United States Patent [19]

O'Neill et al.

[11] **3,793,214**

[45] **Feb. 19, 1974**

[54] **TRANSPARENT SOAP COMPOSITION**

[75] Inventors: **John J. O'Neill,** Cresskill; **Joseph A. Komor,** Ramsey; **Thomas E. Babcock,** Mahwah, all of N.J.; **Robert J. Edmundson,** Cornwall; **Edward G. Shay,** Suffern, both of N.Y.

[73] Assignee: **Avon Products, Inc.,** Suffern, N.Y.

[22] Filed: **Oct. 22, 1971**

[21] Appl. No.: **191,794**

[52] **U.S. Cl.** **252/117,** 252/118, 252/132, 252/134, 252/370, 252/DIG. 16

[51] **Int. Cl.** ... **C11d 7/32,** C11d 13/16, C11d 17/00

[58] **Field of Search** ... 252/108, 117, 118, 121, 132, 252/134, DIG. 16

[56] **References Cited**

UNITED STATES PATENTS

3,654,167	4/1972	Akrongold	252/119
3,607,761	9/1971	Feighner et al.	252/108
3,562,167	2/1971	Kamen	252/121
3,520,816	7/1970	DeAcetis	252/108
2,820,768	1/1958	Fromont	252/118

Primary Examiner—Leon D. Rosdol
Assistant Examiner—Dennis L. Albrecht
Attorney, Agent, or Firm—Pennie & Edmonds

[57] **ABSTRACT**

A transparent soap composition, preferably in the form of a bar, which will maintain its transparency and surface gloss after repeated use comprising an admixture of saturated fatty acids and a branched chain C_5–C_{18} saturated aliphatic monocarboxylic acid neutralized with an agent comprising a mixture of an alkaline sodium compound and an alkanolamine, and an alkanolamine. The process of making such compositions comprises mixing the acids, neutralizing agent, and alkanolamine as a hot melt and forming the composition to the shape desired by cooling without further working.

5 Claims, No Drawings

TRANSPARENT SOAP COMPOSITION

BACKGROUND OF THE INVENTION

Numerous attempts have been made to have transparent soap compositions, such as soap bars, which will maintain their intial glassy, high gloss appearance and transparency after repeated use. It is well known that with respect to such products the appearance thereof, particularly high gloss, is an important factor in public acceptance. Heretofore it has not been possible to obtain the combination of main-tenance of transparency and high gloss appearance even though various formulation modifications have been made. Thus, Pat. No. 3,155,624 is directed to obtaining transparency by the addition of certain polyhydric alcohols to superfatted transparent soap bars. Others, as in Pat. No. 2,970,116, require certain processing steps in order to obtain the desired degree of transparency. Maintenance of such glossy appearance is also difficult in washing compositions generally whether or not they be of the transparent type, as best illustrated in Pat. No. 3,223,645. This patent shows that a high glossy surface appearance can be obtained by the addition of certain proportions of sodium and potassium chloride and by carefully regulating the amount of sodium and potassium cation portion of the soap. Also, as set forth in Pat. No. 2,820,768, transparent soaps have been made by first saponifying certain fats with the sodium compound and then adding thereto triethanolammonium salts of fatty acids. The resultant products, however, are not satisfactory in that they are only transluscent and do not maintain their surface gloss.

None of these methods or formulations, however, has been found to produce a transparent soap composition, such as a bar, which retains its transparency as well as its initial glossy appearance after repeated usage.

SUMMARY OF THE INVENTION

A transparent soap composition and method of making same has now been found which results in products that maintain their transparency as well as their glossy surface appearance even after repeated usage.

The present invention comprises a transparent soap composition, preferably in the form of a bar, comprising an admixture of saturated free fatty acids and a branched chain C_5–C_{18} saturated monocarboxylic acid neutralized with an agent comprising a mixture of an alkaline sodium compound and an alkanolamine, and an alkanolamine. The invention also comprises the method of making such composition comprising forming a hot melt of the components and shaping the composition to the form desired by cooling and without further working of the composition.

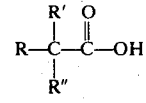
DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENT

The essential components of the composition are the saturated free fatty acids, branched chain C_5–C_{18} saturated aliphatic monocarboxylic acids, and alkanolamines as more particularly set forth hereinafter. In addition, the usual preservatives, colorants, perfumes, bleaching agents, antioxidants, chelating agents, and the like can be added to the composition in their usual amounts and for their usual effects without detracting from the novel properties of the subject composition. Also, such cosmetic additives as glycerine, mineral oil,

and the like, can be added in minor amounts in order to help reduce skin irritation, and in the case of glycerine to additionally help in preserving the transparent clarity of composition.

With respect to the free fatty acids used, these are preferably C_{12}–C_{18} saturated fatty acids with mixtures of stearic, palmitic, myristic and lauric acids being preferred. While naturally occurring sources of such fatty acids can be used, whether in the form of a fat or an oil, such as coconut oil, these are not preferred. As to proportions of fatty acids in the mixtures thereof, the most satisfactory results are obtained when substantially equivalent amounts by weight of stearic, palmitic and myristic acid are used with the lauric acid being present in an amount of about 25 to 30 percent of the weight of myristic acid. In some formulations, the proportions of myristic and lauric acid can be reversed. While C_{18} saturated fatty acids have been indicated as a practical upper limit minor percentages of C_{20} acids such as aracludic can be tolerated.

The branched chain acid used must be a C_5–C_{18} saturated monocarboxylic acid, preferably one made by carboxylating alkenes. Examples of suitable acids are the trialkylacetic acids, more commonly known as neo-acids, 2-ethylhexanoic acid, oxoprocess acids (such as 5-methyl heptanoic acid) and Versatic 911 acid (an acid of average molecular weight 175 composed of a mixture of saturated monocarboxylic acids, mainly of tertiary structure, having C_9, C_{10} and C_{11} chain length). With respect to the neo-acids, these are branched chain carboxylic acids produced from olefins and having the representative formula:



wherein R, R′, and R″ are the same or different alkyl groups. Some specific examples thereof are Neopentanoic acid (trimethylacetic acid), Neo-heptanoic acid (95 percent 2, 2-dimethylpentanoic acid and 5 percent 2-ethyl-2-methylbutanoic acid), and Neo-decanoic acid (a mixture of c_{10} trialkylacetic acids typically having an alpha carbon configuration of 31 percent 2,2-dimethyl, 67 percent 2-methyl-2-higher alkyl, and 2 percent 2, 2-di-higher alkyl). The use of C_5–C_{18} saturated monocarboxylic acids alone is preferred, but certain dibasic and tribasic branched chain saturated acids can be used in combination therewith. Such polybasic acids can be substituted for up to 50 percent by weight of the monocarboxylic acid. Examples of such polybasic acids are the C_{36} aliphatic dibasic acids and C_{54} trimer acids containing alkyl side chains. Specific examples are Hystrene 3695 (95 percent dimer, 4 percent trimer, 1 percent monomer), Hystrene 3880 (83 percent dimer, 17 percent trimer), Hystrene 3675 (75 percent dimer, 25 percent trimer), Empol 1010 (97 percent dimer, 3 percent trimer), Empol 1014 (95 percent dimer, 4 percent trimer, 1 percent monomer), and Hystrene 5,440 (20 percent dimer, 80 percent trimer).

The neutralizing agent comprises a combination of an alkaline sodium compound, such as sodium hydroxide or sodium carbonate, with an alkanolamine. The alkanolamine preferred is triethanolamine because the monoalkanolamines such as monoethanolamine tend

to have an undesireable odor which is difficult to mask even with perfumes. With respect to dialkanolamines, it is best not to use such alone but in combination with the triethanolamine, and then they should not be substituted for more than about 50 percent by weight of the triethanolamine nor used in amount less than about 10 percent by weight of the triethanolamine. In the combination sufficient alkaline sodium compound is used to neutralize completely from about 40 to 80 percent of the total fatty acid content. The preferred neutralizing agent is a combination of sodium hydroxide and triethanolamine. The amount of neutralizing agent used is that required to neutralize the acids, i.e., the combination of the fatty acids and branched chain saturated acids discussed above. The alkanolamine is preferably added in an amount exceeding that required to neutralize the acids since the final product requires an excess of alkanolamine. Specifically, the composition should include an amount of alkanolamine, preferably triethanolamine, above that required in the composition for neutralization of from about 15 to 45 parts by weight based on 100 parts by weight of the composition.

As previously noted, additional materials, such as preservatives, antioxidants, colorants, and perfumes can also be used in their usual proportions and for their usual effect.

As to proportions, from about 10 to about 20 parts by weight, based on the total weight of the soap base, must comprise a branched chain C_5–C_{18} saturated acid and the fatty acid should comprise from about 25 to 75 parts by weight, with the proportion of alkanolamine noted above, or more of the total composition. This soap base comprises at least 50 percent by weight of the final soap bar. The remainder of the composition, if other materials are added, can comprise the preservatives, colorants, perfumes and other conventional additives as discussed above which are usually added in minor amounts.

The method of making the composition is different from that ordinarily employed in making soap. First, the fatty acids and branched chain acids are heated and then neutralized with a neutralizing agent (such as a mixture of sodium hydroxide and triethanolamine). The heating and neutralization are carried out at a temperature of about 130°F to 210°F and in any conventional equipment such as vats provided with stirrers and heating means. To this hot melt there are also added the other components of the soap including additional alkanolamine if an excess thereof was not added with the neutralizing agent. The hot melt is then solidified by being cooled and can be shaped during cooling to any desired form, as bars, utilizing the usual and well known molding equipment present employed for the purpose of shaping soaps.

The invention will be further described in connection with the following examples, which are set forth for purposes of illustration only and in which proportions are by weight unless specifically stated to the contrary.

EXAMPLE I

Transparent soap bars were prepared using the following formulation:

INGREDIENTS	% BY WEIGHT
Neo-Decanoic Acid	16.434
Stearic Acid (Triple pressed grade)[1]	19.955
Myristic Acid	9.978
Lauric Acid	2.935
Sodium Hydrosulfite (25% Solution)	0.047
Triethanolamine (Techanical grade)[2]	37.563
Sodium Hydroxide	6.456
Water	6.456
Versenex 80 (Pentasodium salt of diethylenetriamine-pentaacetic acid)	0.176
	100.000

1. 45 percent Stearic acid and 55 percent palmitic acid
2. 85 percent Triethanolamine and 15 percent Diethanolamine

The fatty acids, branched chain acid, and sodium hydrosulfite were heated at 180°F with stirring until a substantially homogeneous molten mass was formed. To this molten mass there was slowly added a preblend of sodium hydroxide, triethanolamine, Versenex 80, and water. The entire mixture was stirred until homogeneous and neutralization of the acids was complete and then poured into standard soap bar molds where the mass was permitted to cool to form the shaped bars.

The resultant bars were clear and transparent to the eye and had a high surface gloss with the transparency and surface gloss being retained after repeated usage of the bars.

EXAMPLE II

Transparent soap bars were prepared using the following formulation:

INGREDIENTS	% BY WEIGHT
Neo-Decanoic Acid	15.1737
Stearic Acid (Triple press grade)	19.0895
Myristic Acid	9.3003
Lauric Acid	2.4476
Sodium Hydrosulfite (25% Solution)	0.1957
Ortho-Tolyl Biguanide	0.2936
Glycerine	11.2579
Triethanolamine (Techanical grade)	31.3265
Sodium Hydroxide	5.3842
Water	5.3842
Versenex 80	0.1468
	100.0000

The procedure of Example 1 was followed except that the orthotolyl biguanide and glycerine were included with the acids and hydrosulfite.

The products were clear and transparent to the eye with surface gloss present after repeated usage and subsequent drying.

EXAMPLE II

Transparent soap bars were prepared using the following formulation:

INGREDIENTS	% BY WEIGHT
Versatic Acid 911	14.4793
Stearic Acid (Triple press grade)	14.4793
Myristic Acid	7.9403
Lauric Acid	2.3353
Glycerine	20.0840
Triethanolamine (Technical grade)	29.8925
Sodium Hydroxide	5.1377
Water	5.1377
Versenex 80	0.1403
Ortho-Tolyl Biguanide	0.2802
Sodium Hydrosulfite (25% Solution)	0.0934
	100.0000

The precedure of Example II was followed and the products were clear and transparent to the eye with

surface gloss present after repeated usage and subsequent drying.

EXAMPLE IV

The process of Example I is followed except that for the Neodecanoic acid used therein there is substituted, separately and in turn an equal proportion of 2-ethylhexanoic acid, Versatic 911 acid, neopentanoic acid, and neo-heptanoic acid. In each case the finished product has a high surface gloss and retains such gloss upon repeated usage.

EXAMPLE V

Transparent soap bars were formed using the following formulation:

INGREDIENTS	% BY WEIGHT
Neo-Decanoic Acid	2.6
Empol 1010 Dimer Acid	2.6
Stearic Acid (Triple pressed grade)	20.0
Myristic Acid	9.7
Lauric Acid	2.6
Sodium Hydrosulfite (25% solution)	0.2
Antioxidant (Sopanox)	0.3
Glycerine	6.6
Triethanolamine (Technical grade)	37.6
50% Sodium Hydroxide	8.5
Demineralized Water	6.0
Versenex 80	0.1
Lilac perfume (Compound 2-2368)	3.0
Violet color (C.S. D&C Violet No. 2)	0.2
	100.0

The procedure of Example II was followed with respect to the glycerine addition with the antioxidant being included in the preblend. The perfume and color was added to and dispersed in the homogeneous mixture just prior to the mixture being poured into molds.

Transparent and high gloss soap bars were formed which maintains such characteristics after repeated usage.

While the exact theory of the instant invention is not precisely understood, it is believed that the glassy or high gloss surface appearance of the soap composition of the invention which is maintained after repeated use is due to the fact that the particular combination of fatty acids and branched chain saturated acid prevents phase separation during usage into substances that are not transparent and which would tend to give the surface of the soap a cloudy, dull, opaque appearance.

As used herein, the term "soap bar" is meant to define a solidified soap of any shape, i.e., round, rectangular, square, or any of the myriad shapes in which soaps can be molded.

It will be understood that it is intended to cover all changes and modifications of the disclosure of the invention herein chosen for the purpose of illustration which do not constitute departures from the spirit and scope of the invention.

What is claimed is:

1. A transparent soap bar comprising a C_{12}–C_{18} straight chain saturated fatty acid and a branched chain C_5–C_{18} saturated unsubstituted aliphatic monocarboxylic acid neutralized with a combination of an alkaline sodium compound and an alkanolamine, the sodium compound being present in an amount sufficient to neutralize at least about 40 percent of the acid, and an alkanolamine, said alkanolamines being selected from diethanolamine, triethanolamine and mixtures thereof, and the proportions, by weight, for each 100 parts by weight of the combined components are from about 25 to 75 parts fatty acids, from about 10 to 20 parts branched chain acid, and from about 15 to 45 parts of alkanolamine, said amount of alkanolamine being in excess of the amount required to neutralize said acids.

2. The soap of claim **1** wherein the neutralized admixture includes from about 5–10 parts of each 100 parts by weight of the combined components of a polybasic branched chain saturated acid selected from the group consisting of C_{36} aliphatic dibasic acids and C_{54} trimer acids containing alkyl side chains and mixtures thereof.

3. The transparent soap bar of claim **1** in which the sodium compound is present in an amount sufficient to neutralize from about 40–80 percent of the acid.

4. The soap of claim **3** including a polybasic branched chain saturated acid selected from the group consisting of C_{36} aliphatic dibasic acids and C_{54} trimer acids containing alkyl side chains and mixture thereof, substituted for not more than 50 percent by weight of the branched chain C_5–C_{18} saturated aliphatic monocarboxylic acid.

5. The soap of claim **3** wherein the fatty acids are a mixture of stearic, palmitic, myristic, and lauric acids, the branched chain acid is c_{10} trialkyl acetic acids, the sodium compound is sodium hydroxide, and the alkanolamine is triethanolamine.

* * * * *