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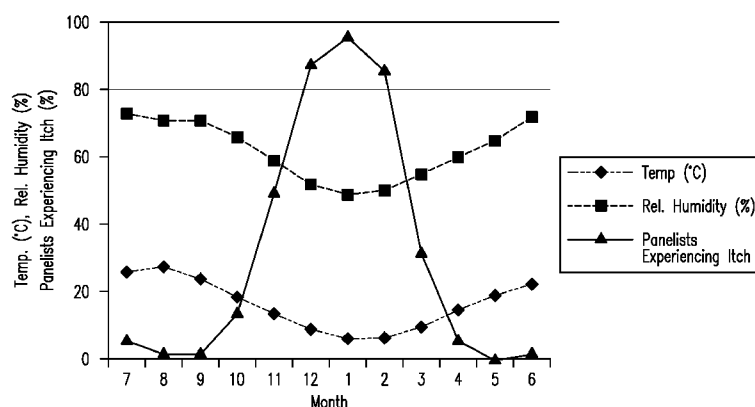


FIG-1

(57) Abstract: The disclosed technology relates to a method for the treatment of a pruritic skin sensation comprising applying to the scalp and/or skin at least one composition comprising: a) at least one salt of a fatty acid; b) a polymer prepared from i. about 35% to about 65% by weight of acrylic acid, methacrylic acid, or combinations thereof; ii. about 65% to about 35% by weight of at least one C₁ to C₅ alkyl ester of acrylic acid or methacrylic acid; and iii. about 0.03% to about 3% by weight of at least one polyunsaturated crosslinker monomer; c) water; and d) optionally at least one surfactant.

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SOAP COMPOSITIONS AND TREATMENT METHODS FOR THE MITIGATION OF WINTER SEASON RELATED PRURITUS

TECHNOLOGICAL FIELD

[0001] The present technology relates to a method for mitigating pruritus caused by prolonged exposure to low humidity conditions comprising applying to the scalp and skin of a mammalian subject a cleansing composition including at least one fatty acid soap and least one acrylic copolymer.

BACKGROUND

[0002] Many people suffer from different skin conditions that result in dryness, discoloration, edema, pain and general irritation. Some of these conditions are elicited by topical cleansing products including shampoos, body cleansers and other personal care products that contain harsh deterative surfactants. These deterative surfactants remove some of the skin's protective lipids and/or secretions which may increase the permeability and sensitivity of the skin to topically applied chemicals which would not otherwise produce irritation. A typical symptom of irritation includes itching (pruritus). Itch can be defined as a sensation which provokes the desire to scratch the area from which the sensation originates. No matter what the ultimate cause of itch, the sensation experienced is the same and provokes the desire to scratch in order to curtail the sensation.

[0003] Environmental influences may also adversely affect the skin's barrier function and provoke irritation. Irritation results from, or is aggravated by, extremes in humidity, exposure to sunlight, and abrasive clothing. A very common condition due to low humidity is known as "winter itch" in which the very low humidity conditions of winter month cold climates (particularly when accompanied by indoor heating) or long exposure to refrigerated air from air conditioners in summer month warm climates produces itchy scalp and/or skin. When cold, dry air is artificially heated it becomes even dryer, acts almost like a sponge, and "pulls" water from the skin through enhanced surface evaporation.

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Since water is the main “softener” of the skin, dry skin may become rough, scaly, and eventually red, inflamed, and itchy. In severe cases these changes will have the appearance of dermatitis. A treatment for “winter itch” is to: 1) increase the relative humidity of the air; 2) decrease factors that may exacerbate the problem, such as excessive bathing and the use of harsh cleansers; and 3) moisturize the skin with humectant and/or emollient containing creams, lotions, or ointments.

[0004] International Pub. No. WO 2005/023970 provides a method for reducing the irritation associated with surfactant containing personal care cleansing compositions. The disclosure in the paragraph bridging pages 5 and 6 of the publication postulates that the free unbound surfactant molecules and/or free unbound surfactant micelles contained in a personal care composition are irritants to the skin and eyes. The disclosure teaches that the irritation associated with anionic surfactant containing personal care compositions can be reduced by including a hydrophobically modified acrylic polymer that is capable of binding the free unbound anionic surfactant and/or free unbound anionic surfactant micelles. The anionic surfactants suitable for the disclosed method are set forth on pages 8 to 12 of the publication. The preferred anionic surfactants are selected from alkyl ether sulfates.

[0005] Disclosed hydrophobically modified acrylic polymers include hydrophobically modified crosslinked acrylic copolymers that are synthesized from at least one ethylenically unsaturated carboxylic acid monomer and at least one ethylenically unsaturated hydrophobically modified monomer. International Pub. No. WO 2005/023970 discloses that exemplary hydrophobically modified acrylic copolymers are set forth in U.S. Patent No. 6,433,061 (assigned to Lubrizol Advanced Materials, Inc.). The WO publication additionally exemplifies polymers available under the trade names Carbopol® Aqua SF-1 (INCI name: Acrylates Copolymer) and Carbopol® ETD 2020 (INCI name: Acrylates/C10-30 Alkyl Acrylate Crosspolymer) both manufactured and marketed by Lubrizol Advanced Materials, Inc. as suitable polymers for use as a surfactant binder.

[0006] Hydrophobically modified acrylic polymers in combination with fatty acid salts are not contemplated by the method disclosed in Pub. No. WO

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2005/023970. While the disclosure proposes a solution for mitigating the underlying cause of itching (i.e., irritation triggered by harsh anionic surfactants), there is no appreciation that a fatty acid soap in combination with an acrylic copolymer can treat a symptom (itchiness) of winter itch irritation when applied to the scalp and/or the skin.

[0007] Fatty acid soap compositions are known in the art. These soaps have been widely employed for many years as effective general all purpose body cleansers. Fatty acid soaps are formulated with a myriad of different ingredients to obtain the desired cleansing effect and the requisite physical property parameters so that they can be easily stored and dispensed in a convenient manner. Fatty acid soaps must have the appropriate rheology characteristics to be flowable when dispensed from the product container but of a sufficient viscosity not run off of the skin when applied to the body. In addition, today's consumer is increasingly looking for additional benefits beyond the basic cleansing effects brought about by the traditional soap product. Efforts are continually being made to make improvements in product function and aesthetics by incorporating various adjuncts into the formulation such as moisturizers, emollients, colorants, opacifiers, perfumes, antioxidants, antibacterial agents, and the like to name a few. It has also been increasingly popular to incorporate water insoluble moieties such as microcapsules, beads, and pearlescent agents into the soap composition for delivery of actives to the skin and for product aesthetics.

[0008] In order to achieve the desired rheology profiles and to disperse the multitude of different ingredients within the soap composition, synthetic rheology modifying polymers and synthetic surfactants have been employed in an attempt to obtain a composition which is stable with respect to viscosity and visual phase homogeneity over a period of time and a wide range of temperatures. These parameters are particularly significant for liquid compositions wherein the large quantity of water in the formulation makes the establishment of a stable composition more difficult, particularly when substantially water insoluble adjuncts are dispersed in the formulation.

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[0009] Japanese Patent Publication No. 2004-204153 (publication date July 22, 2004) discloses a cleansing composition containing (a) a fatty acid salt; (b) a sulfate ester surfactant; and (d) a copolymer obtained from the polymerization of at least one monomer selected from (meth)acrylic acid, maleic acid, and an alkyl (meth)acrylate.

[0010] Japanese Patent Publication No. H11-189785 (publication date July 13, 1999) concerns a cleansing agent containing (a) a fatty acid salt; (b) a polyhydric alcohol; and (c) and alkyl acrylate copolymer.

[0011] U.S. Patent Application Pub. No. U.S. 2007/0213243 discloses a stable soap composition comprising: (a) an crosslinked acrylic copolymer (INCI name: Acrylates Copolymer); (b) a fatty acid soap; (c) an acidifying agent; (d) an optional surfactant; (e) an optional humectant; (f) an optional emollient; and (g) water. The composition is stabilized with the acrylic copolymer and subsequently back-acid treated with the acidifying agent to obtain compositions that are storage and phase stable over a wide temperature range.

[0012] While the foregoing fatty acid soap based compositions contain polymeric acrylic thickeners, there is no recognition that pruritus caused by winter itch irritation can be treated or mitigated by a deterative combination of fatty acid soap(s), an acrylic copolymer and an optional surfactant(s).

[0013] Others have attempted to address the underlying cause of irritation by attempting to mitigate the effects of the causative agent(s). We have discovered a way to treat the symptom of irritation by mitigating the itching sensation and the desire to scratch.

SUMMARY OF THE TECHNOLOGY

[0014] In accordance with a general embodiment of the present technology, the cleansing soap utilized in the treatment method comprises a fatty acid salt soap base selected from at least one fatty acid salt; a crosslinked alkali-swellaable acrylic based emulsion polymer; and water.

[0015] In accordance with another general embodiment of the present technology, the cleansing soap comprises a fatty acid salt soap base selected

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from at least one fatty acid salt, a crosslinked alkali-swellaable acrylic based emulsion polymer, a surfactant selected from an anionic surfactant, an amphoteric surfactant, and mixtures thereof; and water.

[0016] In accordance with still another general embodiment of the technology there is provided a method for the treatment or mitigation of a pruritic skin condition comprising applying to the scalp and/or skin at least one composition comprising:

- a) a soap comprising at least one fatty acid salt;
- b) a polymer prepared from
 - i. about 35% to about 65% by weight of acrylic acid, methacrylic acid, or combinations thereof;
 - ii. about 65% to about 35% by weight of at least one C₁ to C₅ alkyl ester of acrylic acid or methacrylic acid; and
 - iii. about 0.03% to about 3% by weight of at least one polyunsaturated crosslinker monomer;
- c) water; and
- d) optionally at least one surfactant.

[0017] In accordance with still another general embodiment of the technology there is provided a method for the treatment or mitigation of a pruritic skin condition caused by prolonged exposure to low relative humidity conditions comprising applying to the scalp and/or skin at least one composition comprising:

- a) a soap comprising at least one fatty acid salt
- b) a polymer prepared from
 - i. about 35% to about 65% by weight of acrylic acid, methacrylic acid, or combinations thereof;
 - ii. about 65% to about 35% by weight of at least one C₁ to C₅ alkyl ester of acrylic acid or methacrylic acid; and
 - iii. about 0.03% to about 3% by weight of at least one polyunsaturated crosslinker monomer;
- c) water; and

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d) optionally at least one surfactant.

BRIEF DESCRIPTION OF THE DRAWINGS

[0018] Fig. 1 is a plot showing the results of a survey illustrating the relationship between temperature, relative humidity and time of the year an itch sensation is experienced by survey participants.

[0019] Fig. 2 is a plot of itch intensity (y-axis) versus time progression in days (x-axis) rated by a human test panel following the application of 2 control shampoo samples and a shampoo formulated in accordance with the disclosed technology. The itch intensity for the shampoo composition of the disclosed technology is rated in days 5-11 in the plot.

DESCRIPTION OF EXEMPLARY EMBODIMENTS

[0020] Certain embodiments of the technology disclosed herein are based on the surprising discovery that a cleansing composition comprising at least one fatty acid salt soap, a crosslinked acrylic copolymer, water, and optionally, at least one surfactant can mitigate pruritus of the scalp and skin.

[0021] In particular it has been discovered that the soap based cleansing composition disclosed herein can be employed as an effective treatment for mitigating pruritus caused by prolonged exposure to low relative humidity conditions.

[0022] As used here and throughout the present specification the term "pruritus" or "pruritic" means is a sensation that causes the desire or reflex to scratch.

[0023] As used here and throughout the present specification the term "low relative humidity" (RH) means a RH value of 50% or less in one aspect, 45% or less in another aspect, 40% or less in still another aspect, 35% or less in a further aspect, 30% or less in a still further aspect, and 25%, 20%, 15%, 10%, 5% and 1% in an additional aspect.

[0024] By "relative humidity" is meant the ratio of the actual amount of water vapor present in a volume of air (by vapor density or vapor pressure) at a given

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temperature to the maximum amount of water vapor that could exist in the air at that temperature (by saturation vapor density or saturation vapor pressure), expressed as a percentage, and can be calculated by the equations:

$$RH = (\text{actual vapor density})/(\text{saturation vapor density}) \times 100$$

or

$$RH = (\text{actual vapor pressure})/(\text{saturation vapor pressure}) \times 100$$

[0025] By “prolonged exposure to low relative humidity” means exposure to low humidity conditions for a sufficient time to develop pruritus.

[0026] As used here and throughout the specification “winter itch” is a pruritic condition caused by exposure to cold winter air and/or to low humidity conditions.

[0027] By “cold winter air” is meant a temperature of 20°C or less in one aspect, 15°C or less in another aspect, 10°C or less in still another aspect, and 9°C, 8°C, 7°C, 6°C, 5°C, 4°C, 3°C, 2°C, 1°C, 0°C, -5°C, -10°C and -15°C or less in a further aspect.

[0028] The phrase “at least one” means one or more of a particular component and thus includes individual components as well as mixtures/combinations of individually recited components.

[0029] The methods, polymers, components, and compositions of the present technology may suitably comprise, consist of, or consist essentially of the components, elements, steps, and process delineations described herein. The technology illustratively disclosed herein suitably may be practiced in the absence of any element, component or step which is not specifically disclosed herein.

[0030] Unless otherwise stated, all percentages, parts, and ratios expressed herein are based upon the total composition weight of the soap cleansing composition.

[0031] When referring to a specified monomer(s) that is incorporated into a polymer of the disclosed technology, it will be recognized that the monomer(s)

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will be incorporated into the polymer as a unit(s) derived from the specified monomer(s) (e.g., repeating unit).

[0032] The term "personal care" as used herein includes, without being limited thereto, cosmetics, toiletries, cosmeceuticals, beauty aids, insect repellents, personal hygiene and cleansing products applied to the body, including the skin, hair, scalp, and nails of humans and animals.

[0033] Here, as well as elsewhere in the specification and claims, individual numerical values (including carbon atom numerical values), or limits, can be combined to form additional non-disclosed and/or non-stated ranges.

[0034] The headings provided herein serve to illustrate, but not to limit the disclosed technology in any way or manner.

[0035] In addition to the foregoing ingredients, the cleansing compositions can include other optional adjuncts conventionally used in soaps. These include, for example, one or more emollients, one or more humectants, one or more preservatives, one or more viscosity adjusting agents, one or more skin conditioning agents, one or more hair conditioning agents, one or more antibacterial agents, one or more antioxidants, one or more fragrances, one or more colorants, one or more chelating (sequestering) agents and one or more insoluble materials. These optional materials are described in more detail below.

[0036] The selection and the amounts of the foregoing ingredients will be dependent upon the desired liquid soap end product of the invention. For example, a hand soap, body wash, shampoo, and facial cleanser can contain different ingredients as well as varying amounts of the same ingredient. The choice and amount of ingredients in formulated compositions of the invention will vary depending on the product and its function, as is well known to those skilled in the formulation arts.

[0037] While overlapping weight ranges for the various ingredients that make up the cleansing soap composition will be expressed for various embodiments of the disclosed technology, it should be readily apparent that the specific amount of each component in the composition will be selected from its disclosed range

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such that the desired amount of each component will be adjusted so that the sum of all components in the liquid soap composition totals 100 wt. %.

Fatty Acid Salt Soap

[0038] In one aspect of the disclosed technology the soap composition contains at least one the fatty acid salt soap containing from about 8 to about 22 carbon atoms. In another aspect of the disclosed technology the soap composition contains at least one fatty acid salt soap containing from about 10 to about 18 carbon atoms. In a further aspect of the disclosed technology the soap composition contains at least one fatty acid salt soap containing from about 12 to about 16 carbon atoms. The fatty acids utilized in the soaps can be saturated and unsaturated and can be derived from synthetic sources, as well as from the hydrolysis of fats and natural oils. Exemplary saturated fatty acids include but are not limited to octanoic, decanoic, lauric, myristic, pentadecanoic, palmitic, margaric, steric, isostearic, nonadecanoic, arachidic, behenic, and the like, and mixtures thereof. Exemplary unsaturated fatty acids include but are not limited to myristoleic, palmitoleic, oleic, linoleic, linolenic, and the like, and mixtures thereof. The fatty acids can be derived from animal fat such as tallow, lard, poultry fat or from vegetable sources such as coconut oil, red oil, palm kernel oil, palm oil, cottonseed oil, linseed oil, sunflower seed oil, olive oil, soybean oil, peanut oil, corn oil, safflower oil, sesame oil, rapeseed oil, canola oil, and mixtures thereof.

[0039] The soap can be prepared by a variety of well known means such as by the direct base neutralization of a fatty acid or mixtures thereof or by the saponification of suitable fats and vegetable oils or mixtures thereof with a suitable base. Exemplary bases include potassium hydroxide, potassium carbonate, sodium hydroxide and alkanol amines such as triethanolamine. Generally, the fat or oil is heated until liquefied and a solution of the desired base is added thereto. Soaps included in a personal care composition utilized in the method of the disclosed technology can be made, for example, by a classic kettle process or modern continuous manufacturing process wherein natural fats

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and oils such as tallow or coconut oil or their equivalents are saponified with an alkali metal hydroxide using procedures well known to those skilled in the art. Alternatively, soaps can be made by the direct neutralization of free fatty acids such as lauric acid (C₁₂), myristic acid (C₁₄), palmitic acid (C₁₆), steric acid (C₁₈), isostearic (C₁₈), and mixtures thereof, with an alkali metal hydroxide or carbonate.

[0040] The amount of the at least one fatty acid salt soap that is employed in the soap composition of the present technology ranges from about 10% to about 35% by wt. in one aspect, from about 12% to about 30% by wt. in another aspect, from about 15% to about 25% by wt. in still another aspect, and from about 18% to about 20% by wt., based on the total weight of the composition.

[0041] In one aspect of the disclosed technology, the fatty acid salt soap comprises a fatty acid salt wherein the fatty acid is selected from a mixture of lauric acid, myristic acid, and steric acid. In another aspect, the fatty acid salt soap comprises a fatty acid salt wherein the fatty acid is selected from a mixture of lauric acid, myristic acid, and isostearic acid. In still another aspect, the fatty acid salt soap comprises a fatty acid salt wherein the fatty acid is selected from a mixture of lauric acid, myristic acid, and palmitic acid. In a further aspect, the fatty acid salt soap comprises a fatty acid salt wherein the fatty acid is selected from a mixture of lauric acid, myristic acid, palmitic acid, and steric acid, an alkali metal fatty acid salt soap. In another aspect of the technology, the fatty acid soap is the potassium salt of a fatty acid.

Acrylic Copolymer

[0042] The acrylic copolymer component of the disclosed technology is polymerized from a monomer mixture comprising three polymerizable monomeric components. The first monomeric component is selected from one or more unsaturated carboxylic acid containing monomers and salts thereof having a total of from about 3 to about 10 carbon atoms. Examples of such monomers include but are not limited to acrylic acid, methacrylic acid, itaconic acid, fumaric acid, crotonic acid, maleic acid, or aconitic acid. Moreover, half esters of polyacids, such

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as maleic acid, fumaric acid, itaconic acid, or aconitic acid and the like with C₁ to C₄ alkanols can also be used, particularly if it is used in minor amounts in combination with acrylic acid or methacrylic acid. Salts of the foregoing monomers (e.g., sodium and potassium) can be employed.

[0043] The amounts of such carboxylic acid monomers is generally from about 20% to 80% by wt. in one aspect, from about 25% to about 70% by wt. in another aspect and from about 35% to about 65% by wt. in a further aspect, based upon the total wt. of the monomers.

[0044] The second monomeric component is selected from one or more vinyl monomers represented by the formulae:

- 1) $\text{CH}_2=\text{CXY}$,
 where X is H and Y is $-\text{C}(\text{O})\text{OR}$, $-\text{C}_6\text{H}_4\text{R}'$, $-\text{CN}$, $-\text{C}(\text{O})\text{NH}_2$, $-\text{Cl}$,
 $-\text{NC}_4\text{H}_6\text{O}$, $-\text{NH}(\text{CH}_2)_3\text{C}(\text{O})\text{OH}$, $-\text{NHC}(\text{O})\text{CH}_3$, $-\text{C}(\text{O})\text{NHC}(\text{CH}_3)_3$,
 $-\text{C}(\text{O})\text{N}(\text{CH}_3)_2$,
 or X is CH_3 and Y is $-\text{C}(\text{O})\text{OR}$, $-\text{C}_6\text{H}_4\text{R}'$, $-\text{CN}$ or $-\text{CH}=\text{CH}_2$;
 or X is Cl and Y is Cl, and
 R is C₁-C₁₈ alkyl, or hydroxy C₂-C₁₈ alkyl,
 R' is H or C₁-C₁₈ alkyl;
- 2) $\text{CH}_2=\text{CHOC}(\text{O})\text{R}^1$,
 where R¹ is C₁-C₁₈ alkyl; or
- 3) $\text{CH}_2=\text{CH}_2$ or $\text{CH}_2=\text{CHCH}_3$.

[0045] Typical of such vinyl monomers or mixture of monomers are the various acrylate or hydroxy acrylate esters wherein the ester portion has from 1 to 10 carbon atoms such as methyl acrylate, ethyl acrylate, n-butyl acrylate, 2-ethylhexyl acrylate, 2-hydroxyethyl acrylate, or various vinyl acetates, or styrene, or vinyl chloride, or vinylidene chloride, or acrylonitrile, acrylamide, N,N-dimethylacrylamide, t-butyl-acrylamide, and their methacrylate analogs.

[0046] The amount of such non-acid vinyl monomers is generally from about 80% to about 15% by wt. in one aspect, from about 75% to about 25% by wt. in another aspect, and from about 65% to about 35% by wt. in a further aspect based upon the total wt. of the monomers.

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[0047] The third monomeric component forming the acrylic emulsion polymer is one or more polyunsaturated crosslinking monomers. Monomeric unsaturated compounds carrying a reactive group that is capable of causing a formed copolymer to be crosslinked before, during, or after polymerization has taken place can also be used.

[0048] The polyunsaturated compound is utilized to generate either a partially or substantially crosslinked three dimensional polymeric network. By polyunsaturated is meant that the crosslinking monomer contains at least two polymerizable double bonds that are reactive with the foregoing unsaturated carboxylic acid containing monomers and the vinyl monomers. Examples of such polyunsaturated compounds are the polyalkenyl ethers of sucrose, or polyalcohols; diallylphthalates, divinyl benzene, allyl (meth)acrylate, ethylene glycol di(meth)acrylate, methylene bisacrylamide, trimethylolpropane tri(meth)acrylate, diallyl itaconate, diallyl fumarate, diallyl maleate, zinc (meth)acrylate, derivatives of castor oils or polyols made from ethylenically unsaturated carboxylic acid and the like, glycidyl methacrylate, N-methylol acylamide or N-alkoxymethylacrylamide, alkoxy being C₁ to C₁₈ alcohol; hydroxy(meth)acrylate or (meth)acrylate end-capped caprolactones.

[0049] For those skilled in the art of making unsaturated derivatives, a reaction scheme such as an esterification reaction of polyols made from ethylene oxide or propylene oxide or combinations thereof with unsaturated acid such as acrylic acid, methacrylic acid, or with unsaturated anhydride such as maleic anhydride, citraconic anhydride, itaconic anhydride, or an addition reaction with unsaturated isocyanate such as 3-isopropenyl- α - α -dimethylbenzene isocyanate (TMI), is also within the scope of the present invention.

[0050] As used herein, the term "(meth)acrylic" acid and "(meth)acrylate" are meant to include the corresponding methyl derivatives of acrylic acid and the corresponding alkyl acrylate. For example, "(meth)acrylic" acid refers to acrylic acid and/or methacrylic acid and "(meth)acrylate" refers to alkyl acrylate and/or alkyl methacrylate.

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[0051] The polyunsaturated crosslinker monomer component can be used in an amount from about 0.01 to about 5% by wt. in one aspect, from about 0.03 to about 3% by wt. in another aspect, and from about 0.05 to about 1% by wt. in a further aspect, based upon the total wt. of all of the monomer components.

[0052] In one aspect, the acrylic copolymer of the disclosed technology can be prepared by emulsion polymerization techniques. The emulsion polymerization is generally carried out at a pH of from about 2.5 to about 5.0, with the at least three essentially ethylenically unsaturated components set forth above. None of these monomers are an associative monomer which is a copolymerizable surfactant capable of nonspecific hydrophobic association similar to those of conventional surfactants.

[0053] The acrylic copolymers of the present technology can be prepared by any conventional manner such as set forth in U.S. Patent No. 4,138,380, or U.S. Patent No. 4,110,291 which are hereby fully incorporated by reference. Generally, one or more monomers of the above noted carboxylic acid monomers, vinyl monomers, and polyunsaturated monomers are added to a reaction vessel which contains water therein. Suitable amounts of conventional or typical emulsion polymerization surfactants such as sodium lauryl sulfate are added as well as emulsion type initiators, for example sodium or potassium persulfate, redox initiator, and the like. The reaction vessel can also contain a chain transfer agent. The temperature is then increased from about 60°C to about 100°C and polymerization commences. Optionally, during the reaction, additional monomers are added over a period of time. Upon completion of the addition of the monomers, polymerization is allowed to run to completion generally by adding additional initiator.

[0054] In one aspect of the disclosed technology, the acrylic copolymer is prepared from a monomer composition comprising:

- i. about 35% to about 65% by weight of acrylic acid, methacrylic acid, or combinations thereof;
- ii. about 65% to about 35% by weight of at least one C₁ to C₅ alkyl ester of acrylic acid or methacrylic acid; and

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iii. about 0.03% to about 3% by weight of at least one polyunsaturated crosslinker monomer.

[0055] In one aspect of the disclosed technology, the acrylic copolymer is an emulsion polymer prepared by emulsion polymerizing a monomer composition comprising:

i. about 35% to about 65% by weight of acrylic acid, methacrylic acid, or combinations thereof;

ii. about 65% to about 35% by weight of at least one C₁ to C₅ alkyl ester of acrylic acid or methacrylic acid; and

iii. about 0.03% to about 3% by weight of at least one polyunsaturated crosslinker monomer.

[0056] In one embodiment the acrylic copolymer suitable for use in the liquid soap component of the disclosed technology is commercially available from Lubrizol Advanced Materials, Inc., Cleveland, Ohio and is marketed under the tradename Carbopol® Aqua SF-1. Carbopol Aqua SF-1 polymer is an alkali-swellaable acrylic emulsion polymer composition containing approximately 30% by wt. polymer solids. The polymer is a branched to lightly crosslinked copolymer made from at least one pH sensitive first monomer selected from acrylic acid and/or methacrylic acid and at least one second monomer selected from a C₁ to C₅ alkyl ester of acrylic acid or methacrylic acid, and a third polyunsaturated crosslinking monomer.

[0057] The amount of the acrylic copolymer employed in the soap composition in accordance with the present technology generally ranges from about 0.5% to about 5% by wt. of the total composition in one aspect, from about 0.6% to about 4% by wt. in another aspect, from about 1% to about 3% by wt. in still another aspect, and from about 1.5% to about 2 wt.% in a further aspect of active (neat) polymer solids based upon the total weight of the composition.

Surfactant

[0058] The fatty acid soap compositions of the invention can include an optional synthetic deterative surfactant (syndet) selected from anionic, amphoteric, zwitterionic, nonionic, and combinations thereof.

[0059] The anionic surfactant can be any of the anionic surfactants known or previously used in the art of aqueous surfactant compositions. Suitable anionic surfactants include but are not limited to alkyl sulfates, alkyl ether sulfates, alkaryl sulfonates, alkyl succinates, alkyl sulfosuccinates, N-alkoyl sarcosinates, alkyl phosphates, alkyl ether phosphates, alkyl ether carboxylates, alkylamino acids, alkyl peptides, alkoyl taurates, carboxylic acids, acyl and alkyl glutamates, alkyl isethionates, and alpha-olefin sulfonates, especially their sodium, potassium, magnesium, ammonium and mono-, di- and triethanolamine salts. The alkyl groups generally contain from 8 to 18 carbon atoms and may be unsaturated. The alkyl ether sulfates, alkyl ether phosphates and alkyl ether carboxylates may contain from 1 to 10 ethylene oxide and/or propylene oxide units per molecule in one aspect, and from about 1 to about 4 ethylene oxide units per molecule in another aspect.

[0060] Examples of suitable anionic surfactants include sodium and ammonium lauryl ether sulfate (ethoxylated with 1, 2, and 3 moles of ethylene oxide), sodium trideceth sulfate (ethoxylated with 1, 2, 3, and 4 moles of ethylene oxide), sodium, ammonium, and triethanolamine lauryl sulfate, disodium laureth sulfosuccinate, sodium cocoyl isethionate, sodium C₁₂₋₁₄ olefin sulfonate, sodium laureth-6 carboxylate, sodium C₁₂₋₁₅ pareth sulfate, sodium methyl cocoyl taurate, sodium dodecylbenzene sulfonate, sodium cocoyl sarcosinate, and triethanolamine monolauryl phosphate.

[0061] Amphoteric and zwitterionic surfactants are those compounds which have the capacity of behaving either as an acid or a base. These surfactants can be any of the surfactants known or previously used in the art of aqueous surfactant compositions. Suitable materials include but are not limited to alkyl betaines, alkyl amidopropyl betaines, alkyl sulphobetaines, alkyl glycinate, alkyl carboxyglycinates, alkyl amphopropionates, alkyl amidopropyl hydroxysultaines,

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acyl taurates and acyl glutamates wherein the alkyl and acyl groups have from 8 to 18 carbon atoms. Examples include cocamidopropyl betaine, sodium cocoamphoacetate, cocamidopropyl hydroxysultaine, and sodium cocamphopropionate.

[0062] The nonionic surfactant can be any of the nonionic surfactants known or previously used in the art of aqueous surfactant compositions. Suitable nonionic surfactants include but are not limited to aliphatic (C₆ to C₁₈) primary or secondary linear or branched chain acids, alcohols or phenols, alkyl ethoxylates, alkyl phenol alkoxyates (especially ethoxylates and mixed ethoxy/propoxy), block alkylene oxide condensate of alkyl phenols, alkylene oxide condensates of alkanols, ethylene oxide/propylene oxide block copolymers, semi-polar nonionics (e.g., amine oxides and phosphine oxides), as well as alkyl amine oxides. Other suitable nonionics include mono or di alkyl alkanolamides and alkyl polysaccharides, sorbitan fatty acid esters, polyoxyethylene sorbitan fatty acid esters, polyoxyethylene sorbitol esters, polyoxyethylene acids, and polyoxyethylene alcohols. Examples of suitable nonionic surfactants include coco mono or diethanolamide, coco diglucoside, alkyl polyglucoside, cocamidopropyl and lauramine oxide, polysorbate 20, ethoxylated linear alcohols, cetearyl alcohol, lanolin alcohol, stearic acid, glyceryl stearate, PEG-100 stearate, and oleth 20.

[0063] Other surfactants which can be utilized in the present invention are set forth in more detail in WO 99/21530, U.S. Patent No. 3,929,678, U.S. Patent No. 4,565,647, U.S. Patent No. 5,720,964, and U.S. Patent No. 5,858,948. Other suitable surfactants are described in McCutcheon's Emulsifiers and Detergents (North American and International Editions, by Schwartz, Perry and Berch) which is hereby fully incorporated by reference.

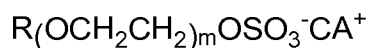
[0064] In one embodiment of the disclosed technology, the amount of surfactant can vary widely if present. The amounts (active basis) which are often utilized generally range from about 0 or 1 to about 15 wt.% in one aspect, from about 2 to about 12 wt.% in another aspect, from about 2.5 to about 10 wt.% in a further aspect, and from about 5 to about 8 wt.% in still further aspect, based

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upon the total weight of the composition, subject to the proviso that the total amount of surfactant employed in the composition is less than the amount of fatty acid salt soap utilized in the composition.

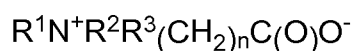
[0065] In other embodiment, the amount of surfactant utilized in the composition can be based on the amount of fatty acid soap present in the liquid cleansing composition, and can be expressed as the weight ratio of fatty acid soap to surfactant. In one aspect of the disclosed technology, the ratio of fatty acid soap to surfactant ranges from about 1:1 to about 5:1, in another aspect the soap to surfactant ratio ranges from about 1.5:1 to about 3:1, and in a further aspect the soap to surfactant ratio ranges from about 2:1 to about 2.5:1 (all ratios based on a wt./wt. basis).

[0066] In one aspect of the disclosed technology the surfactant is selected from a mixture of an anionic surfactant(s) and amphoteric surfactant(s). In one aspect, the anionic surfactant is selected from at least one alkyl ether sulfate conforming to the formula:



wherein R is C₁₀ to C₁₆ alkyl; m is an integer of 1, 2, 3 or 4; and CA is a cation selected from an alkali metal (e.g., sodium, potassium) or ammonium. In one aspect the anionic surfactant is sodium laureth sulfate or sodium trideceth sulfate containing 1 to 4 moles of ethoxylation.

[0067] In one aspect, the amphoteric surfactant is selected from an alkyl betaine and/or an amido alkyl betaine conforming to the respective formulas:



wherein R¹ is a C₈ to C₂₂ alkyl group; R² and R³ independently represent a C₁ to C₄ alkyl group or a hydroxy C₁ to C₄ alkyl group; and n is 1 or 2.

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wherein R^4 is a C_9 to C_{21} alkyl group; R^5 and R^6 independently represent C_1 to C_4 alkyl group or a hydroxyl C_1 to C_4 alkyl group; p is an integer ranging from about 1 to about 6; and q is 1 or 2.

[0068] In one aspect, the mixture of anionic surfactant and amphoteric surfactant comprises sodium laureth sulfate (with 1 to 3 moles of ethoxylation) with cocamidopropyl betaine. In one aspect, the surfactant comprises sodium trideceth sulfate with cocamidopropyl betaine.

Water

[0069] Water is also an ingredient in the compositions according to embodiments of the disclosed technology. In one aspect, the liquid cleansing compositions described herein are in the form of non-emulsion liquids in which water is the principal carrier/diluent/carrier. Taking into account the desired amounts (wt.%) of the other active components utilized to formulate the soap compositions of the disclosed technology, the quantity of water employed in the compositions will always correspond to a weight percentage needed to bring the total weight of the composition to 100 (i.e., quantity sufficient (q.s.) to 100). In another aspect, the amount of water can range from about 25 to about 89.5 wt.%, in a further aspect from about 35 to about 85 wt.%, in a still further aspect from about 40 to about 80 wt.%, in an additional aspect from about 40 to about 75 wt.%, in a still additional aspect from about 50 to about 70 wt.%, and a further additional aspect from about 55 to about 65 wt.%, based on the total weight of the composition.

pH Adjusting Agents

[0070] The pH of the cleansing compositions of the disclosed technology is above 7 in one aspect, from about 7.5 to about 10.5 in another aspect, from about 7.8 to about 9.8 in still another aspect, from about 8 to about 9.5 in a further aspect, and from about 8.2 to about 9.2 in a still further aspect. Because

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of the base saponification of the precursor animal and vegetable derived fatty acids and/or base neutralization of free fatty acids to obtain the fatty acid salt soap component of the disclosed technology, the soap compositions will typically be in the basic pH range, i.e. above about pH 7. However, it may be desired or necessary to adjust the pH of the final composition to the desired pH value. A sufficient amount of a pH adjusting agent (base and/or acid) can be added to the soap composition of the disclosed technology to attain the desired pH.

[0071] Many types of alkaline (basic) pH adjusting agents can be used, including inorganic and organic bases, and combinations thereof. Examples of inorganic bases include but are not limited to the ammonium and alkali metal hydroxides (especially sodium and potassium), and alkali metal salts of inorganic acids, such as sodium borate (borax), sodium phosphate, sodium pyrophosphate, and the like; and mixtures thereof. Examples of organic bases include, but are not limited to, triethanolamine (TEA), diisopropanolamine, triisopropanolamine, aminomethyl propanol, dodecylamine, cocamine, oleamine, morpholine, triamylamine, triethylamine, tetrakis(hydroxypropyl)ethylenediamine, L-arginine, aminomethyl propanol, tromethamine (2-amino 2-hydroxymethyl-1,3-propanediol), and PEG-15 cocamine.

[0072] In one aspect, the acidic pH adjusting agents are selected from an organic acid, such as citric acid, acetic acid, alpha-hydroxy acids, beta-hydroxy acids, salicylic acid, lactic acid, fumaric acid, glutamic acid, glycolic acid, tartaric acid, natural fruit acids, or combinations thereof. In addition, inorganic acids, for example, hydrochloric acid, nitric acid, sulfuric acid, sodium bisulfate, sulfamic acid, phosphoric acid, and combinations thereof can be utilized. Mixtures of organic acids and inorganic acids are also contemplated.

Humectant

[0073] The fatty acid liquid soap composition of the disclosed technology optionally includes at least one humectant. Humectants are defined as materials that absorb or release water vapor, depending on the relative humidity of the environment, (Harry's Cosmetology, Chemical Publishing Company Inc., 1982

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p. 266). Suitable humectants that can be included in the soap compositions include, but are not limited to, allantoin; pyrrolidonecarboxylic acid and its salts; hyaluronic acid and salts thereof; sorbic acid and salts thereof; urea, lysine, arginine, cystine, guanidine, and other amino acids; polyhydroxy alcohols such as glycerin, propylene glycol, hexylene glycol, hexanetriol, ethoxydiglycol, dimethicone copolyol, and sorbitol, and the esters thereof; polyethylene glycol; glycolic acid and glycolate salts (e.g. ammonium and quaternary alkyl ammonium); chitosan; aloe-vera extracts; algae extract; honey and derivatives thereof; inositol; lactic acid and lactate salts (e.g. ammonium and quaternary alkyl ammonium); sugars and starches; sugar and starch derivatives (e.g. alkoxyated glucose); DL-panthenol; magnesium ascorbyl phosphate, arbutin, kojic acid, lactamide monoethanolamine; acetamide monoethanolamine; and the like, and mixtures thereof. Humectants also include the C₃ to C₆ diols and triols, such as glycerin, propylene glycol, hexylene glycol, hexanetriol, and the like, and mixtures thereof. Ethoxylated methyl glucose ethers containing an average of 5 to 30 moles of ethoxylation, such as, for example, those available under the INCI names Methyl Glucose-10 and Methyl Glucose-20, are suitable. When utilized, humectants typically comprise from about 1 wt.% to about 10 wt.% of the total weight of the soap compositions of the disclosed technology. In another aspect the amount can range from about 2 wt.% to about 8 wt. %, and in a further aspect from about 3 wt. % to about 5 wt. % of the total weight of the soap composition.

Emollient

[0074] The fatty acid soap composition of the disclosed technology optionally includes at least one emollient. An emollient is defined as a substance which regulates the rate and quantity of water uptake by the skin (Handbook of Cosmetic Science and Technology, Elsevier Science Publishing, 1993, p. 175). Suitable emollients include mineral oil; vegetable oil; hydrogenated vegetable oil, stearic acid; fatty alcohols such as cetyl alcohol, cetearyl alcohol, myristyl alcohol, behenyl alcohol, and lauryl alcohol, cetyl acetate in acetylated lanolin

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alcohol, benzoate esters such as C₁₂ to C₁₅ alkyl benzoates, isostearyl benzoate, dicaprylyl maleate, petrolatum, lanolin, coco butter, shea butter, beeswax and esters thereof, ethoxylated fatty alcohol esters such as cetareth-20, oleth-5, and ceteth-5, alkoxylated fatty acid esters such as polyethylene glycol 400 propoxylated monolaurate, avocado oil or glycerides, sesame oil or glycerides, safflower oil or glycerides, sunflower oil or glycerides, and other mono-, di-, and triglycerides of natural vegetable and botanical oils, such as, for example, caprylic triglyceride, capric triglyceride, caprylic/capric triglyceride, and caprylic/capric/lauric triglyceride, Guerbet esters such as G-20, G-36, G-38, and G-66 marketed by Lubrizol Advanced Materials, Inc., botanical seed oils, volatile silicone oils, non-volatile emollients, and the like; and mixtures thereof.

[0075] Suitable non-volatile emollients include fatty acid and fatty alcohol esters, highly branched hydrocarbons, and the like, and mixtures thereof. Such fatty acid and fatty alcohol esters include decyl oleate, butyl stearate, octyl stearate, myristyl myristate, octyldodecyl stearyl stearate, octylhydroxystearate, di-isopropyl adipate, isopropyl myristate, isopropyl palmitate, ethyl hexyl palmitate, isodecyl neopentanoate C₁₂ to C₁₅ alcohol benzoate, diethyl hexyl maleate, PPG-14 butyl ether and PPG-2 myristyl ether propionate, cetearyl octanoate, and the like, and mixtures thereof. Suitable highly branched hydrocarbons include isohexadecane and the like, and mixtures thereof.

[0076] Suitable volatile emollients include the volatile silicones, such as cyclic or linear polydimethylsiloxanes, and the like. The number of silicon atoms in cyclic silicones can range from about 3 to about 7 in one aspect of the invention, and in another aspect from 4 to 5. Exemplary volatile silicones, both cyclic and linear, are available from Dow Corning Corporation as Dow Corning 344, 345, and 200. The linear volatile silicones typically have viscosities of less than about 5 cP at 25°C, while the cyclic volatile silicones typically have viscosities of less than about 10 cP at 25°C. "Volatile" means that the silicone has a measurable vapor pressure. A description of volatile silicones can be found in Todd and Byers, "Volatile Silicone Fluids for Cosmetics", Cosmetics and Toiletries, Vol. 91, January 1976, pp. 27-32.

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[0077] Other emollient silicones include polydimethylsiloxane gums, aminosilicones, phenylsilicones, polydimethyl siloxane, polydiethylsiloxane, polymethylphenylsiloxane, polydimethylsiloxane gums, polyphenyl methyl siloxane gums, amodimethicone, trimethylsilylamodimethicone, diphenyldimethyl polysiloxane gums, and the like. I

[0078] The emollients, if present (alone or in combination), range from about 1 wt.% to about 15 wt.% in one aspect, from about 2 wt.% to about 10 wt.% in another aspect, and from about 3 wt.% to about 5 wt.% in a further aspect, based of the total weight of the soap composition.

Other Optional Components

[0079] The fatty acid soap compositions of the invention can contain a variety of other conventional optional components suitable for rendering the cleansing compositions more desirable. Such optional components are well known to those skilled in the art of formulating soap compositions and include, but not limited to, one or more preservatives, one or more thickening agents, one or more viscosity adjusting agents, one or more skin conditioners, one or more antibacterial agents, one or more fragrances, one or more colorants, and one or more insoluble materials.

[0080] Suitable preservatives and antimicrobial agents, if present, include polymethoxy bicyclic oxazolidine, methyl paraben, propyl paraben, ethyl paraben, butyl paraben, benzoic acid and the salts of benzoic acid, e.g., sodium benzoate, benzyltriazole, DMDM hydantoin (also known as 1,3-dimethyl-5,5-dimethyl hydantoin), imidazolidinyl urea, phenoxyethanol, phenoxyethylparaben, methylisothiazolinone, methylchloroisothiazolinone, benzoisothiazolinone, triclosan, sorbic acid, salicylic acid salts, and the like, and mixtures thereof. Preservatives typically comprise about 0.01 wt. % to about 1.5 wt. % of the total wt. of the personal care compositions of the present invention.

[0081] Suitable thickening agents may be any natural and/or synthetic agent (or combination thereof) to obtain enhanced thickening properties. The person skilled in the art will readily select a proper thickening agent(s) and amounts(s)

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thereof to obtain the desired rheology. Non-limiting examples of natural thickening agents are tree & shrub exudates (karaya gum, tragacanth gum, gum Arabic, gum ghatti), seed extracts (guar gum, cassia gum, locust bean gum, tamarind seed), seaweed extracts (carrageenan, alginates, agar), fruit extracts (pectins, waxes), grains & roots (corn starch, potato starch, etc), microbial polysaccharides (Xanthan gum, dextran), modified natural products (cellulose derivatives such as hydropropyl cellulose, methylcellulose, hydroxypropyl methylcellulose, cellulose gum, etc.); and hydrophobically modified ethoxylated methyl glucosides, such as PEG 120 methyl glucose dioleate, PEG-120 methyl glucose trioleate, and PEG-20 methyl glucose sesquistearate, available from Lubrizol Advanced Materials, Inc., under the trade names, Glucamate™ DOE-120, Glucamate™ LT and VLT, and Glucamate™ SSE-20, respectively, are also suitable as thickening agents. Non-limiting examples of synthetic thickening agents include the polyethylene glycols (PEG) having 5 to 200 glycol units, such as, for example, those available under the INCI names PEG- 6, PEG-8, PEG-12, PEG-20, PEG-30, PEG-32, PEG-75, PEG-90, PEG-100 and PEG-200; acrylic/methacrylic acid homopolymers and copolymers, such as, for example, those sold under the trade names Carbopol® 934, Carbopol 940, Carbopol 941, Carbopol 980, Carbopol 981, Carbopol 2984, Carbopol 5984, Carbopol ETD 2050, Carbopol Ultrez 10, Carbopol Ultrez 30 (INCI name: Carbomer); Carbopol 1342, Carbopol 1382, Carbopol ETD 2020, Carbopol Ultrez 20, Carbopol Ultrez 21, Pemulen™ TR-1 and Pemulen TR-2 (INCI name: Acrylates/C₁₀-C₃₀ Alkyl Acrylate Crosspolymer); Carbopol Aqua SF-1 (INCI name: Acrylates Copolymer); manufactured and sold by Lubrizol Advanced Materials, Inc., Cleveland, OH; acrylamide homopolymers and copolymers; polymers prepared from 2-acrylamido-2-methylpropanesulfonic acid (AMPS® monomer).

[0082] Another class of synthetic thickeners suitable for use includes the hydrophobically modified alkali-swellaable emulsion polymers, commonly referred to as (HASE) polymers. Typical HASE polymers are free radical addition polymers polymerized from pH sensitive or hydrophilic monomers (e.g., acrylic acid and/or methacrylic acid, 2-acrylamido-2-methylpropane sulfonic acid),

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hydrophobic monomers (e.g., C₁-C₃₀ alkyl esters of acrylic acid and/or methacrylic acid, acrylonitrile, styrene), an "associative monomer", and an optional crosslinking monomer. The associative monomer comprises an ethylenically unsaturated polymerizable end group, a non-ionic hydrophilic midsection that is terminated by a hydrophobic end group. The non-ionic hydrophilic midsection comprises a polyoxyalkylene group, e.g., polyethylene oxide, polypropylene oxide, or mixtures of polyethylene oxide/polypropylene oxide segments. The terminal hydrophobic end group is typically a C₈-C₄₀ aliphatic moiety. Exemplary aliphatic moieties are selected from linear and branched alkyl substituents, linear and branched alkenyl substituents, carbocyclic substituents, aryl substituents, aralkyl substituents, arylalkyl substituents, and alkylaryl substituents. In one aspect, associative monomers can be prepared by the condensation (e.g., esterification or etherification) of a polyethoxylated and/or polypropoxylated aliphatic alcohol (typically containing a branched or unbranched C₈-C₄₀ aliphatic moiety) with an ethylenically unsaturated monomer containing a carboxylic acid group (e.g., acrylic acid, methacrylic acid), an unsaturated cyclic anhydride monomer (e.g., maleic anhydride, itaconic anhydride, citraconic anhydride), a monoethylenically unsaturated monoisocyanate (e.g., α,α -dimethyl-m-isopropenyl benzyl isocyanate) or an ethylenically unsaturated monomer containing a hydroxyl group (e.g., vinyl alcohol, allyl alcohol). Polyethoxylated and/or polypropoxylated aliphatic alcohols are ethylene oxide and/or propylene oxide adducts of a monoalcohol containing the C₈-C₄₀ aliphatic moiety. Non-limiting examples of alcohols containing a C₈-C₄₀ aliphatic moiety are capryl alcohol, iso-octyl alcohol (2-ethyl hexanol), pelargonic alcohol (1-nonanol), decyl alcohol, lauryl alcohol, myristyl alcohol, cetyl alcohol, cetyl alcohol, cetearyl alcohol (mixture of C₁₆-C₁₈ monoalcohols), stearyl alcohol, isostearyl alcohol, elaidyl alcohol, oleyl alcohol, arachidyl alcohol, behenyl alcohol, lignoceryl alcohol, ceryl alcohol, montanyl alcohol, melissyl, lacceryl alcohol, geddyl alcohol, and C₂-C₂₀ alkyl substituted phenols (e.g., nonyl phenol), and the like.

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[0083] Exemplary HASE polymers are disclosed in U.S. Patent Nos. 3,657,175; 4,384,096; 4,464,524; 4,801,671; and 5,292,843, which are herein incorporated by reference. In addition, an extensive review of HASE polymers is found in Gregory D. Shay, Chapter 25, "Alkali-Swellable and Alkali-Soluble Thickener Technology A Review", Polymers in Aqueous Media - Performance Through Association, Advances in Chemistry Series 223, J. Edward Glass (ed.), ACS, pp. 457-494, Division Polymeric Materials, Washington, DC (1989), the relevant disclosures of which are incorporated herein by reference. Commercially available HASE polymers are sold under the trade names, Aculyn® 22 (INCI Name: Acrylates/Steareth-20 Methacrylate Copolymer), Aculyn® 44 (INCI Name: PEG-150/Decyl Alcohol/SMDI Copolymer), Aculyn 46® (INCI Name: PEG-150/Stearyl Alcohol/SMDI Copolymer), and Aculyn® 88 (INCI Name: Acrylates/Steareth-20 Methacrylate Crosspolymer) from Rohm & Haas, and Novethix™ L-10 (INCI Name: Acrylates/Beheneth-25 Methacrylate Copolymer) from Lubrizol Advanced Materials, Inc. Other thickeners are commercially available under the INCI designations Ammonium Acryloyldimethyltaurate/VP Copolymer, Ammonium Acryloyl Dimethyltaurate/Carboxyethyl Acrylate Crosspolymer, and Ammonium Acryloyldimethyltaurate/Beheneth-25 Methacrylate Crosspolymer.

[0084] If utilized, the thickeners can comprise from about 0.01 wt. % to about 5 wt. % of the total weight of the personal care composition. In another aspect the amount ranges from about 0.1 wt. % to about 3 wt. %, and in a further aspect from about 0.1 wt. % to about 2.0 wt. % of the total weight of the personal care composition.

[0085] Viscosity adjusting agents are used in cosmetics to enhance the fluidity of products without a significant lowering of the concentration of the active constituents. Suitable viscosity adjusting agents if present include organic and inorganic compounds, and combinations thereof. Examples of organic compounds include ethanol, isopropyl alcohol, sorbitol, propylene glycol, diethylene glycol, triethylene glycol, dimethyl ether, butylene glycol, and the like, and mixtures thereof. Examples of inorganic compounds include sodium

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chloride, sodium sulfate, potassium chloride, potassium nitrate, and mixtures thereof. If utilized the viscosity adjusting agents typically comprise from about 0.1 wt. % to about 20 wt.% in one aspect, and from about 1 wt.% to about 5 wt.% of the total weight of the fatty acid soap composition of the disclosed technology.

[0086] Skin and/or hair conditioning polymers include quaternized guar gum (INCI name Guar Hydroxypropyltrimonium Chloride), quaternized cassia gum (INCI name Cassia Hydroxypropyltrimonium Chloride), such as, for example, products available under the Sensomer™ trade name from Lubrizol Advanced Materials, Inc., quaternized cellulose, polyquaternium-4, polyquaternium-6, polyquaternium-7, polyquaternium-22, polyquaternium-39, polyquaternium-52, silicone quaternium-8 (dimethicone copolyol quaternized with an alkylamido dimethylamine, polyquaternium 10, polyquaternium 11, polyquaternium 39, polyquaternium 44, and the like, and mixtures thereof. Such suitable conditioning agents if present typically comprise about 0.01 wt. % to about 3 wt. % of the total wt. of the composition of the present invention.

[0087] Examples of suitable antibacterial agents which can be used herein include, but are not limited to, 2-hydroxy-4,2',4'-trichlorodiphenylether (TCS), 2,6-dimethyl-4-hydroxychlorobenzene (PCMX), 3,4,4'-trichlorocarbanilide (TCC), 3-trifluoromethyl-4,4'-dichlorocarbanilide (TFC), 2,2'-dihydroxy-3,3',5,5',6,6'-hexachlorodiphenylmethane, 2,2'-dihydroxy-3,3',5,5'-tetrachlorodiphenylmethane, 2,2'-dihydroxy-3,3',dibromo-5,5'-dichlorodiphenylmethane, 2-hydroxy-4,4'-dichlorodiphenylether, 2-hydroxy-3,5',4'-tribromodiphenylether, 1-hydroxyl-4-methyl-6-(2,4,4-trimethylpentyl)-2(1H)-pyridinone (Octopirox), salts of 2-pyridinethiol-1-oxide, salicylic acid, and other organic acids. Other suitable antibacterial agents are described in U.S. Patent. Nos. 3,835,057; 4,714,653; and 6,488,943. The disclosed soap composition can include from about 0.001 wt.% to about 2 wt.% in one aspect, from about 0.01 wt.% to about 1.5 wt.% in another aspect, and from about 0.1 wt.% to about 1 wt.% in a further aspect of the antibacterial agent(s), based on the total weight of the composition.

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[0088] The fragrance substances that can be used in the soap compositions of the disclosed technology include natural and synthetic fragrances, perfumes, scents, and essences and any other substances and mixtures which emit a fragrance. As the natural fragrances, there are those of vegetable origin, such as oil extracts from flowers (e.g., lily, lavender, rose, jasmine, neroli, ylang-ylang), stems and leaves (geranium, patchouli, petitgrain, peppermint), fruits (aniseed, coriander, fennel, needle juniper), fruit skin (bergamot, lemon, orange, mace), roots angelica, celery, cardamom, costus, iris, sweet flag), woods (pine tree, sandalwood, guaiacum wood, cedar, rosewood, cinnamon), herbs and grasses (tarragon, lemongrass, sage, thyme), needles and twigs (spruce, pine, European red pine, stone pine), and resins and balsam (galbanum, elemi, benzoin, myrrh, frankincense, opopanax), and those of animal origin, such as musk, civet, castoreum, ambergris, or the like, and mixtures thereof.

[0089] Examples of synthetic fragrances and perfumes are the aromatic esters, ethers, aldehydes, ketones, alcohols, and hydrocarbons including, but are not limited to, benzyl acetate, phenoxyethyl isobutylate, p-tert-butylcyclohexyl acetate, linalyl acetate, dimethylbenzylcarbonyl acetate, phenylethyl acetate, linalyl benzoate, benzyl formate, ethylmethylphenyl glycinate, allylcyclohexyl propionate, styrallyl propionate, and benzyl salicylate; benzylethyl ether; straight chain alkanals having 8 to 18 carbon atoms, citral, citronellal, citronellyloxyaldehyde, cyclamen aldehyde, hydroxycitronellal, lilial, and bougeonal; ionone compounds, α -isomethyl ionone, and methyl cedryl ketone; anethole, citronellol, eugenol, isoeugenol, geraniol, lavandulol, nerolidol, linalool, phenylethyl alcohol, and terpineol, alpha-pinene, terpenes (e.g., limonene), and balsams, and mixtures thereof.

[0090] The amount of fragrance material(s) that can be utilized will depend on the preference of the skilled formulator. In one aspect, the amount of fragrance material can range from about 0.05 wt.% to about 3 wt. %, in another aspect from about 0.1 wt.% to about 1.5 wt.%, in still another aspect from about 0.3 wt.% to about 1 wt.%, and in a further aspect from about 0.5 wt.% to 0.75 wt.%, based on the weight of the total soap composition.

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[0091] Colorants include water soluble dyes such as copper sulfate, iron sulfate, water-soluble sulfopolyesters, rhodamines, natural dyes, for instance carotene and beetroot juice, methylene blue, caramel, the disodium salt of tartrazine and the disodium salt of fuschin, and mixtures thereof. The amount of colorant(s) employed in the soap composition will depend on the aesthetic preference of the skilled formulator.

[0092] Insoluble materials include materials that impart pearlescent and other aesthetic visual, sensory and/or beneficial effects to the soap composition. Some formulations are opacified by deliberately incorporating pearlescent materials therein to achieve a cosmetically attractive pearl-like appearance, known as pearlescence. A detailed discussion of the effect is found in the article "Opacifiers and pearling agents in shampoos" by Hunting, Cosmetic and Toiletries, Vol. 96, pages 65 to 78 (July 1981), incorporated herein by reference.

[0093] The pearlescent material includes titanium dioxide coated mica, iron oxide coated mica, ethylene glycol monostearate, ethylene glycol distearate, polyethylene glycol distearate, bismuth oxychloride coated mica, myristyl myristate, guanine, glitter (polyester or metallic), and mixtures thereof. Other pearlescent materials can be found in U.S. Patent No. 4,654,207 and U.S. Patent No. 5,019,376, herein incorporated by reference.

[0094] The amount of the pearlescent material can generally be used in amounts of from about 0.05% to about 10% and desirably from about 0.15% to about 3% by wt. based upon the total wt. of the composition.

[0095] In addition to the above generally insoluble compounds, numerous other optional substantially insoluble compounds which require stabilization can be utilized in the composition. Examples of such other insoluble compounds include titanium dioxide; pumice; calcium carbonate, talc, potato starch, tapioca starch, jojoba beads, polyethylene beads, walnut shells, loofah, apricot seeds; almond meal, corn meal, paraffin, oat bran/oat hulls, gelatin beads, alginate beads, stainless steel fibers, iron oxide pigments, air bubbles, mica coated iron oxides, kaolin clay, salicylic acid, zinc oxide, zeolite, styrofoam beads, phosphates, silica, and the like. Other generally insoluble compounds include

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teatree powder, microsponges, Confetti (a trademark of united guardian company), talc, beeswax, and the like. The amount of the various insoluble compounds requiring stabilization will vary depending upon its purpose, desired end result, and efficacy thereof. Hence amounts can vary widely, but frequently will be within a general range of from about 0.1% to about 20% by wt. based upon the total wt. of the soap composition.

[0096] The fatty acid salt soap based compositions according to the disclosed technology can be dispensed, for example, onto a user's hand, directly onto the area of a body to be treated, or onto a cloth, such as a washcloth, sponge, loofa or a towelette, as a means to transport the composition to specified area(s) of the human body. In other aspects of the disclosed technology, the composition may be impregnated into carrier means such as a towelette or wipe. When the composition is impregnated into carrier means, the carrier means may be sealed in a container that does not react adversely with the composition prior to use and that helps prevent the composition from being exposed to the environment prior to use.

[0097] The fatty acid salt soap compositions formulated according to the presently disclosed technology may be applied to different parts of the body as rinse-off and/or leave-on applications. For example, such compositions may be applied to a part of a body and then be allowed to dry in place (e.g., a leave-on application, such as a lotion or cream), as it may be non-toxic to users. In other embodiments, the area to which the composition is applied may be toweled or blotted, thereby allowing the composition to evaporate or otherwise sink into the applied area. In further embodiments, the composition may be applied to an area and then rinsed off after a predetermined time. The area of application can be hydrated (pre-wetted) prior to application of the composition. The composition can be applied with a cloth, bath sponge (e.g., luffa or loofah), hand, or the like. In some examples, the composition may be applied by rubbing the composition onto an area (e.g., using mechanical action with a hand, sponge, or the like) for a period ranging from one second to two minutes such as, e.g., a period ranging from approximately fifteen seconds to approximately one minute.

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The mechanical rubbing action helps to create foam, helps loosen and remove debris from the hair and skin, and helps the composition penetrate an afflicted area(s). The composition can be applied as disclosed above to selected areas afflicted with a pruritus including winter itch or can be applied as a personal care body cleanser during showering or bathing. The personal care cleansing composition can be formulated as a shampoo, body wash, shower gel, facial wash or scrub, hand cleanser, or make-up remover.

[0098] The soap cleansing composition can be applied to an afflicted area (with mechanical rubbing) of the body and/or the scalp and allowed to reside on the area (residence time) for greater than approximately 5 seconds before being rinsed off such as, e.g., greater than approximately 20 seconds in one aspect, greater than approximately 25 seconds in another aspect, greater than 30 seconds in still another aspect, greater than 1 minute in a further aspect, greater than approximately 5 minutes in a still further aspect. Recommended residence time ranges can range from approximately 10 seconds to approximately 5 minutes in one aspect, from approximately 20 seconds to approximately 1 minute in another aspect, from approximately 1 minute to approximately 2 minutes in still another aspect, or other lengths of time, as clinically appropriate. The foregoing residence times and residence time ranges can include the amount of time that the composition is actively rubbed on the skin of the user and the amount of time that the composition resides on the skin of the patient without being actively rubbed.

[0099] In some applications, a user can apply the composition to a skin area larger than an area specifically targeted for treatment (e.g., an afflicted area). For example, the user may apply the composition to the skin of an entire limb that includes the area specifically targeted for treatment, to the skin of substantially the entire body (e.g., an entire body wash), or to other suitable portions of a body. Such broader application of the composition may enhance the effectiveness of the composition on the area specifically targeted for treatment (e.g., an area or portion of the body already afflicted with the pruritus).

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condition), by preventively treating adjacent of areas of the skin from developing a pruritus condition.

[0100] Compositions according to the disclosure may be applied to a part of the body with any suitable frequency. In some examples, the compositions may be used comparatively infrequently such as, for example, one per month, once per week, twice per week. Alternatively, the compositions may be applied more frequently such as, for example, at least twice per week, at least once per day, at least twice per day, or the like. In some examples, the skin of the user can be hydrated (e.g., wetted with water) before applying the soap based composition.

[0101] The following examples are presented for the purpose of illustrating the invention disclosed herein in greater detail. However, the examples are not to be construed as limiting the invention in any manner. It is to be appreciated that the forgoing formulations are set forth in an illustrative manner and that other soap compositions and the formulation thereof are within the scope of the present invention. Unless otherwise specified all ingredient amounts are given by wt. % based on the weight of the composition.

Methods Description

Viscosity

[0102] The reported viscosity of each polymer containing composition was measured in milli-Pascal seconds (mPa·s), employing a Brookfield rotating spindle viscometer, (Brookfield, Model RVT) at about 20 revolutions per minute (rpm), at ambient room temperature of about 20 to 25°C. (hereafter referred to as Brookfield viscosity). Viscosity was measured on freshly prepared compositions (referred to as "initial viscosity", and re-measured after allowing the composition to age for at least about 24 hours at ambient room temperature (referred to as "24-hour viscosity"). Where only one viscosity value is shown, the viscosity value is the 24-hour viscosity, unless otherwise indicated.

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Yield Value

[0103] Yield Value, also referred to as Yield Stress, is herein defined as the initial resistance to flow under stress. It can be measured using a number of techniques, such as via the use of a constant stress rheometer or via extrapolation using a Brookfield viscometer. These techniques and the usefulness of the Yield Value measurement are further explained in Technical Data Sheet Number 244 available from Noveon, Inc., herein incorporated by reference.

Panel Testing Methodology

[0104] Soap based body wash compositions containing the acrylic copolymer of the disclosed technology are evaluated for the ability to mitigate pruritus caused by winter itch. Potential test panelists who shower as their only means of bathing and who exclusively use a body wash cleansing product during their showering activity are interviewed and evaluated to determine whether they are afflicted with pruritus caused by conditions conducive to winter itch.

[0105] A panel of 29 persons who are confirmed to suffer from pruritus on any area of the skin affected by winter itch is selected for the test. The panel test is conducted in 3 phases over a period of 18 consecutive days. In phase 1 (days 1-4), the panelists are instructed to use their current-day body wash product for their normal daily showering activity for days 1-4 of the test. None of the body wash products used by the panelists in phase 1 of the test contain an acrylic based copolymer. In phase 2 (days 4-11) of the test, the panelists are instructed to use the soap based body wash in accordance with the disclosed technology formulated with acrylic copolymer for their daily showering activity, and in phase 3 (days 12-18) the panelists are instructed to shower with an identical soap based body wash composition but formulated without acrylic copolymer. In all phases of the test, panelists are instructed not to deviate from their usual body wash product application and shower routines. Prior to the test, panelists are instructed to refrain from the use of moisturizing creams and anti-itch products unless the itch becomes intolerable.

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[0106] On each day during the test period (prior to retiring for the evening), panelists subjectively rate the intensity of any itch sensation emanating from the skin and to assign a rating number according to the following scale.

Rating No.	Rating Description	Intensity of Itch Sensation	Action Necessary to Mitigate Itch Sensation
5	Extremely Itchy	Difficult to Tolerate Itch Sensation Without Hard Scratching	Itch Sensation Cannot be Eased by Scratching. A Steroidal Anti-Itch Cream Needed
4	Very Itchy	Difficult to Tolerate Itch Sensation Without Scratching. Itch Sensation is Reduced by Scratching	Scratching in Combination with Moisturizing Cream Needed to Mitigate Itch Sensation.
3	Moderate Itch Sensation	Scratching Needed to Reduce Itch Sensation	Scratching Eases Itch Sensation. Moisturizing Cream is Not Necessary.
2	Slight Itch Sensation	Able to Tolerate Itching Sensation Without Scratching	No Action Necessary
1	No Itch Sensation	No Itch Sensation	No Action Necessary

[0107] Panelists who report an itchy sensation from multiple sites (skin) on the body are instructed to average the ratings and report the average as a single rating no. for that day.

Example 1

[0108] A liquid soap composition is prepared utilizing the following recipe.

	Ingredient	Wt. %
Part A		
1	potassium hydroxide (85% active) (neutralizer)	6.3
2	deionized water (diluent)	15
Part B		
3	lauric acid (fatty acid)	12.0
4	myristic acid (fatty acid)	4.0
5	stearic acid (fatty acid)	4.0
6	Carbopol® Aqua SF-1 ¹ rheology modifier (as supplied)	6.0
7	glycerin (humectant)	5.0
8	deionized water (diluent)	47.65
Part C		
9	Neolone™ 950 ² (preservative)	0.05
10	citric acid (25%) (acidifying agent)	q.s.

¹Acrylates Copolymer emulsion (supplied as a 30 wt.% polymer solids) (crosslinked copolymer of (meth)acrylic acid and C₁ to C₅ alkyl esters of acrylic acid)

²methylisothiazolinone, Rohm and Haas

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[0109] Part A is prepared by dissolving potassium hydroxide in deionized water and heating the composition to 80°C. Part B is separately prepared by adding glycerin and the rheology modifier to deionized (D.I.) water while mixing. The fatty acids (ingredient Nos. 3, 4, and 5) are added to the glycerin/rheology modifier/water mixture with agitation and the temperature is raised to 80°C. Once the fatty acids melt and are homogeneously mixed, the other Part B ingredients are added to the composition. Part A is added to Part B while the temperature is maintained at 80°C. The Part AB composition is mixed for 30 to 60 minutes. Upon attaining a homogeneous mixture, the Part AB composition is allowed to cool at ambient room temperature. Upon cooling to 40°C, ingredient No. 9 is added to the Part AB. The formulation is cooled under agitation to ambient room temperature. The viscosity and yield value is measured at the initial pH of the formulation. The pH is sequentially lowered by addition of citric acid and the viscosity and yield values are recorded at each pH reading and reported in the Table 1 below.

Table 1

	pH	Viscosity (mPa·s)	Yield Value (dynes/cm ²)
Initial	10.35	1654	43
pH Following Sequential Addition of Acid	9.40	1930	54
	9.10	3000	70
	8.95	8900	300
	8.76	22,800	1300
	8.35	44,500	3000
	7.70	15,250	1700
	7.40	12,900	1400
	7.20	8000	1400

Example 2

[0110] A liquid soap/surfactant blend composition is prepared utilizing the following recipe.

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	Ingredient	Wt. %
Part A		
1	potassium hydroxide (85% active) (neutralizer)	3.6
2	deionized water (diluent)	35
Part B		
3	lauric acid (fatty acid)	7.2
4	myristic acid (fatty acid)	2.4
5	stearic acid (fatty acid)	2.4
Part C		
6	ethylene glycol distearate (pealescent agent)	1.5
Part D		
7	Carbopol® Aqua SF-1 ¹ (as supplied)	4.0
8	glycerin (humectant)	3.0
9	deionized water (diluent)	12.8
Part E		
10	sodium laureth sulfate (2 mole ethoxylate; 28% solution) (surfactant)	14.6
11	cocamidopropyl betaine (30% solution) (surfactant)	13.4
12	Neolone™ 950 ² (preservative)	0.1

¹Acrylates Copolymer emulsion (supplied as a 30 wt.% polymer solids)²methylisothiazolinone, Rohm and Haas

[0111] Part A is prepared by dissolving potassium hydroxide in deionized water and heated to 80°C. The ingredients of Part B are slowly heated with mixing until melted and then further heated until the temperature reaches 80°C. Parts A and B are combined with mixing. Part C is added to the combined Part AB composition which is maintained at 80°C and mixed until dissolved. While the combined Part ABC composition cools at ambient room temperature, the ingredients of Parts D and E are added in numerical order with thorough mixing. The viscosity of the liquid soap composition is adjusted with the addition of 10 g of sodium chloride. The initial pH, viscosity and yield values of the composition are measured. Following the measurement of the viscosity and yield value at the initial pH, the pH is sequentially increased with potassium hydroxide (85% solution) to a pH of 9.5 and then sequentially reduced by the addition of citric acid (25% solution) to a pH of 8.6. The initial viscosity and yield values as well as the viscosity and yield values following the sequential increase and reduction of the pH of the liquid soap composition are reported in the table below.

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Table 2

pH	Viscosity (mPa·s)	Yield Value (dynes/cm ²)
9.00 (initial)	3900	16
9.90	1860	6
9.50 (max.)	1200	4
9.24	2100	7
9.04	3400	11
8.94	5400	20
8.83	8120	32
8.72	11,480	50
8.60 (min.)	22,800	116

Examples 3-6

[0112] Liquid soap compositions are formulated from the ingredients set forth below utilizing the back-acid formulation technique.

	Ingredients	Ex. 3 wt. %	Ex. 4 wt. %	Ex. 5 wt. %	Ex. 6 wt. %
	PART A				
1	KOH (85%) (neutralizing agent)	3.60	3.60	3.60	3.60
2	deionized water (diluent)	40.0	40.0	40.0	40.0
	PART B				
3	lauric acid	4.80	4.80	4.80	4.80
4	myristic acid	2.40	2.40	2.40	2.40
5	stearic acid	4.80	4.80	4.80	4.80
	PART C				
6	Carbopol® Aqua SF-1 (as supplied)	5.0	6.0	7.0	8.0
7	glycerin (humectant)	3.0	3.0	3.0	3.0
8	deionized water (diluent)	8.30	7.30	6.30	5.30
	PART D				
9	sodium laureth sulfate (2 mole ethoxylate; 28% solution) (surfactant)	14.60	14.60	14.60	14.60
10	cocamidopropyl betaine (30% solution) (surfactant)	13.40	13.40	13.40	13.40
11	Neolone™ 950 ² (preservative)	0.10	0.10	0.10	0.10

¹Acrylates Copolymer emulsion (supplied as a 30 wt.% polymer solids)

²methylisothiazolinone, Rohm and Haas

[0113] Part A is prepared by dissolving potassium hydroxide in deionized water and heated to 80°C. The ingredients of Part B are slowly heated with mixing until melted and then further heated until the temperature reaches 80°C. Part A is combined with Part B and mixed for 30 to 60 minutes. The temperature of the mix is maintained at 80°C. Upon attaining a homogeneous mix, the Part

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AB composition is slowly allowed to cool. Part C is separately formulated by adding the rheology modifier and glycerin to D.I. water with mixing. When the Part AB composition reaches a temperature range of between 60 to 70°C, Part C is added thereto and mixed. The Part D ingredients are then added to the Part ABC composition in numerical order. The initial pH, viscosity and yield values of the composition are measured. The pH of each formulation is increased once with potassium hydroxide (85% solution) and then reduced once by the addition of citric acid (25% solution). The viscosity and yield value data at each pH value is set forth in the table below.

Table 3

Ex. No.	pH	Viscosity (mPa·s)	Yield Value (dynes/cm ²)
3	9.64	2070	22
	12.9	1070	9
	9.28	8000	30
4	9.46	5400	41
	12.30	2300	32
	9.33	13,400	70
5	9.40	13,400	100
	11.07	4170	70
	9.48	11,500	90
6	9.30	26,000	230
	10.30	7230	110
	9.60	14,320	130

Example 7

[0114] A liquid soap composition is prepared utilizing the following recipe.

	Ingredient	Wt. %
Part A		
1	potassium hydroxide (91.5% active) (neutralizer)	3.45
2	deionized water (diluent)	15.00
Part B		
3	lauric acid (fatty acid)	6.0
4	myristic acid (fatty acid)	2.0
5	Isostearic acid (fatty acid)	4.99
6	Carbopol® Aqua SF-1 ¹ (as supplied)	4.0
7	glycerin (humectant)	6.0
8	deionized water (diluent)	22.95
Part C		
9	ethylene glycol distearate (pealescent agent)	1.50
10	sodium laureth sulfate (2 mole ethoxylate; 28%	20.0

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	Ingredient	Wt. %
	solution) (surfactant)	
11	cocamidopropyl betaine (30% solution) (surfactant)	13.0
12	silicone quaternium-8 (conditioner)	0.65
13	gluceth-20 (emollient)	0.30
14	fragrance	0.10
15	Neolone™ 950 ² (preservative)	0.05
16	citric acid (25%) (pH adjusting agent)	1.0

¹Acrylates Copolymer emulsion (supplied as a 30 wt.% polymer solids)²methylisothiazolinone, Rohm and Haas

[0115] Part A is prepared by dissolving potassium hydroxide in deionized water and heated to 80°C. The ingredients of Part B are slowly heated with mixing until melted and then further heated until the temperature reaches 80°C. Part A is combined with Part B and mixed for 30 to 60 minutes. The temperature of the mix is maintained at 80°C. Upon attaining a homogeneous mix, the Part AB composition is slowly allowed to cool. When the Part AB composition reaches a temperature range of between 60 to 70°C, ingredient No. 9 is added and mixed until uniform. Ingredient Nos. 10 and 11 are added in order and mixed. When the composition reaches 40°C, ingredient Nos. 12 to 15 are added in numerical order to the composition and mixed. The pH of the composition is adjusted with citric acid to obtain the soap product.

Properties

Appearance: pearlized viscous liquid
 pH: 8.80 - 9.00
 Viscosity (mPa·s): 5000-8000

EXAMPLES 8-9

[0116] A liquid body wash composition is prepared utilizing the following recipe.

	Ingredient	Ex. 8 (wt.%)	Ex. 9 ¹ (wt.%)
	Part A		
1	deionized water (diluent)	14.59	13.78
2	potassium hydroxide (91.5% active) (neutralizer)	3.60	3.40
	Part B		
3	deionized water (diluent)	25.76	30.77
4	lauric acid (fatty acid)	7.20	7.20
5	myristic acid (fatty acid)	2.40	2.40
6	palmitic acid (fatty acid)	2.40	2.40
7	glycerin (humectant)	5.00	5.00

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	Ingredient	Ex. 8 (wt.%)	Ex. 9 ¹ (wt.%)
8	Carbopol® Aqua SF-1 ² (as supplied)	4.00	0.00
Part C			
9	sodium laureth sulfate (2 mole ethoxylate; 25% solution) (surfactant)	20.0	20.0
10	cocamidopropyl betaine (30% solution) (surfactant)	15.0	15.0
11	methylisothiazolinone (preservative)	0.05	0.05

¹Comparative Example²Acrylates Copolymer emulsion (supplied as a 30 wt.% polymer solids)

[0117] Part A is prepared by dissolving potassium hydroxide in deionized water and heating to 80°C. The ingredients of Part B are slowly heated with mixing until homogeneous and then further heated until the temperature reaches 80°C. Part A is combined with Part B and mixed for 30 to 60 minutes. The temperature of the mix is maintained at 80°C. Upon attaining a homogeneous mix, the Part AB composition is slowly allowed to cool. When the Part AB composition reaches a temperature range of between 60 to 70°C, ingredient Nos. 9 and 10 are added in order and mixed. When the composition reaches 40°C, ingredient No. 11 is added to the composition and mixed until a homogeneous mixture is obtained.

EXAMPLE 10

[0118] A liquid body wash composition is prepared utilizing the following recipe.

	Ingredient	Wt. %
Part A		
1	deionized water (diluent)	23.3
2	potassium hydroxide (91.5% active) (neutralizer)	5.35
Part B		
3	deionized water (diluent)	20.0
4	Carbopol® Aqua SF-1 ¹ polymer (as supplied)	8.0
5	lauric acid (fatty acid)	7.0
6	myristic acid (fatty acid)	7.0
Part C		
7	sodium laureth sulfate (2 mole ethoxylate; 28% solution) (surfactant)	12.0
8	cocamidopropyl betaine (35% solution) (surfactant)	7.0
Part D		
9	Glucam™ E-10 ² humectant	1.0
10	glycerin (humectant)	7.0
11	triclosan (antibacterial)	0.3
Part E		
12	methylisothiazolinone (preservative)	0.05

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	Ingredient	Wt. %
13	Merquat 550 ³ conditioner (as supplied)	2.0

¹Acrylates Copolymer emulsion (supplied as a 30 wt.% polymer solids)²Methyl Gluceth-10³Polyquaternium-7 (supplied as 9 wt.% polymer solids)

[0119] Part A is prepared by dissolving potassium hydroxide in deionized water and heated to 80°C. In a separate vessel Part B is prepared by adding Carbopol® Aqua SF-1 polymer, lauric acid and myristic acid to deionized water and slowly heating the ingredients between about 70 to about 80°C with mixing until the fatty acids are melted. Part B is then added to Part A and the temperature of the Part AB mixture is maintained between about 70 to about 80°C. Part AB is mixed for 30 to 60 minutes. The Part C ingredients are added to Part AB in numerical order with mixing. Upon attaining a homogeneous mix, Part ABC is slowly allowed to cool. In a separate vessel Part D is prepared by combining Glucam™ E-10 humectant with glycerin with mixing. Triclosan antimicrobial agent is dispersed into Part D with mixing. When Part ABC cools to slightly below 50°C, Part D is added to Part ABC with mixing. When Part ABCD cools to about 40°C, the Part E ingredients are added to the Part ABCD and mixed until a homogeneous mixture is obtained.

EXAMPLE 11

[0120] A liquid body wash composition is prepared utilizing the following recipe.

	Ingredient	Wt. %
Part A		
1	deionized water (diluent)	14.4
2	potassium hydroxide (91.5% active) (neutralizer)	3.7
Part B		
3	deionized water (diluent)	23.6
4	lauric acid (fatty acid)	7.2
5	myristic acid (fatty acid)	2.4
6	palmitic acid (fatty acid)	2.4
7	glycerin (humectant)	8.0
8	Carbopol® Aqua SF-1 polymer (as supplied)	4.0
Part C		
9	sodium laureth sulfate (2 mole ethoxylate; 25% solution) (surfactant)	20.0
10	cocamidopropyl betaine (38% solution) (surfactant)	11.65
11	methylisothiazolinone (preservative)	0.05
Part D		

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	Ingredient	Wt. %
12	citric acid (25%)	0.6
Part E		
13	Merquat 550 ² conditioner (as supplied)	0.3
14	Merquat 3331PR ³ conditioner (as supplied)	1.5

¹Acrylates Copolymer emulsion (supplied as a 30 wt.% polymer solids)²Polyquaternium-7 (supplied as 9 wt.% polymer solids)³Polyquaternium-39 (supplied as 10 wt.% polymer solids)

[0121] Part A is prepared by dissolving potassium hydroxide in deionized water and heated to 80°C. In a separate vessel Part B is prepared by combining glycerin, Carbopol® Aqua SF-1 polymer and deionized water with mixing. The fatty acid components are then added to PART B and Part B is heated to 80°C with mixing until all fatty acids have melted. PART A is added to PART B. Part AB is mixed for 30-60 minutes while maintaining the temperature at 80°C. Part AB is slowly allowed to cool under ambient conditions by removing the heat source. As Part AB cools the Part C ingredients are added in the numerical order shown to Part AB and mixed until uniform. When the temperature of Part ABC reaches 40°C, PART D is added and mixed until a uniform mixture is obtained. PART E is then added to Part ABCD and the composition is mixed until uniform.

EXAMPLE 12

[0122] This example provides the results of a survey/study distributed to 132 individuals who reside within the prefecture limits of Tokyo, Kanagawa and Aichi, Japan. The individuals were asked if they experienced seasonal itchiness. If affirmative, they were asked to list the month of the year in which they experienced the highest frequency of itchiness. Of the 132 surveys that were distributed for the study, 101 were returned with a response. Of the returned responses, 52 persons (approximately 51% of the respondents) indicated that they experienced seasonal itchiness. Figure 1 is a plot showing the month(s) of the year in which the respondents experienced itchiness. The average temperature (°C) and relative humidity (%) for each month (Tokyo, Japan) is also plotted in the figure. The plotted temperature and relative humidity statistics for

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Tokyo, Japan plotted for each month of the study were obtained from the Japan Meteorological Agency (30 year monthly average for the years 1981 through 2010).

[0123] As can be readily determined from the plotted data seasonal itchiness peaks in the winter months (November to March) when temperature and relative humidity are lower.

EXAMPLE 13

[0124] The liquid body wash compositions of Example 8 (disclosed technology) and Example 9 (comparative) are evaluated for their ability to mitigate pruritus caused by winter itch in accordance with the panel testing methodology described in the Methods Description section above. After each day of the evaluation test, each panelist assigns and records a rating for the intensity of the itchiness sensation. The ratings assigned by the 29 panelists for each day of the test are averaged and plotted in Figure 2.

[0125] As can be seen from the plotted data in Figure 2, the itch intensity ratings for phase 2 (days 5-11) of the test are lower than phase 1 (days 1-4) and phase 3 (days 12-18). From this evaluation it can be concluded that the shampoo of Example 8 mitigates the intensity of the itch sensation.

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What is claimed is:

1. A method for the treatment or mitigation of a pruritic skin condition comprising applying to the scalp and/or skin a least one composition comprising:
 - a) a soap comprising at least one fatty acid salt;
 - b) an acrylic copolymer prepared from
 - i. about 35% to about 65% by weight of acrylic acid, methacrylic acid, or combinations thereof;
 - ii. about 65% to about 35% by weight of at least one C₁ to C₅ alkyl ester of acrylic acid or methacrylic acid; and
 - iii. about 0.03% to about 3% by weight of at least one polyunsaturated crosslinker monomer;
 - c) water; and
 - d) optionally at least one surfactant.
2. A method of claim 1 wherein said at least one fatty acid salt is present in an amount ranging from about 10 to about 35 wt.% in one aspect, from about 12 to about 30 wt. % in another aspect, from about 15 to about 25 wt.% in a further aspect, and from about 18 to about 20 wt. % in a still further aspect (based on the total wt. of the composition).
3. A method of any of the preceding claims wherein said polymer (on an active basis) is present in an amount ranging from about 0.5 to about 5 wt.% in one aspect, from about 0.6 to about 4 wt.% in another aspect, from about 1 to about 3 in a further aspect, and from about 1.5 to about 2 wt.% in a still further aspect (based on the total wt. of the composition).
4. A method of any of the preceding claims wherein said at least one surfactant (on an active basis) is present in an amount ranging from about 0 to about 15 wt.% in one aspect from about 1 to about 12 wt.% in another aspect,

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from about 2.5 to about 10 wt.% in a further aspect, and from about 5 to about 8 wt.% in a still further aspect (based on the total wt. of the composition).

5. The method of any of the preceding claims wherein the pH of said at least one composition ranges from about 7.5 to about 10.5 in one aspect, from about 7.8 to about 9.8 in another aspect, from about 8 to about 9.5 in a further aspect, and from about 8.2 to about 9.2 in a still further aspect.

6. A method of any of the preceding claims wherein said salt of a fatty acid is selected from the alkali metal and/or ethanolamine salt of a C₈ to C₂₂ fatty acid.

7. A method of any of the preceding claims wherein said fatty acid is derived from vegetable oil, seed oil, and mixtures thereof.

8. A method of any of the preceding claims wherein said fatty acid salt is derived from a fatty acid selected from octanoic acid, decanoic acid, lauric acid, myristic acid, pentadecanoic acid, palmitic acid, margaric acid, steric acid, isostearic acid, nonadecanoic acid, arachidic acid, behenic acid, and mixtures thereof.

9. A method of any of the preceding claims wherein said fatty acid salt is an alkali metal or alkanol ammonium salt of said fatty acid.

10. A method of any of the preceding claims wherein said at least surfactant is selected from an anionic surfactant, an amphoteric surfactant, a nonionic surfactant, and mixtures thereof.

11. A method of any of the preceding claims wherein said anionic surfactant is selected from alkyl sulfates, alkyl ether sulfates, alkyl monoglyceryl ether sulfates, alkyl sulfonates, alkylaryl sulfonates, alkyl sulfosuccinates, alkyl ether sulfosuccinates, alkyl sulfosuccinamates, alkyl amidosulfosuccinates, alkyl

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carboxylates, alkyl amidoethercarboxylates, alkyl succinates, fatty acyl sarcosinates, fatty acyl amino acids, fatty acyl taurates, fatty alkyl sulfoacetates, alkyl phosphates, or combinations thereof.

12. A method of any of the preceding claims wherein said amphoteric surfactant is selected from alkyl betaines, alkylamino betaines, and alkylamido betaines, and the corresponding sulfobetaines.

13. A method of any of the preceding claims wherein said at least one surfactant is selected from a combination of an anionic surfactant and an amphoteric surfactant.

14. A method of any of the preceding claims wherein said at least one surfactant is selected from a combination of an anionic surfactant and an amphoteric surfactant wherein the wt. ratio of anionic surfactant to amphoteric surfactant ranges from about 1:1 to about 10:1.

15. A method of any of the preceding claims wherein said at least one composition further comprises a component selected from a humectant, an emollient, a hair conditioner, a skin conditioner, a fragrance agent, an antibacterial agent, a preservative, a colorant, a botanical extract, a chelating agent, a pH adjusting agent, a thickening agent, and combinations thereof.

16. A method of any of the preceding claims wherein said at least one composition comprises:

a) from about 10 to about 20 wt.% of at least one salt of a C₁₂ to C₂₂ fatty acid;

b) from about 0.5 to about 5 wt.% of an acrylic copolymer prepared from

i. about 35% to about 65% by weight of acrylic acid, methacrylic acid, or combinations thereof;

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ii. about 65% to about 35% by weight of at least one monomer selected from ethyl acrylate, butyl acrylate, or combinations thereof; and

iii. about 0.03% to about 3% by weight of at least one polyunsaturated crosslinker monomer, wherein all monomer wt.% is based on the wt. of total monomer present;

c) water; and

d) an anionic surfactant selected from alkyl sulfates, alkyl ether sulfates, alkyl monoglyceryl ether sulfates, alkyl sulfonates, alkylaryl sulfonates, alkyl sulfosuccinates, alkyl ether sulfosuccinates, alkyl sulfosuccinamates, alkyl amidosulfosuccinates, alkyl carboxylates, alkyl amidoethercarboxylates, alkyl succinates, fatty acyl sarcosinates, fatty acyl amino acids, fatty acyl taurates, fatty alkyl sulfoacetates, alkyl phosphates, or combinations thereof;

d1) an amphoteric surfactant selected from alkyl betaines, alkylamino betaines, and alkylamido betaines, and the corresponding sulfobetaines;

17. A method of any of the preceding claims wherein said fatty acid salt is derived from a fatty acid selected from lauric acid, myristic acid, palmitic acid, steric acid, isostearic acid, or combinations thereof.

18. A method of any of the preceding claims wherein said fatty acid salt is derived from a mixture of fatty acids selected from lauric acid, myristic acid, and palmitic acid.

19. A method of any of the preceding claims wherein said fatty acid salt is derived from a mixture of fatty acids selected from lauric acid, myristic acid, and steric acid.

20. A method of any of the preceding claims wherein said fatty acid salt is derived from a mixture of fatty acids selected from lauric acid, myristic acid, and, isostearic acid.

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21. A method of any of the preceding claims wherein said fatty acid salt is an alkali metal or alkanol ammonium salt of said fatty acid.

22. A method of any of the preceding claims wherein said at least one composition has a pH ranging from about 7.5 to about 10.5 in one aspect, from about 7.8 to about 9.8 in another aspect, from about 8 to about 9.5 in a further aspect, and from about 8.2 to about 9.2 in a still further aspect.

23. A method of any of claims 16 to 22 wherein the ratio of anionic surfactant to amphoteric surfactant ranges from about 1:1 to about 10:1.

24. A method of any of claim 16 to 20 wherein said anionic surfactant is from an alkyl ether sulfate containing from about 1 to 3 moles of ethoxylation and said amphoteric surfactant is selected from an alkylamido betaine.

25. A method of any of the preceding claims comprising hydrating the scalp and/or skin prior to said application.

26. A method of any of the preceding claims comprising rubbing the at least one composition after application to the scalp and/or skin to create lather.

27. A method of any of the preceding claims comprising allowing the at least one composition to reside on the scalp and/or skin for a period greater than about 20 seconds in one aspect, greater than about 25 seconds in another aspect, and greater than about 30 seconds in a further aspect.

28. A method of any of the preceding claims comprising rinsing the scalp and/or skin subsequent to said application.

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29. A method of any of the preceding claims wherein said pruritic skin sensation is caused by prolonged exposure to low relative humidity environments.

30. A method of any of the preceding claims wherein said pruritic skin sensation is caused by winter itch irritation.

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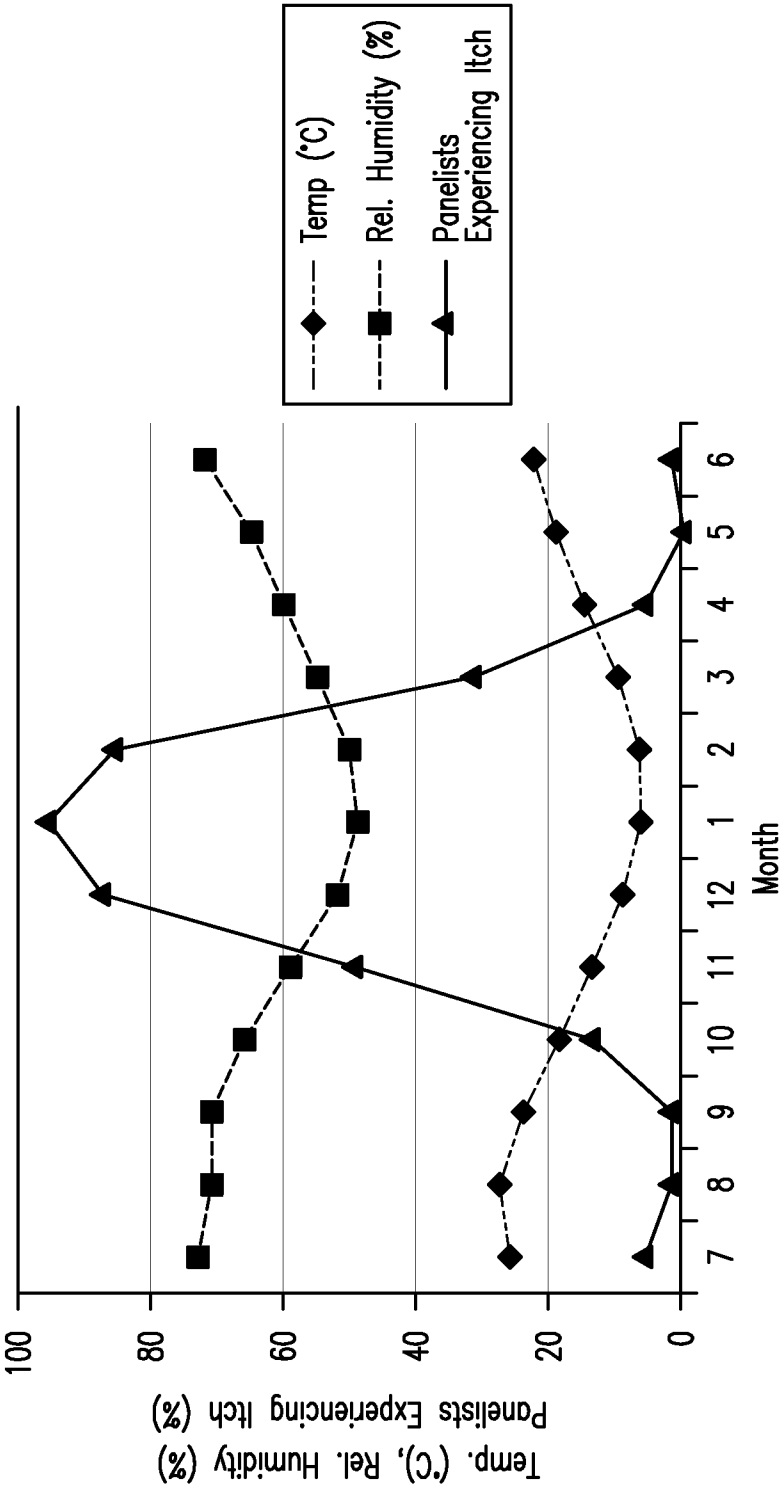


FIG-1

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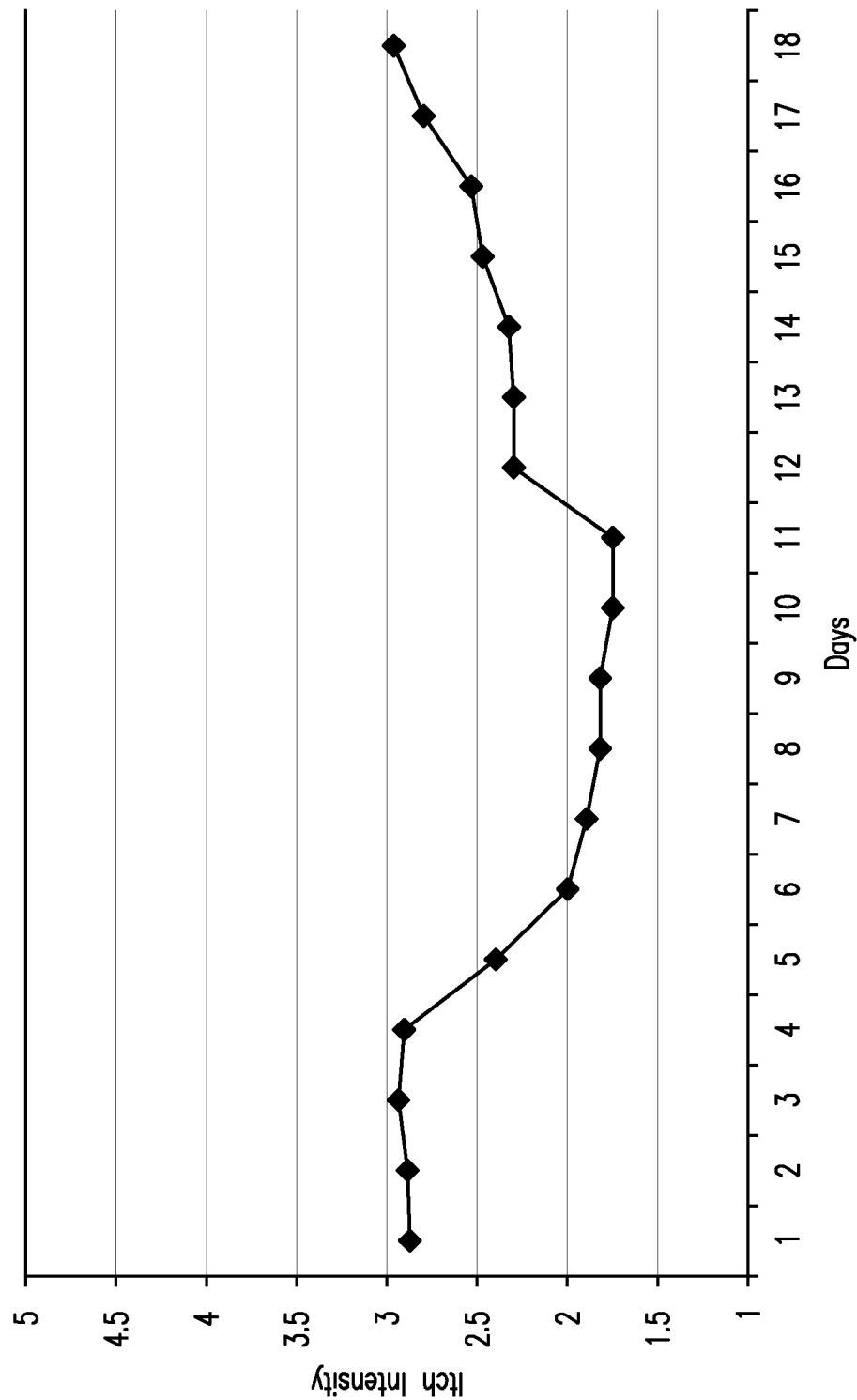


FIG-2

INTERNATIONAL SEARCH REPORT

International application No
PCT/US2014/054936

A. CLASSIFICATION OF SUBJECT MATTER		
INV. A61K8/36	A61Q19/00	A61K8/81 A61Q19/10 A61P17/04
ADD.		
According to International Patent Classification (IPC) or to both national classification and IPC		
B. FIELDS SEARCHED		
Minimum documentation searched (classification system followed by classification symbols) A61K A61Q A61P		
Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched		
Electronic data base consulted during the international search (name of data base and, where practicable, search terms used) EPO-Internal, WPI Data		
C. DOCUMENTS CONSIDERED TO BE RELEVANT		
Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	US 2011/142965 A1 (WALKE BOB [US]) 16 June 2011 (2011-06-16) paragraphs [0003], [0005], [0007], [0012], [0036], [0062] - [0064]; claims; examples; tables -----	1-30
Y	US 2013/130960 A1 (ASTOLFI RAFAEL [BR] ET AL ASOLFI RAFAEL [BR] ET AL) 23 May 2013 (2013-05-23) paragraphs [0012], [0015] - [0020], [0029] - [0035], [0071], [0073] - [0075] -----	1-30
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☒ Further documents are listed in the continuation of Box C. ☒ See patent family annex.		
* Special categories of cited documents : "A" document defining the general state of the art which is not considered to be of particular relevance "E" earlier application or patent but published on or after the international filing date "L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified) "O" document referring to an oral disclosure, use, exhibition or other means "P" document published prior to the international filing date but later than the priority date claimed "T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention "X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone "Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art "&" document member of the same patent family		
Date of the actual completion of the international search 19 November 2014		Date of mailing of the international search report 01/12/2014
Name and mailing address of the ISA/ European Patent Office, P.B. 5818 Patentlaan 2 NL - 2280 HV Rijswijk Tel. (+31-70) 340-2040, Fax: (+31-70) 340-3016		Authorized officer Heller, Dorothee

INTERNATIONAL SEARCH REPORT

International application No
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C(Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT		
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Y	WO 01/41729 A1 (UNILEVER PLC [GB]; UNILEVER NV [NL]; LEVER HINDUSTAN LTD [IN]) 14 June 2001 (2001-06-14) page 1, line 21 - line 23 page 2, line 1 - line 11 page 4, line 10 - line 18; claims; examples -----	1-30

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