Of these, stannic chloride, because it is the cheapest, is preferred, although its action is no better, and in some cases not quite as good, as, for example, stannic sulfate, stannic myristate, stannous phosphate or stannous oxalate. There is some difference in behavior between the various tin compounds, and some are somewhat more effective

than others, or are preferred because of their lower cost.

The coloring materials which are stabilized in the presence of soap by tin compounds, such as those outlined above, include such naturally occurring coloring materials as chlorophyll, which occurs as the primary coloring material in olive oil and is responsible for the green color of olive oil soaps, carotin and xanthophyll, which are the coloring materials present in palm oil and are responsible for the red color of palm oil and soaps made from unbleached palm oil, as well as the synthetic dyestuffs which are ordinarily used to color soaps, including soaps made from bleached palm oil, from cocoanut oil, from tallow, from other fatty materials, or from mixtures of such fatty materials. The tin compounds not only stabilize these coloring materials in their original condition when present in soap, but also have the property of stabilizing the color of products which are obtained when such coloring materials as carotin and xanthophyll are bleached. Thus when bleached palm oil is used in soap, as in admixture with olive oil to make a soap containing palm oil and olive oil constituents, and a small amount of a tin compound is incorporated, the characteristic red color of the pigments originally present in the palm oil does not recur. As a result, soaps may be made from bleached palm oil and olive oil which have a green color due to the natural coloring material of the olive oil, and which, due to the presence of a tin compound, do not change color on standing because of a reappearance of the red color characteristic of the palm oil or because of a change in color of the chlorophyll of the olive oil. Similarly, soaps made from tallow and cocoanut oil, containing a synthetic dyestuff, such as Rhodamine B, Color Index No. 749, Calcocid Yellow MXXX, Color Index No. 138, naphthol yellow, Color Index No. 10, Calcozine Red BX, Color Index No. 749, Pontacyl Fast Blue 1B, naphthol green, Color Index No. 5, or Du Pont Brilliant Silk Blue, are stabilized in color by the addition of a small amount of a tin compound.

The chemical reactions which may occur when a tin compound, such as tin chloride, tin sulfate, or the like is added to soap are not clearly understood. The compounds may react to form tin hydroxides, or insoluble tin soaps; but in any case, the addition of a small amount of a tin compound effectively stabilizes the color of colored soaps. The action is apparently not that of an anti-oxidant, because the stannous compounds are reducing agents and the stannic com-

pounds are oxidizing agents, while both are effective stabilizers. If the action were that of an anti-oxidant, it would be expected that the stannous compounds would be far more effective than the stannic compounds; whereas in general, the stannic compounds are more effective than the stannous compounds.

The amount of tin compound used with the soap may vary over a relatively wide range, from as little as about 0.01% up to about 0.5%, calculated as percentage of tin based on the soap. In general, the larger amounts show a more marked improvement in the stability of the color of the soap than do the smaller amounts. The use of about 0.05% of a tin compound, calculated as tin, produces a marked improvement in the soap, and while larger amounts may bring about a somewhat greater improvement, such improvement is not sufficient to warrant the additional cost of the extra tin compound.

The tin compound may be added to the soap in the crutcher, or subsequently in a soap mixer or amalgamator.

The invention will be further illustrated by the following examples which illustrate various colored soaps produced in accordance with the present invention, but it is not limited thereto.

Example 1.—0.2% of a 50% water solution of stannic chloride is added to dry soap chips containing from 8 to 12% water made from olive oil and bleached palm oil in the proportions of 10 to 30 parts of olive oil to 70 to 90 parts of bleached palm oil. The solution is thoroughly admixed with the soap in the crutcher or in a soap mixer, or amalgamator, after which the usual perfume ingredients are added and the soap worked up in the usual way. The soap so produced, when freshly made, cannot be distinguished from a soap similarly made, except without the addition of the tin chloride. After several weeks standing, the soap made with the tin chloride retains its fresh color, while a similar soap, made without the tin chloride, develops a brown or reddish color.

The tin chloride should be added to the soap before the perfume is added, and should not be admixed with the perfume, as it tends to interact with the perfume to destroy its odor and to produce a dark colored material.

The use of a tin chloride to stabilize the color of a colored soap is advantageous with various types of colored soaps, such as hard toilet soaps containing from 8 to 12% of water, as well as textile or shampoo soaps containing 30% or more of water, and soap chips or granulated soap containing 3 to 12% of water.

Example 2.—0.2% of a 50% water solution of stannic chloride is incorporated in dry soap chips containing 3 to 6% of water made from unbleached palm oil, and having a red color. The tin chloride is crutched into the liquid kettle soap, and the soap is processed in the usual manner to produce soap chips. The resulting red soap chips retain their color well on storage, whereas similar soap chips made without the tin chloride, bleach and turn white after three to six months storage.

Example 3.—0.2% of a 50% water solution of stannic chloride is added to a green olive oil soap containing about 30% water, intended for use as a textile soap. The resulting green soap retains its color and fresh appearance on storage.

Example 4.—0.2% of a 50% water solution of stannic chloride is added to a shampoo soap con-

taining about 30% water and made from coconut oil and olive oil in the proportions of 3 to 1. The resulting green shampoo soap retains its color well on storage.

Example 5.—0.2% of a 50% water solution of stannic chloride is added to dry soap chips containing 8 to 12% water made from bleached oils and containing a synthetic dyestuff, such as Rhodamine B or Du Pont Brilliant Silk Blue (Du Pont Brilliant Silk Blue is the trade name of a synthetic dyestuff of the E. I. du Pont de Nemours Company) to color the soap. The solution is thoroughly admixed with the soap on a soap mixer or amalgamator, and the soap is worked up in the usual way to produce a milled toilet soap. The resulting colored soap retains its color well on storage, without recurrence of the color of the bleached coloring matter.

Stannous chloride or other tin compound may be substituted for stannic chloride in any of the above examples to produce a soap of stable color. Although stannous chloride is not as effective as stannic chloride in stabilizing the color of soaps of the type with which this invention is concerned, it nevertheless produces a marked improvement in such soaps. It may be used in about the same amount as the stannic chloride, that is, amounts ranging from 0.025% or less up to 0.8% or more.

The following examples illustrate various colored soaps made from a white soap base produced from approximately three parts of tallow and one part of cocoanut oil, the soaps being colored with synthetic dyestuffs. The aging characteristics of each of the soaps is markedly improved by the inclusion of the stannic chloride solution.

Example 6.—A yellow milled soap of the following composition is produced as in Example 5:

	Percent
Settled white soap chips, 13.5% H ₂ O	98.890
Titanium dioxide	0.112
50% stannic chloride solution	0.200
Calcocid Yellow MXXX, conc. 1% solution	0.200
Naphthol Yellow, 2% solution	0.345
Lemon soap perfume	0.253
	100.000

Example 7.—A pink soap is prepared as in Example 5 from the following constituents:

	Percent
Settled white soap chips, 13.5% H ₂ O	99.172
Titanium dioxide	0.113
50% stannic chloride solution	0.200
Calcozine Red BX, 0.5% solution	0.194
Naphthol Yellow, 2% solution	0.018
Rose soap perfume	0.303
	100.000

Example 8.—A violet orchid soap is prepared from the following constituents, following the procedure of Example 5:

	Percent
Settled white soap chips, 13.5% H ₂ O	98.879
50% stannic chloride solution	0.200
Calcozine Red BX, 0.5% solution	0.381
Pontacyl Fast Blue IB, 2% solution	0.190
Lavender soap perfume	0.350
	100.000

Example 9.—A pine green soap of the following composition is prepared by the procedure of Example 5:

	Percent
Settled white soap chips, 13.5% H ₂ O-----	98.471
50% stannic chloride solution-----	0.200
Naphthol Green, 4% solution-----	0.259
Calcocid Yellow MXXX, conc. 1% solution-----	0.063
10 Pine oil soap perfume-----	1.007
	100.000

The foregoing examples, that is, Examples 1 through 9, illustrate the use of tin chloride with various types of soap, and are intended to show by way of example the various types of colored soaps to which the present invention is applicable. It will be understood that in each of Examples 1 through 9 the stannic chloride may be replaced by stannous chloride, or by other tin compounds, such as stannic sulfate, stannic myristate, stannous tartrate, stannous oxalate, stannous oxide, stannic phosphate, stannic stearate, stannic oxide, stannic ammonium chloride, etc. In the following examples, the use of these various tin compounds with a particular soap is illustrated, it being understood that any of the tin compounds may be used with any of the soaps of the foregoing examples, with a marked improvement in aging characteristics of the colored soaps.

Example 10.—0.133% of stannic sulfate is added to dry soap chips containing from 8 to 12% of water made from olive oil and bleached palm oil in the proportions of 10 to 30 parts of olive oil to 70 to 90 parts of bleached palm oil. The solution is thoroughly admixed with the soap by crutching or in a soap mixer, or amalgamator, after which the usual perfume ingredients are added and the soap is worked up in the usual way. The soap so produced, when freshly made, cannot be distinguished from a soap similarly made except without the addition of the stannic sulfate. After several weeks standing, the soap made with the stannic sulfate retains its fresh color, while a similar soap made without the stannic sulfate, develops a brown or reddish color.

Example 11.—A soap is prepared as in Example 10, except that about 0.395% of stannic myristate is substituted for the stannic sulfate. The soap shows excellent aging characteristics.

Example 12.—A soap is produced as in Example 10, except that 0.074% of stannous tartrate is substituted for the stannic sulfate.

Example 13.—A soap is produced as in Example 10, except that 0.079% of stannous oxalate is substituted for the stannic sulfate.

Example 14.—A soap is produced as in Example 10, except that 0.052% of stannous oxide is substituted for the stannic sulfate.

Example 15.—A soap is produced as in Example 10, except that 0.120% of stannic phosphate is substituted for the stannic sulfate.

Example 16.—A soap is produced as in Example 10, except that 0.481% of stannic stearate is substituted for the stannic sulfate.

Example 17.—A soap is produced as in Example 10, except that 0.058% of stannic oxide is substituted for the stannic sulfate.

Example 18.—A soap is produced as in Example 10, except that 0.141% of stannic ammonium chloride is substituted for the stannic sulfate.

It will thus be seen that the present invention provides a process for the stabilization of the color of colored soaps containing natural coloring

matter present in the fat or oil from which the soap is made, or containing added synthetic dyestuffs, by the addition to the soap of a small amount of a tin compound; and also provides new and improved colored soaps, which include, in addition to natural coloring matters or synthetic dyestuffs, a small amount of a tin compound to inhibit or prevent change in color of the coloring material, and improved colored soaps which not only contain such coloring materials but also contain residues resulting from the bleaching of natural coloring materials, the color of which is stabilized by the addition of a tin compound which not only stabilizes the coloring matter present but also prevents a recurrence of the color of the bleached coloring matter.

I claim:

1. The method of stabilizing coloring materials when present in soap which comprises incorporating in the soap a small amount of a tin compound.

2. The method of stabilizing natural coloring material when present in soap which comprises incorporating in the soap a small amount of a tin compound.

3. The method of stabilizing coloring material when present in soap which comprises incorporating in the soap a small amount of stannic chloride.

4. Colored soap in which a small amount of a tin compound has been incorporated to stabilize the color.

5. Soap, colored by a natural coloring material present in an oil or fat from which the soap, at least in part, is made, which coloring matter is stabilized by the addition of a small amount of a tin compound to the soap.

6. Colored soap in which a small amount of stannic chloride has been incorporated to stabilize the color.

7. Colored soap in which a small amount of stannic sulfate has been incorporated to stabilize the color.

8. Colored soap in which a small amount of a tin soap has been incorporated to stabilize the color.

9. Green olive oil soap, stabilized in color by the addition of a small amount of a tin compound.

10. Red palm oil soap, stabilized in color by the addition of a small amount of a tin compound.

11. Green olive oil-palm oil soap, stabilized in color by the addition of a small amount of a tin compound.

12. The method of stabilizing the color of colored soaps, made, in part at least, from bleached oil or fat, to stabilize its color and to prevent recurrence of the color of the bleached coloring material which comprises incorporating in the soap a small amount of a tin compound.

13. Colored soap, made from white stock, containing a synthetic dyestuff and stabilized in color by the addition of a small amount of a tin compound.

14. Colored soap containing a synthetic dyestuff and stabilized in color by the addition of a small amount of a tin compound.

15. Green olive oil soap, stabilized in color by the addition of a small amount of a tin chloride.

16. Green olive oil-palm oil soap, stabilized in color by the addition of a small amount of a tin chloride.

17. Red palm oil soap, stabilized in color by the addition of a small amount of a tin chloride.

18. The method of stabilizing the color of green olive oil soap which comprises incorporating in the soap a small amount of a tin chloride.

19. The method of stabilizing the color of red palm oil soap which comprises incorporating in the soap a small amount of a tin chloride.

20. The method of stabilizing the color of green olive oil-palm oil soap and preventing the recurrence of the color of the palm oil, which com-

prises incorporating in the soap a small amount of a tin chloride.

21. Green soap, containing a substantial proportion of soap made from olive oil and a substantial proportion of soap made from bleached palm oil, stabilized in color by the addition of a small amount of a tin chloride.

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CERTIFICATE OF CORRECTION.

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June 13, 1939.

ROBERT F. HEALD.

It is hereby certified that error appears in the printed specification of the above numbered patent requiring correction as follows: Page 3, second column, line 62, claim 13, before the word "stock" insert soap; and that the said Letters Patent should be read with this correction therein that the same may conform to the record of the case in the Patent Office.

Signed and sealed this 15th day of August, A. D. 1939.

Leslie Frazer

Acting Commissioner of Patents.

(Seal)