

DESCRIPTION

MICROEMULSION-CONTAINING SOLID SOAP COMPOSITION

5. TECHNICAL FIELD

[0001]

The present invention relates to solid soap compositions, production methods thereof, and foam-quality improvers for solid soap compositions.

10

BACKGROUND ART

[0002]

Solid soap compositions mainly containing salts of fatty acids are widely used as skin cleansing compositions for facial skin and body skin, for example. It is important that skin cleansing compositions are excellent not only in cleansing power but also in feel. Thus, good foam quality and good durability of foam (foam durability) are required. For example, in the case of foam that quickly disappears due to poor durability, the feel is poor because the foam cannot maintain its elasticity during cleansing, and the foam fails to provide satisfying cleansing feeling. In addition, when the foam quickly disappears, the skin is damaged by skin-to-skin friction (e.g., friction between hands and face). Thus, good foam durability is preferred. As for the foam quality, foam that is elastic and viscous is considered to be good foam. Solid soap compositions have also been studied for improving foam quality. For example, Patent Literature 1 discloses a cleansing composition containing a fatty acid soap part and granules that contain a water-soluble polymer having a foam quality improving effect.

30

[0003]

Microemulsions, which have a transparent or semi-transparent appearance, are stable without separation, and can contain an aqueous component and an oily component

35

simultaneously. Because of these properties, microemulsions are used in the preparation of cosmetic products and liquid or gel-like cleansing compositions. Patent Literature 2 discloses a cosmetic cleansing composition containing a
5 microemulsion that contains alkyl (oligo)glycoside and the like, an anionic surfactant, and a cationic polymer, for example.

CITATION LIST

- Patent Literature
10 [0004]
Patent Literature 1: JP 2013-1860 A
Patent Literature 2: JP 2014-520770 T

SUMMARY OF INVENTION

15 - Technical Problem
[0005]

The cleansing composition of Patent Literature 1 contains an aqueous polymer for improving foam quality. Yet, Patent Literature 1 is silent about microemulsions. Patent
20 Literature 2 nowhere examines improvement of foam quality or foam durability of a solid soap composition. A solid soap composition containing a microemulsion is unknown.
[0006]

The present invention aims to provide a solid soap
25 composition having good foam quality and good foam durability, and a method for producing the same.

- Solution to Problem
[0007]

30 The present inventors keenly conducted studies to solve the problems described above. As a result, they found that it is possible to enhance (improve) foam quality and foam durability by adding a microemulsion to a solid soap composition containing a soap base. It is a surprising finding that the
35 microemulsion can improve the foam quality and the foam

durability of the solid soap composition.

[0008]

The present invention relates to the following solid soap composition.

5 The solid soap composition of the present invention contains (A) a soap base and (B) a microemulsion containing the following components (b1) to (b3):

(b1) at least one surfactant selected from the group consisting of nonionic surfactants and anionic surfactants,

10 (b2) at least one oily component, and

(b3) water.

Owing to the presence of the microemulsion with the soap base, the solid soap composition of the present invention can form foam having elasticity, viscosity, and excellent quality with fine texture at the time of cleansing. In addition, since the foam has good durability, the foam can maintain its elasticity during cleansing, and provides excellent feel. The solid soap composition can also provide good cleansing feeling. Herein, the microemulsion containing the components (b1) to (b3) is also simply referred to as a "microemulsion".

20

[0009]

The amount of the microemulsion (B) in the solid soap composition is preferably 0.15 to 5% by mass.

25 Adding the microemulsion in the amount described above to the solid soap composition enhances the foam quality of the solid soap composition, and the foam thus has better elasticity and better viscosity. The foam also has better durability.

Herein, the amounts (% by mass) of the components of the solid soap composition (the soap base (A), the microemulsion (B), and additional components that are added if desired) are the amounts in 100% by mass of the solid soap composition, unless otherwise stated.

30

[0010]

In the solid soap composition of the present invention, preferably, the microemulsion (B) further contains (b4) a C1-C4

35

monohydric alcohol and/or (b5) a polyhydric alcohol.

The solid soap composition of the present invention is preferably in solid, sheet, powder, or granulated form.

[0011]

5 According to one aspect of the present invention, preferably, the microemulsion is an oil-in-water type (O/W type) microemulsion, and the nonionic surfactant is at least one selected from the group consisting of polyoxyethylene alkyl ethers, polyoxyethylene polyoxypropylene alkyl ethers,
10 polyoxyethylene sorbitan fatty acid esters, polyoxyethylene glycerol fatty acid esters, polyoxyethylene hydrogenated castor oil, polyglycerol fatty acid esters, and polyether-modified silicones, each having an HLB of 10 to 20.

 In one aspect, preferably, the microemulsion is an
15 oil-in-water type (O/W type) microemulsion, and the anionic surfactant is at least one selected from the group consisting of polyoxyethylene alkyl ether phosphates, N-acyl glutamates, and polyoxyethylene alkyl ether phosphoric acids or salts thereof.

20 In one aspect, preferably, the microemulsion is a water-in-oil type (W/O type) microemulsion.

 In one aspect, preferably, the nonionic surfactant is at least one selected from the group consisting of polyoxyethylene di-fatty acid esters, monoglycerol mono-fatty acid esters,
25 monoglycerol di-fatty acid esters, diglycerol mono-fatty acid esters, and polyether-modified silicones, each having an HLB of 1 to 7.

[0012]

 A method for producing a solid soap composition of the
30 present invention includes a step of preparing a soap base composition by mixing at least (A) a soap base and (B) a microemulsion containing the following components (b1) to (b3): (b1) at least one surfactant selected from the group consisting of nonionic surfactants and anionic surfactants,
35 (b2) at least one oily component, and

(b3) water.

The production method of the present invention can produce the above-described solid soap composition of the present invention.

5 In the production method of the present invention, the amount of the microemulsion (B) in the solid soap composition is preferably 0.15 to 5% by mass.

[0013]

A foam-quality improver for a solid soap composition of
10 the present invention contains, as an active ingredient, a microemulsion containing the following components (b1) to (b3):
(b1) at least one surfactant selected from the group consisting of nonionic surfactants and anionic surfactants,
(b2) at least one oily component, and
15 (b3) water.

The foam-quality improver for a solid soap composition of the present invention, when added to a solid soap composition, for example, can improve the foam quality of the solid soap composition. The foam-quality improver can also improve the
20 foam durability of the solid soap composition.

The present invention also encompasses use of a microemulsion for improving foam quality of a solid soap composition, the microemulsion containing the components (b1) to (b3).

25

- Advantageous Effects of Invention

[0014]

The present invention can provide a solid soap composition having good foam quality and good foam durability,
30 and a method for producing the same.

DESCRIPTION OF EMBODIMENTS

[0015]

The present invention is specifically described below,
35 but the present invention is not limited to the following

embodiments and can be adequately modified without departing from the gist of the present invention.

[0016]

5 The solid soap composition of the present invention contains (A) a soap base and a microemulsion (B) containing the following components (b1) to (b3):

(b1) at least one surfactant selected from the group consisting of nonionic surfactants and anionic surfactants,

(b2) at least one oily component, and

10 (b3) water.

The solid soap composition of the present invention has good foam quality and good foam durability because it contains the soap base and the microemulsion. Adding the microemulsion improves the foam quality and foam durability of the solid soap composition. The solid soap composition of the present invention can form foam having elasticity, viscosity, and excellent quality with fine texture at the time of cleansing. In addition, since the foam has good durability, the foam can maintain its elasticity during cleansing. Owing to these properties, at the time of skin cleansing, for example, the foam exhibits good texture and good durability, thus providing excellent feel. The solid soap composition can also provide good cleansing feeling.

[0017]

25 <(A) Soap base>

The soap base in the present invention is not particularly limited as long as it is a soap base for general solid soap compositions. Preferred examples include alkali salts of fatty acids. Such alkali salts of fatty acids may be used alone or in combination of two or more thereof. A fatty acid to form an alkali salt of a fatty acid is preferably a C8-C22 fatty acid. The soap base in the present invention is preferably an alkali salt of a C8-C22 fatty acid, and one or more such alkali salts of fatty acids may be used. The carbon number of the fatty acid is more preferably 10 to 20, still more preferably 12 to 18.

The fatty acid may be linear or branched. The fatty acid may be saturated or unsaturated. Examples of the fatty acid include saturated fatty acids such as lauric acid, myristic acid, palmitic acid, stearic acid, and isostearic acid; unsaturated fatty acids such as oleic acid, linoleic acid, linolenic acid, and ricinoleic acid; and mixtures thereof such as coconut oil fatty acid, palm oil fatty acid, palm kernel fatty acid, tallow fatty acid, hardened tallow fatty acid, and lard fatty acid. In particular, lauric acid, myristic acid, palmitic acid, stearic acid, palm kernel fatty acid, and the like are preferred.

[0018]

An alkali to form an alkali salt of a fatty acid may be an alkali metal such as sodium or potassium, or an organic amine such as ethanolamine. In particular, sodium or potassium is more preferred, and sodium is still more preferred. The amount of a sodium salt of a fatty acid in 100% by mass of an alkali salt of a fatty acid for use as the soap base is preferably 50 to 100% by mass, more preferably 55 to 100% by mass.

The alkali salt of a fatty acid in the present invention is preferably a sodium salt, a potassium salt, or a triethanolamine salt of a saturated fatty acid such as lauric acid, myristic acid, palmitic acid, stearic acid, or isostearic acid. A salt such as a sodium salt or a potassium salt of lauric acid, myristic acid, or palmitic acid is more preferred, and a sodium salt of lauric acid, myristic acid, or palmitic acid is more preferred. These salts may be used alone or in combination of two or more thereof.

The alkali salt of a fatty acid for use as the soap base can be prepared using the fatty acid by a known method such as saponification or neutralization.

[0019]

<(B) Microemulsion>

The microemulsion in the present invention contains the following components (b1) to (b3):

(b1) at least one surfactant selected from the group consisting of nonionic surfactants and anionic surfactants,
(b2) at least one oily component, and
(b3) water.

5 [0020]

The microemulsion in the present invention may be an oil-in-water type (O/W type) microemulsion or a water-in-oil type (W/O type) microemulsion. An O/W type microemulsion and a W/O type microemulsion may be used in combination. In one
10 example, a microemulsion having a pH of 9 to 11 is preferred.

[0021]

<Oil-in-water type (O/W type) microemulsion>

An O/W type microemulsion has an aqueous external phase. The O/W type microemulsion preferably contains 0.1 to 20% by
15 mass of the component (b1), 0.01 to 10% by mass of the component (b2), and 50 to 99% by mass of the component (b3). In the present invention, the amount (% by mass) of each of the components (b1) to (b3) is the amount in 100% by mass of the microemulsion.

[0022]

20 In the case of the O/W type microemulsion, the nonionic surfactant in the component (b1) is preferably a nonionic surfactant having an HLB of 10 to 20. In the case of the O/W type microemulsion, the component (b1) is preferably at least one surfactant selected from the group consisting of anionic
25 surfactants and nonionic surfactants having an HLB of 10 to 20. These anionic surfactants and nonionic surfactant having an HLB of 10 to 20 may be used alone or in combination of two or more thereof. In the case of the O/W type microemulsion, the component (b1) preferably contains at least a nonionic
30 surfactant having an HLB of 10 to 20. The component (b1) is preferably a nonionic surfactant having an HLB of 10 to 20 or a combination of a nonionic surfactant having an HLB of 10 to 20 and an anionic surfactant. In the case of the O/W type microemulsion, the component (b1) preferably contains a
35 nonionic surfactant having an HLB of 10 to 20 in an amount of

80% by mass or more, more preferably 90% by mass or more. For example, the amount is preferably 80 to 100% by mass, more preferably 90 to 100% by mass. In one aspect, the upper limit of the amount of the nonionic surfactant having an HLB of 10 to 20 in the component (b1) may be 99.99% by mass or lower, 99.9% by mass or lower, or 99% by mass or lower. In one aspect, the amount of the anionic surfactant in the component (b1) is preferably 20% by mass or less, more preferably 10% by mass or less. The amount of the anionic surfactant when contained in the component (b1) is, for example, preferably 0.01% by mass or more, more preferably 0.1% by mass or more. In one example, the amount is preferably 0.01 to 20% by mass, more preferably 0.1 to 10% by mass.

In the present invention, the HLB (hydrophilic-lipophilic balance) is an HLB value calculated by the Griffin method.
[0023]

Examples of the nonionic surfactant having an HLB of 10 to 20 include polyoxyethylene alkyl ethers, polyoxyethylene alkyl phenyl ethers, polyoxyethylene polyoxypropylene alkyl ethers, polyoxyethylene fatty acid esters, polyoxyethylene sorbitan fatty acid esters, polyoxyethylene castor oil, polyoxyethylene hydrogenated castor oil, polyoxyethylene sorbitol tetra-fatty acid esters, polyglycerol fatty acid esters, sucrose fatty acid esters, alkyl (poly)glucoside, N-alkyl dimethylaminoxides, polyoxyethylene glycerol fatty acid esters, and polyether-modified silicones. These may be used alone or in combination of two or more thereof.

The nonionic surfactant in the component (b1) of the O/W type microemulsion is more preferably a nonionic surfactant having an HLB of 12 to 20.
[0024]

More preferred examples of the nonionic surfactant having an HLB of 10 to 20 include polyoxyethylene alkyl ethers, polyoxyethylene polyoxypropylene alkyl ethers,

polyoxyethylene sorbitan fatty acid esters, polyoxyethylene glycerol fatty acid esters, polyoxyethylene hydrogenated castor oil, polyglycerol fatty acid esters, and polyether-modified silicones. These may be used alone or in combination of two or more thereof. Use of the O/W type microemulsion containing such a nonionic surfactant having an HLB of 10 to 20 is preferred because it further improves the foam quality and the foam durability of the solid soap composition. In particular, polyoxyethylene alkyl ethers, polyoxyethylene sorbitan fatty acid esters, polyoxyethylene glycerol fatty acid esters, polyoxyethylene hydrogenated castor oil, and the like are more preferred. Use of the O/W type microemulsion containing such a nonionic surfactant having an HLB of 10 to 20 is preferred because it improves effervescence and thus increases foaming speed and improves foamability. [0025]

The polyoxyethylene alkyl ethers are preferably those having a C8-C40 alkyl group in which the number average addition mole number of an oxyethylene group (hereinafter also referred to as "EO") is 10 to 50. Examples include polyoxyethylene octyl ether, polyoxyethylene lauryl ether, polyoxyethylene myristyl ether, polyoxyethylene palmityl ether, polyoxyethylene isostearyl ether, polyoxyethylene stearyl ether, polyoxyethylene oleyl ether, and polyoxyethylene cholesteryl ether. In particular, those having a C12-C40 alkyl group in which the number average addition mole number of EO is 10 to 30 or 15 to 30 are preferred. For example, polyoxyethylene cholesteryl ether is more preferred. [0026]

The polyoxyethylene alkyl phenyl ethers are preferably those having a C8-C22 alkyl group in which the number average addition mole number of EO is 10 to 50. Examples thereof include polyoxyethylene octylphenyl ether and polyoxyethylene nonylphenyl ether. In particular, those having a C12-C20 alkyl group in which the number average addition mole number of EO

is 15 to 30 are preferred.

[0027]

The polyoxyethylene polyoxypropylene alkyl ethers are preferably those having a C8-C22 alkyl group in which the number average addition mole number of EO is 10 to 50 (preferably 20 to 40) and the number average addition mole number of an oxypropylene group (hereinafter referred to as "PO") is 5 to 10. Examples include polyoxyethylene polyoxypropylene octyl ether, polyoxyethylene polyoxypropylene decyl ether, and polyoxyethylene polyoxypropylene decyl tetradecyl ether.

[0028]

The polyoxyethylene fatty acid esters are preferably those having a C8-C22 fatty acid in which the number average addition mole number of EO is 10 to 50. Examples include polyoxyethylene octanoate ester, polyoxyethylene laurate ester, polyoxyethylene myristate ester, polyoxyethylene palmitate ester, polyoxyethylene isostearate ester, polyoxyethylene stearate ester, and polyoxyethylene oleate ester. In particular, those having a C12-C20 fatty acid in which the number average addition mole number of EO is 10 to 30 are preferred. For example, polyoxyethylene oleyl ether and the like are more preferred.

[0029]

The polyoxyethylene sorbitan fatty acid esters are preferably those having a C8-C22 fatty acid in which the number average addition mole number of EO is 10 to 50. Examples include polyoxyethylene sorbitan octanoate ester, polyoxyethylene sorbitan laurate ester, polyoxyethylene sorbitan myristate ester, polyoxyethylene sorbitan palmitate ester, polyoxyethylene sorbitan isostearate ester, polyoxyethylene sorbitan stearate ester, and polyoxyethylene sorbitan oleate ester (also referred to as "polyoxyethylene sorbitan monooleate ester" or "polyoxyethylene sorbitan monooleate"). In particular, those having a C12-C20 fatty acid in which the number average addition mole number of EO is 10 to 30 are

preferred. For example, polyoxyethylene sorbitan monooleate ester (such as polyoxyethylene (20) sorbitan monooleate (Polysorbate 80)) and polyoxyethylene sorbitan monostearate ester (such as polyoxyethylene (20) sorbitan monostearate (Polysorbate 60)) are more preferred.

[0030]

The polyoxyethylene castor oil and the polyoxyethylene hydrogenated castor oil are preferably those in which the number average addition mole number of EO is 10 to 80, more preferably those in which the number average addition mole number of EO is 30 to 70.

The polyoxyethylene sorbitol tetra-fatty acid esters are preferably those having a C8-C22 fatty acid in which the number average addition mole number of EO is 10 to 50. Examples include polyoxyethylene sorbitol tetraoctanoate ester and polyoxyethylene sorbitol tetraoleate ester. In particular, those having a C12-C20 fatty acid in which the number average addition mole number of EO is 10 to 30 are preferred.

[0031]

The polyglycerol fatty acid esters are preferably those having a C12-C22 fatty acid. In one example, polyglycerol fatty acid esters having a glycerol polymerization degree of 5 to 12 can be mentioned. Examples of the polyglycerol fatty acid esters include decaglycerol monostearate. The sucrose fatty acid esters are preferably those having a C12-C22 fatty acid. Examples include sucrose stearate ester.

Examples of the alkyl (poly)glucosides include those having a C8-C22 alkyl group, such as decyl glucoside and lauryl glucoside. In one aspect, the microemulsion preferably contains no alkyl (poly)glucosides. The presence of an alkyl (poly)glucoside may cause yellowing over time, for example, in a pale solid soap composition.

[0032]

The polyoxyethylene glycerol fatty acid esters are preferably polyoxyethylene glycerol mono-fatty acid esters

having a C8-C22 fatty acid in which the number average addition mole number of EO is 10 to 50. Examples include polyoxyethylene glycerol monooctanoate ester, polyoxyethylene glycerol monolaurate ester, polyoxyethylene glycerol monomyristate ester, polyoxyethylene glycerol monopalmitate ester, polyoxyethylene glycerol monoisostearate ester (polyoxyethylene glyceryl isostearate), polyoxyethylene glycerol monostearate ester, and polyoxyethylene glycerol monooleate ester. In particular, those having a C12-C18 fatty acid in which the number average addition mole number of EO is 15 to 30 are preferred. For example, polyoxyethylene glycerol monoisostearate ester is preferred.

The polyether-modified silicones having an HLB of 10 to 20 are preferably those having, as the polyether group, a polyoxyethylene group in which the number average addition mole number of EO is 10 to 50. Examples include polyoxyethylene-methylpolysiloxane copolymers in which the number average addition mole number of EO is 10 to 50 (such as PEG-12 dimethicone).

[0033]

Examples of the anionic surfactant include salts of fatty acids, alkyl ether carboxylates, acyl lactates, N-acyl sarcosine salts, N-acyl glutamates, N-acyl methylalanine salts, N-acyl methyltaurine salts, alkane sulfonates, α -olefin sulfonates, α -sulfo-fatty acid methyl ester salts, alkyl sulfosuccinates, acyl isethionates, alkyl sulfuric acid ester salts, alkyl ether sulfuric acid ester salts, polyoxyethylene alkyl ether sulfates, fatty acid alkanolamide sulfuric acid ester salts, monoacylglycerol sulfuric acid ester salts, monoalkyl phosphates, polyoxyethylene alkyl ether phosphoric acids or salts thereof, and polyoxyethylene alkyl ether phosphates. These may be used alone or in combination of two or more thereof.

Examples of the salts include salts of alkali metals such as sodium and potassium; organic amine salts such as

ethanolamine. In particular, sodium salts and potassium salts are more preferred, and sodium salts are still more preferred.
[0034]

Among the anionic surfactants, polyoxyethylene alkyl
5 ether phosphates, N-acyl glutamates, and polyoxyethylene alkyl ether phosphoric acids or salts thereof are preferred. Polyoxyethylene alkyl ether phosphoric acids or salts thereof are more preferred.
[0035]

10 Examples of the salts of fatty acids include alkali salts of C8-C22 fatty acids and metal soaps.

Examples of the alkyl ether carboxylates include alkyl ether carboxylates in which the alkyl group has a carbon number of 8 to 22 and polyoxyethylene alkyl ether carboxylates in which
15 the alkyl group has a carbon number of 8 to 22.

The acyl lactates, N-acyl sarcosine salts, N-acyl glutamates, N-acyl methylalanine salts, N-acyl methyltaurine salts, acyl isethionates, and monoacylglycerol sulfuric acid ester salts are preferably those in which the acyl group has
20 a carbon number of 8 to 22, for example.
[0036]

The alkane sulfonates, α -olefin sulfonates, α -sulfo-fatty acid methyl ester salts, alkyl sulfosuccinates, alkyl sulfuric acid ester salts, alkyl ether sulfuric acid ester
25 salts, polyoxyethylene alkyl ether sulfates, fatty acid alkanolamide sulfuric acid ester salts, and monoalkyl phosphates are preferably those having a carbon number of 8 to 22, for example. The polyoxyethylene alkyl ether sulfates are preferably those in which the number average addition mole
30 number of EO is 5 to 50, for example.
[0037]

The polyoxyethylene alkyl ether phosphoric acids or salts thereof are, for example, preferably those having a C8-C22 alkyl group in which the number average addition mole number of EO
35 is 5 to 50, and are more preferably those having a C12-C20 alkyl

group in which the number average addition mole number of EO is 5 to 20. Examples include polyoxyethylene lauryl ether phosphoric acid, polyoxyethylene tridecyl ether phosphoric acid, polyoxyethylene myristyl ether phosphoric acid, polyoxyethylene pentadecyl ether phosphoric acid, and salts thereof. Dipolyoxyethylene (POE) (8) (C12-15) alkyl ether phosphoric acid or a salt thereof is also suitably used as one of the polyoxyethylene alkyl ether phosphoric acids or salts thereof.

10 [0038]

The polyoxyethylene alkyl ether phosphates are preferably those having a C8-C22 alkyl group in which the number average addition mole number of EO is 10 to 50. Examples include polyoxyethylene decyl ether phosphate and polyoxyethylene lauryl ether phosphate.

15 [0039]

The oily component used as the component (b2) is not particularly limited. For example, those generally used in cosmetic products can be suitably used. The oily component of the component (b2) is, for example, preferably at least one selected from the group consisting of vegetable oils, animal oils, ester oils, ether oils, higher fatty acids, silicone oils, essential oils, and hydrocarbon oils.

20 One or a combination of two or more oily components may be used.

25 [0040]

Examples of the vegetable oils include olive oil, argan oil, jojoba oil, linseed oil, camellia oil, sunflower oil, almond oil, rapeseed oil, sesame oil, soybean oil, peanut oil, avocado oil, grape seed oil, castor oil, and shea butter.

30 Examples of the animal oils include horse oil.

[0041]

Examples of the ester oils include octyldodecyl myristate, isopropyl palmitate, butyl stearate, myristyl myristate, isopropyl myristate, di-2-ethylhexyl adipate, diisopropyl

35

sebacate, neopentyl glycol dicaprate, triethylhexanoic acid and cetyl ethylhexanoate.

[0042]

5 Examples of the ether oils include dioctyl ether, cetyl dimethylbutyl ether, ethylene glycol octyl ether, ethylene glycol dioctyl ether, and glycerol monooleyl ether.

[0043]

Examples of the higher fatty acids include eicosanoic acid, isomyristic acid, and capric acid.

10 Examples of the silicone oils include dimethylpolysiloxane, cyclic dimethylpolysiloxane, methylphenylpolysiloxane, amino-modified silicones, epoxy-modified silicones, carboxy-modified silicones, alcohol-modified silicones, alkyl-modified silicones, polyether-modified silicones, and fluorine-modified silicones.

[0044]

Examples of the essential oils include orange oil and lavender oil.

20 Examples of the hydrocarbon oils include liquid paraffin, squalane, squalene, and n-hexadecane.

[0045]

25 In one aspect, the oily component as the component (b2) of the O/W type microemulsion is, for example, preferably one having a melting point of 60°C or lower, more preferably 50°C or lower.

30 In the case where the internal phase (oil phase) of the O/W type microemulsion contains a monohydric alcohol of the component (b4) (described later) and/or a polyhydric alcohol of the component (b5) (described later), it is preferred to select components that dissolve in alcohol to be used at a temperature equal to or lower than the boiling temperature of the alcohol. For example, in the case where the component (b4) is ethanol, and the component (b4) is contained in the internal phase of the O/W type microemulsion, an oily component having

35

a melting point of 78°C or lower is preferably used.

[0046]

The oily component to be added to the microemulsion can be suitably selected according to the performance and the like expected of the solid soap composition. In one aspect, the oily component as the component (b2) is preferably a vegetable oil, with argan oil, jojoba oil, or olive oil, for example, being more preferred. For example, use of argan oil or jojoba oil can improve the moisturizing effect of the solid soap composition. In addition, use of olive oil, for example, improves the cleansing effect of the solid soap composition for removal of makeup and sebum.

In the present invention, adding an oily component to the microemulsion can allow the oily component to impart its moisturizing effect and cleansing effect to the solid soap composition.

[0047]

The water for use as the component (b3) can be tap water, ion-exchanged water, distilled water, or the like. The ion-exchanged water or distilled water is preferred.

[0048]

In the case of the O/W type microemulsion, the amount of the component (b1) is more preferably 0.15 to 10% by mass, still more preferably 0.3 to 5% by mass. The amount of the component (b2) is preferably 0.05 to 5% by mass, more preferably 0.07 to 1% by mass. The amount of the component (b3) is more preferably 60 to 95% by mass, still more preferably 70 to 90% by mass.

The mixing ratio (mass ratio) of the component (b1) to the component (b3) is preferably $(b1)/(b3) = 1/100$ to $1/10$, more preferably $1/100$ to $1/50$. The mixing ratio (mass ratio) of the component (b2) to the component (b3) is preferably $(b2)/(b3) = 1/1000$ to $1/50$, more preferably $1/900$ to $1/100$.

[0049]

<Water-in-oil type (W/O type) microemulsion>

In the solid soap composition of the present invention,

the microemulsion may be a W/O type microemulsion. The O/W type microemulsion has an oily external phase. Preferably, the W/O type microemulsion contains 0.1 to 20% by mass of the component (b1), 50 to 99% by mass of the component (b2), and 0.01 to 10% by mass of the component (b3). The amount (% by mass) of each of the components (b1) to (b3) is the amount (% by mass) in 100% by mass of the microemulsion. In one aspect, the amount of the component (b3) may be 0.001 to 10% by mass.

[0050]

10 In the case of the W/O type microemulsion, the nonionic surfactant in the component (b1) is preferably a nonionic surfactant having an HLB of 1 to 7. One or more nonionic surfactants having an HLB of 1 to 7 may be used. In one example, the amount of the nonionic surfactant having an HLB of 1 to 7 in the component (b1) is preferably 90% by mass or more, more preferably 95% by mass or more. For example, the amount is preferably 90 to 100% by mass, more preferably 95 to 100% by mass. In the case of the W/O type, the component (b1) is preferably a nonionic surfactant having an HLB of 1 to 7.

20 Examples of the nonionic surfactant having an HLB of 1 to 7 include polyoxyethylene di-fatty acid esters, monoglycerol mono-fatty acid esters, monoglycerol di-fatty acid esters, diglycerol mono-fatty acid esters, monoglycerol monoalkyl ethers, diglycerol monoalkyl ethers, sorbitan fatty acid esters, and polyether-modified silicones. These may be used alone or in combination of two or more thereof.

[0051]

The monoglycerol mono-fatty acid esters or monoglycerol di-fatty acid esters are preferably monoesters or diesters of glycerol and C8-C22 fatty acids. Preferred examples include monoglycerol octanoate ester, monoglycerol 2-ethylhexanoate ester, monoglycerol decanoate ester, monoglycerol laurate ester, monoglycerol myristate ester, and monoglycerol palmitate ester.

35 [0052]

The diglycerol mono-fatty acid esters are preferably esters of diglycerol and C8-C22 fatty acids. Examples include diglycerol octanoate ester, diglycerol laurate ester, diglycerol myristate ester, and diglycerol palmitate ester.

5 The monoglycerol monoalkyl ethers are preferably ethers of glycerol and a C8-C22 alkyl group. Examples include monoglycerol octyl ether, monoglycerol decyl ester, monoglycerol lauryl ether, monoglycerol myristyl ether, and monoglycerol palmityl ether.

10 [0053]

 The diglycerol monoalkyl ethers are preferably ethers of diglycerol with C8-C22 alkyl groups. Examples include diglycerol octyl ether, diglycerol lauryl ether, and diglycerol myristyl ether, diglycerol palmityl ether.

15 The sorbitan fatty acid esters are preferably C8-C22 fatty acid esters. Examples include sorbitan octanoate ester, sorbitan caprylate ester, sorbitan caprate ester, sorbitan laurate ester, sorbitan myristate ester, and sorbitan palmitate ester.

20 Polyether-modified silicones having an HLB of 1 to 7 are preferably those having, as the polyether group, a polyoxyethylene polyoxypropylene group in which the number average addition mole number of EO is 10 to 20 and the number average addition mole number of PO is 1 to 10. Examples include
25 cetyl dimethicone copolyol (cetyl PEG/PPG-10/1 dimethicone).
 [0054]

 In particular, the nonionic surfactant having an HLB of 1 to 7 is more preferably a polyoxyethylene di-fatty acid ester, a monoglycerol mono-fatty acid ester, a monoglycerol di-fatty
30 acid ester, a diglycerol mono-fatty acid ester, or a polyether-modified silicone, with the polyether-modified silicone being more preferred. Use of a microemulsion containing such a nonionic surfactant having an HLB of 1 to 7 as the W/O type microemulsion is preferred because it further
35 improves the foam quality and the foam durability of the solid

soap composition. It also advantageously improves the effervescence and thus increases the foaming speed and improves foamability of the solid soap composition.

[0055]

5 Examples of the component (b2) in the W/O type microemulsion are the same as those of the component (b2) for use in the O/W type microemulsion, and the components can be suitably selected. One or a combination of two or more components (b2) may be used. In particular, those having a
10 melting point of 60°C or lower are preferred, and those having a melting point of 50°C or lower are more preferred. Vegetable oils are more preferred, with olive oil, jojoba oil, and argan oil, for example, being still more preferred.

[0056]

15 In the case of the W/O type microemulsion, the amount of the component (b1) is more preferably 0.15 to 10% by mass, still more preferably 0.5 to 5% by mass. The amount of the component (b2) is more preferably 60 to 99% by mass, still more preferably 70 to 99% by mass. The amount of the component (b3) is
20 preferably 0.05 to 5% by mass, more preferably 0.07 to 1% by mass.

[0057]

 The microemulsions (O/W type and W/O type) in the present invention may suitably contain an optional component other than
25 the components (b1) to (b3), as long as the effects of the present invention are not impaired.

 For example, preferably, the microemulsion further contains (b4) a C1-C4 monohydric alcohol (hereinafter also referred to as the "component (b4)"). The component (b4) is
30 suitably used as a solvent for surfactants and oily components. Use of the component (b4) is preferred because it facilitates the formation of a microemulsion and stabilizes the microemulsion. Examples of the C1-C4 monohydric alcohol include methanol, ethanol, n-propanol, isopropanol, and
35 butanol. These may be used alone or in combination of two or

more thereof. In particular, ethanol is preferred.

When the microemulsion contains the component (b4), the amount of the component (b4) in the microemulsion is preferably 0.01 to 20% by mass, more preferably 0.1 to 20% by mass, still
5 more preferably 1 to 20% by mass, yet still more preferably 2 to 15% by mass.

[0058]

The microemulsion may further contain (b5) a polyhydric alcohol (hereinafter also referred to as the "component (b5)").
10 The microemulsion preferably contains the component (b4) and/or the component (b5). The polyhydric alcohol is, for example, a polyhydric alcohol preferably having a carbon number of 2 to 10, more preferably 2 to 8, still more preferably 2 to 6, particularly preferably 2 to 4.

15 The component (b5) is suitably used as a solvent for surfactants and oily components. Use of the component (b5) is preferred because it facilitates formation of a microemulsion, and stabilizes the resulting microemulsion. The polyhydric alcohol is preferably a compound having two or more hydroxy
20 groups, which can be added to cosmetic products and the like. Examples include dihydric alcohols such as ethylene glycol, 1,2-propanediol (propylene glycol), 1,3-propanediol (propanediol), 1,2-butylene glycol, 1,3-butylene glycol, 1,4-butylene glycol, 2,3-butylene glycol, and dipropylene
25 glycol; trihydric alcohols such as glycerol; and tetrahydric alcohols such as diglycerol. These may be used alone or in combination of two or more thereof. In particular, dihydric and trihydric alcohols are preferred. For example, 1,3-propanediol and 1,3-butylene glycol are preferred.

30 When the microemulsion contains the component (b5), the amount thereof in the microemulsion is preferably 0.01 to 20% by mass, preferably 0.1 to 20% by mass, more preferably 1 to 20% by mass, still more preferably 2 to 15% by mass.

When the microemulsion contains the component (b4) and/or
35 the component (b5), in one aspect, the total amount of the

component (b4) and the component (b5) in the microemulsion is preferably 0.01 to 30% by mass, preferably 0.02 to 30% by mass, more preferably 0.1 to 25% by mass, more preferably 0.2 to 25% by mass, still more preferably 1 to 25% by mass, still more preferably 2 to 20% by mass.

[0059]

The microemulsion may contain one or more optional components, if necessary, in addition to the above components. Examples of such optional components include humectants, emollient agents, cationic surfactants, thickeners, pH regulators, antioxidants, preservatives, perfumes, dyes, and plant extracts. The microemulsion may contain an amphoteric surfactant. Yet, in one aspect, it is preferred that the microemulsion contains no amphoteric surfactant. A microemulsion containing an amphoteric surfactant may tend to have poor stability.

[0060]

The microemulsion in the present invention is a thermodynamically stable single-phase composition containing the surfactant, the oily component, and water. As for the properties, the microemulsion in the present invention usually has a transparent or semi-transparent appearance, and is a single-phase solution in which all of its components are uniformly dissolved therein. The microemulsion being in a single phase can be usually confirmed by visual observation.

In one aspect, in the microemulsion in the present invention, the average particle size of dispersed particles is preferably 10 to 200 nm, more preferably 30 to 150 nm. The term "average particle size" as used herein refers to a medium particle size (D50) in distribution of scattered light intensity as measured by the laser diffraction/scattering method. The average particle size of the dispersed particles being in the above range is preferred because the resulting microemulsion is usually transparent or semi-transparent.

[0061]

<Microemulsion preparation method>

The microemulsion preparation method is not particularly limited. For example, the following method can be employed.

(1) Components to be contained in the internal phase of the microemulsion are weighed out, mixed together, and stirred. Thus, a uniform solution of the internal phase components is prepared. This may involve heating, if necessary. In particular, when the solution contains a solid component for the internal phase, heating for sufficient dissolution is preferred.

(2) Components for the external phase are weighed out. This may involve heating, if necessary. When the solution contains a solid component for the external phase, heating for sufficient dissolution is preferred to obtain a uniform solution of the external phase components.

(3) While the solution of the external phase components prepared in (2) is stirred, the solution of the internal phase components prepared in (1) is gradually added to the solution.

(4) The mixture is stirred until the mixture has a single-phase as observed visually.

In (4) above, if the mixture has a single-phase as observed visually (transparent or semi-transparent; or slightly pale in some cases), usually, it is considered that a microemulsion is formed. If desired, the method may include a step of adjusting the pH of the microemulsion to a predetermined pH value (preferably, 9 to 11).

The optional components (such as the component (b4) and the component (b5)) that can be added if desired are added by being mixed into the solution of the internal phase components at the time of preparation of the solution, or by being mixed into the solution of the external phase components at the time of preparation of the solution.

[0062]

For example, in the case of an O/W type microemulsion, usually, the components (b1) and (b2) are used as the components

for the internal phase, and the component (b3) is used as the component for the external phase.

When preparing an O/W type microemulsion, first, the components (b1) and (b2) are mixed together to prepare a uniform solution containing the components (b1) and (b2). Preparation of the solution may involve heating, if necessary. Subsequently, while the component (b3) is stirred, the uniform solution containing the components (b1) and (b2) is gradually added to the component (b3). After adding, the mixture is stirred, whereby an O/W type microemulsion can be obtained.

The optional components (such as the component (b4) and the component (b5)) that can be added if desired are added by being mixed into the solution containing the components (b1) and (b2) at the time of preparation of the solution, or by being mixed into the component (b3). When adding the optional components to the internal phase (oil phase) of the O/W type microemulsion, the optional components are preferably mixed by being added, in addition to the components (b1) and (b2), to the solution containing the components (b1) and (b2) at the time of preparation of the solution. When adding the optional components to the external phase (aqueous phase), the optional components are preferably mixed into the water component (b3).

In the case of a W/O type microemulsion, usually, the solution can be prepared as described above using the components (b1) and (b3) as the components for the internal phase (aqueous phase) and the component (b2) as the component for the external phase (oil phase).

[0063]

<Solid soap composition>

The solid soap composition of the present invention is a solid soap composition containing the soap base (A) and the microemulsion (B). One or a combination of two or more microemulsions may be used. The solid soap composition of the present invention contains the soap base (A) and the microemulsion (B), and the microemulsion is preferably

uniformly dispersed in the solid soap composition.

The solid soap composition of the present invention is applicable to both milled soap (milled soap composition) and framed soap (framed soap composition).

5 [0064]

The amount (proportion) of the soap base (A) in the solid soap composition may be usually 20 to 99% by mass, preferably 20 to 95% by mass, more preferably 22 to 90% by mass, still more preferably 25 to 88% by mass.

10 In one aspect, in the case of milled soap, the amount of the soap base in the solid soap composition is preferably 50 to 99% by mass, more preferably 60 to 95% by mass, still more preferably 65 to 90% by mass, particularly preferably 70 to 88% by mass. In view of improving effervescence, it is better if
15 the amount of the soap base (A) is larger. However, the larger the amount of the soap base, the stronger the cleansing power to remove sebum and the like. Thus, unfortunately, the skin may be damaged, or the skin may feel tight after cleansing. When the amount of the soap base (A) is in the above range, the solid
20 soap composition has good effervescence. In addition, a component having a moisturizing effect or the like can be added to the solid soap composition, if desired. This advantageously can improve the feel such as fresh feeling after cleansing, for example. In one aspect, in the case of framed soap, the amount
25 of the soap base in the solid soap composition is preferably 20 to 70% by mass, more preferably 20 to 65% by mass, still more preferably 20 to 60% by mass, yet still more preferably 22 to 50% by mass, particularly preferably 25 to 45% by mass.

[0065]

30 In order to achieve good foam quality of the solid soap composition, the amount of the microemulsion (B) in the solid soap composition is, for example, preferably 0.15% by mass or more, more preferably 0.2% by mass or more or 0.25% by mass or more, still more preferably 0.3% by mass or more. The amount
35 of the microemulsion in the solid soap composition is, for

example, preferably 12% by mass or less, more preferably 10% by mass or less, still more preferably 5% by mass or less, 4% by mass or less, or 3% by mass or less. Any of these lower limits and any of these upper limits can be combined.

5 [0066]

In one aspect, the amount of the microemulsion (B) in the solid soap composition is preferably 0.15 to 12% by mass, more preferably 0.15 to 10% by mass. The amount of the microemulsion being in the above range is preferred because the resulting
10 solid soap composition has good foam quality. In addition, with the amount, advantageously, the solid soap composition has good formability during production, and can be produced by either a mechanical milling method or a framing method (method for producing a framed soap). In one aspect, the upper limit of
15 the amount of the microemulsion is preferably set to 5% by mass or lower in the solid soap composition. When the amount of the microemulsion is 5% by mass or less, the solid soap composition has better formability during production. The amount of the microemulsion in the solid soap composition is more preferably
20 0.15 to 5% by mass. When the amount of the microemulsion is in the above range, the solid soap composition has good foam quality, with elastic and viscous foam. The foam durability is also good. In addition, the formability is also good during the production of the solid soap composition. In one aspect,
25 the amount of the microemulsion in the solid soap composition is still more preferably 0.15 to 4% by mass, particularly preferably 0.2 to 3% by mass. In one aspect, the amount of the microemulsion is preferably 0.2 to 5% by mass, more preferably 0.25 to 4% by mass, still more preferably 0.25 to 3% by mass.
30 In the case where two or more microemulsions are used, "the amount of the microemulsion" is the total amount of these microemulsions.

[0067]

The solid soap composition contains the microemulsion (B)
35 and the soap base (A) at a mixing ratio (mass ratio (B)/(A))

of preferably 1/2000 or more, 1/1500 or more, or 1/1000 or more, more preferably 1/600 or more, 1/500 or more, or 1/400 or more, still more preferably 1/350 or more, particularly preferably 1/300 or more. The mass ratio (B)/(A) is preferably 1/15 or less, more preferably 1/18 or less, 1/20 or less, or 1/25 or less, still more preferably 1/50 or less, particularly preferably 1/60 or less. Any of these lower limits and any of these the upper limits can be combined.

In one example, the solid soap composition contains the microemulsion (B) and the soap base (A) at a mixing ratio (mass ratio (B)/(A)) of preferably 1/2000 to 1/15, more preferably 1/1500 to 1/15, more preferably 1/1000 to 1/15, more preferably 1/1000 to 1/18, still more preferably 1/1000 to 1/20, yet still more preferably 1/1000 to 1/50, particularly preferably 1/600 to 1/60, 1/500 to 1/60, 1/400 to 1/60, 1/350 to 1/60, or 1/300 to 1/60. In one aspect, the solid soap composition contains the microemulsion (B) and the soap base (A) at a mixing ratio (mass ratio (B)/(A)) of preferably 1/600 to 1/15, preferably 1/500 to 1/15, more preferably 1/400 to 1/20, still more preferably 1/350 to 1/25, particularly preferably 1/300 to 1/25.

The mixing ratio of the microemulsion to the soap base in the solid soap composition being in the above range is preferred because the foam quality is better and the foam has elasticity, viscosity, and good durability.

[0068]

In one example of a preferred embodiment, the present invention may provide a solid soap composition containing the soap base (A) and the microemulsion (B), the soap base (A) being an alkali salt of at least one saturated fatty acid selected from the group consisting lauric acid, myristic acid, palmitic acid, stearic acid, and isostearic acid (more preferably, lauric acid, myristic acid, and palmitic acid), and the microemulsion (B) being an O/W type microemulsion and/or a W/O type microemulsion described below.

An O/W type microemulsion in which the nonionic surfactant in the component (b1) is a nonionic surfactant having an HLB of 10 to 20, and the nonionic surfactant having an HLB of 10 to 20 is at least one selected from the group consisting of polyoxyethylene alkyl ethers, polyoxyethylene polyoxypropylene alkyl ethers, polyoxyethylene sorbitan fatty acid esters, polyoxyethylene glycerol fatty acid esters, polyoxyethylene hydrogenated castor oil, polyglycerol fatty acid esters, and polyether-modified silicones (more preferably, polyoxyethylene alkyl ethers, polyoxyethylene sorbitan fatty acid esters, polyoxyethylene glycerol fatty acid esters, and polyoxyethylene hydrogenated castor oil); and

in which the anionic surfactant is at least one selected from the group consisting of polyoxyethylene alkyl ether phosphates, N-acyl glutamates, and polyoxyethylene alkyl ether phosphoric acids or salts thereof, and is more preferably at least one selected from the group consisting of polyoxyethylene alkyl ether phosphoric acids and salts thereof

An W/O type microemulsion in which the nonionic surfactant in the component (b1) is a nonionic surfactant having an HLB of 1 to 7, and the nonionic surfactant having the HLB of 1 to 7 is at least one selected from the group consisting of polyoxyethylene di-fatty acid esters, monoglycerol mono-fatty acid esters, monoglycerol di-fatty acid esters, diglycerol mono-fatty acid esters, and polyether-modified silicones, and is more preferably a polyether-modified silicone [0069]

The solid soap composition may contain a component (hereinafter referred to as "additional components") other than the soap base (A) and the microemulsion (B), as long as the effects of the present invention are not impaired. The solid soap composition can contain one or more components that can be added to solid soap. Examples of such components include humectants (moisturizers), emollient agents, antiseptics, chelating agents, surfactants (emulsifiers), inorganic salts,

stabilizing agents (antioxidants, ultraviolet absorbers), plant extracts, fragrances, colorants (such as dyes), and water.

[0070]

5 Examples of the humectants include hyaluronic acid, collagen, and polyhydric alcohol. Examples of the polyhydric alcohol include glycerol, propylene glycol, 1,3-butylene glycol, sorbitol, sucrose, and trehalose. In the case of milled soap, the amount of the polyhydric alcohol in the solid soap
10 composition, if added, is preferably 0.01 to 2% by mass, more preferably 0.1 to 1% by mass. In the case of framed soap, the amount of the polyhydric alcohol in the solid soap composition, if added, is preferably 20 to 40% by mass, more preferably 25 to 35% by mass.

15 [0071]

 Examples of the emollient agents include any of the oily components for use as the component (b2). Examples of the antiseptics include trichlorocarbanilide, triclosan, and isopropylmethylphenol.

20 [0072]

 Examples of the chelating agents include pentetic acid pentasodium salt (pentasodium pentetate), etidronic acid tetrasodium salt (tetrasodium etidronate), ethylenediaminetetraacetic acid or salts thereof, and citric
25 acid or salts thereof. Examples of the salts include sodium salts and potassium salts.

 Examples of the surfactants include the anionic surfactant, nonionic surfactant, and cationic surfactant. Examples of the anionic surfactant include alkyl ether sulfuric acid ester salts and polyoxyethylene alkyl ether sulfates (such
30 as sodium laureth sulfate and sodium lauryl sulfate). The alkali salt of a fatty acid as the soap base and the components of the microemulsion are not included in surfactants that are used as additional components in the solid soap composition.

35 [0073]

Examples of the inorganic salts include sodium chloride, potassium chloride, sodium sulfate, and sodium carbonate.

Examples of the antioxidants include tocopherol (vitamin E) and ascorbic acid (vitamin C). Examples of the plant
5 extracts include camellia sinensis leaf extract and oolong tea extract. The solid soap composition may contain, as an additional component(s), a C8-C22 fatty acid (preferably a C12-C18 fatty acid, such as stearic acid, lauric acid, or myristic acid) and/or a monohydric alcohol (such as ethanol,
10 propanol, or butanol).

[0074]

When the solid soap composition contains water, the amount of the water in the solid soap composition is preferably
1 to 30% by mass. The water in this case is contained as an
15 additional component. In the case of milled soap, the amount of the water in the solid soap composition is preferably 1 to 20% by mass, more preferably 1 to 10% by mass. In the case of framed soap, the amount of the water in the solid soap
composition is preferably 10 to 30% by mass, more preferably
20 15 to 30% by mass. The water can be the tap water, ion-exchanged water, distilled water, or the like mentioned above.

One or more additional components may be used. Examples of the additional components are listed above. These optional components may be added for purposes other than those described
25 above, according to effects or properties of these optional components. For example, a substance mentioned as a chelating agent may be added as an antiseptic or a stabilizing agent.
[0075]

The solid soap composition of the present invention can
30 be produced using a soap base composition containing the soap base, the microemulsion, and the additional components that are added if desired. The soap base composition can be obtained by kneading the above components.

[0076]

35 The solid soap composition of the present invention may

be in any form. For example, the solid soap composition is preferably in solid, sheet, powder, or granulated form.

The solid soap composition of the present invention can be used for, for example, skin cleansing such as face and body, and hair cleansing. For example, the solid soap composition is suitably used for skin cleansing. In particular, it is suitably used as a cleansing composition particularly for removal of makeup.

[0077]

10 <Method for producing a solid soap composition>

The solid soap composition of the present invention can be produced by a production method including a step of preparing a soap base composition by mixing at least (A) a soap base and (B) a microemulsion containing the following components (b1)

15 to (b3):

(b1) at least one surfactant selected from the group consisting of nonionic surfactants and anionic surfactants,

(b2) at least one oily component, and

(b3) water.

20 The method for producing a solid soap composition including the above step is also encompassed by the present invention. The method for producing a solid soap composition of the present invention (hereinafter also simply referred to as "the production method of the present invention") is preferred as a method for producing the solid soap composition of the present invention.

25 The production method of the present invention may include a step other than the step of preparing a soap base composition. For example, the method may include a step of preparing a microemulsion.

30 [0078]

The soap base, the microemulsion, and preferred embodiments thereof in the production method of the present invention are the same as described above for the solid soap composition of the present invention. Examples of the alkali

35

salt of a fatty acid as the soap base and examples of the microemulsion each may be used alone or in combination of two or more thereof. The minimum requirement for the production of the soap base composition is kneading the soap base (A) and the microemulsion (B) together. In addition to these components (A) and (B), the additional components mentioned above may be added if desired. Preferably, the amounts of the components such as the soap base and the microemulsion to be used in the soap base composition are suitably set such that the amounts of these components in the resultant solid soap composition are in the ranges described above. For example, the amount of the microemulsion in the solid soap composition is preferably 0.15 to 12% by mass, more preferably 0.15 to 10% by mass, still more preferably 0.15 to 5% by mass, particularly preferably 0.15 to 4% by mass, particularly preferably 0.2 to 3% by mass. In one aspect, the amount of the microemulsion in the solid soap composition is preferably 0.2 to 5% by mass, more preferably 0.25 to 4% by mass, still more preferably 0.25 to 3% by mass.

The amount of the microemulsion in the soap base composition during the production of the solid soap composition is, for example, preferably 0.15 to 12% by mass, more preferably 0.15 to 10% by mass, still more preferably 0.15 to 5% by mass, particularly preferably 0.15 to 4% by mass, particularly preferably 0.2 to 3% by mass. In one aspect, the amount of the microemulsion in the soap base composition is preferably 0.2 to 5% by mass, more preferably 0.25 to 4% by mass, still more preferably 0.25 to 3% by mass.

In addition, it is also preferred to suitably set the mixing ratio of the microemulsion (B) to the soap base (A) such that the mass ratio (B)/(A) in the resultant solid soap composition is in the range described above.

[0079]

The step of preparing the soap base composition may only involve kneading the soap base, the microemulsion, and the

additional components that are added if desired. Kneading is preferably performed until the components are uniformly mixed. The kneading order of these components is not particularly limited. The kneading method is not particularly limited. The components may be stirred with a device such as a mixer for kneading. In addition, raw materials such as the soap base and the microemulsion may be added entirely in a lump or in several batches. For example, the kneading may be performed by any of the following methods: kneading the soap base, the microemulsion, and the additional components that are added if desired all together at one time; kneading the soap base and the additional components first, and then adding the microemulsion to the kneaded mixture and kneading together; kneading one or some of the additional components and the soap base together first, and then adding the rest of the additional components and the microemulsion to the kneaded mixture and kneading together; or kneading the soap base and the microemulsion together first, and then adding the additional components to the kneaded mixture and kneading together. Kneading may involve heating if desired.

The soap base composition obtained by the above step can be formed into a solid soap composition by using a common method such as the framing method or the mechanical milling method. [0080]

For example, in the case of the mechanical milling method, the soap base composition can be directly used as a solid soap composition. For example, in the case of using the soap base composition as a solid soap composition, the soap base composition is cut or stamped into the form of solid soap. It is also preferred to crush the soap base composition and kneading the resultant particles to obtain a further uniform soap base composition. In this case, subsequently, the soap base composition can be extruded into a bar or the like by an extruder, and then the extrudate is cut into a desired size or stamped, whereby a solid soap composition can be obtained.

In the case of the framing method, the soap base composition is poured into a frame and solidified, and subsequently, the solidified soap base is cut into a desired size, whereby a solid soap composition (framed soap composition) can be produced. Solidification may be accompanied by cooling, if necessary. After or before cutting, the soap composition may be further dried. After cutting, the soap composition may be stamped.

To obtain powder of the solid soap composition, a method such as cutting the solid soap composition may be employed for powdering.

[0081]

<Foam-quality improver for solid soap composition>

The foam-quality improver for a solid soap composition of the present invention contains, as an active ingredient, a microemulsion containing the following components (b1) to (b3): (b1) at least one surfactant selected from the group consisting of nonionic surfactants and anionic surfactants, (b2) at least one oily component, and (b3) water.

Adding the foam-quality improver for a solid soap composition of the present invention (hereinafter also simply referred to as "foam-quality improver") to a solid soap composition can improve the foam quality of the solid soap composition. It can also improve the foam durability of the solid soap composition. Thus, a solid soap composition having good foam quality and good foam durability can be obtained by adding the foam-quality improver of the present invention to the solid soap composition. The foam-quality improver for a solid soap of the present invention is suitably used in a solid soap composition that is prepared using a soap base. The foam-quality improver can also be referred to as a foam quality improver.

[0082]

The foam-quality improver in the present invention

contains the microemulsion.

The microemulsion and preferred embodiments thereof in the foam-quality improver of the present invention are the same as the microemulsion and preferred embodiments thereof for use
5 in the solid soap composition described above.

In the foam-quality improver, the amount of the microemulsion may be 100% by mass, but the foam-quality improver may contain other component(s) if desired, as long as the effects of the present invention are not impaired.

10 [0083]

In one aspect, for improving the foam quality of a solid soap composition using the foam-quality improver of the present invention, the foam-quality improver is preferably added to a soap base in the production of the solid soap composition. The
15 amount of the foam-quality improver is preferably adjusted such that the solid soap composition contains the microemulsion in the amount described above for the solid soap composition of the present invention. In one example, the foam-quality improver is added in an amount of 0.15 to 12% by mass as the
20 microemulsion in the solid soap composition. In one example, the amount of the foam-quality improver as the microemulsion in the solid soap composition is more preferably 0.15 to 10% by mass, still more preferably 0.15 to 5% by mass, particularly preferably 0.15 to 4% by mass, particularly preferably 0.2 to
25 3% by mass. In one aspect, the amount of the foam-quality improver as the microemulsion in the solid soap composition is preferably 0.2 to 5% by mass, 0.25 to 4% by mass, or 0.25 to 3% by mass.

In the production method of a solid soap composition, the
30 microemulsion is added to a soap base to improve the foam quality of the solid soap composition. Such a foam improving method is also encompassed by the present invention. Preferably, the production of the solid soap composition includes kneading a soap base and the microemulsion together. The soap base is not
35 particularly limited, and any of those mentioned above can be

used. Use of the microemulsion can improve the foam quality and the foam durability of the solid soap composition.

The foam-quality improver of the present invention can also be used without being added to a solid soap composition. For example, the foam-quality improver may be added to a diluted solution of a solid soap composition during use of the solid soap composition. Foam from such a diluted solution can have better quality and better durability. In this case, the foam-quality improver is used such that the amount of the microemulsion is preferably 0.15 to 12% by mass, more preferably 0.15 to 10% by mass, still more preferably 0.15 to 5% by mass, particularly preferably 0.15 to 4% by mass or 0.2 to 3% by mass, for example, relative to the total amount of the solid soap composition and the foam-quality improver. In one aspect, the amount of the foam-quality improver in terms of the microemulsion relative to the total amount of the solid soap composition and the foam-quality improver is preferably 0.2 to 5% by mass, 0.25 to 4% by mass, or 0.25 to 3% by mass.

[0084]

The present invention also encompasses use of a microemulsion for producing a foam-quality improver of a solid soap composition, the microemulsion containing the components (b1) to (b3). The present invention also encompasses use of a microemulsion for improving foam quality of a solid soap composition, the microemulsion containing the components (b1) to (b3). Details such as preferred embodiments and usage of the microemulsion are the same as described above.

EXAMPLES

[0085]

The following provides examples that more specifically describe the present invention. The present invention is not limited to these examples. In the examples, percentages (%) and parts are by mass unless otherwise stated.

[0086]

Surfactants, oily components, and the like used in the examples are as follows.

(Surfactants)

- Polyoxyethylene sorbitan monooleate (20E.O.): product name
 5 "Nonion OT-221" available from NOF Corporation, INCI
 (International Nomenclature of Cosmetic Ingredients) name
 "Polysorbate 80", HLB 15.7
- Polyoxyethylene glyceryl isostearate: product name "EMALEX
 GWIS-120" available from Nihon Emulsion Co., Ltd., INCI name
 10 "PEG-20 Glyceryl Isostearate", HLB 13
- Di POE (8) (C12-C15) alkyl ether phosphoric acid: product name
 "NIKKOL DDP-8" available from Nikko Chemicals Co., Ltd., INCI
 name "Di-C12-15 Pareth-8 Phosphate", HLB 11.5
- Polyoxyethylene cholesteryl ether: product name "EMALEX CS-10"
 15 available from Nihon Emulsion Co., Ltd., INCI name "Choleth-10",
 HLB 10
- Polyoxyethylene (60) hydrogenated castor oil: product name
 "NIKKOL HCO-60" available from Nikko Chemicals Co., Ltd., INCI
 name "PEG-60 hydrogenated castor oil", HLB 14.0
- 20 Cetyl dimethicone copolyol (cetyl PEG/PPG-10/1 dimethicone):
 product name "ABIL EM 90" available from Evonik, HLB 3.5
- Polyoxyethylene-polyoxypropylene polymer: product name
 "NIKKOL PEN-4630" available from Nikko Chemicals Co., Ltd.,
 INCI name "PPG-6-Decyltetradeceth-30" (polyoxyethylene
 25 polyoxypropylene decyl tetradecyl ether), HLB 12.0
- Decaglycerol monostearate: product name "NIKKOL Decaglyn 1-SV"
 available from Nikko Chemicals Co., Ltd., INCI name
 "Polyglyceryl-10 stearate", HLB 12.0
- Polyoxyethylene-methylpolysiloxane copolymer: product name
 30 "DOW CORNING TORAY SS-2804" available from Toray Industries,
 Inc., INCI name "PEG-12 dimethicone", HLB13
 [0087]

(Oily components)

- Argan oil: product name "Lipofructyl (registered trademark)
 35 Argan LS 9779" available from BASF, INCI name "Argania spinosa

kernel oil"

Cetyl ethylhexanoate: product name "NS-CIO" available from Nippon Fine Chemical Co., Ltd.

Olive oil: product name "NIKKOL olive oil" available from Nikko Chemicals Co., Ltd.

Jojoba oil: product name "NIKKOL Jojoba Oil S" available from Nikko Chemicals Co., Ltd., INCI name "Simmondsia Chinensis (Jojoba) Seed Oil"

[0088]

(Additional components)

Propanediol (1,3-propanediol): product name "Zemea (registered trademark) Select propanediol" available from DuPont Tate & Lyle Bio Products

Butylene glycol: 1,3-butylene glycol

Citrus extract: product name "MandarinClear" available from Ichimaru Pharcos Co., Ltd., INCI name "Citrus Nobilis (Mandarin Orange) Peel Extract" (components: purified water, 1,3-butylene glycol, citrus unshiu peel extract)

Water used for the production of the microemulsion is ion-exchanged water.

[0089]

The foaming speed, foamability, and drainage time of the solid soap composition were evaluated by the following methods, using a solid soap composition as a soap sample.

The foaming speed represents the rate of effervescence. The foamability represents the amount of foam. The drainage time represents the foam durability (creaminess). A longer drainage time indicates better foam durability.

(Evaluation methods)

(1) Ion-exchanged water or tap water (300 mL) (water temperature: 25°C) was fed into a juice mixer (product name "Juice Mixer", model number JM-N-88, JIK type, available from Nakasa Co., Ltd.). The same water (ion-exchanged water or tap water) was used for evaluation in the same test system (for example, in the case of a comparison between a solid soap

composition of Example 1 and a solid soap composition of Comparative Example 1).

(2) A particulate soap sample was fed into the juice mixer in (1) to obtain a sample.

5 (3) The juice mixer was rotated, and the foam height was measured at second 10 of rotation to determine the foaming speed.

(4) At second 60, the rotation was stopped, and the foam height was measured to determine foamability.

10 (5) The time required for the amount (volume) of the foam to decrease to 200 mL in the mixer after the 60-second rotation was measured to determine drainage time (foam durability).

In the data of the examples presented below, the values are averages of measurements in three tests, i.e., $n = 3$ (3 times).

[0090]

<Example 1>

An O/W type microemulsion (O/W 1-1) containing the components shown in Table 1 was prepared by the following method.

(1) The components of the internal phase were weighed out and mixed together. The mixture was stirred while being heated to 60°C, whereby a uniform solution was obtained.

25 (2) The components of the external phase were weighed out and mixed together in a container different from the one used in (1) above.

(3) While the mixture obtained in (2) was sufficiently stirred with a spatula, the solution obtained in (1) was gradually added to the mixture.

30 (4) After adding, the mixture was stirred for about 0.5 minutes, whereby a transparent microemulsion having a single phase as observed visually was obtained.

[0091]

[Table 1]

O/W 1-1	Components	Amount (%)
Internal phase	Polyoxyethylene sorbitan monooleate (20E.O.)	1
	Ethanol	10
	Jojoba oil	0.1
External phase	Water	78.9
	Propanediol	10
Total		100

[0092]

The same method described above was repeated, except that the components shown in Tables 2 and 3 were used for the internal phase and the external phase. Thus, O/W type microemulsions O/W 1-2 and O/W 1-3 containing the components shown in Tables 2 and 3, respectively, were prepared.

[0093]

[Table 2]

O/W 1-2	Components	Amount (%)
Internal phase	Polyoxyethylene glyceryl isostearate	1
	Di POE (8) (C12-C15) alkyl ether phosphoric acid	0.1
	Ethanol	10
	Olive oil	0.1
External phase	Water	78.8
	Propanediol	10
Total		100

[0094]

[Table 3]

O/W 1-3	Components	Amount (%)
Internal phase	Polyoxyethylene cholesteryl ether	1
	Ethanol	10
	Argan oil	0.1
External phase	Water	78.9
	Propanediol	10
Total		100

[0095]

A composition having the following makeup containing a soap base (hereinafter referred to as a "composition (I)") and

the microemulsions O/W 1-1 to O/W 1-3 were kneaded together at room temperature until the components were uniformly mixed. Thus, a soap base composition was obtained. The soap base composition was stamped by a stamping machine, whereby a solid soap composition was obtained. The solid soap composition was a milled soap.

[0096]

The composition (I) used in the following examples and comparative examples is a composition having the following makeup containing a soap base (alkali salts of fatty acids) and additional components (components other than the soap base and the microemulsion) (the amounts (%) of the soap base and the additional components below are the amounts (%) in the composition (I)). The amount of the soap base in the composition (I) is 86.5%.

Makeup of the composition (I)

(Soap base)

Sodium myristate: 32.7%

Potassium myristate: 21.8%

Sodium laurate: 14.0%

Potassium laurate: 9.3%

Sodium palmitate: 5.2%

Potassium palmitate: 3.5%

(Other components)

Water: 9.997%

Lauric acid: 2.5%

Glycerol: 0.7%

[0097]

The amount (%) of the microemulsions (ME) in the solid soap composition was (1) 0.05%, (2) 0.15%, (3) 0.20%, (4) 0.25%, or (5) 0.30%. The amount of the microemulsions was the total of the microemulsions O/W 1-1 to O/W 1-3 (the amount of each microemulsion was the same). For example, in the case of (2) in which the amount of the microemulsion is 0.15%, 99.85 parts of the composition (I) and 0.05 parts of each of the

microemulsions O/W 1-1 to O/W 1-3 (0.15 parts in total) were used to prepare the soap base composition.

The amounts of the microemulsions (ME) and the soap bases in solid soap compositions (1) to (5) prepared in Example 1 are shown below, with a mass ratio ME/soap base in the parenthesis for each composition.

(1) ME 0.05%, soap base 86.46% (ME/soap base = 1/1729)

(2) ME 0.15%, soap base 86.37% (ME/soap base = 1/576)

(3) ME 0.20%, soap base 86.33% (ME/soap base = 1/432)

(4) ME 0.25%, soap base 86.28% (ME/soap base = 1/345)

(5) ME 0.30%, soap base 86.24% (ME/soap base = 1/287)

[0098]

<Comparative Example 1>

A solid soap composition was obtained by the same method as in Example 1, except that no microemulsions were used. The solid soap composition of Comparative Example 1 is a solid soap composition prepared from the composition (I).

[0099]

The solid soap compositions (0.5 g each) prepared in Example 1 and Comparative Example 1 were used as soap samples for drainage time evaluation by the method described above (soap sample concentration in the sample: 0.5 g/300 mL). Table 4 shows the results. The drainage time increase rate (%) is the increase rate of a drainage time (T1) (sec) of the solid soap composition containing the microemulsions relative to a drainage time (T0) (sec) of the solid soap composition of Comparative Example 1 (the solid soap composition containing no microemulsions). The drainage time increase rate was determined by the following calculation.

Drainage time increase rate (%) = $100 \times (T1 - T0)/T0$

[0100]

[Table 4]

Amount of ME	Drainage time (sec)	Drainage time increase rate (%)
0%	302	0
0.05%	307	1.7
0.15%	330	9.3
0.20%	323	7.0
0.25%	335	10.9
0.30%	354	17.2

[0101]

The one with 0% of ME represents Comparative Example 1. Adding the microemulsions to the solid soap composition increased the drainage time. In particular, adding the microemulsion in an amount of 0.15% by mass or more to the solid soap composition significantly increased the drainage time.

[0102]

<Example 2>

The same method as in Example 1 was repeated, except that the components shown in Table 5 were used for the internal phase and the external phase. Thus, an O/W type microemulsion (O/W 2-1) containing the components shown in Table 5 was prepared.

[0103]

[Table 5]

O/W 2-1	Components	Amount (%)
Internal phase	Polyoxyethylene (60) hydrogenated castor oil	1
	Ethanol	10
	Argan oil	0.1
External phase	Water	78.9
	Butylene glycol	10
Total		100

[0104]

The same method described above was repeated, except that the components shown in Table 6 were used for the internal phase and the external phase. Thus, a W/O type microemulsion (W/O 2-1) containing the components shown in Table 6 was prepared.

[0105]

[Table 6]

W/O 2-1	Components	Amount (%)
Internal phase	Citrus extract	0.1
External phase	Cetyl dimethicone copolyol	1
	Argan oil	1
	Cetyl ethylhexanoate	97.9
Total		100

[0106]

The composition (I) (75.6 parts), the microemulsion O/W 2-1 (0.15 parts), the microemulsion W/O 2-1 (0.15 parts), and the additional components (such as an emulsifier, an emollient agent, a moisturizer, a stabilizing agent, a perfume, and a colorant, 24.1 parts in total) were kneaded together at room temperature until the components were uniformly mixed. Thus, a soap base composition was obtained. The soap base composition was stamped by a stamping machine, whereby a solid soap composition was obtained. In the solid soap composition, the amount of the microemulsions was 0.3%, and the amount of the soap base was 65.4% (mass ratio ME/soap base: 1/218).

The additional components used in the examples and the comparative examples do not contain the soap base or the microemulsions.

[0107]

The solid soap compositions prepared in Example 2 and Comparative Example 1 were evaluated for the foaming speed, foamability, and drainage time by the evaluation methods described above. The solid soap compositions (1 g each) were used as soap samples (soap sample concentration in the sample: 1 g/300 mL). Table 7 shows the results. The solid soap composition containing the microemulsions obtained in Example 2 exhibited a longer drainage time and better foam durability, as compared to the solid soap composition of Comparative Example 1. In addition, the solid soap composition of Example 2 exhibited high foaming speed and excellent foamability.

[0108]

[Table 7]

	Foaming speed (mL)	Foamability (mL)	Drainage time (sec)
Example 2	750	850	355
Comparative Example 1	700	820	305

[0109]

5 <Example 3>

The same method as in Example 1 was repeated, except that the compositions shown in Tables 8 to 10 were used for the internal phase and the external phase. Thus, three kinds of O/W type microemulsions (O/W 3-1 to O/W 3-3) containing the components shown in Tables 8 to 10, respectively, were prepared. A solid soap composition was obtained as in Example 2, except that the microemulsions O/W 3-1 to O/W 3-3 (0.1 parts each, 0.3 parts in total) were used instead of the microemulsion O/W 2-1 (0.15 parts) and the microemulsion W/O 2-1 (0.15 parts). In the solid soap composition, the amount of the microemulsions was 0.3%, and the amount of the soap base was 65.4% (mass ratio ME/soap base: 1/218).

[0110]

[Table 8]

O/W 3-1	Components	Amount (%)
Internal phase	Polyoxyethylene sorbitan monooleate (20E.O.)	1
	Ethanol	10
	Jjoba oil	0.1
External phase	Water	78.9
	Butylene glycol	10
Total		100

20

[0111]

[Table 9]

O/W 3-2	Components	Amount (%)
Internal phase	Polyoxyethylene glyceryl isostearate	1
	Di POE (8) (C12-C15) alkyl ether phosphoric acid	0.1
	Ethanol	10
	Olive oil	0.1
External phase	Water	78.8
	Butylene glycol	10
Total		100

[0112]

[Table 10]

O/W 3-3	Components	Amount (%)
Internal phase	Polyoxyethylene cholesteryl ether	1
	Ethanol	10
	Argan oil	0.1
External phase	Water	78.9
	Butylene glycol	10
Total		100

5 [0113]

The solid soap compositions prepared in Example 3 and Comparative Example 1 were evaluated for the foaming speed, foamability, and drainage time by the evaluation methods described above. The solid soap compositions (1 g each) were used as soap samples (soap sample concentration in the sample: 1 g/300 mL). Table 11 shows the results.

[0114]

[Table 11]

	Foaming speed (mL)	Foamability (mL)	Drainage time (sec)
Example 3	900	1000	400
Comparative Example 1	850	950	315

15 [0115]

<Example 4>

The three kinds of microemulsions O/W 1-1 to O/W 1-3 (containing the components shown in Tables 1 to 3, respectively)

were prepared by the same method as in Example 1. A solid soap composition was obtained as in Example 1, except that a soap base composition was produced using the composition (I) (86.0 parts), the microemulsions O/W 1-1 to O/W 1-3 (0.1 parts each, 5 0.3 parts in total), and the additional components (such as an emulsifier, an emollient agent, a moisturizer, a stabilizing agent, a perfume, and a colorant, 13.7 parts in total). In the solid soap composition, the amount of the microemulsions was 0.3%, and the amount of the soap base was 74.4% (mass ratio 10 ME/soap base: 1/248).

[0116]

<Comparative Example 2>

A solid soap composition was obtained as in Example 4, except that the composition (I) (86.0 parts), the additional 15 components (such as an emulsifier, an emollient agent, a moisturizer, a stabilizing agent, a perfume, and a colorant, 13.7 parts in total), and the components (raw materials) (0.1 parts each, 0.3 parts in total) of the microemulsions O/W 1-1 to O/W 1-3 shown in Tables 1 to 3 not subjected to 20 microemulsification were used.

[0117]

The solid soap compositions prepared in Example 4 and Comparative Example 2 were evaluated for the foaming speed, foamability, and drainage time by the evaluation methods 25 described above. The solid soap compositions (1 g each) were used as soap samples (concentration in the sample: 1 g/300 mL). Table 12 shows the results.

The solid soap composition containing the microemulsions obtained in Example 4 exhibited higher foaming speed, better 30 foamability, and better foam durability, as compared to the solid soap composition of Comparative Example 2 to which the components of the microemulsion were added without microemulsifying these components.

[0118]

35 [Table 12]

	Foaming speed (mL)	Foamability (mL)	Drainage time (sec)
Example 4	950	1100	640
Comparative Example 2	915	1080	545

[0119]

<Example 5>

The same method as in Example 1 was repeated, except that the compositions shown in Tables 13 to 15 were used for the internal phase and the external phase. Thus, three kinds of O/W type microemulsions (O/W 5-1 to O/W 5-3) containing the components shown in Tables 13 to 15, respectively, were prepared. A solid soap composition was obtained as in Example 1, except that the composition (I) (99.7 parts) and the microemulsions O/W 5-1 to O/W 5-3 (0.1 parts each, 0.3 parts in total) were used. In the solid soap composition, the amount of the microemulsions was 0.3%, and the amount of the soap base was 86.2% (mass ratio ME/soap base: 1/287).

15 [0120]

[Table 13]

O/W 5-1	Components	Amount (%)
Internal phase	Polyoxyethylene-polyoxypropylene polymer	1
	Ethanol	10
	Argan oil	0.1
External phase	Water	78.9
	Propanediol	10
Total		100

[0121]

[Table 14]

O/W 5-2	Components	Amount (%)
Internal phase	Decaglycerol monostearate	1
	Ethanol	10
	Argan oil	0.1
External phase	Water	78.9
	Propanediol	10
Total		100

[0122]

[Table 15]

O/W 5-3	Components	Amount (%)
Internal phase	Polyoxyethylene-methylpolysiloxane copolymer	1
	Ethanol	10
	Argan oil	0.1
External phase	Water	78.9
	Propanediol	10
Total		100

5 [0123]

The solid soap compositions prepared in Example 5 and Comparative Example 1 were evaluated for the foaming speed, foamability, and drainage time by the evaluation methods described above. The solid soap compositions (1 g each) were used as soap samples (soap sample concentration in the sample: 1 g/300 mL). Table 16 shows the results.

[0124]

[Table 16]

	Foaming speed (mL)	Foamability (mL)	Drainage time (sec)
Example 5	800	1050	349
Comparative Example 1	800	1000	302

15 [0125]

<Example 6>

The three kinds of O/W type microemulsions O/W 1-1 to O/W 1-3 containing the components shown in Tables 1 to 3, respectively, were prepared by the same method as in Example

1. A composition (II) containing a soap base (described below) and these microemulsions were used to prepare a soap base composition.

5 The composition (II) (99.7 parts) and the microemulsions O/W 1-1 to O/W 1-3 (0.1 parts each, 0.3 parts in total) were kneaded together at room temperature until the components were uniformly mixed. Thus, a soap base composition was obtained. The soap base composition was poured into a 100-mL plastic frame, and solidified by cooling at room temperature. Then, the solid
10 soap composition was taken out from the frame. In the solid soap composition, the amount of the microemulsions was 0.3%, and the amount of the soap base was 25.8% (mass ratio ME/soap base: 1/86). The solid soap composition was a framed soap. [0126]

15 The composition (II) is a composition having the following makeup containing the soap base and additional components (the amounts (%) of the soap base and the additional components below are the amounts (%) in the composition (II)). The amount of the soap base in the composition (II) is 25.9%.

20 Makeup of the composition (II)

(Soap base)

Sodium stearate: 16.0%

Sodium laurate: 8.0%

Sodium myristate: 1.9%

25 (Other components)

Water: 29.9%

Glycerol: 14.0%

Propylene glycol (PG): 14.0%

Sorbitol: 6.0%

30 Sodium laureth sulfate: 6.0%

Sodium lauryl sulfate: 2.4%

Sodium chloride: 0.6%

Stearic acid: 0.6%

Lauric acid: 0.2%

35 Myristic acid: 0.2%

Pentasodium pentetate: 0.1%

Tetrasodium etidronate: 0.1%

[0127]

<Comparative Example 3>

5 A solid soap composition was obtained by the same method as in Example 6, except that the microemulsions were not used. The solid soap composition of Comparative Example 3 is a solid soap composition prepared from the composition (II).

[0128]

10 The solid soap compositions (1.0 g each) prepared in Example 6 and Comparative Example 3 were used as soap samples for drainage time evaluation by the same method as in Example 1, (soap sample concentration in the sample: 1.0 g/300 mL). Table 17 shows the results. The drainage time increase rate (%) is the increase rate of the drainage time (T1) (sec) of the solid soap composition of Example 6 (the solid soap composition containing the microemulsions) relative to the drainage time (T0) (sec) of the solid soap composition of Comparative Example 3 (the solid soap composition containing no microemulsions).
15 The drainage time increase rate was calculated by the same method as in Example 1.

20 In Table 17, the one with 0% of ME (0%) represents Comparative Example 3. The one with 0.3% of ME represents Example 6. Adding the microemulsions resulted in improved foam durability.

[0129]

[Table 17]

Amount of ME	Drainage time (sec)	Drainage time increase rate (%)
0%	208	0
0.3%	226	8.7

[0130]

30 <Test Example 1>

 The three kinds of O/W type microemulsions O/W 1-1 to O/W 1-3 containing the components shown in Tables 1 to 3,

respectively, were prepared by the same method as in Example 1.

The composition (I) was stamped by a stamping machine, whereby a solid soap base composition was obtained.

5 The foaming speed and drainage time were evaluated by the following evaluation methods.

(1) Tap water (100 mL) was fed into a juice mixer (product name "Juice Mixer", model number JM-N-88, JIK type, available from Nakasa Co., Ltd.) (tap water temperature: 25°C).

10 (2) A particulate solid soap base composition and microemulsions were fed into the juice mixer in (1) to obtain a sample.

(3) The juice mixer was rotated, and the foam height was measured at second 10 of rotation to determine the foaming speed.

15 (4) At second 60, the rotation was stopped, and the foam height was measured.

(5) The time required for the amount (volume) of the foam to decrease to 200 mL in the mixer after the 60-second rotation was measured to determine drainage time (foam durability).

20 In the foaming speed and drainage time data, the values were represented as averages of measurements in three tests, i.e., $n = 3$ (3 times).

[0131]

25 The feed amounts of the solid soap base composition and the microemulsions (ME) are as shown below (1) to (4).

(1) Solid soap base composition 0.5 g; (2) solid soap base composition 0.4985 g, ME 0.0015 g; (3) solid soap base composition 0.485 g, ME 0.015 g; and (4) solid soap base composition 0.475 g, ME 0.025 g

30 The amount of the ME relative to the total mass of the solid soap base composition and ME was 0% in (1), 0.3% in (2), 3.0% in (3), and 5.0% in (4). The microemulsions O/W 1-1 to O/W 1-3 were each used in the same amount to obtain the total amount described above. For example, in (2), the

35

microemulsions O/W 1-1 to O/W 1-3 were used in an amount of 0.0005 g each.

The amount of the soap base relative to the total mass of the solid soap base composition and the ME was 86.5% in (1), 86.2% in (2), 83.9% in (3), and 82.2% in (4).

The mass ratio of the microemulsion to the soap base (ME/soap base) was 0 in (1), 1/287 in (2), 1/28 in (3), and 1/16 in (4).

[0132]

Table 18 shows the results.

The drainage time increase rate (%) is the increase rate of the drainage time (T1) (sec) of the sample containing the microemulsions relative to the drainage time (T0) (sec) of the sample (1) above (the sample containing no ME). The drainage time increase rate was calculated by the same method as in Example 6. The results show that the microemulsions can improve the foam durability of the solid soap composition.

[0133]

[Table 18]

Sample	Amount of ME	Foaming speed (mL)	Drainage time (sec)	Drainage time increase rate (%)
(1)	0	800	390	0
(2)	0.3%	820	425	9.0
(3)	3.0%	820	450	15.4
(4)	5.0%	820	450	15.4

[0134]

<Production Example 1>

The three kinds of O/W type microemulsions O/W 1-1 to O/W 1-3 containing the components shown in Tables 1 to 3, respectively, were prepared by the same method as in Example 1.

The composition (I) (88 parts) and the microemulsions O/W 1-1 to O/W 1-3 (4 parts each, 12 parts in total) were kneaded together at room temperature until the components were

uniformly mixed. Thus, a soap base composition was obtained. The soap base composition was stamped by a stamping machine, whereby a machine-milled solid soap composition was obtained. In the solid soap composition, the amount of the microemulsions
5 was 12%, and the amount of the soap base was 76% (mass ratio ME/soap base: 1/6).

[0135]

<Production Example 2>

A solid soap composition is produced by the same method
10 as in Production Example 1, except that the composition (I) is used in an amount of 97 parts and the microemulsions O/W 1-1 to O/W 1-3 are used in an amount of 1 part each (3 parts in total). In the solid soap composition, the amount of the microemulsions is 3%, and the amount of the soap base is 84% (mass ratio ME/soap
15 base: 1/28).

INDUSTRIAL APPLICABILITY

[0136]

The present invention can provide a solid soap
20 composition having good foam quality, good foam durability, and excellent feel.

CLAIMS

Claim 1. A solid soap composition comprising:

(A) a soap base; and

5 (B) a microemulsion containing the following components
(b1) to (b3):

(b1) at least one surfactant selected from the group
consisting of nonionic surfactants and anionic surfactants,

(b2) at least one oily component, and

10 (b3) water.

Claim 2. The solid soap composition according to claim
1,

15 wherein the amount of the microemulsion (B) in the solid
soap composition is 0.15 to 5% by mass.

Claim 3. The solid soap composition according to claim
1 or 2,

20 wherein the microemulsion (B) further contains (b4) a
C1-C4 monohydric alcohol and/or (b5) a polyhydric alcohol.

Claim 4. The solid soap composition according to any one
of claims 1 to 3,

25 wherein the solid soap composition is in solid, sheet,
powder, or granulated form.

Claim 5. The solid soap composition according to any one
of claims 1 to 4,

30 wherein the microemulsion is an oil-in-water type (O/W
type) microemulsion, and

the nonionic surfactant is at least one selected from the
group consisting of polyoxyethylene alkyl ethers,
polyoxyethylene polyoxypropylene alkyl ethers,
polyoxyethylene sorbitan fatty acid esters, polyoxyethylene
35 glycerol fatty acid esters, polyoxyethylene hydrogenated

castor oil, polyglycerol fatty acid esters, and polyether-modified silicones, each having an HLB of 10 to 20.

Claim 6. The solid soap composition according to any one
5 of claims 1 to 5,

wherein the microemulsion is an oil-in-water type (O/W type) microemulsion, and

the anionic surfactant is at least one selected from the group consisting of polyoxyethylene alkyl ether phosphates,
10 N-acyl glutamates, and polyoxyethylene alkyl ether phosphoric acids or salts thereof.

Claim 7. The solid soap composition according to any one of claims 1 to 6,

15 wherein the microemulsion is a water-in-oil type (W/O type) microemulsion, and

the nonionic surfactant is at least one selected from the group consisting of polyoxyethylene di-fatty acid esters, monoglycerol mono-fatty acid esters, monoglycerol di-fatty
20 acid esters, diglycerol mono-fatty acid esters, and polyether-modified silicones, each having an HLB of 1 to 7.

Claim 8. A method for producing a solid soap composition, comprising:

25 a step of preparing a soap base composition by mixing at least (A) a soap base and (B) a microemulsion containing the following components (b1) to (b3):

(b1) at least one surfactant selected from the group consisting of nonionic surfactants and anionic surfactants,

30 (b2) at least one oily component, and

(b3) water.

Claim 9. The method for producing a solid soap composition according to claim 8,

35 wherein the amount of the microemulsion (B) in the solid

soap composition is 0.15 to 5% by mass.

Claim 10. A foam-quality improver for a solid soap composition, the foam-quality improver comprising, as an active
5 ingredient:

a microemulsion containing the following components (b1)
to (b3):

(b1) at least one surfactant selected from the group consisting
of nonionic surfactants and anionic surfactants,
10 (b2) at least one oily component, and
(b3) water.

Claim 11. Use of a microemulsion for improving foam
quality of a solid soap composition,

15 the microemulsion containing the following components
(b1) to (b3):

(b1) at least one surfactant selected from the group consisting
of nonionic surfactants and anionic surfactants,
(b2) at least one oily component, and
20 (b3) water.