

SUPERINTENDENCIA DE INDUSTRIA Y COMERCIO



No. 01-109551- -00009-0000

Fecha: 2007-06-25 16:37:29 Dep. 2020 NUECREACIONES
Tra. 2 PATENTES Eve: 1 REGDEPOSITO
Act. 444 RESPUESTAREQUE Folios: 9

ESCOBAR - URIBE ASOCIADOS

Intellectual Property

Clarke, Modet & C^o
COLOMBIA

2461/P

SUPERINTENDENCIA DE INDUSTRIA Y COMERCIO
DIVISION DE NUEVAS CREACIONES

E. S. D.

Re: Expediente No. 01109551.

Solicitud de patente a nombre de Johnson & Johnson Consumer
Companies, Inc.

Yo, JIMENA ESCOBAR URIBE, identificada como aparece al pie de mi firma, domiciliada en la carrera 11 A No. 94-76, Of. 305, obrando como apoderada de la sociedad Johnson & Johnson Consumer Companies, Inc, domiciliada en Skillman, New Jersey, Estados Unidos de América, solicitante de la patente de la referencia, en respuesta al oficio No. 2756 notificado por fijación en lista el 01 de marzo de 2007, relacionado con el concepto técnico de fondo No. 298, me permito manifestar:

1. Con fundamento en la facultad que confiere el artículo 34 de la Decisión 486 al solicitante para modificar la solicitud de patente en cualquier momento del trámite, presento junto con este memorial nuevo capítulo reivindicatorio en el cual se realizaron las siguientes modificaciones:

1.1 Se cancelaron las expresiones “aproximadamente” dentro de las reivindicaciones para las proporciones en pesos de los componentes que hacen parte de la composición limpiadora transparente de la presente invención.

1.2. Se modificó la antigua reivindicación 1 como sigue:

“ 1. Una composición limpiadora transparente en barra no irritante a los ojos, caracterizada porque comprende:

a) desde el 0.5% al 30% en peso de la composición total de por lo menos un surfactante anfotérico del grupo que consiste de

Examples of betaines useful herein include the high alkyl betaines such as coco dimethyl carboxymethyl betaine, lauryl dimethyl carboxymethyl betaine, lauryl dimethyl alpha-carboxyethyl betaine, cetyl dimethyl carboxymethyl betaine, lauryl bis(2-hydroxyethyl)carboxy methyl betaine, stearyl bis-(2-hydroxypropyl)carboxymethyl betaine, oleyl dimethyl gamma-carboxypropyl betaine, lauryl bis-(2-hydroxypropyl)alpha-carboxyethyl betaine, etc. The sulfobetaines may be represented by coco dimethyl sulfopropyl betaine, stearyl dimethyl sulfopropyl betaine, lauryl bis-(2-hydroxyethyl)sulfopropyl betaine, amido betaines amidosulfobetaines, and the like.

Many cationic surfactants are known to the art. By way of example, the following may be mentioned: stearyldimethylbenzyl ammonium chloride; dodecyltrimethylammonium chloride; nonylbenzylethyldimethyl ammonium nitrate; tetradecylpyridinium bromide; laurylpyridinium chloride; cetylpyridinium chloride; laurylpyridinium chloride; laurylisoquinolium bromide; ditallow(hydrogenated)dimethyl ammonium chloride; dilauryldimethyl ammonium chloride; and stearalkonium chloride.

Many additional nonsoap surfactants are described in McCUTCHEON'S, DETERGENTS AND EMULSIFIERS, 1979 ANNUAL, published by Allured Publishing Corporation, which is incorporated here by reference.

The above-mentioned surfactants can be used in the cleansing bath/shower compositions of the present invention. The anionic surfactants, particularly the alkyl sulfates, the ethoxylated alkyl sulfates and mixtures thereof are preferred. More preferred are C₁₂-C₁₄ alkyl anionic surfactants selected from the group consisting of sodium alkyl glycerol ether sulfonate, sodium lauroyl sarcosinate, sodium alkyl sulfate, sodium ethoxy (3) alkyl sulfate, and mixtures thereof.

Nonionic surfactants can be broadly defined as compounds produced by the condensation of alkylene oxide groups (hydrophilic in nature) with an organic hydrophobic compound, which may be aliphatic or alkyl aromatic in nature. Examples of preferred classes of nonionic surfactants are:

1. The polyethylene oxide condensates of alkyl phenols, e.g., the condensation products of alkyl phenols having an alkyl group containing from about 6 to 12 carbon atoms in either a straight chain or branched chain configuration, with ethylene oxide, the said ethylene oxide being present in amounts equal to 10 to 60 moles of ethylene oxide per mole of alkyl phenol. The alkyl substituent in such compounds may be derived from polymerized propylene, diisobutylene, octane, or nonane, for example.
2. Those derived from the condensation of ethylene oxide with the product resulting from the reaction of propylene oxide and ethylene diamine products which may be varied in composition depending upon the balance between the hydrophobic and hydrophilic elements which is desired. For example, compounds containing from about 40% to about 80% polyoxyethylene by weight and having a molecular weight of from about 5,000 to about 11,000 resulting from the reaction of ethylene oxide groups with a hydrophobic base constituted of the reaction product of ethylene diamine and excess propylene oxide, said base having a molecular weight of the order of 2,500 to 3,000, are satisfactory.

3. The condensation product of aliphatic alcohols having from 8 to 18 carbon atoms, in either straight chain or branched chain configuration with ethylene oxide, e.g., a coconut alcohol ethylene oxide condensate having from 10 to 30 moles of ethylene oxide per mole of coconut alcohol, the coconut alcohol fraction having from 10 to 14 carbon atoms. Other ethylene oxide condensation products are ethoxylated fatty acid esters of polyhydric alcohols (e.g., Tween 20-polyoxyethylene (20) sorbitan monolaurate).
4. Long chain tertiary amine oxides corresponding to the following general formula:



wherein R₁ contains an alkyl, alkenyl or monohydroxy alkyl radical of from about 8 to about 18 carbon atoms; from 0 to about 10 ethylene oxide moieties, and from 0 to 1 glyceryl moiety, and R₂ and R₃ contain from 1 to about 3 carbon atoms and from 0 to about 1 hydroxy group, e.g., methyl, ethyl, propyl, hydroxy ethyl, or hydroxy propyl radicals. The arrow in the formula is a conventional representation of a semipolar bond. Examples of amine oxides suitable for use in this invention include dimethyldodecylamine oxide, oleyldi(2-hydroxyethyl)amine oxide, dimethyloctylamine oxide, dimethyldodecylamine oxide, dimethyltetradecylamine oxide, 3,6,9 trioxaheptadecyldiethylamine oxide, di(2-hydroxyethyl)-tetradecylamine oxide, 2-dodecoxyethyl dimethylamine oxide, 3-dodecoxy-2-hydroxypropyldi(3-hydroxypropyl)amine oxide, dimethylhexadecylamine oxide.

5. Long chain tertiary phosphine oxides corresponding to the following general formula:



wherein R contains an alkyl, alkenyl or monohydroxy-alkyl radical ranging from 8 to 18 carbon atoms in chain length, from 0 to about 10 ethylene oxide moieties and from 0 to 1 glyceryl moiety and R' and R'' are each alkyl or monohydroxyalkyl groups containing from 1 to 3 carbon atoms. The arrow in the formula is a conventional representation of a semipolar bond. Examples of suitable phosphine oxides are: dodecyldimethylphosphine oxide, tetradecylmethylethylphosphine oxide, 3,6,9-trioxaoctadecyldimethylphosphine oxide, cetyldimethylphosphine oxide, 3-dodecoxy-2-hydroxypropyldi(2-hydroxyethyl)phosphine oxide, stearyldimethylphosphine oxide, cetyldiethylphosphine oxide, dodecyldiethylphosphine oxide, tetradecyldiethylphosphine oxide, dodecyldipropylphosphine oxide, dodecyldi(hydroxymethyl)phosphine oxide, dodecyldi(2-hydroxyethyl)phosphine oxide, tetradecylmethyl-2-hydroxypropylphosphine oxide, oleyldimethylphosphine oxide, 2-hydroxydodecyldimethylphosphine oxide.

6. Long chain dialkyl sulfoxides containing one short chain alkyl or hydroxy alkyl radical of 1 to about 3 carbon atoms (usually methyl) and one long hydrophobic chain which contain alkyl, alkenyl, hydroxy alkyl, or keto alkyl radicals containing from about 8 to about 20 carbon atoms, from 0 to about 10 ethylene oxide moieties and from 0 to 1 glyceryl moiety. Examples include: octadecyl methyl sulfoxide, 2-ketotridecyl methyl sulfoxide, 3,6,9-trioxaoctadecyl 2-hydroxy-

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cetylpyridinium chloride;
laurylpyridinium chloride;
laurylisoquinolium bromide;
ditallow(hydrogenated)dimethyl ammonium chloride;
dilauryldimethyl ammonium chloride; and
stearalkonium chloride.

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2. Those derived from the condensation of ethylene oxide with the product resulting from the reaction of propylene oxide and ethylene diamine products which may be varied in composition depending upon the balance between the hydrophobic and hydrophilic elements which is desired. For example, compounds containing from about 40% to about 80% polyoxyethylene by weight and having a molecular weight of from about 5,000 to about 11,000 resulting from the reaction of ethylene oxide groups with a hydrophobic base constituted of the reaction product of ethylene diamine and excess propylene oxide, said base having a molecular weight of the order of 2,500 to 3,000, are satisfactory.

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5. Long chain tertiary phosphine oxides corresponding to the following general formula:



wherein R contains an alkyl, alkenyl or monohydroxy-alkyl radical ranging from 8 to 18 carbon atoms in chain length, from 0 to about 10 ethylene oxide moieties and from 0 to 1 glyceryl moiety and R' and R'' are each alkyl or monohydroxyalkyl groups containing from 1 to 3 carbon atoms. The arrow in the formula is a conventional representation of a semipolar bond. Examples of suitable phosphine oxides are: dodecyldimethylphosphine oxide, tetradecylmethylethylphosphine oxide, 3,6,9-trioxaoctadecyldimethylphosphine oxide, cetyldimethylphosphine oxide, 3-dodecoxy-2-hydroxypropyldi(2-hydroxyethyl)phosphine oxide, stearyldimethylphosphine oxide, cetylpropylphosphine oxide, oleyldiethylphosphine oxide, dodecyldiethylphosphine oxide, tetradecyldiethylphosphine oxide, dodecyldipropylphosphine oxide, dodecyldi(hydroxymethyl)phosphine oxide, dodecyldi(2-hydroxyethyl)phosphine oxide, tetradecylmethyl-2-hydroxypropylphosphine oxide, oleyldimethylphosphine oxide, 2-hydroxydodecyldimethylphosphine oxide.

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- anfocarboxilatos, alquil betainas, amidoalquil betainas, amidoalquil sultainas, anfofosfatos, fosfobetainas, pirofosfobetainas, carboxialquil alquil poliaminas, y mezclas de los mismos;*
- b) desde el 0.5% al 30% en peso de la composición total de por lo menos un surfactante aniónico del grupo que consiste de *alquil sulfatos; alquil éter sulfatos; alquil monogliceril éter sulfatos; alquil monoglicérido sulfatos; alquil monoglicérido sulfonatos; alquil sulfonatos; alquilaril sulfonatos; alquil sulfosuccinatos; alquil éter sulfosuccinatos; alquil sulfosuccinamatos; alquil amidosulfosuccinatos; alquil carboxilatos; alquil amidoétercarboxilatos; alquil succinatos; acil sarcosinatos grasos, acil aminoácidos grasos; acil tauratos grasos; alquil sulfoacetatos grasos; alquil fosfatos; y mezclas de los mismos;*
 - c) desde el 0.5% al 30% en peso de la composición total de por lo menos un surfactante no-iónico; y
 - d) desde el 0.1% al 20% en peso de la composición total de un agente solidificante del grupo que consiste de *alditales de dibencilideno; y*
 - e) desde el 10% al 90% en peso de la composición total de por lo menos un solvente orgánico del grupo que consiste de *alcoholes dihidroxílicos alifáticos que contienen desde 3 a 6 átomos de carbono; polietilen y polipropilen glicoles; alcoholes monohídricos, alcoholes polihídricos; y mezclas de los mismos."*

El examinador podrá notar que se introdujeron las especificaciones para los componentes a, b, d y e de acuerdo con lo revelado desde la página 2 hasta la página 4 de la descripción.

1.3 Adicionalmente, se especificó que los porcentajes para los componentes que hacen parte de la composición limpiadora, son tomados en peso de la composición total. El sustento para esta modificación se encuentra en las páginas 2 a 4 de la memoria descriptiva.

En cuanto a las anteriores modificaciones, me permito manifestar que las mismas no involucran ninguna clase de ampliación de la materia objeto de ésta solicitud y que sólo responden a superar las objeciones de claridad expresada por el examinador.

Para este efecto, me permito acompañar el recibo No. 07-47,641 de 14 de junio de 2007, con lo cual queda cubierta la tasa correspondiente a la modificación de una solicitud de patente en cuanto a sus reivindicaciones.

2. Claridad de la solicitud

El examinador estableció en su concepto técnico No. 298, que "*El capítulo reivindicatorio presentado en los folios 26 a 29 cuenta con 13 cláusulas reivindicatorias en las que se establece la composición cuali-cuantitativa de una fórmula limpiadora que en términos generales cuenta con las siguientes proporciones:*

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Surfactante anfotérico	0,5 a 30%
Surfactante aniónico	0,5 a 30%
Surfactante no iónico	0,5 a 30%
Agente solidificante	0,1 a 20%
Solvente orgánico	10 a 90%

y eventualmente

Agente sinergizante	0.05 a
solidificante	10%

si bien es cierto se definen las proporciones de los elementos que la componen, no se establece con claridad la suma total de las cantidades y proporciones medidas en términos del peso total de la formulación o 100%. Tal como se presentan suman más de 100% cuando se toman los límites superiores establecidos por el Señor inventor, es por esta razón que se exhorta al interesado para que defina claramente el alcance de su invención, precisando los elementos (uno a uno) y las cantidades y proporciones que de cada uno de ellos se utiliza para obtener una fórmula detergente en barra de tipo transparente. También se sugiere que se tome el modelo presentado en la cláusula (11) que además de incluir la categoría funcional del tensioactivo determina la clase del compuesto químico incorporado en la formulación.

La cláusula independiente (1) se limita a señalar los elementos que componen la fórmula en términos de la categoría química en la cual se clasifican los diferentes excipientes: surfactantes (agentes de tensión superficial), solventes y promotores de solidificación. Sólo en las cláusulas dependientes se lista una diversidad de excipientes que se clasifican según su capacidad de disociación en presencia de un electrolito (que atiende a su carga eléctrica) y sus propiedades fisicoquímicas, hecho éste que no permite determinar con precisión el alcance de la fórmula reclamada por cuanto de la primera reivindicación no es posible precisar el verdadero objeto: composición limpiadora transparente en barra de acuerdo con el título de la invención."

Sobre este particular, me permito manifestar que mediante la inclusión de la expresión "en peso de la composición total" luego de los intervalos en porcentaje para los componentes, queda claro que cada uno de dichos elementos se encuentra dentro del intervalo enseñado y que la suma de los mismos debe ser igual a cien por ciento.

↘ ciento

En este sentido, me permito dirigir la atención del examinador al ejemplo 1 de preparación de la barra limpiadora transparente en el cual se mezclaron los siguientes componentes según la reivindicación 1.

Como se establece en la descripción para este ejemplo no limitante de la presente invención, en un recipiente de 1 kilogramo se preparó una composición limpiadora transparente en barra cargando 202.5 g de glicerina y 500 g de polipropilén glicol (solvente) que en porcentaje de la composición total es del 71.73% lo cual está de acuerdo con el intervalo divulgado para este componente dentro del capítulo reivindicatorio. Luego se agrega HPC en una cantidad de 2.1 g, lo cual corresponde en porcentaje en peso de la

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composición total el 0.21% que también está de acuerdo con el intervalo para el agente sinergizante solidificante. ? Comprobar.

En la siguiente tabla el examinador podrá constatar que los ingredientes para este ejemplo ilustrativo tienen un porcentaje **en peso de la composición total** que van de acuerdo con lo establecido en las reivindicaciones y que además obviamente no pasan de 100%, toda vez que como una persona versada en la materia sabe, la base de cálculo estará dada por la suma de los componentes totales, que para este caso son de 976.6 g toda vez que se realiza en un recipiente de 1000 gramos de capacidad.

Componente		Cantidad en peso (g)	% en peso de composición total
Solvente	Glicerina	2002.5	71.73
	Propilenglicol	500	
Hidroxipropilcelulosa		2.1	0.21
Sorbitol		20.1	2.06
Laureth sulfato de sodio		38.6	3.95
Laureth-13 carboxilato de sodio		4.5	0.46
Laurato de POE-sorbitan		63.0	6.45
Cocamidopropilbetaína		125.0	12.8
Lauroanfoglicinato		20.8	2.13
Total		976.6 (base de cálculo)	100%

En este sentido, me permito decir que es claro para una persona versada en la materia que desee llevar a cabo las diferentes realizaciones de esta invención, definir la cantidad de composición que va a preparar (base de cálculo) y con los intervalos de **porcentaje en peso total de la composición** en los cuales funciona la invención para cada uno de los componentes de la formulación, le deberá sumar cien por ciento.

Por consiguiente, es claro para la persona versada en la materia que los límites superiores de los intervalos revelados para los componentes dentro de las reivindicaciones no deberán sumar necesariamente 100 por ciento, toda vez que sabrá que cada componente se mueve dentro de un determinado rango y con base a la cantidad final de composición deseada, tendrá que alcanzar el cien por ciento debido a dicha base de cálculo.

Finalmente, en cuanto a la afirmación del señor examinador en cuanto a que: "...cuando se estudian los ejemplos relacionados con la invención -ver folios 11 a 15 - se hace más palpable el hecho de que no todas las modalidades que se generan como producto de las combinaciones reclamadas a lo largo de las cláusulas 1 a 10 se encuentran suficientemente desarrolladas en el aparte descriptivo de la solicitud y en este sentido el



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objeto real de la invención debe relacionarse con la verdadera composición que fue diseñada y creada en el laboratorio y que solucionó los problemas de las barras convencionales, tal es el caso de la formación de geles en las zonas que más agua absorbían o la formación de grietas en las barras de jabón una vez se secan o la irritación que causaban a los ojos."

"Es necesario entonces que el interesado defina con precisión y claridad el objeto de su invención porque se está empleando un lenguaje químico general, que no permite definir el alcance del objeto reclamado."

En primer lugar, me permito manifestar que como bien se establece en la página 5 de la memoria descriptiva de la presente invención, los ejemplos se suministran para efectos ilustrativos y no deben de ser interpretados como limitantes del alcance de la invención en estudio, pues resultaría redundante y dispendioso para el inventor consignar en la descripción todos los ejemplos y modalidades realizadas para los cuales funciona la invención.

En este sentido, el solicitante revela los intervalos para las proporciones en las cuales encontró que la invención proporciona una barra de jabón con la cual se supera el problema de las barras convencionales, como lo es la formación de geles en las zonas que más agua absorben o la formación de grietas en las barras de jabón cuando se secan o la irritación que causaban a los ojos, problemas manifestados en la descripción de la presente invención.

En segundo lugar, teniendo en cuenta las recomendaciones del examinador, se definió con precisión y claridad el objeto de su invención toda vez que con las modificaciones anteriormente expuestas en el capítulo reivindicatorio se define dicha materia objeto.

Así las cosas, me permito decir que con el presente memorial brindo cabal cumplimiento a las objeciones de claridad manifestadas por el examinador en su concepto técnico.

Señor Superintendente,


JIMENA ESCOBAR URIBE
C.C.39.779.452 de Usaqué
T.P. 68228
Cód. 5376

RESPONSABLE :

RECIBO DE CAJA APLICADO AL EXPEDIENTE No. _____

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8489

SUPERINTENDENCIA DE INDUSTRIA Y COMERCIO



No. 01-109551- -00009-0000

Fecha: 2007-06-25 16:37:29 Dep. 2020 NUECREACIONES
Tra 2 PATENTES Eve: 1 REGDEPOSITO
Act 444 RESPUESTAREQUE Folios: 9

SUPERINTENDENCIA DE INDUSTRIA Y COMERCIO

NIT : 800176089-2

RECIBO OFICIAL DE CAJA : 07 - 47,641
FECHA : JUNIO 14 DE 2007

***** CONSIGNACION *****

DEPOSITANTE	TIPO PAGO	BANCO	CUENTA	No. PAGO	FECHA PGO	Vr. PAGO
ESCOBAR URIBE ASOCIADOS	CONSIGNACION	BANCO POPULAR	050-00110-6	66415405	13/06/2007	2,526,000.00

***** CONCEPTO *****

CANT.	RENTISTICO	CONCEPTO	TOTAL CONCEPTO
1	50005-01-03	CAMBIO DE MODALIDAD Y MODIFICA	
		12 MARCAS Y LENAS COMERCIALES	99,000.00
		TOTAL :	\$ 99,000.00

SON: NOVENTA Y NUEVE MIL PESOS

[Handwritten signature]

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REIVINDICACIONES

28 gk

1. Una composición limpiadora transparente en barra no irritante a los ojos, caracterizada porque comprende:

- a) desde el 0.5% al 30% en peso de la composición total de por lo menos un surfactante anfotérico del grupo que consiste de anfocarboxilatos, alquil betaínas, amidoalquil betaínas, amidoalquil sultaínas, anfoposfatos, fosfobetaínas, pirofosfobetaínas, carboxialquil alquil poliaminas, y mezclas de los mismos; ✓
- b) desde el 0.5% al 30% en peso de la composición total de por lo menos un surfactante aniónico del grupo que consiste de alquil sulfatos; alquil éter sulfatos; alquil monogliceril éter sulfatos; alquil monoglicérido sulfatos; alquil monoglicérido sulfonatos; alquil sulfonatos; alquilaril sulfonatos; alquil sulfosuccinatos; alquil éter sulfosuccinatos; alquil sulfosuccinatos; alquil amidosulfosuccinatos; alquil carboxilatos; alquil amidoétercarboxilatos; alquil succinatos; acil sarcosinatos grasos, acil aminoácidos grasos; acil tauratos grasos; alquil sulfoacetatos grasos; alquil fosfatos; y mezclas de los mismos; ✓
- c) desde el 0.5% al 30% en peso de la composición total de por lo menos un surfactante no-iónico; y → D
- d) desde el 0.1% al 20% en peso de la composición total de un agente solidificante del grupo que consiste de alditoles de dibencilideno; y
- e) desde el 10% al 90% en peso de la composición total de por lo menos un solvente orgánico del grupo que consiste de alcoholes dihidroxílicos alifáticos que contienen desde 3 a 6 átomos de carbono; polietilen y polipropilen glicoles; alcoholes monohídricos, alcoholes polihídricos; y mezclas de los mismos. ✓ 4

2. La composición limpiadora transparente en barra de la Reivindicación 1, caracterizada porque el agente solidificante se selecciona del grupo conformado por sorbitol dibencilideno, xilitol dibencilideno, ribitol dibencilideno, y mezclas de los mismos. d)

3. La composición limpiadora transparente en barra de la Reivindicación 1, caracterizada porque por lo menos un solvente orgánico se selecciona del grupo conformado por alcoholes dihidroxílicos alifáticos que contienen de 3 a 6 átomos de carbono; polietilen y polipropilen glicoles; alcoholes monohídricos; alcoholes polihídricos; y mezclas de los mismos. e)

4. La composición limpiadora transparente en barra de la Reivindicación 3, caracterizada porque por lo menos un solvente orgánico se selecciona del grupo conformado por glicerina, propilen glicol, y mezclas de los mismos. → e)

5. La composición limpiadora transparente en barra de la Reivindicación 1, caracterizada porque por lo menos un surfactante anfotérico se selecciona del grupo conformado por anfocarboxilatos, alquil betaínas, amidoalquil betaínas, amidoalquil sultaínas, anfoposfatos, fosfobetaínas, pirofosfobetaínas, carboxialquil alquil poliaminas, y mezclas de los mismos. → a)

x



6. La composición limpiadora transparente en barra de la Reivindicación 5, caracterizada porque por lo menos un surfactante anfotérico se selecciona del grupo conformado por cocamidopropilbetaína, lauroanfoglucinato, fosfobetaínas láurico-mirísticas, y lauril betaína. 86
gb
→ a)

7. La composición limpiadora transparente en barra de la Reivindicación 1, caracterizada porque por lo menos un surfactante aniónico se selecciona del grupo conformado por alquil sulfatos; alquil éter sulfatos; alquil monogliceril éter sulfatos; alquil monoglicérido sulfatos; alquil monoglicérido sulfonatos; alquil sulfonatos; alquilaril sulfonatos; alquil sulfosuccinatos; alquil éter sulfosuccinatos; alquil sulfosuccinatos; alquil amidosulfosuccinatos; alquil carboxilatos; alquil amidoétercarboxilatos; alquil succinatos; acil sarcosinatos grasos, acil aminoácidos grasos; acil tauratos grasos; alquil sulfoacetatos grasos; alquil fosfatos; y mezclas de los mismos, en donde el grupo alquilo tiene desde 10 a 16 átomos de carbono. → b)

8. La composición limpiadora transparente en barra de la Reivindicación 7, caracterizada porque por lo menos un surfactante aniónico se selecciona del grupo conformado por laureth sulfato de sodio y laureth-13 carboxilatos de sodio. b)

→ Lauril.

9. La composición limpiadora transparente en barra de la Reivindicación 1, caracterizada porque por lo menos un surfactante no-iónico se selecciona del grupo conformado por derivados de polioxietileno de ésteres de poliol, en donde el derivado de polioxietileno de éster de poliol (1) se deriva de (a) un ácido graso que comprende desde 8 a 22 átomos de carbono, y (b) un poliol seleccionado de sorbitol, sorbitan, glucosa, α -metil glucósido, poliglucosa con un promedio desde 1 a 3 residuos de glucosa por molécula, glicerina, pentaeritritol y mezclas de los mismos; (2) contiene un promedio de desde 10 a 120 unidades de oxietileno; y (3) tiene un promedio de 1 a 3 residuos de ácido graso por mol de derivado de polioxietileno de éster de poliol; alquil glucósidos de cadena larga, y poliglucósidos, los cuales son los productos de la condensación de (a) un alcohol de cadena larga que contiene desde 6 a 22 átomos de carbono, con (b) glucosa o un polímero con contenido de glucosa. → c)

10. La composición limpiadora transparente en barra de la Reivindicación 9, caracterizada porque por lo menos un surfactante no-iónico se selecciona del grupo conformado por polisorbato 20 y polioxietilen-sorbitan laurato. → c)

11. La composición limpiadora transparente en barra de la Reivindicación 1, que comprende:

a) desde el 1% al 20% en peso de la composición total de por lo menos un surfactante anfotérico seleccionado del grupo conformado por cocamidopropilbetaína, lauroanfoglucinato, fosfobetaínas láurico-mirísticas, y lauril betaína;

b) desde el 1% al 20% en peso de la composición total de por lo menos un surfactante aniónico seleccionado del grupo conformado por laureth sulfato de sodio y laureth-13 carboxilatos de sodio;

c) desde el 1% al 20% de por lo menos un surfactante no-iónico seleccionado del grupo conformado por polisorbato 20 y polioxietilen-sorbitan laurato;

d) desde el 0.5% al 5% en peso de la composición total de un agente solidificante seleccionado del grupo conformado por sorbitol dibencilideno, xilitol dibencilideno, ribitol dibencilideno, y mezclas de los mismos; y

e) desde el 20% al 80% en peso de la composición total de por lo menos un solvente orgánico seleccionado del grupo conformado por glicerina, propilen glicol, y mezclas de los mismos.

12. La composición limpiadora transparente en barra de la Reivindicación 11, caracterizada porque además comprende:

f) desde el 0.05% al 10% de un sinergizante solidificante.

13. La composición limpiadora transparente en barra de la Reivindicación 12, caracterizada porque el sinergizante solidificante se selecciona del grupo conformado por celulosa y derivados de guar, polímeros de ácido acrílico, poliacrilamidas, polímeros de óxido de alquileo/alquileo, esmectita hidrofílica y organoarcillas, sílices hidratados y ahumados, gelatina, queratina, gomas de xantana y guar, carragenina, agar y alginatos.



US005389279A

United States Patent [19]

Au et al.

[11] **Patent Number:** 5,389,279[45] **Date of Patent:** Feb. 14, 1995[54] **COMPOSITIONS COMPRISING NONIONIC GLYCOLIPID SURFACTANTS**

[75] **Inventors:** Van Au, Peekskill, N.Y.; George Grudev, Hewitt, N.J.; Bijan Harirchian, South Orange, N.J.; Michael Massaro, Ridgefield Park, N.J.; Abid N. Khan-Lodhi, Hoole Chester, England

[73] **Assignee:** Lever Brothers Company, Division of Conopco, Inc., New York, N.Y.

[21] **Appl. No.:** 981,737

[22] **Filed:** Nov. 25, 1992

Related U.S. Application Data

[63] Continuation-in-part of Ser. No. 816,419, Dec. 31, 1991, abandoned.

[51] **Int. Cl.⁶** C11D 9/00; C11D 9/30; C11D 1/18

[52] **U.S. Cl.** 252/108; 252/117; 252/173; 252/542; 252/546; 252/548; 252/DIG. 6; 252/DIG. 13; 252/DIG. 14; 252/DIG. 16

[58] **Field of Search** 252/108, 117, 542, 546, 252/548, 173, DIG. 6, DIG. 13, DIG. 14, DIG. 16

[56] **References Cited****U.S. PATENT DOCUMENTS**

2,752,334 6/1956 Walten 260/211
5,009,814 4/1991 Kelkenberg et al. 252/548

FOREIGN PATENT DOCUMENTS

2523962 9/1983 France .

OTHER PUBLICATIONS

Williams et al. Archives of Biochem & Biophysics, 195(1):145-151 (1979).

Chemical Abstract No. CA90(11):87774K.

Primary Examiner—Helen M. S. Sneed

Assistant Examiner—Nhat D. Phan

Attorney, Agent, or Firm—Ronald A. Koatz

[57] **ABSTRACT**

The present invention relates to personal product compositions which comprise aldobionamide (i.e. amide of an aldobionic acid or aldobionalactone) as a surfactant in the compositions. The aldobionamide compounds are based on compounds comprising two or more saccharide units. It is believed that such compounds pack less closely, are more water soluble than linear saccharides and thereby allow stable compositions to form more readily.

27 Claims, No Drawings

NOVEDAD
SORBITOL

12

2 1



COMPOSITIONS COMPRISING NONIONIC GLYCOLIPID SURFACTANTS

CROSS REFERENCES

This is a continuation-in-part of Ser. No. 07/816,419, filed Dec. 31, 1991, now abandoned.

BACKGROUND OF THE INVENTION

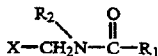
The present invention relates to novel personal product or detergent compositions comprising glycolipids, and in particular to compositions comprising nonionic aldobionamides as surface active agents in the compositions. An aldobionamide is defined as the amide of an aldobionic acid (or aldobionolactone) and an aldobionic acid in turn is defined as a sugar substance (e.g., any cyclic sugar) in which the aldehyde group (generally found at the C₁ position on the sugar) has been replaced by a carboxylic acid. Aldobionamides may be based on compounds comprising two saccharide units, (e.g., lactobionamide or maltobionamide) or they may be based on compounds comprising more than two saccharide units as long as the polysaccharide has a terminal sugar unit with an aldehyde group available. There must, however, be at least two saccharide units because these materials pack less closely in the solid state making them more water soluble than a linear saccharide (e.g., a gluconamide or glucoheptonamide) thereby allowing a stable composition to form.

Most surfactants presently used in personal product and in detergent compositions are based on petrochemicals. Because of increased concern over environmental issues raised by use of petrochemicals and also because of the continually rising costs of these petrochemicals, it would be useful to develop surfactants which are instead derived from carbohydrates. These natural occurring compounds represent a source of renewable raw materials that are synthetically versatile, inexpensive, optically pure and environmentally friendly.

U.S. Pat. No. 2,752,334 to Walden teaches compounds which are the reaction products of aldonic acids (e.g., lactobionic acid) and fatty amines. The compound is said to be useful as an emulsifier in food composition.

In Williams et al., Archives of Biochem. and Biophysics, 195(1):145-151 (1979), there is described glycolipids prepared by linking aldobionic acids to alkylamine through an amide bond. Although it is said that these compounds, like all surfactants, form micelles, there is no teaching or suggestion of the use of these compounds in detergent or personal product compositions.

U.S. Pat. No. 5,009,814 teaches N-polyhydroxyalkyl fatty acid amides used as thickeners in aqueous surfactant systems having the formula



wherein R₁ is alkyl, R₂ is hydrogen, alkyl or alkyl hydroxide and X is a polyhydroxy group.

This is a completely different class of compounds than those of the invention. In these compounds the polyhydroxy group is separated by a methylene group attached to the Nitrogen atom rather than the carbonyl group resulting in an amide linkage that is reversed compared to the compounds of the invention. These compounds are prepared by the reaction of a monosaccharide sugar amine with an alkyl ester of a fatty acid.

The compounds of this invention are prepared by the reaction of disaccharide (or greater) sugar lactones with a fatty amine. Again, ours is completely different.

In addition, there is a series of Procter and Gamble applications teaching a number of compositions which comprise polyhydroxy amide. WO-92/06172, for example, teaches built liquid detergent compositions containing polyhydroxy acid amide. There are about 20 applications reciting various compositions containing the same polyhydroxy amide.

The polyhydroxy amide of each of these references is, like the compound of U.S. Pat. No. 5,009,814, a completely different compound from that of the invention. Again, the hydroxy group in each case is separated by a methylene group attached to the Nitrogen atom rather than the carbonyl group.

French Patent No. 82/05005 (Publication No. 2,523,962) teaches linear amides having the formula:



in which m is 2 to 6 and R is a linear or branched alkyl group having 6 to 18 carbons. These surfactants are said to be low foaming and must be ethoxylated or propoxylated by typical means for sufficient solubility.

The reference fails to teach the aldobionamide of the invention. Aldobionamides do not pack as closely in the solid state as aldonamides and are therefore more soluble (lower Krafft point) and higher foaming. To the extent that the reference teaches low foaming (suggesting low solubility and high Krafft point), the reference not only fails to teach or suggest the aldobionamides of the subject invention, but actually teaches away.

Accordingly, it would be greatly desirable to find carbohydrates, in particular aldobionamides, which can be successfully used as surfactants in personal product and detergent compositions.

BRIEF SUMMARY OF THE INVENTION

This invention relates to personal product or detergent compositions comprising glycolipid surfactants. In particular, the invention relates to the use of compositions comprising aldobionamide compounds used as surfactants or cosurfactants.

DETAILED DESCRIPTION OF THE INVENTION

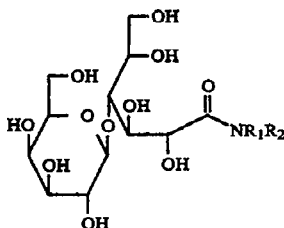
The present invention relates to the use of personal product or detergent compositions comprising environmentally friendly surfactants, in particular environmentally friendly nonionic surfactants, such as aldobionamides.

Aldobionamides are defined as the amide of an aldobionic acid (or aldobionolactone) and an aldobionic acid is a sugar substance (e.g., any cyclic sugar comprising at least two saccharide units) wherein the aldehyde group (generally found at the C₁ position of the sugar) has been replaced by a carboxylic acid, which upon drying cyclizes to an aldolactone.

An aldobionamide may be based on compounds comprising two saccharide units (e.g., lactobionamides or maltobionamides from the aldobionamide bonds), or they may be based on compounds comprising more than two saccharide units, as long as the terminal sugar in the polysaccharide has an aldehyde group. By definition an aldobionamide must have at least two saccharide units and cannot be linear. Disaccharide compounds such as lactobionamides or maltobionamides are preferred com-

pounds. Other examples of aldobionamides (disaccharides) which may be used include cellobionamides, melibionamides and gentiobionamides.

A specific example of an aldobionamide which may be used for purposes of the invention is the disaccharide lactobionamide set forth below:



wherein R_1 and R_2 are the same or different and are selected from the group consisting of hydrogen; an aliphatic hydrocarbon radical (e.g., alkyl groups and alkene groups which groups may contain heteroatoms such as N, O or S or alkoxyalkyl chains such as ethoxylated or propoxylated alkyl groups), preferably an alkyl group having 8 to 24, preferably 10 to 18 carbons; an aromatic radical (including substituted or unsubstituted aryl groups and arenes); a cycloaliphatic radical; an amino acid ester, ether amines and mixtures thereof, except that R_1 and R_2 cannot be hydrogen at the same time.

Suitable aliphatic hydrocarbon radicals include saturated and unsaturated radicals including but not limited to methyl, ethyl, amyl, hexyl, heptyl, nonyl, decyl, undecyl, dodecyl, tridecyl, tetradecyl, pentadecyl, hexadecyl, heptadecyl, and octadecyl, and allyl, undecenyl, oleyl, linoleyl, linolenyl, propenyl, and heptenyl.

Aromatic radicals are exemplified, for example, by benzyl.

Suitable mixed aliphatic aromatic radicals are exemplified by benzyl, phenyl ethyl, and vinyl benzyl.

Cycloaliphatic radicals are exemplified by cyclopentyl and cyclohexyl.

The aldobionamides used in the composition of the invention have been found to have properties (i.e., critical micelle concentrations; Krafft Point; foaming; detergency) indicating that they are equal to or better than other well known nonionic surfactants which are based on petrochemicals (e.g., alkoxyalkylated surfactants from the Neodol™ series from Shell), thereby indicating that they can be a viable, environmentally friendly alternative to the use of more traditional nonionic surfactants. The aldobionamides also have lower Krafft points and greater solubility than the single saccharide linear counterpart.

While not wishing to be bound by theory, it is believed that the lower solubility of the aldobionamide is due to the sugar structure which prevents the close packing which occurs in linear monosaccharide aldionamides such as gluconamides. The greater number of hydroxyl groups also probably help to make the aldobionamides more soluble.

In addition, the surfactants of the invention may be used as cosurfactants with other nonionic surfactants or with other surfactants (e.g., cationic, anionic, zwitterionic, amphoteric) used in personal product or detergent formulations.

COMPOSITIONS

The personal product compositions of the invention may be, for example, toilet bar compositions, facial or body cleansing compositions, shampoos for hair or body, conditioners, cosmetic compositions, dental compositions, light duty liquids, shaving creams and shaving lotion compositions, and shower gel compositions.

In one embodiment of the invention, the aldobionamide surfactant of the invention may be used, for example, in a toilet bar (i.e., soap and/or detergent bar) formulation.

Typical toilet bar compositions are those comprising fatty acid soaps used in combination with a detergent other than fatty acid soap and free fatty acids. It should be noted that the composition may comprise fatty acid soap and may be based merely on actives other than fatty acid soap. Mildness improving salts, such as alkali metal salt or isethionate, are also typically added. In addition other ingredients, such as germicides, perfumes, colorants, pigments, suds-boosting salts and anti-mushing agents may also be added.

Fatty acid soaps are typically alkali metal or ammonium salts of aliphatic alkane or alkene monocarboxylic acids. Sodium, potassium, mono-, di- and triethanol ammonium cations, or combinations thereof, are suitable for purposes of the invention. The soaps are well known alkali metal salts of natural or synthetic aliphatic (alkanoic or alkenoic) acids having about 8 to 22 carbons, preferably 12 to about 18 carbons. They may be described as alkali metal carboxylates of acrylic hydrocarbons having about 12 to 22 carbons.

Examples of soap which may be used may be found in U.S. Pat. No. 4,695,395 to Caswell et al. and U.S. Pat. No. 4,260,507 (Barrett), both of which are incorporated herein by reference.

In a soap-based bar, fatty acid soaps will generally comprise greater than 25% of the composition, generally from 30-95%. Preferably, the amount of soap will range from 40% to 70% by weight of the composition. In a bar based on other actives, soap may comprise 0-50% by weight. In general C_8 to C_{24} fatty acid comprises 5-60% of the composition.

The compositions will also generally comprise a non-soap detergent which is generally chosen from anionic, nonionic, cationic, zwitterionic or amphoteric synthetic detergent materials or mixtures thereof. These surfactants are all well known in the art and are described, for example, in U.S. Pat. Nos. 4,695,395 and 4,260,507 discussed above. One preferred non-soap anionic is a C_8 - C_{22} alkyl isethionate. These ester may be prepared by the reaction between alkali metal isethionate and mixed aliphatic fatty acids having from 8 to 22 carbons. The non-soap actives may comprise from 0 to 50% of the composition.

A certain amount of free fatty acids of 8 to 22 carbons are also desirably incorporated into soap compositions to act as superfatting agents or as skin feel and creaminess enhancers. If present, the free fatty acids comprise between 1 and 40% of the compositions.

A preferred salt which may be added to soap compositions is a simple unsubstituted sodium isethionate. This may be present as 0.1 to 50% of the composition, preferably 0.5% to 25%, more preferably 2% to about 15% by weight. Other mildness co-actives which may be used include betain compounds or ether sulphates. These also may be present at 0.1 to 50% of the composition, preferably 0.5% to 25%.

40
90
90

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COMPONENT	% BY WEIGHT
Water	5%

All the components were combined and processed in a Braybender mixer for 40 minutes at 80°-85° C. The homogeneous mixture was then removed, allowed to cool, and pressed into bars. The bars were hard, cohesive, white solids. Initial qualitative experiments indicated that they lathered well with minimum of mashing.

EXAMPLE 25

Additional Information Regarding Detergency

Detergency performance was assessed in triolein removal experiments using Terg-O-Tometer. ³H radio-labelled triolein was used to assess soil removal; subsequent to the wash, 4×1 ml samples of wash liquor were removed from each pot and the activity determined using a liquid scintillation counter. Percentage detergency was calculated from the relationship:

$$\% \text{ Detergency} = \frac{A_w}{A_s} \times 100$$

where A_w is the total activity in the wash liquor and A_s is the level of activity originally applied to the cloth.

Wash conditions are given below:

Apparatus	Terg-O-Tometer UR 7227
Wash Time	20 Minutes
Agitation	70 rpm
Wash Liquid Volume	500 mls
Active Dosage	1 g/l
Salt Concentration	0.05M
Test Cloth	Knitted Polyester
Soil Level	ca. 1.9%

The Krafft Temperature of the N-alkyl lactobionamides is summarized in Table 2 below.

	Krafft Temp.
N-dodecyl lactobionamide	38
N-tetradecyl lactobionamide	46
N-Coco lactobionamide	<6

When these surfactants were mixed with $C_{12}EO_3$ synergistic detergency was obtained. For the tetradecyl derivative a sharp synergistic maximum was observed at a surfactant composition of 80/20=lactobionamide $C_{12}EO_3$.

EXAMPLE 26

Aldobionamide is Used in a Toilet Soap Bar

Ingredients	% by Weight
C_8 to C_{24} fatty acid	5%-60%
Aldobionamide	1-45%
Coactive other than Aldonamide	0-50%
Alkyl or Aryl sulfate or Sulfonate	0-5%
Moisturizer (e.g. Sorbitol or Glycerin)	0.1-10%
Water soluble polymer (e.g. Cellulose or Polyacrylates)	0-10%
Sequestering agents (e.g.	0.1-0.5%

28

-continued

Ingredients	% by Weight
citrate)	
Dye stuff	<0.1%
Optical brighteners	<0.1%
Whitening agents	0.1-0.4%
Fragrance	0.1-2.0%
Water	Balance

EXAMPLE 27

Aldobionamide is Used in a Facial/Body Cleanser Composition

Ingredients	% by Weight
C_8 -24 fatty acid salt (e.g. triethanolamine)	1-45%
Aldobionamide	10-75%
Alkyl or aryl sulfate or sulfonate	0-20%
Coactive surfactant (e.g. cocoamidobetaine)	1-15%
Moisturizer (e.g. sorbitol)	0.1-15%
Refatting alcohol	0.5-5%
Water soluble polymer	0-10%
Thickener	0-15%
Conditioner (e.g. quaternized cellulose)	0-0.5%
Sequestering agents (e.g. citrate)	0.1-0.4%
Dye stuff	<0.1%
Optical brighteners	<0.1%
Whitening agents	0.1-0.4%
Fragrance	0.1-3.0%
Preservatives	0-0.2%
Water	Balance

EXAMPLE 28

Aldobionamide is Used in a Toothpaste Composition

Ingredients	% by Weight
Synthetic surfactants (sodium lauryl sulfate)	1.5%
Aldobionamide	1-10%
Alkyl or aryl sulfate or sulfonate	0-1%
Abrasive (e.g. silic acid/ $CaCO_3$)	20-55%
Active ingredients (e.g. Pyrophosphates)	0.1-2%
Humectant (glycerin, sorbitol)	10-45%
Thickeners (cellulose derivatives)	0-3%
Sequestering agents (e.g. citrate)	0.1-0.4%
Flavoring agents	0.5-2%
Sweeteners	<0.5%
Dye stuff	<0.1%
Water	Balance

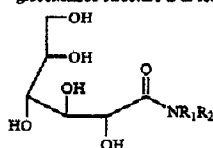
EXAMPLE 29

Cyclic Aldobionamide Versus Linear Saccharide

In order to show that the aldobionamides (i.e., having at least two saccharide units) of the invention are advantageous relative to the linear saccharides (e.g., gluconamide), applicants measured the Krafft points of C_{10} , C_{12} and C_{14} gluconamides and compared those to C_{10} , C_{12} and C_{14} lactobionamide. Specifically, 1 gram surfactant was measured in 99 grams water (1% surfactant solution) and the results set forth below:

Gluconamide*		Lactobionamide	
Alkyl Chain Length	Krafft Point (1% concentration)	Alkyl Chain Length	Krafft Point (1% concentration)
C ₁₀	84° C.	C ₁₀	0° C.
C ₁₂	95° C.	C ₁₂	38° C.
C ₁₄	>100° C.	C ₁₄	46° C.

*gluconamide structure is as follows:



wherein R₁ and R₂ are defined as for the aldobionamides of the invention.

This data clearly shows that the Krafft point of the lactobionamide (i.e., measure of solubility) is much lower than that of the corresponding chain length gluconamide.

While not wishing to be bound by theory, this is believed to be a function, at least in part, if the fact that the linear gluconamide packs more closely and is therefore less soluble in solution. The lower Krafft point is also associated with higher foaming.

EXAMPLE 30

Shampoo Using Gluconamides and Lactobionamides

To further show the difference in solubility between the aldobionamides of the invention and linear saccharides such as gluconamide, applicants made shampoo compositions comprising the following:

Shampoo Compositions	
Compound	Weight %
(I)	
Sodium dodecylsulfate	14%
Sodium chloride	2%
N-dodecyl Lactobionamide	4%
Water	80%
(II)	
Sodium dodecyl sulfate	14%
Sodium chloride	2%
N-dodecyl Lactobionamide	8%
Water	76%
(III)	
Sodium dodecyl sulfate	14%
NaCl	2%
N-dodecyl gluconamide	4%
Water	80%

Composition (I) and (II) which contain coco lactobionamide (4% and 8%) gave homogeneous clear viscous liquid shampoo, while composition (III) which contain N-dodecyl gluconamide gave cloudy non viscous liquid shampoo resulting from precipitation of the N-dodecyl gluconamide which is believed to be due to high Krafft temperature.

It can also be seen that even up to 8% lactobionamide was readily soluble (versus 4% gluconamide which was not soluble),

We claim:

1. A personal product composition comprising an aldobionamide and a surfactant selected from the group

consisting of anionic surfactants, nonionic surfactants and mixtures thereof.

2. A personal product composition according to claim 1, wherein the composition is a toilet bar soap.

3. A composition according to claim 2, comprising the following:

Ingredients	% by Weight
C ₈ -C ₂₄ fatty acid	5-60%
Aldobionamide	1-45%
Alkyl or aryl sulfate or sulfonate	0-5%
Coactive other than Aldobionamide	0-50%
Sorbitol	0.1-10%
Cellulose	0-10%
Sequestering agent	0.1-0.5%
Water	to Balance.

4. A personal product composition according to claim 1, wherein the composition is a facial/body cleanser.

5. A composition according to claim 4, comprising the following:

Ingredients	% by Weight
C ₈ -C ₂₄ fatty acid salt	1-45%
Aldobionamide	10-75%
Alkyl or aryl sulfate or sulfonate	0-20%
Cocamidobetaine	1-15%
Sorbitol	0.1-15%
Refatting alcohol	0.5-5%
Water soluble polymer	0-10%
Thickener	0-15%
Quaternized cellulose	0-0.5%
Citrate	0.1-0.4%
Water	to Balance.

6. A composition according to claim 1, wherein the composition is a shampoo.

7. A composition according to claim 6 comprising: (all percentages by weight)

- (1) Aldobionamide 5-15%;
- (2) Anionic coactive 0-10%;
- (3) Amphoteric coactive 0-10%;
- (4) Lauramide monoethanolamide 0-5%;
- (5) Thickener 0-5%;
- (6) Fragrance 0-2%;
- (7) Preservative 0-1%; and
- (8) Remainder water.

8. A composition according to claim 1, wherein the composition is a conditioner composition.

9. A composition according to claim 1, wherein the composition is a cosmetic composition.

10. A composition according to claim 1, wherein the composition is a light duty liquid detergent.

11. A composition according to claim 1, wherein the composition is shaving cream or shaving lotion.

12. A composition according to claim 1, wherein the composition is a shower gel.

13. A personal product composition according to claim 1, wherein the aldobionamide has the structure set forth below:



wherein A is a sugar moiety which is an aldobionic acid except that it does not contain the OH group

42
92
92

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normally extending from the carbonyl group on the aldonic acid;

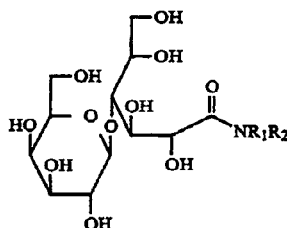
NR_1R_2 is attached where the hydroxyl group on the aldobionamic acid would normally be found; and

R_1 and R_2 are the same or different and are selected from the group consisting of hydrogen, aliphatic hydrocarbons, aromatic radicals, cycloaliphatic radicals, amino acid esters, ether amines and mixtures thereof except that R_1 and R_2 cannot be hydrogen at the same time.

14. A composition according to claim 13 wherein, on the aldobionamide, R_1 is hydrogen and R_2 is an alkyl group having 8 to 24 carbons.

15. A composition according to claim 13 wherein, on the aldobionamide, A is a disaccharide sugar group forming the compound which is an aldonic acid except for the OH group.

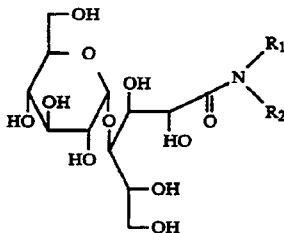
16. A composition according to claim 15, wherein the aldobionamide is a lactobionamide having the structure



wherein R_1 and R_2 are the same or different and are selected from the group consisting of hydrogen, aliphatic hydrocarbons, aromatic radicals, cycloaliphatic radicals, amino acid esters, ether amines and mixtures thereof, except that R_1 and R_2 cannot be hydrogen at the same time.

17. A composition according to claim 16 wherein, on the aldobionamide, R_1 is hydrogen and R_2 is an alkyl group having 8 to 24 carbons.

18. A composition according to claim 13, wherein the aldobionamide is maltobionamide having the structure:



wherein R_1 and R_2 are the same or different and are selected from the group consisting of hydrogen, aliphatic hydrocarbons, aromatic radicals, cycloaliphatic radicals, amino acid esters, ether amines, and mixtures thereof, except that R_1 and R_2 cannot be hydrogen at the same time.

19. A composition according to claim 18 wherein, on the aldobionamide, R_1 is hydrogen and R_2 is an alkyl group having 8 to 24 carbons.

20. A detergent composition comprising an aldobionamide and a surfactant selected from the group

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consisting of anionic surfactants, nonionic surfactants and mixtures thereof.

21. A composition according to claim 20 wherein the aldobionamide has the structure:



wherein A is a sugar moiety which is an aldobionamic acid except that it does not contain the OH group normally extending from the carbonyl group on the aldobionamic acid;

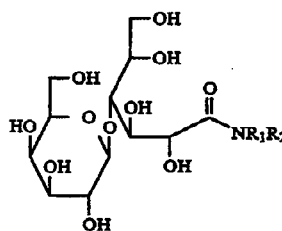
NR_1R_2 is attached where the hydroxyl group on the aldobionamic acid would normally be found; and

R_1 and R_2 are the same or different and are selected from the group consisting of hydrogen, aliphatic hydrocarbons, aromatic radicals, cycloaliphatic radicals, amino acid esters, ether amines, and mixtures thereof, except that R_1 and R_2 cannot be hydrogen at the same time.

22. A composition according to claim 21 wherein, on the aldobionamide, R_1 is hydrogen and R_2 is an alkyl group having 8 to 24 carbons.

23. A composition according to claim 21 wherein, on the aldobionamide, A is a disaccharide sugar group forming the compound which is an aldonic except for the OH group.

24. A composition according to claim 23 wherein the aldobionamide is a lactobionamide having the structure:



R_1 and R_2 are the same or different and are selected from the group consisting of hydrogen, aliphatic hydrocarbons, aromatic radicals, cycloaliphatic radicals, amino acid esters, ether amines, and mixtures thereof, except that R_1 and R_2 cannot be hydrogen at the same time.

25. A composition according to claim 24 wherein, on the aldobionamide, R_1 is hydrogen and R_2 is an alkyl group having 8 to 24 carbons.

26. A detergent composition according to claim 20, which is a liquid composition as follows:

(1) 5 to 70% by weight of a detergent active system comprising lactobionamide and further comprising a surfactant selected from the group consisting of anionic surfactants, nonionic surfactants and mixtures thereof;

(2) 0 to 50% by weight builder;

(3) 0 to 40% by weight electrolyte;

(4) 0.01 to 5% by weight enzyme;

(5) 0.1 to 5% by weight enzyme stabilizer;

(6) 0-20% 0 to 20% by weight phase regulant; and

(7) remainder water and minors.

27. A detergent composition according to claim 20, which is a powdered composition as follows:

(1) 5 to 40% by weight of a detergency active system comprising lactobionamide and further comprising a surfactant selected from the group consisting of

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anionic surfactants, nonionic surfactants and mix-
tures thereof;
(2) 0 to 40% by weight builder;
(3) 0 to 30% by weight buffer salts;

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(4) 0 to 30% by weight sulfate;
(5) 0 to 20% by weight bleach system;
(6) 0-40% 0 to 40% by weight enzyme; and
(7) minors plus water to 100%.

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US005919744A

United States Patent [19]
Lazarowitz[11] **Patent Number:** **5,919,744**
[45] **Date of Patent:** **Jul. 6, 1999**[54] **TRANSPARENT DISHWASHING BAR/PASTE
COMPRISING ALKYL POLYGLYCOSIDES**[75] Inventor: **Virginia Lazarowitz, Hatfield, Pa.**[73] Assignee: **Henkel Corporation, Gulph Mills, Pa.**[21] Appl. No.: **08/919,753**[22] Filed: **Aug. 27, 1997****Related U.S. Application Data**[63] Continuation of application No. 08/613,574, Mar. 11, 1996,
abandoned.[51] **Int. Cl.^o** **C11D 10/04; C11D 3/22;**
C11D 3/32; C11D 3/43[52] **U.S. Cl.** **510/147; 510/130; 510/133;**
510/141; 510/152; 510/153; 510/155; 510/156;
510/158; 510/220; 510/221; 510/224; 510/470;
510/481; 510/483; 510/491; 510/501[58] **Field of Search** **510/130, 133,**
510/141, 147, 152, 153, 155, 156, 158,
220, 221, 224, 470, 481, 483, 491, 501[56] **References Cited****U.S. PATENT DOCUMENTS**4,483,780 11/1984 Llenado 252/135
4,874,538 10/1989 Dawson et al. 252/1175,096,608 3/1992 Small et al. 252/132
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5,338,491 8/1994 Connor et al. 252/548
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5,565,146 10/1996 Jakubicki et al. 510/235**Primary Examiner**—Mark Kopec**Assistant Examiner**—Charles Boyer**Attorney, Agent, or Firm**—Ernest G. Szoke; Wayne C.
Jaeschke; Steven J. Trzaska[57] **ABSTRACT**A transparent/translucent dishwashing composition in bar/
paste form containing: (a) an alkyl polyglycoside of the
formula Iwherein R_1 is a monovalent organic radical having from
about 6 to about 30 carbon atoms; R_2 is divalent alkylene
radical having from 2 to 4 carbon atoms; Z is a saccharide
residue having 5 or 6 carbon atoms; b is a number having a
value from 0 to about 12; a is a number having a value from
1 to about 6; (b) a short-chain alcohol; (c) a fatty acid; (d)
an amide; and (e) a polyol.**32 Claims, No Drawings**No iónico
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TRANSPARENT DISHWASHING BAR/PASTE COMPRISING ALKYL POLYGLYCOSIDES

This application is a continuation of application Ser. No. 08/613,574 filed on Mar. 11, 1996, now abandoned.

FIELD OF THE INVENTION

This invention relates to transparent dishwashing soap bars. More specifically, the present invention relates to transparent dishwashing bars which exhibit effective lathering and foaming characteristics.

DESCRIPTION OF THE INVENTION

Transparent soap bars are normally milder than opaque bars. These soaps depend for their distinctive appearance upon the fact that soap is deposited from alcoholic solution in a transparent, ultramicrocrystalline form. The incorporation of glycerol and sugars also tend to cause soap to assume this form. The effect is entirely physical, and depends upon the conditions under which the soap crystallizes rather than the presence of alcohol or any other substance in the finished soap cake. Thus, a transparent soap made with the aid of alcohol retains its appearance after most of the alcohol has been evaporated from it.

Transparent soaps vary greatly in composition. They may be prepared simply by dissolving soap flakes in alcohol and then driving off the greater part of the alcohol. Such a product will not be greatly different in composition from the original soap flakes. A more usual method of manufacture, however, is to add alcohol and glycerol, in the proportion of about two parts of alcohol to one of glycerol, to a hot saponified batch of semi-boiled soap until a rapidly cooled sample is clear, after which the batch is framed in the usual way. Sugar may also be added. The fats used in transparent soaps usually are tallow and coconut oil. Up to about 30% castor oil is often used in the fat charge, as the presence of this oil reduces the amount of alcohol, glycerol or sugar required to render the soap transparent. The anhydrous soap content of transparent soaps is usually well under 50%.

There has always been a need to increase the lathering and foaming characteristics of transparent soap bars by inclusion of various types of surfactants. However, it has been found that when a synthetic surfactant is added to a transparent soap formulation, the resulting bar is not transparent.

SUMMARY OF THE INVENTION

The present invention is directed to a dishwashing composition containing:

(a) from about 2 to about 40% by weight of an alkyl polyglycoside of the formula I



wherein R_1 is a monovalent organic radical having from about 6 to about 30 carbon atoms; R_2 is a divalent alkylene radical having from 2 to 4 carbon atoms; Z is a saccharide residue having 5 or 6 carbon atoms; b is a number having a value from 0 to about 12; a is a number having a value from 1 to about 6;

(b) from about 1 to about 10% by weight of a short-chain alcohol;

(c) from about 2 to about 15% by weight of a fatty acid;

(d) from about 1 to about 20% by weight of an amide; and

(e) from about 1 to about 20% by weight of a polyol, all weights being based on the weight of the composition.

The present invention also provides a process for making a dishwashing composition involving combining the above-disclosed components in the disclosed proportions.

DESCRIPTION OF THE INVENTION

Other than in the operating examples, or where otherwise indicated, all numbers expressing quantities of ingredients or reaction conditions are to be understood as being modified in all instances by the term "about".

The alkyl polyglycosides which can be used in the compositions according to the invention have the formula I



wherein R_1 is a monovalent organic radical having from about 6 to about 30 carbon atoms; R_2 is a divalent alkylene radical having from 2 to 4 carbon atoms; Z is a saccharide residue having 5 or 6 carbon atoms; b is a number having a value from 0 to about 12; a is a number having a value from 1 to about 6. Preferred alkyl polyglycosides which can be used in the compositions according to the invention have the formula I wherein Z is a glucose residue and b is zero. Such alkyl polyglycosides are commercially available, for example, as APG®, GLUCOPON®, or PLANTAREN® surfactants from Henkel Corporation, Ambler, PA., 19002. Examples of such surfactants include but are not limited to:

1. APG® 225 Surfactant—an alkyl polyglycoside in which the alkyl group contains 8 to 10 carbon atoms and having an average degree of polymerization of 1.7.

2. APG® 425 Surfactant—an alkyl polyglycoside in which the alkyl group contains 8 to 16 carbon atoms and having an average degree of polymerization of 1.6.

3. APG® 625 Surfactant—an alkyl polyglycoside in which the alkyl groups contains 12 to 16 carbon atoms and having an average degree of polymerization of 1.6.

4. APG® 325 Surfactant—an alkyl polyglycoside in which the alkyl groups contains 9 to 11 carbon atoms and having an average degree of polymerization of 1.6.

5. GLUCOPON® 600 Surfactant—an alkyl polyglycoside in which the alkyl groups contains 12 to 16 carbon atoms and having an average degree of polymerization of 1.4.

6. PLANTAREN® 2000 Surfactant—a C_{8-16} alkyl polyglycoside in which the alkyl group contains 8 to 16 carbon atoms and having an average degree of polymerization of 1.4.

7. PLANTAREN® 1300 Surfactant—a C_{12-16} alkyl polyglycoside in which the alkyl groups contains 12 to 16 carbon atoms and having an average degree of polymerization of 1.6.

Other examples include alkyl polyglycoside surfactant compositions which are comprised of mixtures of compounds of formula I wherein Z represents a moiety derived from a reducing saccharide containing 5 or 6 carbon atoms; a is a number having a value from 1 to about 6; b is zero; and R_1 is an alkyl radical having from 8 to 20 carbon atoms. The compositions are characterized in that they have increased surfactant properties and an HLB in the range of about 10 to about 16 and a non-Flory distribution of glycosides, which is comprised of a mixture of an alkyl monoglycoside and a mixture of alkyl polyglycosides having varying degrees of polymerization of 2 and higher in progressively decreasing amounts, in which the amount by weight of polyglycoside having a degree of polymerization of 2, or mixtures thereof with the polyglycoside having a degree of polymerization of 3, predominate in relation to the amount of monoglycoside, said composition having an average degree of polymerization of about 1.8 to about 3. Such compositions, also known as peaked alkyl polyglycosides, can be prepared by separation of the monoglycoside from the original reaction mixture of alkyl monoglycoside and alkyl polyglycosides after

removal of the alcohol. This separation may be carried out by molecular distillation and normally results in the removal of about 70–95% by weight of the alkyl monoglycosides. After removal of the alkyl monoglycosides, the relative distribution of the various components, mono- and polyglycosides, in the resulting product changes and the concentration in the product of the polyglycosides relative to the monoglycoside increases as well as the concentration of individual polyglycosides to the total, i.e. DP2 and DP3 fractions in relation to the sum of all DP fractions. Such compositions are disclosed in U.S. Pat. No. 5,266,690, the entire contents of which are incorporated herein by reference.

Other alkyl polyglycosides which can be used in the compositions according to the invention are those in which the alkyl moiety contains from 6 to 18 carbon atoms in which and the average carbon chain length of the composition is from about 9 to about 14 comprising a mixture of two or more of at least binary components of alkyl polyglycosides, wherein each binary component is present in the mixture in relation to its average carbon chain length in an amount effective to provide the surfactant composition with the average carbon chain length of about 9 to about 14 and wherein at least one, or both binary components, comprise a Flory distribution of polyglycosides derived from an acid-catalyzed reaction of an alcohol containing 6–20 carbon atoms and a suitable saccharide from which excess alcohol has been separated. The inclusion of alkyl polyglycosides into transparent soap bar formulations containing alkanolamines, polyols, water, and alkali soaps inhibits weeping of water and polyols.

A preferred alkyl polyglycoside is one wherein in formula I, R_1 is a monovalent organic radical having from about 8 to about 16 carbon atoms, b is zero, and a is a number having a value of from 1.4 to 1.7. A particularly preferred alkyl polyglycoside is one wherein in formula I, R_1 is a monovalent organic radical having from 12 to 16 carbon atoms, b is zero and a is a number having a value of 1.6. The amount of alkyl polyglycoside that can be used generally ranges from about 2 to about 40% by weight, and preferably from about 5 to about 15% by weight, based on the weight of the composition.

The short-chain alcohol component of the present invention can be any short-chain monohydric alcohol. Suitable short-chain alcohols include, but are not limited to, methyl alcohol, ethyl alcohol, propyl alcohol, and the like. A particularly preferred short-chain alcohol is isopropyl alcohol. The amount of short-chain alcohol that can be employed in the present invention ranges from about 1 to about 10% by weight, based on the weight of the composition.

The polyol component of the soap bars according to the invention can be any aliphatic compound having 2 or more alcohol functionalities. Such polyols include diols, triols, tetraols, etc. Examples of such polyols include, but are not limited to, ethylene glycol, 1,2-propylene glycol, 1,3-propylene glycol, diethylene glycol, dipropylene glycol, triethylene glycol, 1,6-hexylene glycol, glycerine, polyglycerols, monosaccharides such as glucose or fructose, disaccharides such as sucrose, sorbitol, and polyvinyl alcohol. Preferred polyols include 1,2-propylene glycol, glycerine, polyglycerol, and sorbitol. The most preferred polyol is 1,2-propylene glycol. The amount of polyol that can be used is preferably from about 1 to about 20% by weight, and most preferably from about 7 to about 15% by weight, based on the weight of the composition.

The specific amount of polyol employed will depend upon the aesthetic form of the composition desired. For example,

if a transparent dishwashing composition is desired, the composition will typically contain from about 8 to about 20, and preferably from about 12 to about 16% by weight of the polyol component, based on the weight of the composition. Conversely, if a translucent dishwashing composition is desired, the composition will typically contain from about 1 to about 10, and preferably from about 3 to about 7% by weight of the polyol component, based on the weight of the composition. A particularly preferred polyol is CARBOWAX®400, a linear polyethylene glycol polymer commercially available from Union Carbide Corporation.

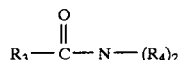
The fatty acid component of the composition according to the invention can be any saturated or unsaturated, branched or linear carboxylic acid having from 8 to 30 carbon atoms or a mixture of such acids. An example of a preferred commercial grade stearic acid is EMERSOL® 150 Stearic Acid, a trademark product of Henkel Corporation, Emery Group, Cincinnati, Ohio, which has an average weight percent composition of 2.0% myristic acid, 1% pentadecanoic acid, 11% palmitic acid, 2.0% margaric acid, and 83% stearic acid. The amount of fatty acid component that can be used in the composition according to the invention generally ranges from about 2 to about 15% by weight, and preferably from about 3 to about 8% by weight, based on the weight of the composition. A particularly preferred fatty acid component is a high grade stearic acid containing more than 50% pure stearic acid, and preferably at least 80% pure stearic acid.

It should be noted, however, that the specific amount of fatty acid employed will depend upon the hardness and, hence, the form of the composition desired. For example, if a dishwashing bar is desired, the composition will typically contain from at least 4% up to about 15% by weight of the fatty acid component. Conversely, if a dishwashing paste is desired, the composition will typically contain less than 4% by weight, and preferably from about 2.5 to about 3.5% by weight of the fatty acid component.

The degree of neutralization of the fatty acids ranges from at least 70% up to 100%, with the most preferred range being from 90 to 100%. The fatty acids can be neutralized using any alkali material such as, for example, sodium hydroxide.

The amides which may be employed in the present invention have the general formula II:

(II)



wherein R_3 is an alkyl group containing from about 8 to about 18 carbon atoms and each R_4 is the same or different and is selected from the group consisting of hydrogen, C_{1-3} alkyl, C_{1-3} alkanol, and $-(C_2H_4O)-$, and mixtures thereof. The preferred amide is a diethanolamide, and more particularly, a cocodiethanolamide. It should also be noted that monoethanolamides have been found to be ineffective in formulating the dishwashing compositions of the present invention. The amount of amide to be used in the present invention generally ranges from about 1 to about 20% by weight, and preferably from about 2 to about 6% by weight, based on the weight of the composition.

In a particularly preferred embodiment of the present invention, the dishwashing composition contains from about 8 to about 12% by weight of an alkyl polyglycoside of formula I wherein R_1 is a monovalent organic radical having from 12 to 16 carbon atoms, from about 3 to about 5% by weight of isopropylalcohol, from about 4 to about 6% by

weight of stearic acid, from about 5 to about 10% by weight of cocodiethanolamide, and from about 10 to about 14% by weight of 1,2-propylene glycol, all weights being based on the weight of the composition. In this embodiment, the dishwashing composition formed is a transparent, solid bar. However, as was noted above, by varying the amount of fatty acid used, in this case using less stearic acid, the composition will take on the form of a paste. Similarly, by varying the amount of polyol used, in this case using more 1,2-propylene glycol, a more translucent dishwashing composition is formed. Regardless of the aesthetic appearance desired, the amount of fatty acid employed will range from about 2 to about 15% by weight, and the amount of polyol employed will range from about 1 to about 20% by weight, all weights being based on the weight of the composition.

It should also be noted that a bar or paste form of the dishwashing composition of the present invention has application in both the institutional and industrial sectors. For example, a bar form of the composition may be packaged in a container capable of being inverted in a downwardly-dispensing direction. By attaching a hot water source to the dispensing end of the container, small amounts of the dishwashing composition can be melted and dispensed, via gravitational pull, onto articles to be cleaned.

Additional dishwashing ingredients may also be incorporated into the composition without departing from the spirit of the invention. Examples thereof include, but are not limited to, anionic surfactants, nonionic surfactants, and builders. However, since the aesthetic appearance of the dishwashing composition is meant to range between transparent and translucent, additives such as those listed above must be chosen with caution so as not to render the composition opaque.

Anionic surfactants which may be employed in the composition of the present invention include linear alkyl sulfonates and ether sulfates.

The sulfonate group, $\text{—SO}_3\text{M}$ attached to an alkyl, aryl or alkylaryl hydrophobe is a highly effective solubilizing group. Sulfonic acids are strong acids and their salts are relatively unaffected by pH. They are stable to both oxidation and, because of the strength of the C—S bond, also to hydrolysis. They interact moderately with the hardness ions Ca^{2+} and Mg^{2+} , significantly less so than carboxylates. Modification of the hydrophobe in sulfonate surfactants, by introduction of double bonds or ester or amide groups into the hydrocarbon chain or as substituents, yields surfactants that offer specific performance advantages.

Because the introduction of the SO_3H function is inherently inexpensive, e.g., by oleum, SO_3 , SO_2 , Cl_2 , or NaHSO_3 , sulfonates are heavily represented among the high-volume surfactants. While representative sulfonates include alkylarenesulfonates, short-chain lignosulfates, naphthalenesulfonates, alpha-olefinsulfonates, petroleum sulfonates, and sulfonates with ester, amide or ether linkages, the present invention is directed to the use of linear or branched alkyl sulfonates (LAS), i. e., straight- or branched-chain alkylbenzenesulfonates in its surfactant composition. The linear alkylates thereof may be normal, iso (branched at the end only) or highly branched, and must have at least 10 carbon atoms.

The preferred linear alkyl sulfonates of the present invention contain a straight alkyl chain having from about 9 to about 25 carbon atoms, most preferably from about 10 to about 13 carbon atoms, and the cation is sodium, potassium, ammonium, mono-, di-, or triethanolammonium, calcium or magnesium and mixtures thereof. Suitable straight-chain alkylbenzenesulfonates include C_{10-15} alkylbenzene-

sulfonates. Linear alkyl sulfonates will typically be employed in the composition in an amount ranging from about 5 to about 40, and preferably from 15 to 30% by weight, based on the weight of the composition.

The ether sulfates which may be employed are short-chain alkyl sulfates characterized by the formula $\text{R}^1\text{O—SO}_4^-\text{X}^+$ wherein R^1 is C_{12-16} alkyl radical and X is Na, K, Mg, and NH_4 . These can be manufactured from alkyl alcohols by sulfation with SO_3 or chlorosulfonic acid. Ether sulfates will typically be employed in the composition in an amount ranging from about 1 to about 20%, and preferably from 7 to 14% by weight, based on the weight of the composition.

Nonionic surfactants suitable for use as auxiliaries in the dishwashing composition of the present invention include, for example, alcohol ethoxylates characterized by a carbon chain length of $\text{C}_9\text{—C}_{16}$ having from 5 to 13 moles of ethylene oxide per mole of alcohol.

A particularly preferred alcohol ethoxylate is a nonylphenol ethoxylate having 9 moles of ethylene oxide. Alcohol ethoxylates will typically be employed in the composition in an amount ranging from about 1 to about 20%, and preferably from 5 to 10% by weight, based on the weight of the composition.

Other auxiliaries which may be employed include builders. Particularly preferred builders include urea and/or sugar due to the enhanced tactile properties which they impart onto the dishwashing composition when in contact with human skin. These types of builders will typically be employed in the composition in an amount ranging from about 5 to about 25%, and preferably from 18 to 23% by weight, based on the weight of the composition.

The present invention will be better understood from the examples which follow, all of which are intended to be illustrative only and not meant to unduly limit the scope of the invention. Unless otherwise indicated, percentages are on a weight-by-weight basis.

EXAMPLE

A dishwashing bar in accordance with the present invention was made having the following formulation.

Component	%/wt.
(a) LAS	35.5
(b) APG @ 625*	10.0
(c) nonylphenol (EO) ₉	5.25
(d) cocodiethanolamide	4.0
(e) ether sulfate	7.5
(f) 1,2-polyethylene glycol	10.0
(g) urea	20.0
(h) stearic acid (80% pure)	4.0
(i) isopropyl alcohol	3.0
(j) NaOH	1.0
	100.0

*APG @ 625 is an alkyl polyglycoside, commercially available from Henkel Corporation, Ambler, PA, in which the alkyl groups contain 12 to 16 carbon atoms and having an average degree of polymerization of 1.6.

The above-listed surfactants were combined and heated to a temperature of about 55° C. The urea was then added to the mixture, with mixing, until it was completely dissolved therein. The stearic acid was then added, with mixing, and once it was all in solution, the stearic acid was then neutralized with the sodium hydroxide. The isopropyl alcohol was then added, with mixing. The resultant solution was then poured into molds and allowed to harden, thus forming a dishwashing bar.



What is claimed is:

1. A transparent/translucent dishwashing composition in bar/paste form comprising:

(a) from 2% to 40% of an alkyl polyglycoside having general formula I



wherein R_1 is a monovalent organic radical having from about 6 to about 30 carbon atoms;

R_2 is a divalent alkylene radical having from 2 to 4 carbon atoms; Z is a saccharide residue having 5 or 6 carbon atoms; b is a number having a value from 0 to about 12; a is a number having a value from 1 to about 6;

(b) a short-chain alcohol;

(c) from 2% to 15% of a stearic acid component having a degree of neutralization of from at least 70% up to 100%, wherein the stearic acid component contains greater than 50% pure stearic acid;

(d) an amide; and

(e) a polyol.

2. The composition of claim 1 wherein in formula I R_1 is a monovalent organic radical having from about 8 to about 16 carbon atoms, b is zero, and a is a number having a value of about 1.6.

3. The composition of claim 1 wherein the short-chain alcohol is present in the composition in an amount of from about 1 to about 10% by weight, based on the weight of the composition.

4. The composition of claim 1 wherein the amide is a diethanolamide.

5. The composition of claim 1 wherein the amide is present in the composition in an amount of from about 1 to about 20% by weight, based on the weight of the composition.

6. The composition of claim 1 wherein the polyol is a linear polyethylene glycol.

7. The composition of claim 1 wherein the polyol is present in the composition in an amount of from about 1 to about 20% by weight, based on the weight of the composition.

8. The composition of claim 1 further comprising an auxiliary component selected from the group consisting of an anionic surfactant, a nonionic surfactant other than alkyl polyglycoside, a builder and mixtures thereof.

9. The composition of claim 8 wherein the anionic surfactant is an alkyl benzene sulfonate.

10. The composition of claim 8 wherein the anionic surfactant is an ether sulfate.

11. The composition of claim 8 wherein the anionic surfactant is present in the composition in an amount of from about 3 to about 40% by weight, based on the weight of the composition.

12. The composition of claim 8 wherein the nonionic surfactant is an alcohol ethoxylate.

13. The composition of claim 12 wherein the alcohol ethoxylate is a nonylphenol having 9 moles of ethylene oxide.

14. The composition of claim 8 wherein the nonionic surfactant is present in the composition in an amount of from about 1 to about 20% by weight, based on the weight of the composition.

15. The composition of claim 8 wherein the builder is selected from the group consisting of urea, an additional sugar and mixtures thereof.

16. The composition of claim 8 wherein the builder is present in the composition in an amount of from about 5 to about 25% by weight, based on the weight of the composition.

17. A process for making a transparent/translucent dishwashing composition in bar/paste form comprising combining:

(a) from 2% to 40% of an alkyl polyglycoside having general formula I



wherein R_1 is a monovalent organic radical having from about 6 to about 30 carbon atoms;

R_2 is divalent alkylene radical having from 2 to 4 carbon atoms; Z is a saccharide residue having 5 or 6 carbon atoms; b is a number having a value from 0 to about 12; a is a number having a value from 1 to about 6;

(b) a short-chain alcohol;

(c) from 2% to 15% of a stearic acid component acid having a degree of neutralization of from at least 70% up to 100%, wherein the stearic acid component contains greater than 50% pure stearic acid;

(d) an amide; and

(e) a polyol.

18. The process of claim 17 wherein in formula I R_1 is a monovalent organic radical having from about 8 to about 16 carbon atoms, b is zero, and a is a number having a value of about 1.6.

19. The process of claim 17 wherein the short-chain alcohol is present in the composition in an amount of from about 1 to about 10% by weight, based on the weight of the composition.

20. The process of claim 17 wherein the amide is a diethanolamide.

21. The process of claim 17 wherein the amide is present in the composition in an amount of from about 1 to about 20% by weight, based on the weight of the composition.

22. The process of claim 17 wherein the polyol is a linear polyethylene glycol.

23. The process of claim 17 wherein the polyol is present in the composition in an amount of from about 1 to about 20% by weight, based on the weight of the composition.

24. The process of claim 17 further comprising an auxiliary component selected from the group consisting of an anionic surfactant, a nonionic surfactant other than alkyl polyglycoside, a builder and mixtures thereof.

25. The process of claim 24 wherein the anionic surfactant is an alkyl benzene sulfonate.

26. The process of claim 24 wherein the anionic surfactant is an ether sulfate.

27. The process of claim 24 wherein the anionic surfactant is present in the composition in an amount of from about 3 to about 40% by weight, based on the weight of the composition.

28. The process of claim 24 wherein the nonionic surfactant is an alcohol ethoxylate.

29. The process of claim 28 wherein the alcohol ethoxylate is nonylphenol having 9 moles of ethylene oxide.

30. The process of claim 24 wherein the nonionic surfactant is present in the composition in an amount of from about 1 to about 20% by weight, based on the weight of the composition.

31. The process of claim 24 wherein the builder is selected from the group consisting of urea, an additional sugar and mixtures thereof.

32. The process of claim 24 wherein the builder is present in the composition in an amount of from about 5 to about 25% by weight, based on the weight of the composition.

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United States Patent [19]**Kacher et al.**[11] **Patent Number:** **5,496,488**[45] **Date of Patent:** **Mar. 5, 1996**

[54] **CLEANSING BAR COMPOSITION
CONTAINING PETROLATUM HAVING A
SPECIFIC SIZE RANGE**

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Related U.S. Application Data

[63] Continuation of Ser. No. 909,877, Jul. 7, 1992, Pat. No. 5,312,559.

[51] **Int. Cl.⁶** C11D 9/24; C11D 9/48; C11D 13/16; C11D 17/00

[52] **U.S. Cl.** 252/125; 252/119; 252/120; 252/121; 252/126; 252/127; 252/130; 252/132; 252/134; 252/368; 252/369; 252/370

[58] **Field of Search** 252/122, 123, 252/125-127, 130, 132, 134, 173, 369, 368, 370, DIG. 5, DIG. 16, 117, 118, 119, 120, 121; 424/78.03, 489, 502; 514/846, 847, 873, 762

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[57] **ABSTRACT**

A very stable mild soap personal cleansing and moisturizing composition comprising: C₈-C₂₂ free fatty acid soap, C₈-C₂₂ free fatty acid, water, and petrolatum, preferably having a weight average particle size larger than 45 microns.

7 Claims, No Drawings

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CLEANSING BAR COMPOSITION CONTAINING PETROLATUM HAVING A SPECIFIC SIZE RANGE

This is a continuation of application Ser. No. 07/909,877, filed on Jul. 7, 1992, now U.S. Pat. No. 5,312,559.

TECHNICAL FIELD

The present invention is related to personal cleansing products, especially cleansers and creams for bath or shower which are formulated for mildness, viscosity control, phase stability, and moisturization.

BACKGROUND OF THE INVENTION

Personal cleansing compositions are well known.

The need for mild skin cleansing compositions is made more acute by both the aging of the human population and the everincreasing environmental insult to which the skin is subject. The mildest skin cleansing products can, at best, produce cleansing without negatively affecting the skin condition. To achieve an improvement in skin condition, the consumer is forced to use a second, separate product often called a "moisturizer". The use of two separate products to achieve the desired skin state is inconvenient and often unpleasant due to the greasy skin feel resultant from many moisturizers. As a result, many persons suffer from the effects of poor skin condition rather than use two separate products.

There is a clear need for a single product which is capable of delivering both mild skin cleansing and a skin conditioning benefit. Many skin cleansing products contain humectant substances which, although effective in topical application, are ineffective in cleansing products. These humectants are ineffective because they are very water soluble and suffer from poor skin substantivity. Hydrophobic emollient materials are generally more substantive to the skin, but are more difficult to incorporate into an aqueous skin cleansing matrix. There are at least two sources of difficulty typically encountered: poor lather effects and physically unstable product.

U.S. Pat. No. 3,829,563, Barry et al., issued Aug. 13, 1974, discloses a liquid skin cleansing composition containing petrolatum in the range of 10-70% having a diameter particle size of (>95%) smaller than 5 microns.

U.S. Pat. No. 4,673,525, Small et al., issued Jun. 16, 1987, incorporated herein by reference, discloses mild surfactant based personal cleansing systems, primarily synbars.

Most non-solid soaps comprise mostly "soluble," "unsaturated," or shorter chains, e.g., lauric/oleic soaps for phase stability. This, however, compromises lather quality and/or mildness.

The present invention allows for the incorporation of substantially larger petrolatum particles than the prior art. These larger particles result in greater functional efficacy than previously has been achieved.

OBJECT OF THE INVENTION

One object of this invention is to provide a personal cleansing product which conditions and moisturizes the skin as the product is used. Another object of this invention is to provide a single product which achieves the benefits of using two separate products for cleansing and moisturizing the skin.

A further object is to provide processes for making these products.

It is still another object of the present invention to provide a semi-solid cleansing bath/shower soap composition which is phase stable, shelf stable, lathers well, and is cosmetically attractive.

It is a further object of the present invention to provide a semi solid soap cleansing composition which is relatively mild.

These and other objects of the present invention will become obvious from the detailed description which follows.

SUMMARY OF THE INVENTION

The present invention relates to a stable dispersoidal semi-solid personal cleansing composition comprising:

- (A) from about 7% to about 33% by weight of potassium C₈-C₂₂ fatty acid soap;
- (B) from about 4% to about 18% C₈-C₂₂ free fatty acid;
- (C) from about 40% to about 70% water; and
- (D) from about 5% to about 30% of a polyol selected from the group consisting of: glycerin, glycerol, propylene glycol, polypropylene glycols, polyethylene glycols, ethyl hexanediol, hexylene glycols, and other aliphatic alcohols; and mixtures thereof; and
- (E) from about 0.5% to about 15% petrolatum emollient, preferably having a weight average particle size of from about 45 microns to about 120 microns.

DETAILED DESCRIPTION OF THE INVENTION

The present invention relates to a stable dispersoidal semi-solid soap cleansing composition comprising: 40% to 70%, preferably 45% to 65%, water; 7% to 33%, preferably 9% to 25%, of mostly insoluble saturated (low IV) higher fatty acid potassium soap; 4% to 18%, preferably 5% to 17%, of free fatty acids; and 0.5% to 15%, preferably 0.7% to about 13% petrolatum. The soap and the free fatty acids have a preferred ratio of above about 1.3:1 to about 1.8:1 and more preferably from about 1.35:1 to about 1.75:1. The semi-solid compositions having petrolatum at levels of from 0.5% to 6% preferably have a weight particle size of from 45 micron to 120 micron, but have improved mildness over comparable compositions without petrolatum notwithstanding the particle size of the petrolatum.

This invention relates to a semi-solid composition and also a bar composition suitable for cleansing and "conditioning" or "moisturization" of the skin. The "conditioning" benefit is defined as the deposition of a material on the skin surface which is known to improve skin condition and at a level that surpasses the threshold for a noticeable benefit.

The present invention is concerned with the ability to incorporate petrolatum and/or an equivalent into an aqueous skin cleansing matrix and maintain the larger particle size that results in functional efficacy without producing an unstable product. Formulations and processes have been invented which allow the petrolatum particle size to be increased to a weight average particle size of from about 45 microns to about 120 microns within the product, preferably from about 50-110 microns, more preferably from about 55-110 microns. It will be demonstrated that the larger particles result in improved skin deposition.

A very stable mild dispersoidal semi-solid soap personal cleansing composition comprising:

(A) from about 7% to about 33% by weight of potassium C_8 - C_{22} fatty acid soap;

(B) from about 4% to about 18% C_8 - C_{22} free fatty acid;

(C) from about 40% to about 70% water (preferably C_{10} - C_{20}); and

(D) from about 5% to about 30% of a polyol selected from the group consisting of: glycerin, glycerol, propylene glycol, polypropylene glycols, polyethylene glycols, ethyl hexanediol, hexylene glycols, and other aliphatic alcohols; and mixtures thereof; and

(E) from about 0.5% to about 15%, preferably 1-6%, petrolatum having a weight average particle size larger than 45 microns;

wherein said fatty acid of said (A) and (B) has an Iodine Value of from zero to about 15;

wherein said soap and said free fatty acid have a weight ratio of about 1.3:1 to about 1.8:1; and

wherein said semi-solid has a viscosity of from about 60,000 cps to about 400,000 cps at 25° C.

An improved stable product with improved moisturizing benefit is achieved with the incorporation of larger sized petrolatum particles into selected fatty acid and/or soap matrixes. The larger sized petrolatum particles will vary for a liquid, semisolid, or bar. The key is to select the fatty acid and/or soap matrix as exemplified herein, and mix in the petrolatum using a minimal controlled amount of shear to maintain larger petrolatum particles and achieve a homogeneous stable product, e.g., an improved stable liquid personal cleanser with improved moisturizing benefits is disclosed in commonly assigned U.S. Patent Application No. U.S. Pat. No. 5,308,526, L. C. Dias, et al., issued May 3, 1994. Dias, et al.

Petrolatum and Other Emollients

A requirement for the present compositions is that they contain from about 0.5% to about 15% petrolatum, having a weight average particle size larger than about 45 microns.

The petrolatum useful in the present invention can be any grade of white or yellow petrolatum recognized in the art as suitable for human application. The preferred type is USP Class III with a melting point between 122° and 135° F. (50° and 57° C.). Such a material is commercially available as Penreco Snow White Pet USP. The petrolatum of the present invention includes hydrocarbon mixtures formulated with mineral oils in combination with paraffin waxes of various melting points.

Alternatively, the composition of the present invention can contain from about 0.5% to about 15% of a lipophilic emollient selected from the group consisting of: petrolatum; esters of fatty acids; glycerin mono-, di-, and tri-esters; epidermal and sebaceous hydrocarbons such as cholesterol, cholesterol esters, squalene, squalane; silicone oils and gums; mineral oil; lanolin and derivatives and the like; and mixtures thereof. The petrolatum and/or emollient particle size is alternatively expressed as a particle size distribution with 10% to 80% of the particles being about 5 microns to about 120 microns within the product, preferably 20% to 80% being from about 10-110 microns, more preferably 25% to 80% from about 30-110 microns, more preferably 60-100 microns.

Personal Cleansing Solid Bar

The present invention includes a solid bar composition. Specifically, a stable personal cleansing solid bar composition,

by weight, comprises:

(A) from about 5% to about 75% of a substantially saturated fatty acid material selected from the group consisting of: C_8 - C_{22} free fatty acid and fatty soap and mixtures thereof;

(B) from about 10% to about 90% water; and

(C) from about 0.5% to about 35% petrolatum having a particle size of distribution with from 10% -80% being from 5 microns to about 120 microns.

Methods of Making Semi-Solid and Bar

The semi-solid composition is preferably made by (1) heating and mixing free fatty acid to provide a stable melt; (2) forming soap in situ by adding aqueous potassium hydroxide to provide a dispersion of soap and free fatty acid having said ratio of about 1.3:1 to about 1.8:1; and (3) adding water, polyol and mild, lathering surfactant to said dispersion with mixing; (4) cooling the dispersion of Step 3 to a temperature below the melting point of petrolatum; and (5) adding said petrolatum with mixing to provide said dispersoidal semi-solid personal cleansing composition.

The solid bar is made by: (1) heating and mixing free fatty acid to provide a stable melt; (2) forming soap in situ by aqueous sodium hydroxide, sodium chloride, and water to provide a heated mix; (3) adding other ingredients such as polyols, synthetic surfactants, etc., to said heated mix; (4) adding petrolatum to the said heated mix (3) using low shear and minimal mixing time to provide a homogeneous mix; (5) pouring the heated homogeneous mix of (4) into bar molds and cooling to provide solid personal cleansing bars.

The Fatty Acid

The fatty acid matter of the present invention has an IV of from zero to about 15, preferably below 10, more preferably below 3.

The compositions contain fatty acids derived from essentially saturated hydrocarbon chainlengths of from about 10 to about 22. These fatty acids may be highly purified individual chainlengths and/or crude mixtures such as those derived from fats and oils. In general, the higher the proposition of longer chainlength fatty acids, the poorer the lather, but the greater the pearlescent appearance and mildness of the product.

The ratio of soap to fatty acid is an important determinant of overall product rheology. The higher the ratio of soap to fatty acid, the thinner the product is. For the semi-solid composition, the ratio of soap to fatty acid is from about 1.3:1 to 1.8:1, preferably from about 1.35:1 to 1.75:1. If the soap to fatty acid ratio is larger than the specified range, poor lather results, if it is lower than the specified range, poor product stability (oil syneresis) results.

The semi-solid soap cleanser has a viscosity of 60,000-400,000 cps, preferably 70,000 cps to about 200,000 cps at about 25° C., Brookfield RVTDV-II with a Spindle D or F at 5 rpm.

The Soap.

The compositions contain soaps derived from the essentially saturated hydrocarbon chainlengths of from about 10 to about 22. It is preferred that the soap be the potassium salt, but other soluble soaps can be used. Some sodium, ammonium, triethanolammonium, and/or mixtures thereof, are deemed acceptable, at least in potassium blends. The soaps are preferably prepared in situ soap by neutralization of the

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corresponding fatty acids, but they may also be introduced as preformed soaps.

The semi-solid soap is called a dispersoid because at least some of the fatty matter at the levels used herein is insoluble. The level of water in the semi-solid compositions is typically from about 40% to about 70%, preferably from about 45% to about 65%.

Another important attribute of the preferred semi-solid soap of the present invention is it is phase stable, particularly after storage.

The Polyol

The present invention contains from about 5% to about 30% of a polyol selected from the group consisting of: glycerin, glycerol, propylene glycol, polypropylene glycols, polyethylene glycols, ethyl hexanediol, hexylene glycols, and other aliphatic alcohols; and mixtures thereof; and preferably contains 10-25% of said polyol, preferably the polyol is glycerol.

The term "viscosity" as used herein means both of these viscosities as measured by a Brookfield RVTDV-II/Spindle D or F at 5 rpm at 25° C., unless otherwise specified.

Optionals

If present, the optional components individually generally comprise from about 0.001% to about 10% by weight of the composition, but can be more or less.

Optional thickeners are categorized as cationic, nonionic, or anionic and are selected to provide the desired viscosities. Suitable thickeners are listed in the Glossary and Chapters 3, 4, 12 and 13 of the *Handbook of Water-Soluble Gums and Resins*, Robert L. Davidson, McGraw-Hill Book Co., New York, N.Y., 1980, incorporated by reference herein.

The liquid personal cleansing products can be thickened by using polymeric additives that hydrate, swell or molecularly associate to provide body (e.g., hydroxypropyl guar gum is used as a thickening aid in shampoo compositions).

The nonionic cellulose thickeners include, but are not limited to, the following polymers:

1. hydroxyethyl cellulose;
2. hydroxymethyl cellulose;
3. hydroxypropyl cellulose; and
4. hydroxybutyl methyl cellulose.

The anionic cellulose thickener includes carboxymethyl cellulose and the like.

Another thickener is xanthan gum having a molecular weight (M.W.) of from about 2,000,000±500,000. Each molecule has about 2,000 repeating units.

Another thickener is acrylated steareth-20 methylacrylate copolymer sold as Acrysol ICS-1 by Rohm and Haas Company.

Another thickener is Natrosol® 250 KR, sold by the Aqualon Co.

The amount of polymeric thickener found useful in the present compositions is about 0.1% to about 2%, preferably from about 0.2% to about 1.0%.

The semi-solid soap of the present invention can be made with from about 0.1% to about 5%, preferably from about 0.3% to about 3%, of a cationic polymer selected from the group consisting of: cationic polysaccharides and derivatives, cationic copolymers of saccharides and synthetic monomers, synthetic copolymers and cationic protein derivatives. Detailed lists of suitable cationic polymers are

set out in Small et al. and Medcalf et al., incorporated herein by reference.

Another component useful in the present invention is a nonionic. The preferred nonionic is polyglycerol ester (PGE).

Groups of substances which are particularly suitable for use as nonionic surfactants are alkoxyated fatty alcohols or alkylphenols, preferably alkoxyated with ethylene oxide or mixtures of ethylene oxide or propylene oxide; polyglycol esters of fatty acids or fatty acid amides; ethylene oxide/propylene oxide block polymers; glycerol esters and polyglycerol esters; sorbitol and sorbitan esters; glycol esters and polyglycol esters; polyglycol esters of glycerol; ethoxylated lanolin derivatives; and alkanolamides and sucrose esters.

The cleansing bath/shower compositions can contain a variety of nonessential optional ingredients suitable for rendering such compositions more desirable. Such conventional optional ingredients are well known to those skilled in the art, e.g., preservatives such as benzyl alcohol, methyl paraben, propyl paraben and imidazolidinyl urea; other thickeners and viscosity modifiers such as C₈-C₁₈ ethanolamide (e.g., coconut ethanolamide) pH adjusting agents such as citric acid, succinic acid, phosphoric acid, sodium hydroxide, etc.; suspending agents such as magnesium/aluminum silicate; perfumes; dyes; and sequestering agents such as disodium ethylenediamine tetraacetate.

A preferred semi-solid composition also contains from about 0.5% to about 10% of an emollient selected from the group consisting of: esters of fatty acids; glycerin mono-, di-, and triesters; epidermal and sebaceous hydrocarbons, such as cholesterol, cholesterol esters, squalene, squalane; lanolin and derivatives; silicone oils and gums, and the like.

The Surfactant

An important attribute of the preferred soap personal cleansing product of the present invention is its rich and creamy lather.

The preferred composition also contains from about 2% to about 8%, preferably from about 2.5 to about 6.5%, of a high lathering synthetic surfactant.

An important optional component of the present compositions is a lather boosting surfactant. The surfactant, which may be selected from any of a wide variety of anionic (nonsoap), amphoteric, zwitterionic, nonionic and, in certain instances, cationic surfactants, is present at a level of from about 1% to about 10%, preferably from about 2% to about 6% by weight of the product.

The cleansing product patent literature is full of synthetic surfactant disclosures. Some preferred surfactants as well as other cleansing product ingredients are disclosed in the following references:

U.S. Pat. No.	Issue Date	Inventor(s)
4,061,602	12/1977	Oberstar et al.
4,234,464	11/1980	Morshauser
4,472,297	9/1984	Bolich et al.
4,491,539	1/1985	Hoskins et al.
4,540,507	9/1985	Grollier
4,565,647	1/1986	Llenado
4,673,525	6/1987	Small et al.
4,704,224	11/1987	Saud
4,788,006	11/1988	Bolich, Jr., et al.
4,812,253	3/1989	Small et al.
4,820,447	4/1989	Medcalf et al.
4,906,459	3/1990	Cobb et al.
4,923,635	5/1990	Simion et al.

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U.S. Pat. No.	Issue Date	Inventor(s)
4,954,282	9/1990	Rys et al.

All of said patents are incorporated herein by reference. A preferred synthetic surfactant is shown the Examples herein. Preferred synthetic surfactant systems are selectively designed for appearance, stability, lather, cleansing and mildness.

It is noted that surfactant mildness can be measured by a skin barrier destruction test which is used to assess the irritancy potential of surfactants. In this test the milder the surfactant, the lesser the skin barrier is destroyed. Skin barrier destruction is measured by the relative amount of radio-labeled water ($^3\text{H-H}_2\text{O}$) which passes from the test solution through the skin epidermis into the physiological buffer contained in the diffusate chamber. This test is described by T. J. Franz in the *J. Invest. Dermatol.*, 1975, 64, pp. 190-195; and in U.S. Pat. No. 4,673,525, Small et al., issued June 16, 1987, incorporated herein by reference, and which disclose a mild alkyl glyceryl ether sulfonate (AGS) surfactant based synbar comprising a "standard" alkyl glyceryl ether sulfonate mixture. Barrier destruction testing is used to select mild surfactants. Some preferred mild synthetic surfactants are disclosed in the above Small et al. patents and Rys et al.

Some examples of good lather-enhancing, mild detergent surfactants are e.g., sodium or potassium lauroyl sarcosinate, alkyl glyceryl ether sulfonate, sulfonated fatty esters, and sulfonated fatty acids.

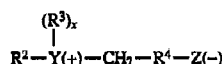
Numerous examples of other surfactants are disclosed in the patents incorporated herein by reference. They include other alkyl sulfates, anionic acyl sarcosinates, methyl acyl taurates, N-acyl glutamates, acyl isethionates, alkyl sulfosuccinates, alkyl phosphate esters, ethoxylated alkyl phosphate esters, trideceth sulfates, protein condensates, mixtures of ethoxylated alkyl sulfates and alkyl amine oxides, betaines, sultaines, and mixtures thereof. Included in the surfactants are the alkyl ether sulfates with 1 to 12 ethoxy groups, especially ammonium and sodium lauryl ether sulfates.

Alkyl chains for these surfactants are C_8 - C_{22} , preferably C_{10} - C_{18} , more preferably C_{12} - C_{14} . Alkyl glycosides and methyl glucose esters are preferred mild nonionics which may be mixed with other mild anionic or amphoteric surfactants in the compositions of this invention. Alkyl polyglycoside detergents are useful lather enhancers. The alkyl group can vary from about 8 to about 22 and the glycoside units per molecule can vary from about 1.1 to about 5 to provide an appropriate balance between the hydrophilic and hydrophobic portions of the molecule. Combinations of C_8 - C_{18} , preferably C_{12} - C_{16} , alkyl polyglycosides with average degrees of glycosidation ranging from about 1.1 to about 2.7, preferably from about 1.2 to about 2.5, are preferred.

Anionic nonsoap surfactants can be exemplified by the alkali metal salts of organic sulfuric reaction products having in their molecular structure an alkyl radical containing from 8 to 22 carbon atoms and a sulfonic acid or sulfuric acid ester radical (included in the term alkyl is the alkyl portion of higher acyl radicals). Preferred are the sodium, ammonium, potassium or triethanolamine alkyl sulfates, especially those obtained by sulfating the higher alcohols (C_8 - C_{18} carbon atoms), sodium coconut oil fatty acid monoglyceride sulfates and sulfonates; sodium or potassium salts of sulfuric acid esters of the reaction product of 1 mole

of a higher fatty alcohol (e.g., tallow or coconut oil alcohols) and 1 to 12 moles of ethylene oxide; sodium or potassium salts of alkyl phenol ethylene oxide ether sulfate with 1 to 10 units of ethylene oxide per molecule and in which the alkyl radicals contain from 8 to 12 carbon atoms, sodium alkyl glyceryl ether sulfonates; the reaction product of fatty acids having from 10 to 22 carbon atoms esterified with isethionic acid and neutralized with sodium hydroxide; water soluble salts of condensation products of fatty acids with sarcosine; and others known in the art.

Zwitterionic surfactants can be exemplified by those which can be broadly described as derivatives of aliphatic quaternary ammonium, phosphonium, and sulfonium compounds, in which the aliphatic radicals can be straight chain or branched and wherein one of the aliphatic substituents contains from about 8 to 18 carbon atoms and one contains an anionic water-solubilizing group, e.g., carboxy, sulfonate, sulfate, phosphate, or phosphonate. A general formula for these compounds is:



wherein R^2 contains an alkyl, alkenyl, or hydroxy alkyl radical of from about 8 to about 18 carbon atoms, from 0 to about 10 ethylene oxide moieties and from 0 to 1 glyceryl moiety; Y is selected from the group consisting of nitrogen, phosphorus, and sulfur atoms; R^3 is an alkyl or monohydroxyalkyl group containing 1 to about 3 carbon atoms; X is 1 when Y is a sulfur atom and 2 when Y is a nitrogen or phosphorus atom; R^4 is an alkylene or hydroxyalkylene of from 1 to about 4 carbon atoms and Z is a radical selected from the group consisting of carboxylate, sulfonate, sulfate, phosphonate, and phosphate groups.

Examples include: 4-[N,N-di(2-hydroxyethyl)-N-octadecylammonio]-butane-1-carboxylate; 5-[S-3-hydroxypropyl-S-hexadecylsulfonio]-3-hydroxypentane-1-sulfate; 3-[P,P-diethyl-P-3,6,9-trioxatetradecylphosphonio]-2-hydroxypropane-1-phosphate; 3-[N,N-dipropyl-N-3-dodecoxy-2-hydroxypropylammonio]-propane-1-phosphonate; 3-(N,N-dimethyl-N-hexadecylammonio)propane-1-sulfonate; 3-(N,N-dimethyl-N-hexadecylammonio)-2-hydroxypropane-1-sulfonate; 4-[N,N-di(2-hydroxyethyl)-N-(2-hydroxydodecyl)ammonio]-butane-1-carboxylate; 3-[S-ethyl-S-(3-dodecoxy-2-hydroxypropyl)-sulfonio]-propane-1-phosphate; 3-(P,P-dimethyl-P-dodecylphosphonio)-propane-1-phosphonate; and 5-[N,N-di(3-hydroxypropyl)-N-hexadecylammonio]-2-hydroxy-pentane-1-sulfate.

Examples of amphoteric surfactants which can be used in the compositions of the present invention are those which can be broadly described as derivatives of aliphatic secondary and tertiary amines in which the aliphatic radical can be straight chain or branched and wherein one of the aliphatic substituents contains from about 8 to about 18 carbon atoms and one contains an anionic water solubilizing group, e.g., carboxy, sulfonate, sulfate, phosphate, or phosphonate. Examples of compounds falling within this definition are sodium 3-dodecylaminopropionate, sodium 3-dodecylaminopropane sulfonate, N-alkyltaurines, such as the one prepared by reacting dodecylamine with sodium isethionate according to the teaching of U.S. Pat. No. 2,658,072, N-higher alkyl aspartic acids, such as those produced according to the teaching of U.S. Pat. No. 2,438,091, and the products sold under the trade name "Miranol" and described in U.S. Pat. No. 2,528,378. Other amphoteric surfactants such as betaines are also useful in the present composition.

