



(22) Date de dépôt/Filing Date: 2002/07/23  
 (41) Mise à la disp. pub./Open to Public Insp.: 2003/01/24  
 (45) Date de délivrance/Issue Date: 2011/06/21  
 (30) Priorité/Priority: 2001/07/24 (DE101 368 82.8)

(51) Cl.Int./Int.Cl. *A61K 8/81* (2006.01),  
*A61K 8/06* (2006.01), *A61K 8/31* (2006.01),  
*A61Q 17/04* (2006.01), *A61Q 19/00* (2006.01)

(72) Inventeurs/Inventors:  
 LOGINOVA, YELENA, US;  
 CERNASOV, DOMNICA, US;  
 MACCHIO, RALPH, US

(73) Propriétaire/Owner:  
 COTY B.V., NL

(74) Agent: BORDEN LADNER GERVAIS LLP

(54) Titre : PRODUIT COSMETIQUE CONTENANT DES ACRYLATES  
 (54) Title: COSMETIC PRODUCT CONTAINING ACRYLATES

(57) **Abrégé/Abstract:**

The invention refers to a cosmetic product containing acrylates and to a method for manufacturing the said product. The object of the invention is to provide a new cosmetic intermediate which, due to its special structure, is suitable for forming a soft and elastic product with waterproof characteristics and which can be processed into further cosmetic products adding both water-based ingredients and ingredients on the basis of organic solvents. The new product with the structure of a gel comprises 0.01-80 % by weight of a film-forming agent on the basis of an acrylate copolymer or acrylate derivate which agent is emulsifiable with water, 0.01-90 % by weight of an aliphatic hydrocarbon solvent or a volatile silicone derivate both of which are not miscible with water and are emulsifiable with water-based ingredients and/or with ingredients on the basis of organic solvents in the presence of an emulsifier, 0.01-5 % by weight of a non-ionic emulsifier, 1.00-80 % by weight of water.



## ABSTRACT

The invention refers to a cosmetic product containing acrylates and to a method for manufacturing the said product. The object of the invention is to provide a new cosmetic intermediate which, due to its special structure, is suitable for forming a soft and elastic product with waterproof characteristics and which can be processed into further cosmetic products adding both water-based ingredients and ingredients on the basis of organic solvents. The new product with the structure of a gel comprises 0.01-80 % by weight of a film-forming agent on the basis of an acrylate copolymer or acrylate derivate which agent is emulsifiable with water, 0.01-90 % by weight of an aliphatic hydrocarbon solvent or a volatile silicone derivate both of which are not miscible with water and are emulsifiable with water-based ingredients and/or with ingredients on the basis of organic solvents in the presence of an emulsifier, 0.01-5 % by weight of a non-ionic emulsifier, 1.00-80 % by weight of water.

## Cosmetic Product Containing Acrylates

The invention refers to a cosmetic product containing acrylates and to a method for manufacturing the said product.

From US-A-5925337 a waterproof mascara composition is known which contains 2-40 % by weight of a wax, 5-15 % by weight of a thickening agent, 35-50 % by weight of a volatile organic solvent and 1-35 % by weight of a water-soluble film-forming agent, wherein the last-named agent may e.g. also be an acrylate polymer. The composition does not contain any emulsifier.

The object of the invention is to provide a new cosmetic intermediate which, due to its special structure, is suitable for forming a soft and elastic product with waterproof characteristics and which can be processed into further cosmetic products adding both water-based ingredients and ingredients on the basis of organic solvents.

According to the invention, the cosmetic composition containing acrylates is characterized in that it contains

(a) 0.01-80 % by weight of a film-forming agent on the basis of an acrylate copolymer or acrylate derivate which agent is emulsifiable with water;

(b) 0.01-90 % by weight of an aliphatic hydrocarbon solvent or a volatile silicone derivate both of which are not miscible with water and are emulsifiable with water-based ingredients and/or with ingredients on the basis of organic solvents in the presence of an emulsifier;

(c) 0.01-5 % by weight of a non-ionic emulsifier;

(d) 1.00-80 % by weight of water;

and wherein the composition has the structure of a gel.

Advantageously, alcoxylated alcohols, ethoxylated alcohols, poly-glyceryl esters and mixtures thereof can be used as emulsifier. The said substances are non-ionic emulsifiers which contain e.g. a polyol group, a poly-alcyl-glycol ether group or a combination thereof, such as e.g. addition products of 2-30 mole ethylene oxide to linear fatty alcohols having 8-22 carbon atoms and to fatty acids having 12-22 carbon atoms, as hydrophylic group. The said substances further include poly-glycerine esters, such as e.g. poly-glycerine ricinoleate or poly-glycerine poly-12-hydroxy-stearate, and mixtures of these different substance classes.

A preferred emulsifier is, for example, Laureth-20, Laureth-23, Oleth-20, Steareth-20, Steareth-50, Cetareth-20, Cetareth-30.

For example an ethyl acrylate/methyl meth-acrylate copolymer can be used as acrylate copolymer or a copolymer prepared from a n-butyl acrylate, tert-butyl acrylate and ethyl or butyl methacrylate.

It is particularly preferred that the film-forming agent be an ethyl acrylate/methyl meth-acrylate copolymer in which the ratio of ethyl acrylate units to methyl meth-acrylate units in the polymer is in the range of 7.5-8.5 : 1.8-2.3.

Acrylic acid, methacrylic acid or their esters also can be used (here called "acrylate derivates").

A preferred range for the acrylate copolymer or acrylate derivate is between 0.1 and 50 % by weight, particularly 0.1-15 % by weight.

Iso-paraffins e.g. iso-do-decane, pentane, hexane, decane etc. are preferably used as aliphatic hydrocarbon solvent which is not miscible with water. Iso-do-decane is special preferred.

A preferred range for the aliphatic hydrocarbon solvent or the volatile silicone derivate is between 30 and 75 % by weight, particularly in the range of 51-70 % by weight.

Advantageously, a compound such as Dimethicone or Cyclomethicone can be used as volatile silicone derivate.

A preferred silicone derivate is e.g. deca-methyl-cyclo-penta-siloxy-siloxane (Silicone SS4230).

The preferred water content is in the range of 1.0 to 40 % by weight, particularly 1.0 to 20 % by weight.

The product according to the invention is a gel which is particularly characterized in that a combination of solvent and film-forming agent is obtained which is stable in the cosmetic formulation. Such a stable combination having the characteristics of a gel was surprising for those skilled in the art, and it permits the manufacture of cosmetic products which are particularly elastic and soft. For example, in the case of an ethyl acrylate /methyl meth-acrylate copolymer, the elasticity can be increased 4- to 5-fold compared to the elasticity of the film-forming agent used.

The elasticity was determined using the strip test method, which is carried out as follows:

The measurement of length of an elastic film made from a polymer has been carried out. Two separate films A and B of about 150 $\mu$ m (6.0 mil) thick has been poured on the non-sticky surface with a Bird applicator. Film A consists of

an aqueous acrylat copolymer (Acrylates Copolymer : Water about 50:50, emulsifier), and film B consists of 50 % components of film A and 50 % isododecane. In 24 hours at 25 °C the specimens were prepared by cutting the strips of about 50 x 25 mm. One end of the strip was attached to a ruler. The specimen has been tested by stretching the strip without breaking in the direction of the end of the ruler. The result for film A was 101 mm, for film B 406 mm.

The softness of the composition after applying it to the skin or to an even surface is also considerably higher than that of the original film-forming agent. This improves the feeling, which plays a central role in the selection of a product by the user.

The invention also refers to the manufacture of a cosmetic composition containing acrylates. The method consists in that

a) a mixture of 0.1-80 % by weight of a film-forming agent on the basis of an acrylate copolymer or acrylate derivate, 1.0-80 % by weight of water and 0.01-1 % by weight of a non-ionic emulsifier is heated up to a temperature in the range of 45 - 50 °C;

b) at this temperature the obtained emulsion is mixed with 0.1-90 % by weight of a volatile aliphatic hydrocarbon solvent or a volatile silicone derivate, wherein the solvent or the silicone derivate are not miscible with water, but are emulsifiable with water-based ingredients and/or with ingredients on the basis of organic solvents in the presence of an emulsifier, and wherein a two-phase liquid system is obtained after homogenization at 1500 - 3000 rpm during 15 - 60 min until the organic phase which is not miscible with water is completely distributed in the aqueous phase in the form of micro-droplets; and

c) the mixture is cooled down to 25-30 °C at a rate of 300 to 600 rpm until a homogeneous gel is obtained.

The emulsion of stage a) may contain further cosmetic constituents, such as esters, oils, sun-blocking agents, perfume, preservatives, vitamins, scavengers and other auxiliary and/or active cosmetic substances. The said substances, if any, can be manufactured as separate phase and added to the emulsion of stage a).

The method according to the invention is characterized by a strictly defined sequence of steps and an unusual temperature regime. It is only in this way that a stable formulation having the above-mentioned advantages can successfully be obtained.

The invention will hereinafter be explained more precisely by means of examples which, however, do not constitute any limitation of the invention. All quantities are given in per cent by weight.

#### **Example 1 Basic Gel**

Ethyl acrylate/methyl meth-acrylate	24.5
Water	25.0
Laureth-200	3
Isododecane	50.0

The copolymer is mixed with water and the emulsifier Laureth-20, and the mixture is heated up to 45 °C. Isododecane is added, and the temperature is increased to 50 °C while stirring. After than homogenization takes place at 2200 rpm for a time of 18 minutes in a laboratory vessel of 1000 ml volume. Subsequently, the mixture is cooled down to 27 °C and stirred at a rate of 400 rpm for approx. 5 min.

#### **Example 2 Sun-blocking Gel**

Basic gel of Example 1    98

Octyl methoxy-cinnamate 2

The processing is done as in Example 1 mixing the sun-blocking agent with the copolymer, water and the emulsifier.

**Example 3 Gel Lotion**

Basic gel of Example 1 80

Oil or ester 20

The processing is done as in Example 2.

**CLAIMS:**

1. A cosmetic composition containing acrylates comprising:
  - (a) 0.01-80% by weight of a film-forming agent is an ethyl acrylate/methyl methacrylate copolymer emulsifiable with water, wherein the ratio of ethyl acrylate units to methyl methacrylate units in the polymer is in the range of 7.5-8.5:1.8-2.3;
  - (b) 0.01-90% by weight of an isoparaffin that is immiscible with water and emulsifiable in the presence of an emulsifier with water-based ingredients and/or with organic solvent-based ingredients;
  - (c) 0.01-5% by weight of a non-ionic emulsifier; and
  - (d) 1.00-80% by weight of water;wherein the composition has the structure of a gel and wherein all percentages are based on the total weight of the composition.
2. A composition according to claim 1, wherein the emulsifier is an alcoxylated alcohol, an ethoxylated alcohol, a polyglyceryl ester or a mixture thereof.
3. A method for manufacturing the cosmetic composition defined in claim 1, the method comprising the following steps:
  - heating up to a temperature in the range of 45-50°C a mixture of 0.1-80% by weight of the film-forming agent which is the ethyl acrylate/methyl methacrylate copolymer in which the ratio of the ethyl acrylate units to the methyl methacrylate units in the polymer is in the range of 7.5-8.5:1.8-2.3, 1.0-80% by weight of water and 0.01-1% by weight of the non-ionic emulsifier;

- mixing the obtained emulsion with 0.1-90% by weight of the isoparaffin that is immiscible with water and emulsifiable in the presence of the emulsifier with water-based ingredients and/or with organic solvent-based ingredients, and wherein a two-phase liquid system is obtained after homogenization at 1500-3000 rpm during 15-60 min until the organic phase being immiscible with water is completely distributed in the aqueous phase in the form of micro-droplets; and

- cooling down the mixture to 25-30°C by stirring at a rate of 300 to 600 rpm.

4. The cosmetic composition according to claim 1 with the structure of a gel prepared by the steps of:

- heating up to a temperature in the range of 45-50°C a mixture of 0.1-80% by weight of the film-forming agent which is the ethyl acrylate/methyl methacrylate copolymer in which the ratio of the ethyl acrylate units to the methyl methacrylate units in the polymer is in the range of 7.5-8.5:1.8-2.3, 1.0-80% by weight of water and 0.01-1% by weight of the non-ionic emulsifier;

- mixing the obtained emulsion with 0.1-90% by weight of the isoparaffin that is immiscible with water and emulsifiable in the presence of the emulsifier with water-based ingredients and/or with organic solvent-based ingredients, and wherein a two-phase liquid system is obtained after homogenization at 1500-3000 rpm during 15-60 min until the organic phase being immiscible with water is completely distributed in the aqueous phase in the form of micro-droplets;

- cooling down the mixture to 25-30°C by stirring at a rate of 300 to 600 rpm and

- optionally adding further auxiliary cosmetic substances, carriers, active cosmetic substances or mixtures thereof,

wherein all percentages are based on the total weight of the composition.

5. The composition of claim 1, wherein the isoparaffin is isododecane.