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STABILIZATION OF FATTY ACID
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santo Chemical Company, St. Louis, Mo., a cor-
poration of DelawareNo Drawing. Application April 25, 1940,
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5 Claims. (Cl. 260—398.5)

The present invention relates to improvements in the stabilization of compounds containing a fatty acid radical as for example fatty acid derivatives such as vegetable oils, fats, soaps, and soap products. More particularly this invention relates to the stabilization of soap or soap products made from fats which ordinarily deteriorate or develop rancidity in a relatively short time.

Among the objects of the present invention is the inhibiting or retarding the deterioration of soap and soap products or similar substances.

Another object is the preparation of an improved vegetable oil or soap. A particular object of the invention is to stabilize both as to color and odor the salts of higher fatty acids comprising the ordinary soap and soap products of commerce. Further objects will hereinafter appear.

According to the present invention it has been found that a fatty acid derivative such as soap or vegetable oil is stabilized against deterioration and development of rancidity by having incorporated therein a small proportion of a thiocyanate (or isothiocyanate). In the description following it is to be understood that unless otherwise indicated the term "thiocyanate" includes the isomeric isothiocyanates.

More particularly the present invention comprises the use of compounds containing one or more monovalent negative radicals consisting of the elements sulfur, carbon and nitrogen. Compounds wherein the valence of said negative radical is satisfied by either an organic or inorganic radical have been found to be effective stabilizers for the class of products defined above. For use with water soluble salts of fatty acids, i. e. for ordinary soaps employed as detergents and the like, alkali metal thiocyanates are astonishingly effective and are especially desirable due to their ready compatibility with the soap and tolerance for the alkaline soap medium. Ammonium thiocyanate while a good stabilizer has a tendency to impart a slight ammonia odor to the soap. Likewise the more volatile organic thiocyanates and isothiocyanates better known as mustard oils, are generally less desirable for use in ordinary soaps than solids and less volatile oils.

As one method of testing the stabilizing properties of the preferred class of materials, the following procedure was employed:

A substantially neutral soap was prepared by saponifying a mixture of substantially three parts of an edible tallow and substantially one part of coconut oil with sodium hydroxide. Substantially 0.1% based on the weight of the soap of one of the stabilizers of this invention was incorpo-

rated therein by a suitable means. Five grams of the treated soap were placed in a 250 c. c. iodine flask together with a piece of filter paper which had been saturated with water and torn to small pieces. The flask was then tightly stoppered and placed in an oven maintained at a constant temperature of 50° C. At the end of each day the color of the soap under test was noted, also the stopper was removed and any odor indicative of rancidity noted. Similar tests were carried out with the same soap but to which no stabilizer was added, and the periods of stability compared as hereinafter set forth.

As specific examples and as specific embodiments of the present invention but in no sense to be understood as limitative of the scope of the invention, the following materials were incorporated in a soap of the above characteristics and tested in the manner described. The period of stability or the period during which the soap did not develop rancidity or materially discolor is given in the following table.

Table

Stabilizing agent	Percent of stabilizing agent based on the weight of the soap	Period of stability, days
Potassium thiocyanate.....	0.1	60
Sodium thiocyanate.....	0.1	60
Ammonium thiocyanate.....	0.1	24
Guanidine thiocyanate.....	0.1	50
Phenyl mustard oil.....	0.1	19
Alpha naphthyl mustard oil.....	0.1	32
Mercurous thiocyanate.....	0.1	29
Ethylene dithiocyanate.....	0.1	38
Benzyl thiocyanate.....	0.1	26
Ethyl thiocyanate.....	0.1	10
n-Butyl thiocyanate.....	0.1	10
Blank.....	No stabilizer	5

As further illustrative of the desirable properties of the preferred class of stabilizers substantially 0.1% of sodium thiocyanate was incorporated into a soap of the characteristics hereinbefore described and the soap so treated exposed to ultra violet light and compared with similarly exposed soap containing no added stabilizer. After forty-eight hours exposure the untreated soap exhibited a surface layer of appreciable depth which had badly discolored, the discoloration ranging from a yellow to brown. However, the soap containing the small proportion of sodium thiocyanate showed no discoloration whatsoever after forty-eight hours exposure to ultra violet light and presented a surface to all appearances identical with the freshly made soap.

From the data set forth it is readily apparent that thiocyanates constitute an important class of soap stabilizers.

If convenient or desirable mixtures of thiocyanates may be employed to good advantage as stabilizers of fatty acid derivatives such as soap and soap products.

The amount of the selected one or mixture of the preferred substances which may be added to the ordinary soap, or soap stock or ingredients used in the manufacture thereof, for effecting desirable results, may be varied, but in general it will be found that good results may be obtained by adding, upon a weight basis from 0.01% to 1.0% of the stabilizing agent to the soap or soap stock.

In utilizing the present invention the stabilizing agent may be introduced at any stage in the process of soap manufacture. For example after the fatty acid has been obtained in the usual manner and has been saponified to produce a soap stock, one or more of the stabilizers of this invention may be incorporated therein. The soap product may be dried in the usual manner and may be marketed in cakes, flakes or any other form as may be desired. Further, if desired the stabilizing agent may be incorporated into the dry soap in the well known crutching process. Moreover, the stabilizing agent may conveniently be added to the oils, fats or fatty acids before saponification. Again the thiocyanates of the present invention may be employed in conjunction with soaps and fatty oils broadly as stabilizers thereof.

Again other methods of testing the stability of fatty acid compounds than those specifically disclosed may be employed, as is well known to those skilled in the art to which the present invention pertains.

The present invention is limited solely by the claims attached hereto as part of the specification.

What is claimed is:

1. A soap stabilized against deterioration and development of rancidity by having incorporated therein a small proportion of an alkali metal thiocyanate.
2. A soap stabilized against deterioration and development of rancidity by having incorporated therein a small proportion of sodium thiocyanate.
3. A soap stabilized against deterioration and development of rancidity by having incorporated therein a small proportion of potassium thiocyanate.
4. A soap stabilized against deterioration and development of rancidity by having incorporated therein a small proportion of guanidine thiocyanate.
5. A soap stabilized against deterioration and development of rancidity by having incorporated therein a small proportion of a compound selected from the group consisting of alkali metal and ammonium thiocyanates, mercury thiocyanate, alkyl thiocyanates, guanidine thiocyanate and aryl mustard oils.

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