Description

This invention relates to stable, low viscosity cosmetic emulsions which have the skin refreshed upon application thereof without becoming sticky after the application and which have appropriate moisture retentivity. The invention also relates to a method for making such emulsions.

In general, cosmetic emulsions consist of water, oils and emulsifiers and, when applied to the skin, they form an oil film on the surface of the skin. By the coverage with the oil film, a percutaneous water loss is so suppressed that moisture in the horny layer is appropriately retained. The moisture-retentive effect depends on the type and amount of the oil, and thus the type and amount of the oil are suitably controlled according to the purposes.

In order to attain less stickiness and refreshness to the touch by the use of emulsions, it is necessary to reduce the amount of oils and use oils which are less sticky.

EP-A-0076146 describes skin conditioning compositions which comprise an emulsion of volatile, water-insoluble liquid; glycerine; a polydiorganosiloxane-polyoxyalkylene copolymer; a surfactant which will emulsify the above named water-insoluble components; and water.

US-A-4311695 discloses water-in-oil type emulsions, wherein the water phase comprises a water-soluble alcohol and the oil phase comprises a methyl siloxane fluid.

GB-A-2064363 discloses silicone-water emulsions of volatile cyclic polysiloxanes which are suitable as vehicles for the application of epidermal enhancing agents including cosmetics and medical and pharmaceutical compounds.

The polysiloxane of the general formula (II), (III) or (IV) indicated hereinafter (hereinafter referred to silicone oil) is able to form a uniform thin film on the skin and is suitable as an oil imparting the stickiness-free smoothness to the touch. However, the silicone oil is rather poor in compatibility with ordinary surface active agents and other oils and has very poor ability of being emulsified, which makes it very difficult to obtain uniform, fine emulsions.

Better stability against coalescence and creaming is obtained when emulsified particles are more uniform and finer. This tendency becomes more pronounced particularly when the viscosity of the system is low. The state of emulsification takes part in the appearance or whiteness of an emulsion. In this sense, optimal results are obtained when the particle size is in the range of from 0.2 to 2 μm. At a smaller particle size, there is obtained a transparent, pale microemulsion. Over the above range, a semi-transparent, greyish emulsion is obtained.

In order to further impart refreshness at the time of application, the cosmetic system is preferred to contain ethyl alcohol. In general, addition of ethyl alcohol results in a considerable lowering of emulsion stability of the system.

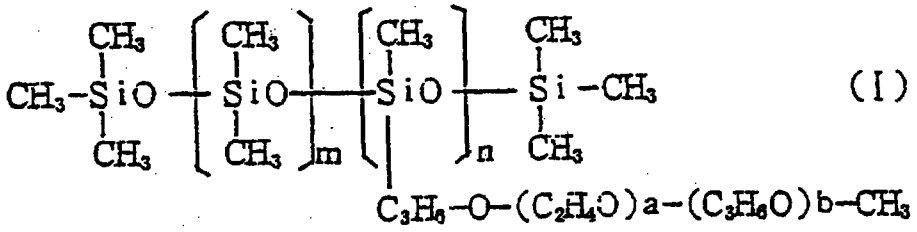
The emulsion system having such properties as described above should satisfy the following requirements: ethyl alcohol is contained in an aqueous phase; an oil being emulsified is mainly composed of silicone oil and is contained in small amounts; and the system is low in viscosity and has emulsified particles which are fine and uniform in size. However, known emulsification techniques cannot satisfy all the above requirements at the same time.

SUMMARY OF THE INVENTION

Under these circumstances, the present inventors have made intensive studies to obtain cosmetic emulsions for which the objects of the invention can be achieved. As a result, it has been found that when a mixture of a specific type of dimethylpolysiloxane-polyoxyalkylene copolymer, a surface active agent having an HLB value not smaller than 10, and a linear, saturated higher alcohol having from 12 to 22 carbon atoms is used as an emulsifier, to which an aqueous phase comprising ethyl alcohol in a predetermined concentration is added under agitation in a predetermined range of temperature thereby forming one phase region of a gel or a highly viscous liquid, there can be obtained an emulsion with a low viscosity which is fine, uniform and stable and which contains the silicone oil as the main component. In addition, the emulsion composition satisfies the requirements for the cosmetic emulsion. the present invention is based on the above finding.

According to one feature of the invention, there is provided a cosmetic emulsion which comprises:

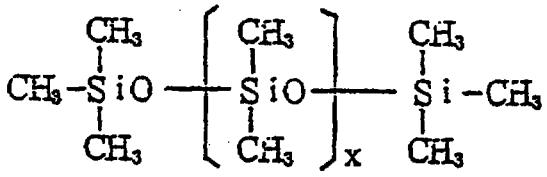
(a) 0.2 to 5 wt% of an emulsifier consisting of (1) a dimethylpolysiloxane-polyoxyalkylene copolymer represented by the general formula (I)



(I)

in which a represents an integer of from 10 to 25, b is an integer of from 25 to 35, m is an integer of from 60 to 80, and n is an integer of from 3 to 8, an aqueous solution of which has a cloud point of from 20 to 45°C, (2) a surface active agent having an HLB value not smaller than 10, and (3) a linear, saturated higher alcohol having from 12 to 22 carbon atoms, and wherein relative ratios of the components (1), (2) and (3) lie within a polygon (including each side) bounded by the points of a ternary composition diagram of the annexed sole figure: A(25: 73: 2), B(25: 55: 20), C (10: 10: 20), and D(88: 10: 2);

(b) 0.5 to 10 wt% of an oil comprising 90% or more of at least one polysiloxane represented by the general formula (II), (III) or (IV)



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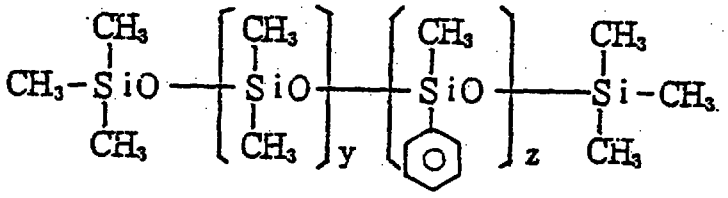

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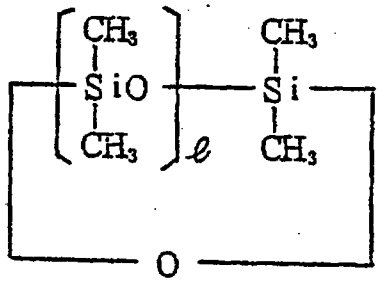


(IV)

in which x represents an integer of from 4 to 100, z is an integer not smaller than 1, y + z is a value from 1 to 100, and ℓ is an integer of from 2 to 5; and, optionally, 0.5 to 10 wt.-% of an oil or wax, and

(c) 85 to 99.3 wt% of a water phase comprising 60 to 100 wt%, based on the total water phase, of an ethyl alcohol aqueous solution in which an ethyl alcohol to water ratio by weight is 50:50 to 2:98.

Another feature of the invention resides in provision of a method of making the cosmetic emulsion.

BRIEF DESCRIPTION OF THE DRAWING

The sole figure is a ternary composition diagram showing relative ratios of dimethylpolysiloxane-polyoxyalkylene copolymer, a surface active agent having an HLB value not smaller than 10, and a linear, saturated higher alcohol having 12 to 22 carbon atoms, which constitute an emulsifier of a cosmetic emulsion of the invention.

DETAILED DESCRIPTION OF THE INVENTION AND PREFERRED EMBODIMENTS

The dimethylpolysiloxane-polyoxyalkylene copolymer of (1), which is one component of the emulsifier (a) of the cosmetic emulsion according to the invention, should preferably have a cloud point, as an aqueous solution thereof, of 25 to 40 °C. If the cloud point of the aqueous solution exceeds 45 °C, one phase emulsion cannot be formed during the emulsification and the emulsified particles of the emulsion become coarse. On the other hand, when the cloud point is lower than 20 °C, it does by no means serve as a surface active agent and thus no emulsification proceeds. The surface active agent (2) are those agents having an HLB value not smaller than 10, which may be used singly or in combination. In particular, surface active agents having an HLB value of from 11 to 16 are preferred. Specific examples of the surface active agents include polyoxyethylene alkyl ethers, polyoxyethylene and fatty acid esters, fatty acid esters of polyoxyethylene and sorbitan, fatty acid esters of polyoxyethylene and glycerine, polyoxyethylene hardened castor oils, polyglycerine and fatty acid esters, sucrose and fatty acid esters.

The linear, saturated higher alcohols (3) have from 12 to 22 carbon atoms, preferably 14 to 18 carbon atoms. When the number of carbon atoms are below 10, the action of stabilizing a material being emulsified lowers to a substantial extent with offensive odor. When the number of carbon atoms exceeds 22, there is the tendency toward crystallization as time passes.

The emulsifier which is component (a) has relative ratios of (1), (2) and (3) within a polygon (including each side thereof) bounded by the points A(25: 73: 2), B(25: 55: 20), C(70: 10: 20) and D(88: 10: 2) of the ternary composition diagram of the sole figure. The emulsifier is used in an amount of 0.2 to 5 wt% (hereinafter referred to simply as %) of the cosmetic emulsion and preferably in an amount of 0.4 to 3%. Outside the range, the emulsification does not proceed satisfactorily.

The oil component (b) contains 90% or more of at least one silicone oil represented by the general formula (II), (III) or (IV). Aside from these silicone oils, there may be used hydrocarbons such as liquid paraffin, paraffin wax, ceresin and squalane, natural animal and plant oils such as olive oil, jojoba oil and mink oil, and synthetic ester oils such as octyldodecyl myristate. These oils are used in an amount of 0.5 to 10%, preferably 1 to 5%, of the cosmetic emulsion. Over 10%, oiliness is unfavorably strengthened.

The aqueous phase (c) should have a ratio by weight of ethyl alcohol and water in the range of 50/50 to 2/98. The ratio is preferably in the range of 30/70 to 5/95. When the ethyl alcohol/water ratio exceeds 50/50, the emulsification becomes unstable and the resulting emulsion is more stimulative against the skin. If, on the contrary, the ratio of ethyl alcohol/water is smaller than 2/98, refreshness does not appear. The aqueous phase may further comprise humectants such as glycerin, sorbitol, maltitol propylene glycol, dipropylene glycol, 1,3-butylene glycol, sodium pyrrolidonecarboxylate, polyoxyethylene methylglucoside, polyoxypropylene methylglucoside and glucose, amino acids such as glycine, serine and proline, and medical agents such as antiinflammatory agents, bactericides and vitamins. The aqueous phase is used in an amount of 85 to 99.3%, preferably 92 to 98.6%, of the cosmetic emulsion.

The cosmetic emulsion of the invention is preferred to be low in viscosity and has generally a viscosity of below 100 mPa•s (cP) at 25 °C, preferably below 20 mPa•s (cP). Over 100 mPa•s (cP), the resulting emulsion is felt sticky upon application thereof.

The cosmetic emulsion of the invention is prepared by the procedure which comprises adding an ethyl alcohol aqueous solution, which has an ethyl alcohol/water ratio by weight of 20/80 to 70/30, to a mixture of (a) 0.2 to 5 parts by weight of an emulsifier and (b) 0.5 to 10 parts by weight of an oil under agitation at a temperature of from 20 to 45 °C to produce an o/w emulsion, and, if necessary, further adding water or an ethyl alcohol aqueous solution to give an intended composition.

In the practice of the invention, when the ethyl alcohol aqueous solution having an ethyl alcohol/water ratio by weight of 20/80 to 70/30, preferably 30/70 to 60/40, is added in an amount of 0.5 to 5 times by weight the mixture of (a) and (b), a gel-like or highly viscous liquid one phase product is produced. Further addition of ethyl alcohol results in an o/w emulsion. If necessary, water or an ethyl alcohol aqueous solution is so added that the ratio by weight of ethyl alcohol/water is in the range of 50/50 to 2/98. The finally added water or ethyl alcohol aqueous solution should preferably be controlled at a temperature of from 5 to 45 °C.

One of features of the invention resides in that one phase region is formed by emulsification using a high content of ethanol, through which region uniform and fine emulsified particles are obtained. The fact that fine emulsified particles are obtained through the one phase region during the course of the

emulsification is known per se with regard to ordinary oil/emulsifier/water systems and oil/emulsifier/water/dihydric alcohol systems ("Journal of Chemical Society of Japan, 10, 1399 (1983), by Sagitani). The method for making cosmetic emulsions according to the invention is different from these known methods in that one phase region is formed under conditions of a high ethyl alcohol concentration in the system comprising an oil chiefly made of silicone oil, thereby obtaining a stable, low viscosity emulsion composition comprising fine, uniform emulsified particles. Moreover, it is also known from, for example, Japanese Laid-open Patent Application No. 58-131910 that polydiorganosiloxane-polyoxyalkylene copolymers are effective for emulsifying silicone oils. The present invention is also different from this prior art in that the emulsifier useful in the present invention consists of dimethylpolysiloxane-polyoxyalkylene copolymer, a surface active agent having an HLB value not smaller than 10, and a linear, saturated higher alcohol having from 12 to 22 carbon atoms in specific ratios, that an aqueous solution of the dimethylpolysiloxane-polyoxyalkylene copolymer has such a low cloud point of from 20 to 45° C that it does not serve as an emulsifier under ordinary emulsifying conditions, but shows good performance as the emulsifier by defining the content of ethyl alcohol and the emulsification temperature in certain ranges, respectively.

The present invention is described by way or examples.

Example 1

Cosmetic emulsions having the formulations indicated in Table 1 were prepared to check the emulsion stability. The results are shown in Table 2.

Table 1

Ingredients	Composition (%)						
	Products of Invention			Comparative Products			
	A	B	C	D	E	F	G
Oil Phase:							
Dimethylpolysiloxane-polyoxyalkylene copolymer (clouding point: 30°C)	0.5	0.5	0.93	0.5	-	0.5	0.81
Dimethylpolysiloxane-polyoxyalkylene copolymer (clouding point: 80°C)	-	-	-	-	0.5	-	-
POE(20) Sorbitan monooleate (HLB: 15)	0.5	0.4	0.12	0.2	0.5	-	0.28
Sorbitan monooleate (HLB: 4.3)	-	-	-	-	-	0.5	-
Cetanol	0.1	0.08	0.05	0.4	0.1	0.1	0.01
Dimethylpolysiloxane	1.5	2	1.5	1.5	1.5	1.5	1.5
Methylphenylpolysiloxane	1.5	-	1.5	1.5	1.5	1.5	1.5
Perfume	small amount	small amount	small amount	small amount	small amount	small amount	small amount
Alcohol Phase:							
Ethyl alcohol	10	20	10	10	10	10	10
Water	10	25	10	10	10	10	10
Glycerine	3	2	3	3	3	3	3
Aqueous Phase:							
Water	balance	balance	balance	balance	balance	balance	balance

Preparation: The oil phase was heated to 60°C and all the ingredients were uniformly dissolved, followed by cooling down to 36°C and keeping at a constant level. To the oil phase was added under agitation the alcohol phase which was controlled at 36°C. Thereafter, the aqueous phase of 25°C was added to the mixture to give an intended composition.

Table 2

	State of Emulsion	Stability (preserved for 1 month)	
Products of Invention:			
A	good	40°C	no change
		5°C	no change
B	good	40°C	no change
		5°C	no change
C	good	40°C	no change
		5°C	no change
Comparative Products:			
D	rather poor	40°C	separation
		5°C	separation as crystals
E	separated immediately after preparation		
F	separated immediately after preparation		
G	rather poor	40°C	separation
		5°C	separation

As will be clear from Table 2, the cosmetic emulsions of the invention showed good stability.

Example 2

Emulsion compositions of the formulations indicated in Table 3 were prepared to check the emulsion stability and viscosity. The results are shown in Table 4. The preparation of each emulsion was made in the same manner as in Example 1.

Table 3

Ingredients	Composition (%)							
	Products of Invention		Comparative Products					
	H	I	J	K	L	M	N	O
Oil Phase:								
Dimethylpolysiloxane-polyoxyalkylene copolymer (cloud point: 30°C)	0.5	0.3	0.3	0.3	0.3	0.3	0.3	0.3
POE(20) hexadecyl ether (HLB: 16)	0.4	0.5	0.5	0.5	0.5	0.5	0.5	0.5
Cetostearyl alcohol	0.1	0.2	0.2	0.2	0.2	0.2	0.2	0.2
Methylphenylpolysiloxane	1.0	1.0	1.0	10.0	1.0	1.0	1.0	1.0
Cyclic dimethylpolysiloxane	2.0	1.0	-	6.0	1.0	1.0	1.0	1.0
Octyldodecyl myristate	0.2	-	1.0	-	-	-	-	-
Perfume	small amount	small amount	small amount	small amount	small amount	small amount	small amount	small amount
Alcohol Phase:								
Ethyl alcohol	8	15	15	15	50	15	-	1.5
Water	12	15	15	15	30	3	15	5
Dipropylene glycol	4	3	3	3	3	3	3	3
Aqueous Phase:								
Water	balance	balance	balance	balance	balance	balance	balance	balance

Table 4

	Emulsion State (immediately after preparation)	Stability (preserved for 1 month)		Viscosity (25°C) mPa·s
Products of Invention:				
H	good	40°C	no change	6
		5°C	no change	
I	good	40°C	no change	4
		5°C	no change	
Comparative Products:				
J	good	40°C	separation	4
		5°C	separation	
K	rather poor	40°C	separation	600
		5°C	no change	
L	good	40°C	separation	3
		5°C	separation	
M	separated immediately after preparation		-	-
N	separated immediately after preparation		-	-
O	rather poor	40°C	separation	6
		5°C	separation	

As will be clear from Table 4, the cosmetic emulsions of the invention showed good stability though very low in viscosity.

Example 3

Five samples, in total, including the cosmetic emulsions A obtained in Example 1 and the cosmetic emulsion I of Example 2, both of which were the products of the invention, and the comparative emulsions J, K and O of Example 2 were organoleptically evaluated by 10 expert panelers with regard to the feelings to the touch. The results are shown in Table 5 below.

Table 5

	Refreshness	Stickiness	Oiliness	Affinity	Appearance
Products of Invention:					
A	1.6	-0.8	-1.2	+1.5	+1.8
I	2.0	-1.6	-1.9	+1.4	+1.6
Comparative Products:					
J	2.0	+1.1	-0.5	-0.2	+1.6
K	1.8	+0.8	+1.7	-1.4	-1.0
O	-0.8	-1.4	-0.8	+0.4	-1.6

(The values are average values of ten panelers.)

Evaluation Standard:

	Refreshness	Stickiness	Oiliness	Affinity for Skin	Appearance
+2	Very good	Very great	Very great	Very good	Very good
+1	Rather good	Rather great	Rather great	Rather good	Rather good
0	Moderate	Moderate	Moderate	Moderate	Moderate
-1	Bad	Small	Small	Rather poor	Rather poor
-2	Very bad	Very small	Very small	Very poor	Very poor

As will be seen from Table 5, the products of the invention are better in refreshness, less in stickiness and oiliness, and better in affinity for skin and appearance than the comparative products.

Example 4

Emulsion compositions P, Q of the invention having formulations indicated in Table 6, a comparative product R free of any oils, and commercially sold lotion S were each applied onto the flexor side of the forearm of men, followed by measurement of a skin conductance. The skin conductance corresponds to a content of water in the epidermic corneum, meaning a greater amount of water at a higher conductance value. The measurement was effected using a high frequency impedance meter (Capacitance-conductance Meter Model 354, by IBS Co., Ltd.). The results are shown in Table 7 below.

Table 6

Ingredients	Composition (%)		
	Products of Invention		Comparative Product
	P	Q	R
Oil Phase:			
Dimethylpolysiloxane-polyoxyalkylene copolymer (cloud point: 28°C)	0.4	0.4	-
POE(60) hardened castor oil (HLB: 14.5)	0.9	0.9	0.9
Stearyl alcohol	0.1	0.1	-
Dimethylpolysiloxane	2.5	2.5	-
Methylphenylpolysiloxane	1	1	-
Perfume	small amount	small amount	small amount
Alcohol phase:			
Ethyl alcohol	12	12	12
Water	16	16	16
Glycerine	4	-	4
Aqueous phase:			
Water	balance	balance	balance

(The comparative product R was a transparent liquid, not an emulsion.)
Preparation: Prepared in the same manner as in Example 1.

Table 7

Tested Sample	Time after Application of Tested Sample (Minutes)				
	10	30	60	90	120
Products of Invention:					
P	360	320	298	316	300
Q	336	293	288	280	288
Comparative Products:					
R	170	100	98	95	92
S (Commercially available lotion)	133	91	88	87	83
Control (nothing applied on the skin)	82	82	80	83	80

(Unit: μν/cm)

As will be seen from Table 7, the cosmetic emulsions of the invention show a higher skin moisture-retentive effect than the comparative product R and the commercial lotion.

Example 5

The cosmetic emulsion A obtained in Example 1 which is a product of the invention was used but prepare in different manners to determine the state and stability of the resulting emulsions. The preparatory procedures are summarized in Table 8 with the results shown in Table 9 below.

Table 8

	Preparation Procedure
Comparative Products:	
T	Prepared in the same manner as in Example 1 but, at the time of emulsification, the oil and alcohol phases were set at 50°C when emulsified.
U	Prepared in the same manner as in Example 1 but, at the time of emulsification, the alcohol and aqueous phases were first mixed together and then used for emulsification.
V	Prepared in the same manner as in Example 1 but, at the time of emulsification, the oil phase was added to the alcohol phase, followed by adding the water phase.
W	Prepared in the same manner as in Example 1 but, at the time of emulsification, the water phase was first added, followed by adding the alcohol phase.

Table 9

	Emulsion State (immediately after preparation)	Average Size of Emulsified Particles (μm)	Stability (preserved at room temperature for 2 months)
Product of Invention:			
A	good	0.5	no change
Comparative Products:			
T	rather poor	8.6	separation
U	rather poor	12	separation
V	rather poor	17	separation
W	separated immediately after preparation	-	-

For the measurement of the particle size, there were used Coulter counter Model TA-II and Coulter submicronanalyzer Model N4.

Example 6 (Astringent Milk)

Ingredients	Formulation (%)
Oil Phase:	
Dimethylpolysiloxane-polyoxyalkylene coplymer (cloud point: 30°C)	0.5
POE(20) hexadecyl ether	0.5
Cetanol	0.1
Dimethylpolysiloxane	2.0
Perfume	small amount
Alcohol Phase:	
Ethyl alcohol	20
Water	20
1,3-Butylene glycol	3
Citric acid	0.1
Zinc paraphenolsulfonate	0.1
Aqueous Phase:	
Water	balance

Preparation: same as in the procedure of Example 1.

Example 7 (Moisture Milk)

Ingredients	Formulation (%)
Oil Phase:	
Dimethylpolysiloxane-polyoxyalkylene coplymer (cloud point: 32°C)	0.8
POE(60) hardened castor oil	1.2
Cetostearyl alcohol	0.2
Methylphenylpolysiloxane	6
(Petrolatum^{R})	0.5
Perfume	small amount
Alcohol Phase:	
Ethyl alcohol	6.0
Glycerine	4.0
Maltitol	2.0
Water	10
Aqueous Phase:	
Water	balance

Preparation: same in the procedure of Example 1.

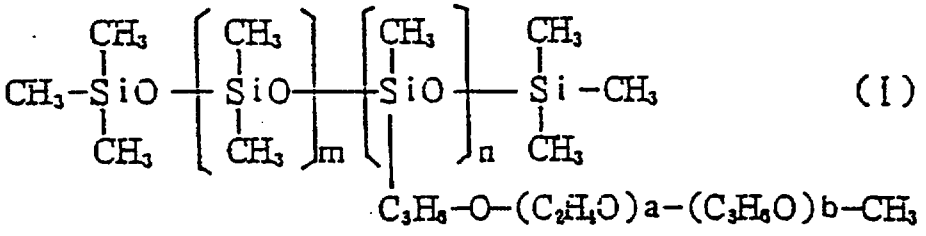
Example 8 (Anhidrotic Lotion)

Ingredients	Formulation (%)
Oil Phase:	
Dimethylpolysiloxane-polyoxyalkylene coplymer (cloud point: 28°C)	0.5
POE(20) hexadecyl ether	0.2
Stearyl alcohol	0.1
Volatile cyclic silicone	1.5
Dimethylpolysiloxane	0.5
Perfume	small amount
Alcohol Phase:	
Ethyl alcohol	40
Water	50
Aluminium hydroxychloride	5
Aqueous Phase:	
Water	balance

Preparation: same as in the procedure of Example 1.
Trade names and registered trade marks are acknowledged as such.

Claims

1. A cosmetic emulsion comprising: (a) 0.2 to 5 wt% of an emulsifier consisting of (1) a dimethylpolysiloxane-polyoxyalkylene copolymer represented by the general formula (I)



(I)

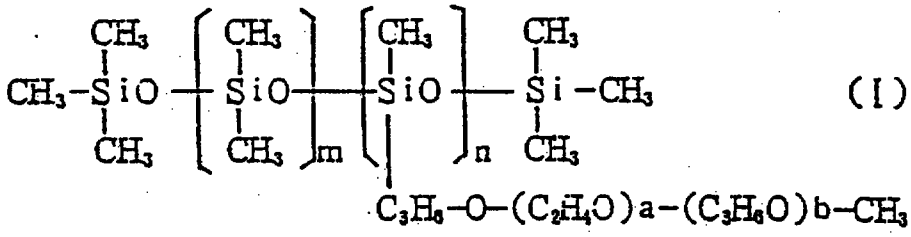
in which a represents an integer of from 10 to 25, b is an integer of from 25 to 35, m is an integer of from 60 to 80, and n is an integer of from 3 to 8, an aqueous solution of which has a cloud point of from 20 to 45°C, (2) a surface active agent having an HLB value not smaller than 10, and (3) a linear, saturated higher alcohol having from 12 to 22 carbon atoms; and wherein relative ratios of the

Ingredients	Formulation (%)
Oil Phase:	
Dimethylpolysiloxane-polyoxyalkylene coplymer (cloud point: 28°C)	0.5
POE(20) hexadecyl ether	0.2
Stearyl alcohol	0.1
Volatile cyclic silicone	1.5
Dimethylpolysiloxane	0.5
Perfume	small amount
Alcohol Phase:	
Ethyl alcohol	40
Water	50
Aluminium hydroxychloride	5
Aqueous Phase:	
Water	balance

Preparation: same as in the procedure of Example 1.
Trade names and registered trade marks are acknowledged as such.

Claims

1. A cosmetic emulsion comprising: (a) 0.2 to 5 wt% of an emulsifier consisting of (1) a dimethylpolysiloxane-polyoxyalkylene copolymer represented by the general formula (I)



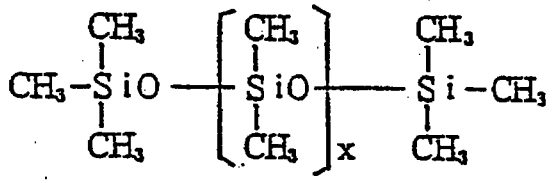
(I)

in which a represents an integer of from 10 to 25, b is an integer of from 25 to 35, m is an integer of from 60 to 80, and n is an integer of from 3 to 8, an aqueous solution of which has a cloud point of from 20 to 45°C, (2) a surface active agent having an HLB value not smaller than 10, and (3) a linear, saturated higher alcohol having from 12 to 22 carbon atoms; and wherein relative ratios of the

* C L M S *

components (1), (2) and (3) lie within a polygon (including each side) bounded by the points of a ternary composition diagram of the annexed sole figure: A(25: 73: 2), B(25: 55: 20), C (70: 10: 20), and D(88: 10: 2);

(b) 0.5 to 10 wt% of an oil comprising 90 wt-% or more of at least one polysiloxane represented by the general formula (II), (III) or (IV)



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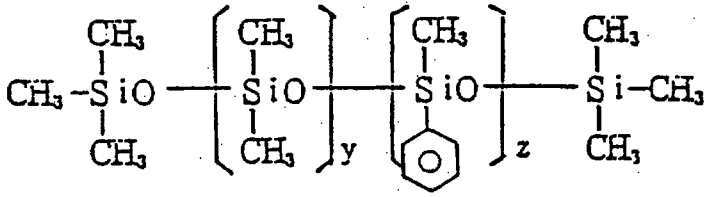

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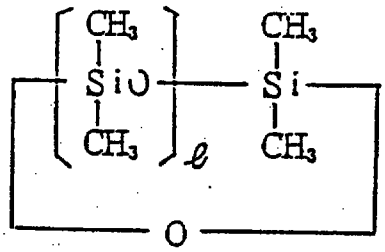

(IV)

in which x represents an integer of from 4 to 100, z is an integer not smaller than 1, y + z is a value from 1 to 100, and ℓ is an integer of from 2 to 5; and, optionally, 0.5 to 10 wt.-% of an oil or wax, and

(c) 85 to 99.3 wt% of a water phase comprising 60 to 100 wt%, based on the total water phase, of an ethyl alcohol aqueous solution in which an ethyl alcohol to water ratio by weight is 50:50 to 2:98.

2. A cosmetic emulsion according to Claim 1, wherein said cosmetic emulsion has a viscosity of below 100 mPa•s at 25°C.

3. A method for making a cosmetic emulsion as defined in claim 1, the method comprising the steps of adding the ethyl alcohol aqueous solution having an ethylalcohol/water ratio by weight in the range of 20/80 to 70/30, to a mixture of 0.2 to 5 parts by weight of the emulsifier (a) and 0.5 to 10 parts by weight of the oil (b) at a temperature of from 20 to 45°C under agitation, thereby obtaining an o/w emulsion, and, optionally, further adding water or an ethyl alcohol aqueous solution to the o/w emulsion to give and intended composition.

Revendications

1. Emulsion cosmétique comprenant :

(a) 0,2 à 5% en poids d'un émulsifiant constitué par :

(1) un copolymère diméthylpolysiloxane-polyoxyalkylène représenté par la formule générale (I) :

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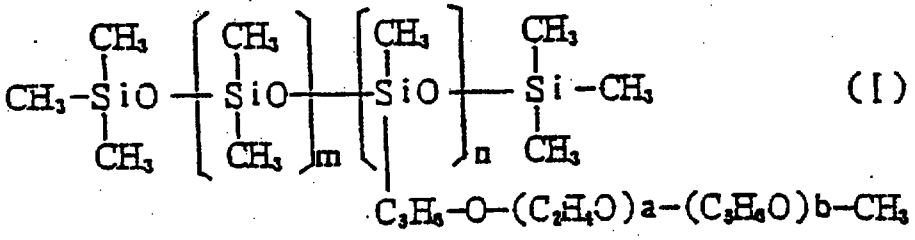


(I)

dans laquelle :

- a représente un nombre entier de 10 à 25 ;
- b représente un nombre entier de 25 à 35 ;
- m représente un nombre entier de 60 à 80 ; et
- n représente un nombre entier de 3 à 8,

dont une solution aqueuse présente un point de trouble de 20 à 45°C ;

(2) un agent tensio-actif ayant une valeur HLB non-inférieure à 10 ; et

(3) un alcool supérieur linéaire, saturé, ayant 12 à 22 atomes de carbone,

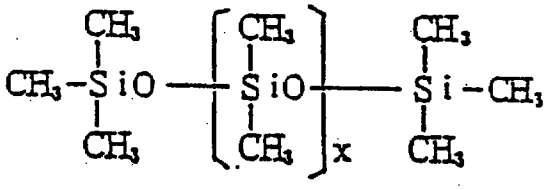
et dans lequel les rapports relatifs des composants (1), (2) et (3) se situent dans un polygone (incluant chaque coté) délimité par les points d'un diagramme de composition ternaire de la figure unique annexée :

(A) (25: 73: 2),

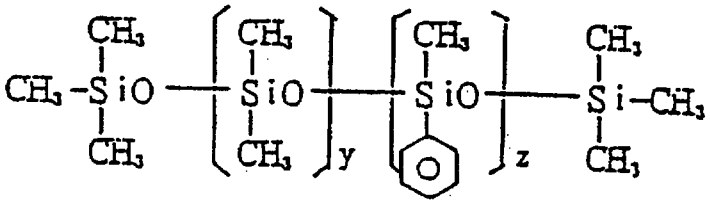
(B) (25: 55: 20),

(C) (70: 10 : 20), et (D) (88: 10: 2),

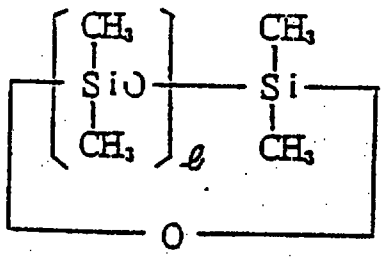
(b) 0,5 à 10% en poids d'une huile comprenant 90% en poids ou davantage d'au moins un polysiloxane représenté par la formule générale (II), (III) ou (IV)



(II)



(III)



(IV)

* C L M S *

dans lesquelles :

- x représente un nombre entier de 4 à 100 ;
- z représente un nombre entier non inférieur à 1 ;
- y + z a une valeur de 1 à 100 ; et
- ℓ est un nombre entier de 2 à 5 ; et de façon facultative, 0,5 à 10% en poids d'une huile ou d'une cire ; et

(c) 85 à 99,3% en poids d'une phase aqueuse comprenant 60 à 100% en poids, sur la base de la phase aqueuse totale, d'une solution aqueuse d'alcool éthylique, dans laquelle le rapport en poids alcool éthylique à eau est de 50:50 à 2:98.

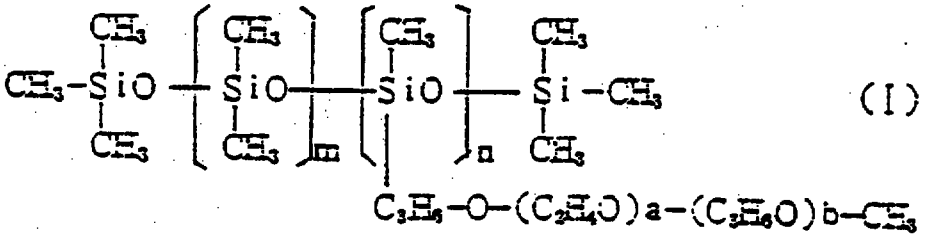
2. Emulsion cosmétique selon la revendication 1, dans laquelle ladite émulsion cosmétique présente une viscosité inférieure à 100 mPa.s à 25 °C.

3. Procédé de fabrication d'une émulsion cosmétique telle que définie à la revendication 1, le procédé comprenant les étapes consistant à ajouter la solution aqueuse d'alcool éthylique ayant un rapport en poids alcool éthylique/eau se situant dans la plage de 20/80 à 70/30, à un mélange de 0,2 à 5 parties en poids de l'émulsifiant (a) et 0,5 à 10 parties en poids de l'huile (b) à une température de 20 à 45 °C, sous agitation, ce qui permet d'obtenir une émulsion h/e, et, de façon facultative, à ajouter à nouveau de l'eau ou une solution aqueuse d'alcool éthylique à l'émulsion h/e, pour donner une composition recherchée.

Patentansprüche

1. Eine Kosmetik-Emulsion, die folgendes umfaßt:

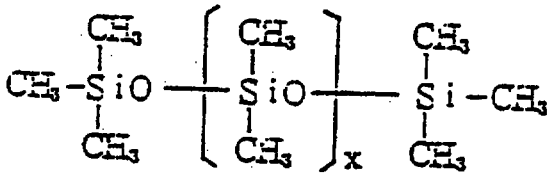
(a) 0,2 bis 5 Gew.-% eines Emulgators, bestehend aus (1) einem Dimethylpolysiloxan-polyoxyalkylen-Copolymer, welches repräsentiert wird durch die allgemeine Formel (I)



(I)

in der a eine ganze Zahl von 10 bis 25 repräsentiert, b eine ganze Zahl von 25 bis 35, m eine ganze Zahl von 60 bis 80 und n eine ganze Zahl von 3 bis 8 ist, wobei eine wässrige Lösung desselben einen Trübungspunkt von 20 bis 45 °C besitzt, (2) einem oberflächenaktiven Mittel, das einen HLB-Wert hat, der nicht kleiner als 10 ist, und (3) einem linearen, gesättigten, höheren Alkohol mit 12 bis 22 Kohlenstoffatomen; wobei die relativen Verhältnisse der Komponenten (1), (2) und (3) innerhalb eines Polygons (einschließlich jeder Seite) liegen, das durch die Punkte des ternären Mischdiagramms in der beigefügten einzigen Figur begrenzt ist: A (25: 73: 2), B(25: 55: 20), C(70: 10: 20), und D(88: 10: 2);

(b) 0,5 bis 10 Gew.-% eines Öls, welches 90 Gew.-% oder mehr wenigstens eines Polysiloxans umfaßt, das durch die folgenden allgemeinen Formeln (II). (III) oder (IV) repräsentiert wird



(II)

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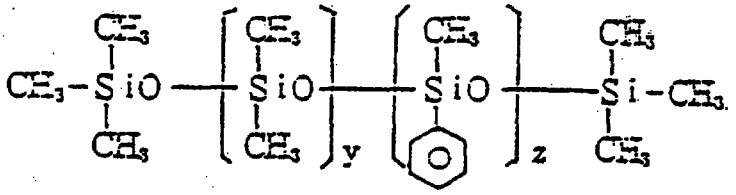
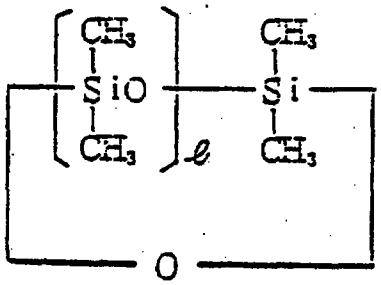


(II)



(IV)

in denen x für eine ganze Zahl von 4 bis 100 steht, z eine ganze Zahl bedeutet, die nicht kleiner als 1 ist, y + z einen Wert zwischen 1 und 100 ergibt und 1 für eine ganze Zahl von 2 bis 5 steht; und welches gegebenenfalls 0,5 bis 10 Gew.-% eines Öls oder Wachses umfaßt, und
(c) 85 bis 99,3 Gew.-% einer wässrigen Phase, die 60 bis 100 Gew-%, basierend auf der Gesamtwasserphase, einer wässrigen Ethylalkohollösung umfaßt, in der ein Ethylalkohol/Wasser-Gewichtsverhältnis von 50:50 bis 2:98 vorliegt.

2. Kosmetik-Emulsion gemäß Anspruch 1, wobei die besagte Kosmetik-Emulsion bei 25 °C eine Viskosität unterhalb von 100 mPa*s hat.

3. Verfahren zur Herstellung einer Kosmetik-Emulsion gemäß Anspruch 1, wobei das Verfahren die folgenden Stufen umfaßt: die Zugabe einer wässrigen Ethylalkohollösung, die ein Ethylalkohol/Wasser-Gewichtsverhältnis im Bereich von 20/80 bis 70/30 aufweist, zu einer Mischung von 0,2 bis 5 Gewichtsteilen des Emulgators (a) und 0,5 bis 10 Gewichtsteilen des Öls (b), unter Agitation bei einer Temperatur von 20 bis 45 °C, wobei eine Öl-in-Wasser-Emulsion erhalten wird; und gegebenenfalls die weitere Zugabe von Wasser oder einer wässrigen Ethylalkohollösung zur Öl-in-Wasser-Emulsion, um die gewünschte Zusammensetzung zu erhalten.

* C L M S *