Patented Dec. 1, 1931 1,833,899

UNITED STATES PATENT OFFICE

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SOAP

No Drawing. Application filed February 7, 1930. Serial No. 426,772.

This invention relates to soaps, and more particularly to soaps of the kind which can be efficiently used in connection with sea water or other hard water.

Heretofore soap made for use in connection with sea water has been made mainly of cocoanut oil and caustic soda or other suitable caustic alkali, such soaps having been found superior to soaps made of other fats or oils in that they lather more freely and that they have a slightly less tendency to be decomposed by the hardness constituents of the water into insoluble soaps such as calcium and magnesium soaps. I have found that by making a soap having incorporated therein a certain quantity of soap made by the reaction of an organic amine upon fatty acids, very superior cleansing and lathering properties are produced and the soap thus formed has much less tendency to be decomposed by the hardness constituents of water, and when so decomposed, the calcium or magnesium soaps formed are of different texture than those produced by hard water soaps heretofore made, and can be readily removed from the skin or washed articles by rinsing.

The objects of this invention, therefore, are to provide a soap having incorporated therein a quantity of an organic amine soap; also to produce a soap made with both caustic alkali and an amine, to produce a soap having a greatly reduced tendency to react with certain hardness constituents of sea water or other hard water; also to produce a soap of this kind in which is incorporated a quantity of ethanolamine soap; also to improve soaps of this kind in other respects hereinafter specified.

It is well known that soap can be made by the action of certain organic amines upon fatty acids, namely, amines of sufficient basicity to react with fatty acids. Organic amines do not react with neutral fats or oils, but only with fatty acids. In order to make useful amine soaps it is not only necessary that the amines have sufficient basicity, but also that the amines are not so volatile as to be driven off from the soap on heating. A number of organic amines have been found suitable for this purpose, the most practical of these being commercial tri-ethanolamine, which is a mixture of about 75 per cent tri-ethanolamine, 20 per cent di-ethanolamine, and 5 per cent mono-ethanolamine. This material is commercially available at prices which are not prohibitive of its use in soap manufacture. Other amines may, however, be used for making soaps with fatty acids, such, for example, as dimethyl-benzylamine, monobenzylamine, piperidine, di-ethylamine, triethylamine, and nicotine. Pure tri-ethanolamine, pure di-ethanolamine or pure monoethanolamine or any mixture of these three ethanolamines can be used effectively for making soaps with fatty acids. All of these soaps, however, when made from fatty acids of low melting point, which are the most suitable for use in making my improved soap, are liquid or jelly-like in form, and, therefore, cannot of themselves be made in cake form convenient for use as toilet soap with hard water.

I have found that by incorporating amine soaps in soaps made with fats or oils and a caustic alkali, the resulting product is peculiarly well adapted for use in connection with sea water or other hard water, and the presence of the amine soap appears to change materially the nature of the caustic alkali soap incorporated in the final product in several respects. In the first place, the resulting soap has a greatly reduced tendency to react with the hardness ingredients of the sea water to form insoluble soaps, and in the second place, such insoluble soaps as are formed are of a texture which does not render them objectionable in washing. While the resulting soap is particularly desirable for use in connection with sea water, it will be understood, however, that the soap is equally useful and desirable in connection with waters of materially less hardness than sea water.

The soap embodying this invention can be made by different methods. For example, the soap may be prepared by incorporating an amine-fatty acid soap in a partially saponified cold made soap of any desired kind and thoroughly mixing these ingredients.

My improved soap may also be made by first preparing a soap of a suitable amine

with any fat or oil which is high in free fatty acid, such, for example, as recovered cocoanut or corn oil, and then incorporating such amine soap into a cold made or boiled soap containing a sufficient excess of caustic alkali to saponify the residual neutral glyceride present in the recovered oil, since the amine, of course, will make soap only with fatty acids and is incapable of saponifying neutral fats or oils.

Soap embodying my invention can also be made by preparing a soap of a suitable amine with a fatty acid and incorporating the same into a boiled kettle soap, or by preparing a soap of an amine and a suitable fatty acid in a soap crutcher or kettle, and adding to this soap the amount of fat or oil necessary for the batch, mixing the amine soap and fat or oil to a uniform suspension or solution, adding the calculated amount of caustic alkali, and then stirring and applying heat until saponification is completed.

My improved soap can also be made by mixing in a soap crutcher, the desired quantities of any suitable fatty acid and the oil or fat to be used in the batch, and then adding the amount of amine necessary to combine with the fatty acids of the mixture, mixing well until the soap formed is dissolved in the oil. Caustic alkali is then added, and the mixture adequately stirred and heated until saponification is completed.

It is also possible to make my improved soap by incorporating an amine soap in jelly or semi-liquid form with dried soap flakes or powdered soap and thoroughly mixing and forming into cakes. The amine soap appears to become incorporated in the ordinary (or common) soap in this manner so as to produce the same results heretofore pointed out when used with sea water.

To obtain the best results, it is desirable to incorporate as much as possible of the amine soap in the final product, it being desirable, however, not to add so much amine soap as to make the finished product too soft to form cakes which will retain their shape. I have found that if the final product contains approximately 20 per cent of amine soap, very good results are obtained without making the soap too soft. I have also found that, if certain amine soaps are added to the ingredients for forming ordinary (or common) soap prior to the saponification of such ingredients, the rate of saponification is greatly accelerated.

While I found that the action of any soap, when used in hard water, is improved by incorporating therein an amine soap, yet the best commercial results have been obtained by incorporating in a soap made from cocoanut oil and caustic alkali a lesser quantity of soap made by the re-action of an amine with the fatty acids of cocoanut oil. Very good results have also been obtained by using lye soap made from palm-kernel oil and caustic alkali, and incorporating therein an amine soap of palm-kernel fatty acids. These two materials are available at prices which are not prohibitive and are of relatively low melting points, so that the resulting soap lathers freely when used in hard water, but it will be understood that other fatty acids and fats and oils can be used in making my improved soap.

Claims:

1. A soap made of fats or oils and a caustic alkali, and having incorporated therein a fatty acid-amine soap.

2. A soap made of fats or oils and a caustic alkali having incorporated therein a lesser quantity of soap in which an amine is used in place of lye.

3. A soap made of fats or oils and a caustic alkali, and having incorporated therein about 20 per cent by weight of a fatty acid amine soap.

4. A soap including a compound made of fats or oils and a caustic alkali and having incorporated therein a soap made of fatty acid and an ethanolamine.

5. A soap made of fats or oils and a caustic alkali, and having incorporated therein a soap made of an amine and a fatty acid of low melting point.

6. A soap made of fats or oils and a caustic alkali, and having incorporated therein about 20 per cent by weight of a fatty acid-ethanolamine soap.

7. A soap made of fats or oils and a caustic alkali having incorporated therein a lesser quantity of a nut-oil fatty acid amine soap.

8. A soap made of cocoanut oil and a caustic alkali having incorporated therein a cocoanut fatty acid-ethanolamine soap.

9. A soap made of cocoanut oil and a caustic alkali having incorporated therein a fatty acid-ethanolamine soap.

10. A detergent in cake form comprising approximately twenty per cent of a triethanolamine soap of a fatty acid and a sodium compound of the acid radicals of a vegetable oil.

11. A hard water soap in cake form comprising a lesser quantity of a triethanolamine soap of a fatty acid and a greater quantity of sodium vegetable oil soap.

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