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(54) IMPROVEMENTS RELATING TO SOAP BARS

VERBESSERUNGEN VON SEIFENSTÜCKEN

PERFECTIONNEMENTS APPORTES AUX SAVONNETTES

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Description

Field of the Invention

The present invention relates to improved soap bars and a process for the manufacture of said bars.

In the context of the present invention the term 'bars' is intended to mean generally solid bodies whether in the form of a bar, tablet, stick, block or other three-dimensional shape. Moreover, the term 'soap bars' relates to bars comprising fatty acid soaps or blends of fatty acid soaps with one or more synthetic detergents.

Background to the Invention

For very many years soap bars have been manufactured from fats by conversion of triglyceride components of fats into fatty acid salts and the formation of these 'soaps' into bars. A general review is to be found in Woollatt, 'The Manufacture of Soaps, Other Detergents and Glycerine', John Wiley & Sons, 1985.

In general the longer chain fatty acid soaps, particularly the less expensive C_{16} and C_{18} soaps (as obtained from tallow and palm oils) provide structure in the finished soap bars and prevent or retard disintegration of the soap bar on exposure to water. The more expensive, shorter chain, lauric fat-derived, (i.e. lauric acid salts) and other soluble soaps (typically as obtained from coconut and palm kernel oil) contribute to the lathering properties of the overall composition.

A general problem in the formulation of bar soaps has been that of finding a balance between providing structure (generally obtained from the cheaper tallow/palm component) and maintaining lathering properties (generally obtained from the more costly coconut oil component) ata practical overall cost. In typical commercial formulations, soap bars contain from 90-50% fatty acid soaps obtained from tallow (i.e. non-lauric fats) and 10-50% of fatty acid soaps obtained from coconut (i.e. lauric fats). In particular, in countries where tallow is acceptable to consumers, most commercial soap formulations comprise 80% tallow and 20% coconut oil. In countries where tallow is unacceptable other non-lauric oils and fats, such as palm oil, replace tallow.

In addition to fatty acid soaps *per se,* toilet soap bars can contain free fatty acid. The addition of free fatty acid is known as 'superfatting' and superfatting at a 5-10% free fatty acid level is known to give a copious, creamy lather. Other superfatting agents (see Woollatt, cit. ultra, page 267) include citric and other acids which function by promoting the formation of free fatty acids in the fat blend. A known disadvantage of superfatted products in bar form is a reduction in the physical stability of the bar, often revealed by an increased 'mushing' on prolonged exposure to water.

The conventional soap making process as applied to the manufacture of toilet soaps is well documented in the literature. In outline the process is as follows. In conventional 'wet' soap making, fats, i.e. tallow and coconut oil blends, are saponified in the presence of an alkali (typically NaOH) to yield fatty acids as alkaline soaps and glycerol. The glycerol is extracted with brine to give a dilute fatty acid soap solution containing around 70% soap and 30% aqueous phase. This soap solution is dried, typically by heating in heat exchangers to circa 130°C and drying under vacuum, to a water content of around 12%, and finished by milling, plodding and stamping into bars.

A drawback of compositions containing fatty acid soap is *harshness,* a property which is determined by a number of tests as will be elaborated upon hereafter. Known solutions to the problem of harshness include reduction of the level of soap present and replacement of the balance of the composition by so-called co-active surfactants. Megson et al, US 3576749 suggests that superfatting of toilet soap bars, as described above, improves mildness but the improvement is not considered as significant as that obtained by the use of co-actives. As with superfatting agents, a recognised problem engendered by the presence of co-actives is a loss of product structure in the resulting soap bars.

GB 2001098 (Colgate-Palmolive: 1978) discloses that superfatted soap bars can advantageously be prepared from compositions comprising predominantly sodium soap of the higher fatty acids and minor proportions of superfatting higher fatty acids, water and up to 4%, preferably less, high molecular weight polyethylene glycol polymer. The advantage of such a composition is said to be that the bars give a rich and creamy lather but are firm and resistant to cracking.

Brief Description of the Invention

We have determined that soap bars comprising at least 5% of a relatively low molecular weight polyalkylene glycol and fatty acid in a ratio of 1:3 to 3:1 exhibit surprisingly improved properties compared with bars having a equivalent coconut based soap content.

In particular, the presence of both polyalkylene glycol and fatty acid significantly increases both lather volume and creaminess, while maintaining acceptable mush and wear rates. Moreover, it is believed that certain processing difficulties associated with the presence of high molecular weight polyalkylene glycols are avoided.

Detailed Description of the Invention

Accordingly, the present invention provides a soap bar comprising:

a) 44-86.5%wt fatty acid soap;

b) 5-30%wt polyalkylene glycol;

c) 2.5-20%wt C_6-C_{22} fatty acid; and

d) 6-20%wt water

wherein the ratio of polyalkylene glycol to C_6-C_{22} fatty acid is in the range 1:3 to 3:1 and the polyalkylene glycol has a molekular weight below 100000 Dalton.

It is believed that bars falling within the above-mentioned formulation space have improved properties as regards mildness and skin feel. Further detail regarding the preferred levels and nature of the components is given below.

Fatty Acid Soaps

Fatty acid soaps at a level of 44-86.5%wt on product are an essential component of the present invention.

Preferably the average chain length of the fatty acid soaps falls into the range C_{12}-C_{22}. Sources of such fatty acids include animal fats/fatty acids, e.g. tallow and lard and the fatty acid derived therefrom, and also vegetable derived oils, particularly fats/fatty acids rich in palmitic and stearic acid such as palm oils and fractions thereof.

Where fatty acids are derived from oil-sources yielding fatty acids with a high degree of unsaturation, such as soya bean oil, sunflower oil, rice bran oil, linseed oil, rapeseed oils, ground nut oil, marine oils and the like, the oil stocks are preferably hardened or fractionated to yield partially or fully hardened fatty acid mixtures and or stearines.

Preferably, the bulk of the fats and fatty acids are derived from tallow except where nut-oil or other vegetable substitutes are employed for cultural reasons.

It is preferred, for reasons of economy, that the compositions of the present invention comprise 10-50% of lauric soaps, i.e. those having an average chain length of less than C_{16}. The most preferable fat blends comprise around 80% tallow and or palm oil and around 20% coconut oil.

In preferred embodiments of the invention the iodine value of the non-lauric soaps ranges from 10 to 55, and is more preferably 45 to 55.

While single oils or rather fatty acid soaps derived therefrom, may be employed as components of the formulations according to the invention, the use of mixtures or two or more oils and/or fatty acid compositions is not hereby excluded and, in practice, will be more commonplace.

Preferred soap levels on product fall in the range 50-80%wt on product, more preferably 55-70%.

Polyalkylene Glycol

Polyalkylene glycol, a polymer, at a level of 5-30%wt on product is an essential component of the compositions according to the present invention.

Preferably, the polyalkylene glycol is polyethylene glycol (PEG).

Lower levels of said polymer do not give the mildness/skinfeel benefit of the present invention, whereas at higher levels of polymer the processability of the product is deleteriously influenced. The preferred level of polymer is about 7.5-25%, most preferably 9-20% on product.

Typically, the PEG has a molecular weight below 100000 Dalton.

Preferably, the polyethylene glycol has a molecular weight in the range of 100-10000 Dalton, and is preferably 400-5000 Dalton. The preferred PEG's are miscible with water. PEG's with molecular weights above 10000 are markedly less water soluble and form increasingly viscous liquids above their melting points. This leads to processing difficulties. While it is envisaged that products can be prepared by dry mixing of high molecular weight PEG and a dry soap base, this would not give the molecular-level mixing believed necessary to achieve the required properties. An advantage of the low molecular weight PEG's is that they can be added as melted liquids or as low viscosity aqueous solutions. Addition of the PEG can occur at any stage in the soap making process, including addition to the dried soap or to the wet soap prior to drying.

Superfatting Agent

Fatty acid, at a level 2.5-20%wt on product, is an essential component of the compositions according to the present invention.

This level of free fatty acids can be obtained by the addition of free fatty acids per se or by the addition of a non-fatty acid superfatting agent which protonates a portion of the fatty acid soaps present to form the free fatty acid.

Suitable fatty acid superfatting agents include tallow, coconut, palm and palm-kernel fatty acids. Other fatty acids can be employed although the low melting point fatty acids, particularly the laurics, are preferred for ease of processing. Preferred levels of fatty acid are 5-15%, most preferably around 10% on product.

As is noted above, the free fatty acids can be added as such or generated *in situ* by the addition of non-fatty acid superfatting agents, such as inorganic or organic acids, preferably citric acid.

In addition to the superfatting agents, formulations according to the present invention can comprise one or more plasticisers, preferably selected from the group comprising fatty alcohols, paraffin waxes, glycerol, monoglycerides and mixtures thereof.

Synthetic Actives

In particular embodiments of the present invention the composition further comprises at least one synthetic anionic active at a level of not more than 20%wt, preferably at a level of not more than 10%wt, on product.

Preferably the synthetic anionic is selected from the group comprising:- alkyl sulphates, alkyl ether sulphates, alpha-olefin sulphonates, fatty isethionates, alkyl glyceryl ether sulphonates, mono-alkyl glyceryl sulphates, alkyl sarcosinates, alkyl taurides, alkyl sulphosuccinates, alkyl phosphates, and mixtures thereof. Preferred amongst the anionic actives are sodium lauryl ether sulphate (SLES), alpha-olefin sulphonates and sodium fatty isethionates. Sodium lauryl ether sulphate (SLES) and sodium fatty isethionates are particularly preferred.

In certain embodiments of the invention, compositions will further comprise a synergistic mildness active.

Preferably, the synergistic mildness active is selected from the group consisting of nonionic surfactants, amphoteric surfactants and mixtures thereof. The synergistic mildness active should be present at a level of at least 5%wt of the total active level. Particularly useful compositions comprise 5-25%wt, preferably 8-20%wt, more preferably 9-18%wt of synergistic mildness active on total actives.

Suitable nonionic surfactants include:- polyethoxylated alcohols, polyethoxylated alkyl phenols, alkyl polyglycosides, sorbitan esters, polysorbates, alkanolamides, poloxamers, and mixtures thereof. Preferred amongst the nonionic surfactants are polyethoxylated alcohols, particularly alkyl ethoxylates. The preferred alkyl ethoxylates have an average alkyl chain length of 10-25 carbons and an average ethoxylate content of 3-250 units.

Suitable amphoteric surfactants include:- amine oxides, aminimides, betaines, amido betaines and sulphobetaines, and mixtures thereof. Coco-amido-propyl betaines and tegobetaines are particularly preferred due to their low potential nitrosamine-precursor content.

Water Content

In embodiments of the present invention the total water content of the soap bar ranges from 6 to 20%wt of the soap bar.

Preferably the water content falls into the range 8-17%wt, and is most preferably 9-15%wt. The most preferred level of water in the final bar is a normal water content for soap bars (around 12% of the bar) hence conventional driers can be used to achieve this level.

Electrolyte Content

The electrolyte content of the bars can vary. In practice the electrolyte level will lie between 0 and 1.5% on product. Some or all of this electrolyte can be residue from the saponification processes typically employed in soap making, as is known in the art. It is also known that the level of electrolyte can have some slight influence on the eventual hardness of the product. This variation modifies the hardness of the soap bars and can be used to control the final hardness within production limits. It is preferred that the electrolyte content lies between 0.2-1.5wt% on product.

The preferred electrolyte is sodium chloride at a level of 0.2-0.8%. Other electrolytes can be employed either alone or in admixture. Amongst the alternative preferred electrolytes are sodium sulphate and sodium carbonate.

Minors

In addition to the essential and optional ingredients mentioned above, compositions according to the present in-

vention may comprise one or more of the following optional ingredients: preservatives, perfumes, colours, opacifiers and optical brighteners, moisturisers, emollients, germicides and other medicinal ingredients.

Typical preservatives include substances which negate or reduce the adverse catalytic effects of heavy metals, particularly iron and copper. These preferably comprise organic sequestrants, such as EDTA or NTA. However it is known that high levels of EDTA can form coloured complexes with iron and it is therefore commonplace to use EHDP (ethane-1-hydroxy-1,1-diphosphonic acid) in admixture with EDTA. Preferred levels of preservative are generally in the range 0.01-0.1%wt on product.

Typical opacifiers include titanium dioxide, preferably at levels of around 0.2-0.4%wt on product.

Typical emollient/moisturising ingredients are selected from the group comprising stearyl alcohol, glyceryl monolaurate, glyceryl monoricinoleate, glyceryl monostearate, propane-1.2-diol, butane-1.3 diol, docosan-1.2-diol, mink oil, cetyl alcohol, isopropyl isostearate, stearic acid, isobutyl palmitate, isocetyl stearate, oleyl alcohol, isopropyl laurate, hexyl laurate, decyl oleate, octadecan-2-ol, isocetyl alcohol, eicosanyl alcohol, behenyl alcohol, cetyl palmitate, silicone oils such as dimethylpolysiloxane, di-n-butyl sebacate, isopropyl myristate, isopropyl palmitate, isopropyl stearate, butyl stearate, polyethylene glycol, triethylene glycol, lanolin, cocoa butter, corn oil, cotton seed oil, tallow, lard, olive oil, palm kernel oil, rapeseed oil, safflower seed oil, soybean oil, sunflower seed oil, olive oil, sesame seed oil, coconut oil, arachis oil, castor oil, acetylated lanolin alcohols, petroleum, mineral oil, butyl myristate, isostearic acid, palmitic acid, isopropyl linoleate, lauryl lactate, myristyl lactate, decyl oleate, myristyl myristate and mixtures thereof.

A preferred electrolyte which may be added to compositions according to the present invention is a simple sodium isethionate, preferably unsubstituted. This may be present as 0.1 to 50% of the composition, preferably 0.5% to 25%, more preferably 2% to about 15% by weight.

In order that the present invention can be better understood it will be illustrated hereafter by way of non-limiting examples.

EXAMPLES

Examples 1 to 7

The following materials were used in the preparation of products according to the present invention with formulations as given in Table 1 below:

TS: Tallow fatty acid soaps having an iodine value of 46. (made in house), quantities quoted as tallow:coconut ratio,

CS: Unhardened coconut fatty acid soap: quantities quoted as tallow:coconut ratio,

CA: Coconut fatty acid; superfatting agent: addition quoted on total fatty matter,

ST: Stearic acid, superfatting agent: addition quoted on total fatty matter,

PA: Polyethylene glycol, mol. wt. 600: addition quoted on total fatty matter,

PB: Polyethylene glycol, mol. wt. 4000: addition quoted on total fatty matter.

Compositions as given in Table 1 were prepared as follows:

a) a neat soap was prepared comprising tallow soaps (TS) and coconut soaps (CS), at a temperature of 85°C,

b) the product of step (a) was combined with the PEG (PA or PB) and the superfatting agents (CA or ST),

c) the product of step (b) was dried, and perfume and opacifiers added using a conventional ribbon mixer,

d) the product of step (c) was milled, plodded and stamped into bars using conventional equipment.

Alternatively, products may be prepared by adding a mixture of PEG (PA or PB) and superfatting agents (CA or ST) to dried soap chips in a suitable mixer eg. a mill or Z-blade mixer.

Products were assessed as regards lather volume (both measured and estimated), creaminess (estimated), mush and wear.

Lather volume (LVM) was measured by a handwash method which closely approximates normal consumer habit. The test involves the use of 20 untrained volunteers. Each volunteer wears a pair of surgical gloves and lathers the

bar in a still body of water at a temperature of 30°C. The volume of the lather produced is measured by submersion of the panellists hands under an inverted, calibrated collecting funnel.

Lather volume (LVE) and creaminess (CR) were also estimated in terms of relative magnitude. The figures quoted represent an ordering of increasing magnitude with higher scores.

Mush was determined by immersing portions of a weighed bar in distilled water at 20°C for two hours and the increase in weight noted. The 'mush value' is the increase in weight per 50 cm^2 of surface mushed.

Wear was determined as the percentage loss of weight of the bar as a result of a controlled wash-down procedure. Panellists wash down pre-weighed bars using a prescribed action, each bar being washed by every panellist each day for four days. After this time the bars are allowed to dry out for 24 hours and are then weighed again. The difference in weight is expressed as a percentage wear-rate.

TABLE 1

Example	1	2	3	4	5	6	7
TS	80	80	80	80	80	80	80
CS	20	20	20	20	20	20	20
CA	-	-	7.5%	-	7.5%	-	5.0%
ST	-	-	-	-	-	7.5%	-
PA	-	10%	10%	-	-	-	-
PB	-	-	-	10%	10%	10%	-
Perfume	1.0	1.0	1.0	1.0	1.0	1.0	1.0 (%)
Water	12	12.5	13.2	12.8	11.8	11	10 (%)
%Wear	23.0	34.0	27.8	29.1	21.4	17.9	21.3
Mush	9.2	17.0	13.0	12.1	11.1	12.4	12.7
LVM	33.0	35.0	51.2	33.0	48.1	41.2	30.1
LVE	0.87	0.93	1.23	0.87	1.16	0.98	0.87
CR	0.96	0.97	1.10	0.93	1.02	-	0.97

Example 1 is a comparative example using a conventional 80/20 soap.

From the above results it can be seen that superfatting per se (example 7) has no significant effect on creaminess, lather volume or wear. Mush is increased as would be expected.

Examples 2 and 4 show the addition of PEG to conventional 80/20 soap. Wear rates are increased, and there is no significant change in the lather volume or creaminess.

Examples 3, 5 and 6 show the benefits of adding both PEG and fatty acid as a superfatting agent. In each case, the lather volume and creaminess have been significantly increased, while maintaining acceptable mush and wear rates.

Examples 8 to 19

The following materials were used in the preparation of products according to the present invention with formulations as given in Tables 2 to 4.

Soap: A 80/20 tallow/unhardened coconut fatty acid soap.
CA: Coconut fatty acid; superfatting agent.
PEG: Polyethylene with molecular weight given in Tables.

Compositions in Tables 2 to 4 were prepared as follows:

a) a neat soap was prepared comprising tallow and coconut soaps at a temperature of 85°C;
b) the PEG and CA was added to the product of step (a) and the mixture dried either by air drying (Air) or via a Mazzoni vacuum drier (M).
(c) the product of step (b) was then mixed with minors and the resulting product milled, plodded and stamped.

The products in Table 2 were assessed for their processability. Processability was assessed by the ability of the processing equipment to satisfactorily transport the product from the milling through to the stamping equipment.

In the tables:-

"DB" indicates that there was slight die blockage of the stamper which could be overcome by the use of lubricant.
"OK" with respect to plodding indicates the hardness of billets was acceptable.

Table 2

Example no. Component	8	9	10	11
	wt%			
Soap	70.1	68.7	70.4	75.7
CA	7.6	7.3	7.6	5.2
PEG 600	10.0	-	-	-
PEG 4000	-	9.9	-	-
PEG 10000	-	-	10.0	-
PEG 100000	-	-	-	5.2
Salt	0.5	0.5	0.5	0.5
Perfume	1.0	1.0	1.0	1.0
Water & minors	←	to 100%	→	
PEG: CA ratio	1.3:1	1.4:1	1.3:1	1:1
Process route	M	Air	M	Air
Milling	OK	OK	OK	No
Plodding	OK	OK	OK	-
Stamping	DB	OK	OK	-

The results demonstrate that product prepared with a high molecular weight PEG was not millable.
In examples 12-14 the effect of the level of PEG on processing was assessed.

Table 3

Example no. Component	12	13	14
	wt%		
Soap	76.0	76.4	71.8
CA	5.2	5.3	5.0
PEG 600	5.2	-	-
PEG 4000	-	5.3	10.4
Salt	0.5	0.6	0.5
Water/Perfume/minors	←	to 100%	→
PEG: CA ratio	1:1	1:1	2:1
Process route:	Air	Air	Air
Milling	OK	OK	OK
Plodding	OK	OK	OK
Stamping	OK	OK	OK

Processing of the compositions of each example was found to be acceptable.
In examples 15 to 19 the effect of the level of CA on processing was examined.

Table 4

Example no. Component	15	16	17	18	19
	wt%				
Soap	75.2	71.8	70.2	66.5	70.4
PEG 4000	9.8	10.4	10.2	9.5	10.0
CA	0	5.0	7.5	9.5	10.0
Salt	0.5	0.5	0.5	0.5	0.5
Water/Perfume & minors	←	to 100%	→		
PEG: CA ratio	-	2.1:1	1.4:1	1:1	1:1
Process route:	Air	Air	Air	M	M
Milling	OK	OK	OK	OK	OK
Plodding	Cracked	OK	OK	OK	OK
Stamping	Cracked	OK	OK	DB	DB

Whereas processability of examples 16 and 17 was acceptable, the compositions of examples 18 and 19 were found to suffer from both softness and stickiness problems which resulted in die blocking in the stamper. The problem was, however, overcome by the use of a lubricant on the faces of the stamper.

Example 15, which contained no fatty acid suffered from severe processing problems, especially at the plodding and stamping stages with the resulting bars showing severe cracking and surface damage even when lubricant was used on the die surfaces of the stamper.

Claims

1. A soap bar comprising:

a) 44 to 86.5%wt fatty acid soap;
b) 5 to 30%wt polyalkylene glycol;
c) 2.5 to 20%wt C_6 to C_{22} fatty acid; and
d) 6 to 20%wt water and

wherein the weight ratio of polyalkylene glycol to C_6 to C_{22} fatty acid is in the range 1:3 to 3:1 and the polyalkylene glycol has a molecular weight below 100000 Dalton.

2. A soap bar according to claim 1 wherein the polyalkylene glycol is polyethylene glycol.

3. A soap bar according to claim 1 wherein the fatty acid soap comprises 10 to 50% of lauric soaps.

4. A soap bar according to claim 1 wherein the iodine value of the non-lauric soaps is in the range 10 to 55.

5. A soap bar according to claim 1 wherein the polyalkylene glycol is present at a level from 7.5 to 25%wt.

6. A soap bar according to claim 1 further comprising a synthetic anionic active at level of not more than 20% wt.

7. A soap bar according to claim 1 further comprising a synergistic mildness active.

8. A soap bar according to claim 1 further comprising electrolyte at a level of 0.2 to 1.5 wt%.

9. A soap bar according to claim 1 wherein the free fatty acid content is obtained by the addition of free fatty acid per se or by formation of free fatty acid in-situ.

Patentansprüche

1. Seifenriegel, umfassend:

a) 44-86,5 Gew.-% Fettsäureseife;
b) 5-30 Gew.-% Polyalkylenglycol;
c) 2,5-20 Gew.-% C_6-C_{22}-Fettsäure und
d) 6-20 Gew.-% Wasser und

wobei das Gewichtsverhältnis von Polyalkylenglycol zu C_6-C_{22}-Fettsäure im Bereich 1:3 bis 3:1 liegt und das Polyalkylenglycol ein Molekulargewicht unterhalb 100 000 Dalton aufweist.

2. Seifenriegel nach Anspruch 1, wobei das Polyalkylenglycol Polyethylenglycol ist.

3. Seifenriegel nach Anspruch 1, wobei die Fettsäureseife 10 bis 50% Laurinseifen umfaßt.

4. Seifenriegel nach Anspruch 1, wobei der Iodwert der Nicht-Laurinseifen im Bereich 10 bis 55 liegt.

5. Seifenriegel nach Anspruch 1, wobei das Polyalkylenglycol in einem Anteil von 7,5 bis 25 Gew.-% vorliegt.

6. Seifenriegel nach Anspruch 1, außerdem umfassend einen synthetischen anionischen Aktivstoff mit einem Anteil von nicht mehr als 20 Gew.-%.

7. Seifenriegel nach Anspruch 1, außerdem umfassend einen synergistischen, Mildheit erzeugenden Aktivstoff.

8. Seifenriegel nach Anspruch 1, außerdem umfassend Elektrolyt mit einem Anteil von 0,2 bis 1,5 Gew.-%.

9. Seifenriegel nach Anspruch 1, wobei der freie Fettsäureanteil durch die Zugabe von freier Fettsäure an sich oder durch Bilden von freier Fettsäure in situ erhalten wird.

Revendications

1. Pain de savon comprenant :

   a) 44 à 86,5 % en poids d'un savon d'acides gras ;
   b) 5 à 30 % en poids d'un polyalkylèneglycol ;
   c) 2,5 à 20 % en poids d'un acide gras en C_6 à C_{22} ; et
   d) 6 à 20 % en poids d'eau, et

   où le rapport en poids du polyalkylèneglycol à l'acide gras en C_6 à C_{22} est compris dans l'intervalle de 1:3 à 3:1, et le polyalkylèneglycol a une masse moléculaire inférieure à 100 000.

2. Pain de savon selon la revendication 1, dans lequel le polyalkylèneglycol est le polyéthylèneglycol.

3. Pain de savon selon la revendication 1, dans lequel le savon d'acides gras comprend de 10 à 50 % de savons lauriques.

4. Pain de savon selon la revendication 1, dans lequel l'indice d'iode des savons non lauriques est compris dans l'intervalle de 10 à 55.

5. Pain de savon selon la revendication 1, dans lequel le polyalkylèneglycol est présent en une quantité de 7,5 à 25 % en poids.

6. Pain de savon selon la revendication 1, qui comprend en outre un tensioactif anionique synthétique en une quantité non supérieure à 20 % en poids.

7. Pain de savon selon la revendication 1, qui comprend en outre un tensioactif synergique assurant la douceur.

8. Pain de savon selon la revendication 1, qui comprend en outre un électrolyte en une quantité de 0,2 à 1,5 % en poids.

9. Pain de savon selon la revendication 1, dans lequel la teneur en acides gras libres est obtenue par addition de l'acide gras libre en tant que tel, ou par formation de l'acide gras libre in situ.