



US010456348B2

(12) **United States Patent**
Lange et al.

(10) **Patent No.:** **US 10,456,348 B2**
(45) **Date of Patent:** **Oct. 29, 2019**

(54) **AGENT AND METHOD FOR THE TEMPORARY DEFORMATION OF KERATIN-CONTAINING FIBERS**

(58) **Field of Classification Search**
None
See application file for complete search history.

(71) Applicant: **Henkel AG & Co. KGaA**, Duesseldorf (DE)

(56) **References Cited**

(72) Inventors: **Julia Bibiane Lange**, Bad Bramstedt (DE); **Diane Metten**, Hamburg (DE); **Cyrielle Martinez**, Hamburg (DE)

U.S. PATENT DOCUMENTS

2015/0030643 A1 1/2015 Gartstein et al.

(73) Assignee: **Henkel AG & Co. KGaA**, Duesseldorf (DE)

FOREIGN PATENT DOCUMENTS

(*) Notice: Subject to any disclaimer, the term of this patent is extended or adjusted under 35 U.S.C. 154(b) by 0 days.

EP 1502577 A2 2/2005
EP 2090295 A1 8/2009
EP 2308461 A1 4/2011
EP 3069709 A1 9/2016

(21) Appl. No.: **16/140,718**

OTHER PUBLICATIONS

(22) Filed: **Sep. 25, 2018**

Machine translation of IDS reference EP 1 502 577 A2; pdf; downloaded Jun. 3, 2019; orig pub. Feb. 2, 2005.*
Intellectual Property Office, Search Report under Section 17(5) for United Kingdom Patent Application No. GB1815607.5 dated Mar. 14, 2019.

(65) **Prior Publication Data**

US 2019/0099355 A1 Apr. 4, 2019

* cited by examiner

(30) **Foreign Application Priority Data**

Sep. 29, 2017 (DE) 10 2017 217 463

Primary Examiner — Jeffrey T. Palenik

(74) *Attorney, Agent, or Firm* — Lorenz & Kopf, LLP

(51) **Int. Cl.**

A61K 8/81 (2006.01)
A61K 8/88 (2006.01)
A61Q 5/06 (2006.01)

(57) **ABSTRACT**

(52) **U.S. Cl.**

CPC **A61K 8/8147** (2013.01); **A61K 8/8152** (2013.01); **A61K 8/8164** (2013.01); **A61K 8/8176** (2013.01); **A61K 8/8182** (2013.01); **A61K 8/88** (2013.01); **A61Q 5/06** (2013.01); **A61K 2800/594** (2013.01)

A cosmetic composition for the temporary shaping of keratinic fibers, containing:

- a) at least one non-crosslinked, hydrophobically modified (meth)acrylic acid copolymer
- b) at least one, at least partially imidized maleic anhydride copolymer,

its use and method using such a composition.

10 Claims, No Drawings

1

**AGENT AND METHOD FOR THE
TEMPORARY DEFORMATION OF
KERATIN-CONTAINING FIBERS****CROSS-REFERENCE TO RELATED
APPLICATION**

This application claims priority to German Patent Application No. 10 2017 217 463.3, filed Sep. 29, 2017, which is incorporated herein by reference in its entirety.

TECHNICAL FIELD

The present disclosure relates to a cosmetic composition based on two specific copolymers for hair setting or for the temporary shaping of keratinic fibers, in particular human hair, and method and use of this composition and its use for improving long-term holding and moisture resistance.

BACKGROUND

The temporary design of hairstyles for a longer period up to several days usually requires the application of setting active ingredients. Hair treatment agents which are used for temporary shaping of the hair therefore play an important role. Corresponding agents for temporary deformation usually contain synthetic polymers and/or waxes as the setting active ingredient. Agents for supporting the temporary shaping of keratin-containing fibers can be formulated, for example, as a hair spray, hair wax, hair gel or hair mousse.

The most important property of an agent for the temporary deformation of hair, hereinafter also referred to as a styling agent, is to give the treated fibers in the newly modeled shape, i.e., a shape impressed on the hair, the strongest possible hold. One also speaks of strong hairstyle hold or the high degree of hold of the styling agent. The hairstyle hold is essentially determined by the type and amount of the setting active ingredients used, wherein, however, an influence of the other ingredients of the styling agent may also be given.

In addition to a high degree of hold, styling agents must meet a whole series of other requirements. These may be broadly subdivided into properties on the hair, properties of the particular formulation, e.g., properties of the foam, of the gel or of the sprayed aerosol, and of properties which affect the handling of the styling agent, wherein the properties on the hair are of particular importance. Particularly noteworthy are moisture resistance, low tack and a balanced conditioning effect. Furthermore, a styling agent should be universally applicable for all hair types and mild to hair and skin.

A variety of synthetic polymers which are used in styling agents have already been developed as setting active ingredients to meet the different requirements. The polymers can be subdivided into cationic, anionic, nonionic and amphoteric setting polymers.

European Patent Application EP 3 069 709 A1 describes hair cosmetic polymer mixtures which contain, in addition to an oxyalkylene polymer, the hydrophobically modified (meth)acrylic acid copolymer having the trade name Luvigel Fit (INCI: Acrylates (C10-30) Alkyl Methacrylate Copolymer).

Ideally, when applied to hair, the polymers provide a polymer film which, on the one hand, gives the hairstyle a strong hold but, on the other hand, is sufficiently flexible not to break under stress. If the polymer film is too brittle, it results in the formation of so-called film plaques, that is,

2

residues that detach during the movement of the hair and give the impression that the user of the corresponding styling agent might have dandruff. Similar problems arise when waxes are used as a setting active ingredient in the styling agent. If the styling agent is a gel or a paste, the polymers should also have thickening properties.

BRIEF SUMMARY

This disclosure provides a cosmetic composition for the temporary shaping of keratinic fibers. The cosmetic composition includes at least one non-crosslinked, hydrophobically modified (meth)acrylic acid copolymer and at least one, at least partially imidized maleic anhydride copolymer.

DETAILED DESCRIPTION

The following detailed description is merely exemplary in nature and is not intended to limit the disclosure or the application and uses of the subject matter as described herein. Furthermore, there is no intention to be bound by any theory presented in the preceding background or the following detailed description.

An object of the present disclosure was to provide further suitable polymer combinations which are distinguished by good film-forming and/or setting properties, have a very high degree of hold, without having to relinquish flexibility and good moisture resistance, in particular perspiration and water resistance, and also be suitable for the production of stable viscous and stable transparent cosmetic compositions. In particular, currently available styling agents can still be improved to the extent that a good combination of stiffness and long-term holding (high humidity curl retention) is not always sufficiently guaranteed. It is therefore an object of the present disclosure to provide such styling agents which, in addition to the abovementioned properties, in particular provide both good stiffness and good long-term holding.

This was achieved as contemplated herein by a combination of two specific copolymers.

The present disclosure provides:

1. A cosmetic composition for the temporary shaping of keratinic fibers, containing:

- a) at least one non-crosslinked, hydrophobically modified (meth)acrylic acid copolymer
- b) at least one, at least partially imidized maleic anhydride copolymer.

2. Cosmetic composition according to point 1, wherein the proportion by weight of the copolymer a) in the total weight of the composition is from about 0.1 to about 15% by weight, preferably from about 0.2 to about 10% by weight and in particular from about 0.5 to about 7.0% by weight.

3. Cosmetic composition according to one of the preceding points, wherein the copolymer a) is obtained by conversion of

at least one monomer (a1) from the group of acrylic acid, methacrylic acid, C₁-C₆ alkyl acrylic acid ester, C₁-C₆ alkyl methacrylic acid ester, with

at least one monomer (a2) from the group of C₁₀₋₃₀ alkyl acrylates, C₁₀₋₃₀ alkyl methacrylates, C₁₀₋₃₀ alkyl PEG acrylates, C₁₀₋₃₀ alkyl PEG methacrylates or C₁₀₋₃₀ alkyl PEG itaconates

4. Cosmetic composition according to one of the preceding points, wherein the copolymer a) is obtained by conversion of

at least one monomer (a1) from the group of acrylic acid, methacrylic acid, with

at least one monomer (a2) from the group of C₁₀₋₃₀ alkyl methacrylates

5. Cosmetic composition according to one of the preceding points, wherein the copolymer a) is selected from the group of compounds having the INCI name Acrylates/C₁₀₋₃₀-Alkyl Methacrylate Copolymer.

6. Cosmetic composition according to one of the preceding points, wherein the proportion by weight of the copolymer b) in the total weight of the composition is from about 0.1 to about 15% by weight, preferably from about 0.2 to about 10% by weight and in particular from about 0.5 to about 7.0% by weight.

7. Cosmetic composition according to one of the preceding points, wherein the maleic anhydride copolymer has at least one comonomer from the group of isobutylene, diisobutylene, octadecene, vinyl acetate, styrene and α -methylstyrene.

8. Cosmetic composition according to one of the preceding points, wherein the maleic anhydride copolymer is an isobutylene/maleic anhydride copolymer.

9. Cosmetic composition according to one of the preceding points, wherein the copolymer b) is selected from the group of compounds having the INCI name Isobutylene/Ethylmaleimide/Hydroxyethyl Maleimide Copolymer.

10. Cosmetic composition according to one of the preceding points, wherein the weight ratio of copolymer a) to copolymer b) is from about 10:1 to about 1:10, preferably from about 5:1 to about 1:5 and in particular from about 3:1 to about 1:3.

11. Cosmetic composition according to one of the preceding points, exemplified in that it further contains

c) polyvinylpyrrolidone and/or vinylpyrrolidone/vinyl acetate copolymer, preferably polyvinylpyrrolidone.

12. Cosmetic composition according to point 11, wherein the proportion by weight of the polyvinylpyrrolidone and/or vinylpyrrolidone/vinyl acetate copolymer c) in the total weight of the cosmetic composition is from about 0.1 to about 10% by weight, preferably from about 2.0 to about 8.5% by weight and in particular from about 3.0 to about 7.0% by weight.

13. Cosmetic composition according to one of the preceding points, wherein the composition, based on its total weight, contains from about 0.05 to about 2.0% by weight, preferably from about 0.1 to about 1.0% by weight and in particular from about 0.1 to about 0.5% by weight of an aminoalcohol, preferably 2-amino-2-methylpropanol.

14. Cosmetic composition according to one of the preceding points, wherein the composition contains, based on its total weight, at least about 20% by weight, preferably at least about 40% by weight and in particular at least about 70% by weight of water and ethanol.

15. Cosmetic composition according to one of the preceding points, exemplified in that the agent is exists as a hair gel, hair spray, hair mousse or hair wax.

16. Use of a cosmetic composition according to any one of points 1 to 15 for the temporary deformation of keratin-containing fibers, in particular human hair.

17. Use of a cosmetic composition according to any one of points 1 to 15 for improving the holding of temporarily deformed keratinic fibers.

18. Use of a cosmetic composition according to any one of points 1 to 15 for improving the moisture resistance of temporarily deformed keratinic fibers.

19. Method for the temporary deformation of keratin-containing fibers, in particular human hair, in which the

keratinic fibers are acted upon by a cosmetic composition according to one of the points 1 to 15 and temporarily fixed in their shape.

In the context of the present disclosure, it has surprisingly been determined that an improved hold of styling products can be achieved by combining known two components which are already used in styling products. Other commonly required properties of styling products such as moisture resistance, stiffness and low tack remained unchanged. Such a good combination of properties was not expected even with knowledge of the individual components and was surprising. It was shown experimentally that the combination of the two components resulted in a strongly super additive, i.e., synergistic effect with respect to hold, which was manifested by the HHRC test (High Humidity Curl Retention Test).

The term keratinic fibers as contemplated herein comprises furs, wool and feathers, but in particular human hair.

The essential components of the cosmetic composition are the non-crosslinked, hydrophobically modified copolymer a) and the copolymer b) different from the copolymer a).

In addition to the abovementioned advantages, the cosmetic compositions are distinguished with respect to alternative cosmetic agents, in particular, by improved long-term holding. As for the cosmetic properties of the compositions as contemplated herein, a weight ratio of the polymers a) and b) in the cosmetic composition from about 10:1 to about 1:10, preferably from about 5:1 to about 1:5 and in particular from about 3:1 to about 1:3 has proven to be particularly advantageous, for example, for the moisture resistance and low tack.

As a first required component, the cosmetic compositions contain a non-crosslinked, hydrophobically modified (meth) acrylic acid copolymer which is composed of at least two different structural units. In addition, further structural units may be present.

Copolymers are preferably used as hydrophobically modified (meth)acrylic acid copolymers a), which can be traced back to

at least one monomer (a1) from the group of unsaturated carboxylic acids and unsaturated carboxylic esters, and at least one monomer (a2) from the group of unsaturated hydrophobically modified monomers

Preferred copolymers a) are based on (at least one monomer a1) from the group of acrylic acid, methacrylic acid, C₁-C₆ alkyl acrylic acid ester, C₁-C₆ alkyl methacrylic acid ester. The acrylic acid esters and methacrylic acid esters are preferably esters of the respective acids with non-tertiary alkyl alcohols having alkyl radicals of 1 to 12 carbon atoms, in particular 2 to 4 carbon atoms. Examples of suitable monomers would be ethyl acrylate, ethyl methacrylate, propyl acrylate, propyl methacrylate, n-butyl acrylate, n-butyl methacrylate, isobutyl acrylate, 2-methylbutyl acrylate, 2-ethylhexyl acrylate, n-octyl acrylate, isooctyl acrylate, isooctyl methacrylate, isononyl acrylate and isodecyl acrylate.

The group of hydrophobically modified monomers (a2) denotes monomers which have a hydrophobic substructure. Preferred monomers (a2) can in turn be traced back to the two following structural units:

an unsaturated acid, preferably acrylic acid, methacrylic acid or itaconic acid;

a C₈₋₄₀ alkyl chain, preferably a C₁₀₋₃₀ alkyl chain, These two partial structures may optionally be supplemented by a third structural unit from the group of the polyoxy-

5

alkylene groups, preferably the polyethylene glycol groups, the polypropylene glycol groups or the polyethylene glycol/polypropylene glycol groups.

C_{10-30} alkyl acrylates, C_{10-30} alkyl PEG acrylates, C_{10-30} alkyl PEG methacrylates or C_{10-30} alkyl PEG itaconates are used, for example, as monomer (a2). Preferred monomers (a2) are selected from the C_{10-30} alkyl acrylates, C_{10-30} alkyl PEG 20-25 acrylates, C_{10-30} alkyl PEG 20-25 methacrylates or C_{10-30} alkyl PEG 20-25 itaconates. Particularly preferred monomers (a2) are selected from the group of C_{10-30} alkyl methacrylates.

Particular preference is given to copolymers a) that are obtained by conversion of

at least one monomer (a1) from the group of acrylic acid, methacrylic acid, C_1 - C_6 alkyl acrylic acid ester, C_1 - C_6 alkyl methacrylic acid ester, with

at least one monomer (a2) from the group of C_{10-30} alkyl acrylates, C_{10-30} alkyl methacrylates, C_{10-30} alkyl PEG acrylates, C_{10-30} alkyl PEG methacrylates or C_{10-30} alkyl PEG itaconates

Very particular preference is given to copolymers a) that are obtained by conversion of

at least one monomer (a1) from the group of acrylic acid, methacrylic acid, with

at least one monomer (a2) from the group of C_{10-30} alkyl methacrylates

In summary, preferred cosmetic agents as contemplated herein are exemplified in that the copolymer a) is selected from the group of compounds with the INCI names Acrylates/ C_{10-30} -Alkyl Methacrylate Copolymer, Acrylates/Stearth-20 Methacrylate Copolymer, Acrylates/Beheneth-25 Methacrylate Copolymer, Acrylates/Stearth-20 Itaconate Copolymer, Acrylates/Ceteth-20 Itaconate Copolymer, Acrylates/Palmeth-25 Acrylate Copolymer, Acrylates/Aminoacrylates/ C_{10-30} Alkyl PEG-20 Itaconate Copolymer. Corresponding polymers are available, for example, under the trade names Luvigel® FIT, Aculyn® 22, Aculyn® 28, Structure® 2001, Structure® 3001, Synthalen® W2000 and Structure® Plus. The copolymer a) is selected with particular preference from the group of compounds having the INCI name Acrylates/ C_{10-30} -Alkyl Methacrylate Copolymer.

The proportion by weight of the copolymer a) in the total weight of the composition is preferably from about 0.1 to about 15% by weight, more preferably from about 0.2 to about 10% by weight and in particular from about 0.5 to about 7.0% by weight.

The copolymer a) is preferably used in the cosmetic composition in partially neutralized or neutralized form. At least one alkanolamine is preferably used for neutralization. The alkanolamines which can be used as alkalizing agents as contemplated herein are preferably selected from primary amines having a C_2 - C_6 alkyl basic body which carries at least one hydroxyl group. Particularly preferred alkanolamines are selected from the group formed from 2-aminoethan-1-ol (monoethanolamine), tris (2-hydroxyethyl) amine (triethanolamine), 3-aminopropan-1-ol, 4-aminobutane-1-ol, 5-aminopentan-1-ol, 1-aminopropan-2-ol, 1-aminobutan-2-ol, 1-aminopentan-2-ol, 1-aminopentan-3-ol, 1-aminopentan-4-ol, 3-amino-2-methylpropan-1-ol, 1-amino-2-methylpropan-2-ol, 3-aminopropane-1,2-diol, 2-amino-2-methylpropane-1,3-diol. Very particularly preferred alkanolamines as contemplated herein are selected from the group of 2-aminoethane-1-ol, 2-amino-2-methylpropan-1-ol and 2-amino-2-methylpropane-1,3-diol. 2-amino-2-methylpropanol has proven to be a particularly suitable neutralizing agent. Cosmetic compositions pre-

6

ferred as contemplated herein contain at least one alkanolamine, preferably 2-amino-2-methylpropanol. The 2-amino-2-methylpropanol is preferably used in the composition as contemplated herein in an amount which does not exceed the amount required to neutralize the copolymer a). The amounts of 2-amino-2-methylpropanol used in the composition as contemplated herein are preferably from about 80 to about 100%, particularly preferably from about 90 to about 100% and in particular from about 95 to about 100% of the amount required for complete neutralization of the copolymer a). Very particular preference is given to proportions by weight of the aminoalcohol, preferably of 2-amino-2-methylpropanol, in the total weight of the cosmetic composition from about 0.05 to about 2.0% by weight, preferably from about 0.1 to about 1.0% by weight, and in particular from about 0.1 to about 0.5% by weight.

A second essential of the cosmetic composition is the at least partially imidized maleic anhydride copolymer.

These copolymers b) are preferably copolymers of maleic anhydride with a comonomer from the group of isobutylene, diisobutylene, octadecene, vinyl acetate, styrene and α -methylstyrene, wherein isobutylene/maleic anhydride copolymers are particularly preferred.

Very particularly preferred copolymers b) are selected from the group of polymers having the INCI name Isobutylene/Ethylmaleimide/Hydroxyethyl Maleimide Copolymer. Corresponding polymers are available, for example, under the trade name Aquaflex® FX 64 from the company Ashland.

The proportion by weight of the copolymer b) in the total weight of the composition is preferably from about 0.1 to about 15% by weight, more preferably from about 0.2 to about 10% by weight and in particular from about 0.5 to about 7.0% by weight.

Preferably, the cosmetic composition of the present disclosure contains one or more other polymers that are different from the copolymers a) and b), for example, supporting the thickening agents or the gel formation or the film formation. Examples are cationic, anionic, nonionic or amphoteric polymers.

Examples are acrylamide/ammonium acrylate copolymer, acrylamides/DMAPA acrylates/methoxy PEG methacrylate copolymer, acrylamidopropyltrimonium chloride/acrylamide copolymer, acrylamidopropyltrimonium chloride/acrylates copolymer, acrylates/acetoacetoxyethyl methacrylate copolymer, acrylates/acrylamide copolymer, acrylates/ammonium methacrylate copolymer, acrylates/t-butylacrylamide copolymer, acrylates/ C_1 -2 succinates/hydroxyacrylates copolymer, acrylates/lauryl acrylate/stearyl acrylate/ethylamine oxide methacrylate copolymer, acrylates/octylacrylamide copolymer, acrylates/octylacrylamide/diphenyl amodimethicone copolymer, acrylates/stearyl acrylate/ethylamine oxide methacrylate copolymer, acrylates/VA copolymer, acrylates/VP copolymer, adipic acid/diethylenetriamine copolymer, adipic acid/dimethylaminohydroxypropyl diethylenetriamine copolymer, adipic acid/epoxypropyl diethylenetriamine copolymer, adipic acid/isophthalic acid/neopentyl glycol/trimethylolpropane copolymer, allyl stearate/VA copolymer, aminoethylacrylate phosphate/acrylates copolymer, aminoethylpropanediol-acrylates/acrylamide copolymer, amino ethylpropanediol-AMPD-acrylates/diacetoneacrylamide copolymer, ammonium VA/acrylates copolymer, AMPD-acrylates/diacetoneacrylamide copolymer, AMP-acrylates/allyl methacrylate copolymer, AMP-acrylates/ C_1 -18 alkyl acrylates/ C_1 -8 alkyl acrylamide copolymer, AMP-acrylates/diacetoneacrylamide copolymer, AMP-acrylates/dimethylaminoethylmethacrylate copoly-

mer, bacillus/rice bran extract/soybean extract ferment filtrate, bis-butyloxyamodimethicone/PEG-60 copolymer, butyl acrylate/ethylhexyl methacrylate copolymer, butyl acrylate/hydroxypropyl dimethicone acrylate copolymer, butylated PVP, butyl ester of ethylene/MA copolymer, butyl ester of PVM/MA copolymer, calcium/sodium PVM/MA copolymer, corn starch/acrylamide/sodium acrylate copolymer, diethylene glycolamine/epichlorohydrin/piperazine copolymer, dimethicone cross polymer, diphenyl amodimethicone, ethyl ester of PVM/MA copolymer, hydrolyzed wheat protein/PVP cross polymer, isobutylene//MA copolymer, isobutylmethacrylate/bis-hydroxypropyl dimethicone acrylate copolymer, isopropyl ester of PVM/MA copolymer, lauryl acrylate cross polymer, lauryl methacrylate/glycol dimethacrylate cross polymer, MEA-sulfite, methacrylic acid/sodium acrylamidomethyl propane sulfonate copolymer, methacryloyl ethyl betaine/acrylates copolymer, octylacrylamide/acrylates/butylaminoethyl methacrylate copolymer, PEG/PPG-25/25 dimethicone/acrylates copolymer, PEG-8/SMDI copolymer, polyacrylamide, polyacrylate-6, polybeta-alanine/glutaric acid cross polymer, polybutylene terephthalate, polyester-1, poly ethylacrylate, polyethylene terephthalate, polymethacryloyl ethyl betaine, polypentaerythrityl terephthalate, polyperfluoroperhydrophenanthrene, Polyquaternium-1, Polyquaternium-2, Polyquaternium-4, Polyquaternium-5, Polyquaternium-6, Polyquaternium-7, Polyquaternium-8, Polyquaternium-9, Polyquaternium-10, Polyquaternium-11, Polyquaternium-12, Polyquaternium-13, Polyquaternium-14, Polyquaternium-15, Polyquaternium-16, Polyquaternium-17, Polyquaternium-18, Polyquaternium-19, Polyquaternium-20, Polyquaternium-22, Polyquaternium-24, Polyquaternium-27, Polyquaternium-28, Polyquaternium-29, Polyquaternium-30, Polyquaternium-31, Polyquaternium-32, Polyquaternium-33, Polyquaternium-34, Polyquaternium-35, Polyquaternium-36, Polyquaternium-37, Polyquaternium-39, Polyquaternium-45, Polyquaternium-46, Polyquaternium-47, Polyquaternium-48, Polyquaternium-49, Polyquaternium-50, Polyquaternium-55, Polyquaternium-56, Polyquaternium-68, polysilicone-9, polyurethane-1, polyurethane-6, polyurethane-10, polyvinyl acetate, polyvinyl butyral, polyvinylcaprolactam, polyvinylformamide, polyvinyl imidazolium acetate, polyvinyl methyl ether, potassium butyl ester of PVM/MA copolymer, potassium ethyl ester of PVM/MA copolymer, PPG-70 polyglyceryl-10 ether, PPG-12/SMDI copolymer, PPG-51/SMDI copolymer, PPG-10 sorbitol, PVM/MA copolymer, PVP, PVP/VA/itaconic acid copolymer, PVP/VA/vinyl propionate copolymer, rhizobian gum, rosin acrylate, shellac, sodium butyl ester of PVM/MA copolymer, sodium ethyl ester of PVM/MA copolymer, sodium polyacrylate, sterculia urens gum, terephthalic acid/isophthalic acid/sodium isophthalic acid sulfonate/glycol copolymer, trimethylolpropane triacrylate, trimethylsilyloxysilylcarbonyl pullulan, VA/crotonates copolymer, VA/crotonates/methacryloxybenzophenone-1 copolymer, VA/crotonates/vinyl neodecanoate copolymer, VA/crotonates/vinyl propionate copolymer, VA/DBM copolymer, VA/vinyl butyl benzoate/crotonates copolymer, vinylamine/vinyl alcohol copolymer, vinyl caprolactam/VP/dimethylaminoethyl methacrylate copolymer, VP/acrylates/lauryl methacrylate copolymer, VP/dimethylaminoethylmethacrylate copolymer, VP/DMAPA acrylates copolymer, VP/hexadecene copolymer, VP/VA copolymer, VP/vinyl caprolactam/DMAPA acrylates copolymer, yeast palmitate and styrene/VP copolymer.

The further component acting as gel formatting agent is preferably a homopolyacrylic acid (INCI: Carbomer), which

is commercially available, for example, under the name Carbopol® in different versions. The Carbomer is preferably present in an amount of from about 0.02 to about 3% by weight, preferably from about 0.05 to about 1.5% by weight, and more preferably from about 0.2 to about 0.8% by weight, based on the total weight of the cosmetic composition.

In order to further increase their cosmetic effect, preferred compositions contain, in addition to the copolymers a) and b) and an optionally added thickening agent or gel formation agent, further contain a film-forming polymer c) different from these ingredients, in particular an anionic or nonionic polymer c).

Examples of nonionic polymers are:

vinylpyrrolidone/vinyl ester copolymers, such as those sold under the trademark Luviskol (BASF). Luviskol VA 64 and Luviskol VA 73, in each case vinylpyrrolidone/vinyl acetate copolymers, are preferred nonionic polymers.

cellulose ethers, such as hydroxypropylcellulose, hydroxyethylcellulose and methylhydroxypropylcellulose, as sold, for example, under the trademarks Culminal and Benecel (AQUALON).

shellac.

polyvinylpyrrolidone, as sold for example under the name Luviskol (BASF).

siloxanes. These siloxanes can be both water-soluble and water-insoluble. Both volatile and nonvolatile siloxanes are suitable, wherein nonvolatile siloxanes are understood to mean those compounds whose boiling point is above about 200° C. under normal pressure. Preferred siloxanes are polydialkylsiloxanes, such as, for example, polydimethylsiloxane, polyalkylarylsiloxanes, such as, for example, polyphenylmethylsiloxane, ethoxylated polydialkylsiloxanes and polydialkylsiloxanes which contain amine and/or hydroxyl groups.

glycosidically substituted silicones.

Based on their cosmetic action in combination with the copolymers a) and b), film-forming polymers preferably used as contemplated herein are the polyvinylpyrrolidones (INCI name: PVP) and the vinylpyrrolidone/vinyl acetate copolymers (INCI name VP/VA Copolymer). By adding film-forming polymers, in particular the abovementioned polyvinylpyrrolidones and vinylpyrrolidone/vinyl acetate copolymers, the holding properties but also the application properties of the cosmetic compositions are noticeably influenced in an advantageous manner. The proportion by weight of these polymers is preferably limited to amounts between from about 1.0 and about 10% by weight. Preferred cosmetic compositions as contemplated herein are therefore exemplified in that, based on their total weight, they furthermore contain from about 1.0 to about 10% by weight of polyvinylpyrrolidone and/or vinylpyrrolidone/vinyl acetate copolymer, preferably polyvinylpyrrolidone. Particularly preferred cosmetic compositions have a proportion by weight of the polyvinylpyrrolidone and/or vinylpyrrolidone/vinyl acetate copolymer c) in the total weight of the cosmetic composition from about 2.0 to about 8.5% by weight, preferably from about 3.0 to about 7.0% by weight.

The cosmetic composition of the present disclosure may contain other conventional substances of styling products. Other suitable auxiliaries and additives are, in particular, additional care substances.

As a care substance, the agent may contain, for example, at least one protein hydrolyzate and/or one of its derivatives. Protein hydrolyzates are product mixtures that are obtained by acid, alkaline or enzymatically catalyzed degradation of

proteins. As contemplated herein, the term protein hydrolyzates is also understood to mean total hydrolyzates and individual amino acids and their derivatives and mixtures of different amino acids. The molecular weight of the usable protein hydrolyzates as contemplated herein is between about 75, the molecular weight for glycine, and about 200,000, preferably the molecular weight is from about 75 to about 50,000 and very particularly preferably from about 75 to about 20,000 daltons.

As a care substance, the agent as contemplated herein may further contain at least one vitamin, a provitamin, a vitamin precursor and/or one of their derivatives. As contemplated herein, such vitamins, provitamins and vitamin precursors which are usually assigned to the groups A, B, C, E, F and H are preferred.

As with the addition of glycerol and/or propylene glycol, the addition of panthenol increases the flexibility of the polymer film formed using the composition according to the present disclosure.

The compositions as contemplated herein may further contain at least one plant extract, but also mono- or oligosaccharides and/or lipids as a care substance.

Furthermore, oil bodies are suitable as a care substance. The natural and synthetic cosmetic oil bodies include, for example, vegetable oils, liquid paraffin oils, isoparaffin oils and synthetic hydrocarbons and di-n-alkyl ethers having a total of between 12 and 36 carbon atoms, in particular 12 to 24 carbon atoms. Preferred cosmetic agents as contemplated herein contain at least one oil body, preferably at least one oil body from the group of silicone oils. The group of silicone oils includes in particular the dimethicones, to which the cyclomethicones are also to be counted, the amino-functional silicones and the dimethiconols. The dimethicones may be both linear and branched and cyclic or cyclic and branched. Suitable silicone oils or silicone gums are, in particular, dialkyl and alkylaryl siloxanes, for example dimethylpolysiloxane and methylphenylpolysiloxane, and also their alkoxyated, quaternized or else anionic derivatives. Preference is given to cyclic and linear polydialkylsiloxanes, their alkoxyated and/or aminated derivatives, dihydroxypolydimethylsiloxanes and polyphenylalkylsiloxanes.

Ester oils, that is, esters of C₆-C₃₀ fatty acids with C₂-C₃₀ fatty alcohols, preferably monoester of fatty acids with alcohols having from 2 to 24 carbon atoms such as isopropyl myristate (Rilanit® IPM), isononanoic acid C₁₆-18 alkyl ester (Cetiol® SN), 2-ethylhexyl palmitate (Cegesoft® 24), stearic acid-2-ethylhexyl ester (Cetiol® 868), cetyl oleate, glycerol tricaprilate, cocofatty alcohol caprate/caprylate (Cetiol® LC), n-butyl stearate, oleyl erucate (Cetiol® J 600), isopropyl palmitate (Rilanit® IPP), oleyl oleate (Cetiol®), hexyl laurate (Cetiol® A), di-n-butyl adipate (Cetiol® B), myristyl myristate (Cetiol® MM), cetearyl isononanoate (Cetiol® SN), decyl oleate (Cetiol® V) are more preferred caring oil bodies.

Also suitable as care products are dicarboxylic acid esters, symmetrical, asymmetrical or cyclic esters of carbonic acid with fatty alcohols, triflic acid esters of saturated and/or unsaturated linear and/or branched fatty acids with glycerol or fatty acid partial glycerides, which are understood to mean monoglycerides, diglycerides and their technical mixtures.

Furthermore, emulsifiers or surface-active substances are preferably present in the composition as contemplated herein. Preferred are PEG derivatives of hydrogenated castor oil which are available, for example, under the name PEG Hydrogenated Castor Oil, e.g., PEG-30 Hydrogenated Castor Oil, PEG-33 Hydrogenated Castor Oil, PEG-35 Hydrogenated Castor Oil, PEG-36 Hydrogenated Castor Oil or PEG-40 Hydrogenated Castor Oil. Preferred as contemplated herein is the use of PEG-40 Hydrogenated Castor Oil. These are preferably present in an amount from about 0.05 to about 1.5% by weight, more preferably from about 0.1 to about 1.0% by weight, also preferably from about 0.2 to about 0.8% by weight or from about 0.3 to about 0.6% by weight. By adding the surface-active substances, in particular the abovementioned PEG derivatives of hydrogenated castor oil, in addition to the processability, the ability of the cosmetic compositions to be washed out is improved in particular.

The cosmetic compositions as contemplated herein contain the ingredients or active ingredients in a cosmetically tolerable carrier.

Preferred cosmetically tolerable carriers are aqueous, alcoholic or aqueous-alcoholic media having preferably at least about 10% by weight of water, calculated on the total weight of the agent. The cosmetic carrier as contemplated herein particularly preferably contains water, in particular in an amount such that the cosmetic composition, based on its total weight, contains at least about 20% by weight, in particular at least about 40.0% by weight, most preferably at least about 70% by weight of water and ethanol. Very particularly preferred cosmetic compositions have, based on their total weight, a water and ethanol content from about 50 to about 95% by weight, preferably from about 60 to about 90% by weight and in particular from about 65 to about 85% by weight.

As further alcohols, it is possible in particular to include the lower alcohols having from about 1 to about 4 carbon atoms, typically used for cosmetic purposes, such as, for example, isopropanol.

Examples of water-soluble solvents as cosolvent are glycerol and/or ethylene glycol and/or 1,2-propylene glycol in an amount of from about 0 to about 30% by weight based on the total agent.

The composition of some preferred cosmetic agents can be found in the following tables (in % by weight based on the total weight of the cosmetic agent, unless stated otherwise).

	Formula 1	Formula 2	Formula 3	Formula 4	Formula 5
Copolymer a)	0.1 to 15	0.2 to 10	0.2 to 10	0.5 to 7.0	0.5 to 7.0
Copolymer b)	0.1 to 15	0.1 to 15	0.2 to 10	0.2 to 10	0.5 to 7.0
Misc	ad 100	ad 100	ad 100	ad 100	ad 100
	Formula 1a	Formula 2a	Formula 3a	Formula 4a	Formula 5a
Acrylates/C ₁₀₋₃₀ Alkyl Methacrylate Copolymer	0.1 to 15	0.2 to 10	0.2 to 10	0.5 to 7.0	0.5 to 7.0

-continued

Isobutylene/Ethylmaleimide/ Hydroxyethyl Maleimide Copolymer	0.1 to 15	0.1 to 15	0.2 to 10	0.2 to 10	0.5 to 7.0
Misc	ad 100	ad 100	ad 100	ad 100	ad 100
	Formula 1b	Formula 2b	Formula 3b	Formula 4b	Formula 5b
Luvigel ® Fit Up (specified as solids content)	0.1 to 15	0.2 to 10	0.2 to 10	0.5 to 7.0	0.5 to 7.0
Aquaflex ® FX 64 (specified as solids content)	0.1 to 15	0.1 to 15	0.2 to 10	0.2 to 10	0.5 to 7.0
Misc	ad 100	ad 100	ad 100	ad 100	ad 100
	Formula 6	Formula 7	Formula 8	Formula 9	Formula 10
Copolymer a)	0.1 to 15	0.2 to 10	0.2 to 10	0.5 to 7.0	0.5 to 7.0
Copolymer b)	0.1 to 15	0.1 to 15	0.2 to 10	0.2 to 10	0.5 to 7.0
Polyvinylpyrrolidone	1.0 to 10	2.0 to 8.5	2.0 to 8.5	3.0 to 7.0	3.0 to 7.0
Misc	ad 100	ad 100	ad 100	ad 100	ad 100
	Formula 6a	Formula 7a	Formula 8a	Formula 9a	Formula 10a
Acrylates/C ₁₀₋₃₀ Alkyl Methacrylate Copolymer					
Isobutylene/Ethylmaleimide/ Hydroxyethyl Maleimide Copolymer	0.1 to 15	0.1 to 15	0.2 to 10	0.2 to 10	0.5 to 7.0
Polyvinylpyrrolidone	1.0 to 10	2.0 to 8.5	2.0 to 8.5	3.0 to 7.0	3.0 to 7.0
Misc	ad 100	ad 100	ad 100	ad 100	ad 100
	Formula 6b	Formula 7b	Formula 8b	Formula 9b	Formula 10b
Luvigel ® Fit Up (specified as solids content)	0.1 to 15	0.2 to 10	0.2 to 10	0.5 to 7.0	0.5 to 7.0
Aquaflex ® FX 64 (specified as solids content)	0.1 to 15	0.1 to 15	0.2 to 10	0.2 to 10	0.5 to 7.0
Polyvinylpyrrolidone	1.0 to 10	2.0 to 8.5	2.0 to 8.5	3.0 to 7.0	3.0 to 7.0
Misc	ad 100	ad 100	ad 100	ad 100	ad 100
	Formula 11	Formula 12	Formula 13	Formula 14	Formula 15
Copolymer a)	0.1 to 15	0.2 to 10	0.2 to 10	0.5 to 7.0	0.5 to 7.0
Copolymer b)	0.1 to 15	0.1 to 15	0.2 to 10	0.2 to 10	0.5 to 7.0
Vinylpyrrolidone/vinyl acetate copolymer	1.0 to 10	2.0 to 8.5	2.0 to 8.5	3.0 to 7.0	3.0 to 7.0
Misc	ad 100	ad 100	ad 100	ad 100	ad 100
	Formula 11a	Formula 12a	Formula 13a	Formula 14a	Formula 15a
Acrylates/C ₁₀₋₃₀ Alkyl Methacrylate Copolymer	0.1 to 15	0.2 to 10	0.2 to 10	0.5 to 7.0	0.5 to 7.0
Isobutylene/Ethylmaleimide/ Hydroxyethyl Maleimide Copolymer	0.1 to 15	0.1 to 15	0.2 to 10	0.2 to 10	0.5 to 7.0
Vinylpyrrolidone/vinyl acetate copolymer	1.0 to 10	2.0 to 8.5	2.0 to 8.5	3.0 to 7.0	3.0 to 7.0
Misc	ad 100	ad 100	ad 100	ad 100	ad 100
	Formula 11b	Formula 12b	Formula 13b	Formula 14b	Formula 15b
Luvigel ® Fit Up (specified as solids content)	0.1 to 15	0.2 to 10	0.2 to 10	0.5 to 7.0	0.5 to 7.0
Aquaflex ® FX 64 (specified as solids content)	0.1 to 15	0.1 to 15	0.2 to 10	0.2 to 10	0.5 to 7.0
Vinylpyrrolidone/vinyl acetate copolymer	1.0 to 10	2.0 to 8.5	2.0 to 8.5	3.0 to 7.0	3.0 to 7.0
Misc	ad 100	ad 100	ad 100	ad 100	ad 100

-continued

	Formula 16	Formula 17	Formula 18	Formula 19	Formula 20
Copolymer a)	0.1 to 15	0.2 to 10	0.2 to 10	0.5 to 7.0	0.5 to 7.0
Copolymer b)	0.1 to 15	0.1 to 15	0.2 to 10	0.2 to 10	0.5 to 7.0
Carbomer	0.02 to 3.0	0.05 to 2.0	0.05 to 1.5	0.2 to 1.5	0.2 to 0.8
Misc	ad 100	ad 100	ad 100	ad 100	ad 100
	Formula 16a	Formula 17a	Formula 18a	Formula 19a	Formula 20a
Acrylates/C ₁₀₋₃₀ Alkyl Methacrylate Copolymer	0.1 to 15	0.2 to 10	0.2 to 10	0.5 to 7.0	0.5 to 7.0
Isobutylene/ Ethylmaleimide/ Hydroxyethyl Maleimide Copolymer	0.1 to 15	0.1 to 15	0.2 to 10	0.2 to 10	0.5 to 7.0
Carbomer	0.02 to 3.0	0.05 to 2.0	0.05 to 1.5	0.2 to 1.5	0.2 to 0.8
Misc	ad 100	ad 100	ad 100	ad 100	ad 100
	Formula 16b	Formula 17b	Formula 18b	Formula 19b	Formula 20b
Luvigel ® Fit Up (specified as solids content)	0.1 to 15	0.2 to 10	0.2 to 10	0.5 to 7.0	0.5 to 7.0
Aquaflex ® FX 64 (specified as solids content)	0.1 to 15	0.1 to 15	0.2 to 10	0.2 to 10	0.5 to 7.0
Carbomer	0.02 to 3.0	0.05 to 2.0	0.05 to 1.5	0.2 to 1.5	0.2 to 0.8
Misc	ad 100	ad 100	ad 100	ad 100	ad 100
	Formula 21	Formula 22	Formula 23	Formula 24	Formula 25
Copolymer a)	0.1 to 15	0.2 to 10	0.2 to 10	0.5 to 7.0	0.5 to 7.0
Copolymer b)	0.1 to 15	0.1 to 15	0.2 to 10	0.2 to 10	0.5 to 7.0
PEG-40 Hydrogenated Castor Oil	0.05 to 1.5	0.1 to 1.0	0.2 to 0.8	0.3 to 0.8	0.3 to 0.6
Misc	ad 100	ad 100	ad 100	ad 100	ad 100
	Formula 21a	Formula 22a	Formula 23a	Formula 24a	Formula 25a
Acrylates/C ₁₀₋₃₀ Alkyl Methacrylate Copolymer	0.1 to 15	0.2 to 10	0.2 to 10	0.5 to 7.0	0.5 to 7.0
Isobutylene/ Ethylmaleimide/ Hydroxyethyl Maleimide Copolymer	0.1 to 15	0.1 to 15	0.2 to 10	0.2 to 10	0.5 to 7.0
PEG-40 Hydrogenated Castor Oil	0.05 to 1.5	0.1 to 1.0	0.2 to 0.8	0.3 to 0.8	0.3 to 0.6
Misc	ad 100	ad 100	ad 100	ad 100	ad 100
	Formula 21b	Formula 22b	Formula 23b	Formula 24b	Formula 25b
Luvigel ® Fit Up (specified as solids content)	0.1 to 15	0.2 to 10	0.2 to 10	0.5 to 7.0	0.5 to 7.0
Aquaflex ® FX 64 (specified as solids content)	0.1 to 15	0.1 to 15	0.2 to 10	0.2 to 10	0.5 to 7.0
PEG-40 Hydrogenated Castor Oil	0.05 to 1.5	0.1 to 1.0	0.2 to 0.8	0.3 to 0.8	0.3 to 0.6
Misc	ad 100	ad 100	ad 100	ad 100	ad 100
	Formula 26	Formula 27	Formula 28	Formula 29	Formula 30
Copolymer a)	0.1 to 15	0.2 to 10	0.2 to 10	0.5 to 7.0	0.5 to 7.0
Copolymer b)	0.1 to 15	0.1 to 15	0.2 to 10	0.2 to 10	0.5 to 7.0
Water/ethanol	50 to 95	50 to 95	60 to 90	60 to 90	65 to 85
Misc	ad 100	ad 100	ad 100	ad 100	ad 100

-continued

	Formula 26a	Formula 27a	Formula 28a	Formula 29a	Formula 30a
Acrylates/C ₁₀₋₃₀ Alkyl Methacrylate Copolymer	0.1 to 15	0.2 to 10	0.2 to 10	0.5 to 7.0	0.5 to 7.0
Isobutylene/Ethylmaleimide/ Hydroxyethyl Maleimide Copolymer	0.1 to 15	0.1 to 15	0.2 to 10	0.2 to 10	0.5 to 7.0
Water/ethanol	50 to 95	50 to 95	60 to 90	60 to 90	65 to 85
Misc	ad 100	ad 100	ad 100	ad 100	ad 100
	Formula 26b	Formula 27b	Formula 28b	Formula 29b	Formula 30b
Luvigel ® Fit Up (specified as solids content)	0.1 to 15	0.2 to 10	0.2 to 10	0.5 to 7.0	0.5 to 7.0
Aquaflex ® FX 64 (specified as solids content)	0.1 to 15	0.1 to 15	0.2 to 10	0.2 to 10	0.5 to 7.0
Water/ethanol	50 to 95	50 to 95	60 to 90	60 to 90	65 to 85
Misc	ad 100	ad 100	ad 100	ad 100	ad 100
	Formula 31	Formula 32	Formula 33	Formula 34	Formula 35
Copolymer a)	0.1 to 15	0.2 to 10	0.2 to 10	0.5 to 7.0	0.5 to 7.0
Copolymer b)	0.1 to 15	0.1 to 15	0.2 to 10	0.2 to 10	0.5 to 7.0
Polyvinylpyrrolidone	1.0 to 10	2.0 to 8.5	2.0 to 8.5	3.0 to 7.0	3.0 to 7.0
Water/ethanol	50 to 95	50 to 95	60 to 90	60 to 90	65 to 85
Misc	ad 100	ad 100	ad 100	ad 100	ad 100
	Formula 31a	Formula 32a	Formula 33a	Formula 34a	Formula 35a
Acrylates/C ₁₀₋₃₀ Alkyl Methacrylate Copolymer	0.1 to 15	0.2 to 10	0.2 to 10	0.5 to 7.0	0.5 to 7.0
Isobutylene/Ethylmaleimide/ Hydroxyethyl Maleimide Copolymer	0.1 to 15	0.1 to 15	0.2 to 10	0.2 to 10	0.5 to 7.0
Polyvinylpyrrolidone	1.0 to 10	2.0 to 8.5	2.0 to 8.5	3.0 to 7.0	3.0 to 7.0
Water/ethanol	50 to 95	50 to 95	60 to 90	60 to 90	65 to 85
Misc	ad 100	ad 100	ad 100	ad 100	ad 100
	Formula 31b	Formula 32b	Formula 33b	Formula 34b	Formula 35b
Luvigel ® Fit Up (specified as solids content)	0.1 to 15	0.2 to 10	0.2 to 10	0.5 to 7.0	0.5 to 7.0
Aquaflex ® FX 64 (specified as solids content)	0.1 to 15	0.1 to 15	0.2 to 10	0.2 to 10	0.5 to 7.0
Polyvinylpyrrolidone	1.0 to 10	2.0 to 8.5	2.0 to 8.5	3.0 to 7.0	3.0 to 7.0
Water/ethanol	50 to 95	50 to 95	60 to 90	60 to 90	65 to 85
Misc	ad 100	ad 100	ad 100	ad 100	ad 100
	Formula 36	Formula 37	Formula 38	Formula 39	Formula 40
Copolymer a)	0.1 to 15	0.2 to 10	0.2 to 10	0.5 to 7.0	0.5 to 7.0
Copolymer b)	0.1 to 15	0.1 to 15	0.2 to 10	0.2 to 10	0.5 to 7.0
Vinylpyrrolidone/vinyl acetate copolymer	1.0 to 10	2.0 to 8.5	2.0 to 8.5	3.0 to 7.0	3.0 to 7.0
Water/ethanol	50 to 95	50 to 95	60 to 90	60 to 90	65 to 85
Misc	ad 100	ad 100	ad 100	ad 100	ad 100
	Formula 36a	Formula 37a	Formula 38a	Formula 39a	Formula 40a
Acrylates/C ₁₀₋₃₀ Alkyl Methacrylate Copolymer	0.1 to 15	0.2 to 10	0.2 to 10	0.5 to 7.0	0.5 to 7.0
Isobutylene/Ethylmaleimide/ Hydroxyethyl Maleimide Copolymer	0.1 to 15	0.1 to 15	0.2 to 10	0.2 to 10	0.5 to 7.0
Vinylpyrrolidone/vinyl acetate copolymer	1.0 to 10	2.0 to 8.5	2.0 to 8.5	3.0 to 7.0	3.0 to 7.0
Water/ethanol	50 to 95	50 to 95	60 to 90	60 to 90	65 to 85
Misc	ad 100	ad 100	ad 100	ad 100	ad 100

-continued

	Formula 36b	Formula 37b	Formula 38b	Formula 39b	Formula 40b
Luvigel ® Fit Up (specified as solids content)	0.1 to 15	0.2 to 10	0.2 to 10	0.5 to 7.0	0.5 to 7.0
Aquaflex ® FX 64 (specified as solids content)	0.1 to 15	0.1 to 15	0.2 to 10	0.2 to 10	0.5 to 7.0
Vinylpyrrolidone/vinyl acetate copolymer	1.0 to 10	2.0 to 8.5	2.0 to 8.5	3.0 to 7.0	3.0 to 7.0
Water/ethanol	50 to 95	50 to 95	60 to 90	60 to 90	65 to 85
Misc	ad 100	ad 100	ad 100	ad 100	ad 100
	Formula 41	Formula 42	Formula 43	Formula 44	Formula 45
Copolymer a)	0.1 to 15	0.2 to 10	0.2 to 10	0.5 to 7.0	0.5 to 7.0
Copolymer b)	0.1 to 15	0.1 to 15	0.2 to 10	0.2 to 10	0.5 to 7.0
Carbomer	0.02 to 3.0	0.05 to 2.0	0.05 to 1.5	0.2 to 1.5	0.2 to 0.8
Water/ethanol	50 to 95	50 to 95	60 to 90	60 to 90	65 to 85
Misc	ad 100	ad 100	ad 100	ad 100	ad 100
	Formula 41a	Formula 42a	Formula 43a	Formula 44a	Formula 45a
Acrylates/C ₁₀₋₃₀ Alkyl Methacrylate Copolymer	0.1 to 15	0.2 to 10	0.2 to 10	0.5 to 7.0	0.5 to 7.0
Isobutylene/ Ethylmaleimide/ Hydroxyethyl Maleimide Copolymer	0.1 to 15	0.1 to 15	0.2 to 10	0.2 to 10	0.5 to 7.0
Carbomer	0.02 to 3.0	0.05 to 2.0	0.05 to 1.5	0.2 to 1.5	0.2 to 0.8
Water/ethanol	50 to 95	50 to 95	60 to 90	60 to 90	65 to 85
Misc	ad 100	ad 100	ad 100	ad 100	ad 100
	Formula 41b	Formula 42b	Formula 43b	Formula 44b	Formula 45b
Luvigel ® Fit Up (specified as solids content)	0.1 to 15	0.2 to 10	0.2 to 10	0.5 to 7.0	0.5 to 7.0
Aquaflex ® FX 64 (specified as solids content)	0.1 to 15	0.1 to 15	0.2 to 10	0.2 to 10	0.5 to 7.0
Carbomer	0.02 to 3.0	0.05 to 2.0	0.05 to 1.5	0.2 to 1.5	0.2 to 0.8
Water/ethanol	50 to 95	50 to 95	60 to 90	60 to 90	65 to 85
Misc	ad 100	ad 100	ad 100	ad 100	ad 100
	Formula 46	Formula 47	Formula 48	Formula 49	Formula 50
Copolymer a)	0.1 to 15	0.2 to 10	0.2 to 10	0.5 to 7.0	0.5 to 7.0
Copolymer b)	0.1 to 15	0.1 to 15	0.2 to 10	0.2 to 10	0.5 to 7.0
PEG-40 Hydrogenated Castor Oil	0.05 to 1.5	0.1 to 1.0	0.2 to 0.8	0.3 to 0.8	0.3 to 0.6
Water/ethanol	50 to 95	50 to 95	60 to 90	60 to 90	65 to 85
Misc	ad 100	ad 100	ad 100	ad 100	ad 100
	Formula 46a	Formula 47a	Formula 48a	Formula 49a	Formula 50a
Acrylates/C ₁₀₋₃₀ Alkyl Methacrylate Copolymer	0.1 to 15	0.2 to 10	0.2 to 10	0.5 to 7.0	0.5 to 7.0
Isobutylene/ Ethylmaleimide/ Hydroxyethyl Maleimide Copolymer	0.1 to 15	0.1 to 15	0.2 to 10	0.2 to 10	0.5 to 7.0
PEG-40 Hydrogenated Castor Oil	0.05 to 1.5	0.1 to 1.0	0.2 to 0.8	0.3 to 0.8	0.3 to 0.6
Water/ethanol	50 to 95	50 to 95	60 to 90	60 to 90	65 to 85
Misc	ad 100	ad 100	ad 100	ad 100	ad 100

-continued

	Formula 46b	Formula 47b	Formula 48b	Formula 49b	Formula 50b
Luvigel ® Fit Up (specified as solids content)	0.1 to 15	0.2 to 10	0.2 to 10	0.5 to 7.0	0.5 to 7.0
Aquaflex ® FX 64 (specified as solids content)	0.1 to 15	0.1 to 15	0.2 to 10	0.2 to 10	0.5 to 7.0
PEG-40 Hydrogenated Castor Oil	0.05 to 1.5	0.1 to 1.0	0.2 to 0.8	0.3 to 0.8	0.3 to 0.6
Water/ethanol Misc	50 to 95 ad 100	50 to 95 ad 100	60 to 90 ad 100	60 to 90 ad 100	65 to 85 ad 100
	Formula 51	Formula 52	Formula 53	Formula 54	Formula 55
Copolymer a)	0.1 to 15	0.2 to 10	0.2 to 10	0.5 to 7.0	0.5 to 7.0
Copolymer b)	0.1 to 15	0.1 to 15	0.2 to 10	0.2 to 10	0.5 to 7.0
Polyvinylpyrrolidone	1.0 to 10	2.0 to 8.5	2.0 to 8.5	3.0 to 7.0	3.0 to 7.0
PEG-40 Hydrogenated Castor Oil	0.05 to 1.5	0.1 to 1.0	0.2 to 0.8	0.3 to 0.8	0.3 to 0.6
Water/ethanol Misc	50 to 95 ad 100	50 to 95 ad 100	60 to 90 ad 100	60 to 90 ad 100	65 to 85 ad 100
	Formula 51a	Formula 52a	Formula 53a	Formula 54a	Formula 55a
Acrylates/C ₁₀₋₃₀ Alkyl Methacrylate Copolymer	0.1 to 15	0.2 to 10	0.2 to 10	0.5 to 7.0	0.5 to 7.0
Isobutylene/ Ethylmaleimide/ Hydroxyethyl Maleimide Copolymer	0.1 to 15	0.1 to 15	0.2 to 10	0.2 to 10	0.5 to 7.0
Polyvinylpyrrolidone	1.0 to 10	2.0 to 8.5	2.0 to 8.5	3.0 to 7.0	3.0 to 7.0
PEG-40 Hydrogenated Castor Oil	0.05 to 1.5	0.1 to 1.0	0.2 to 0.8	0.3 to 0.8	0.3 to 0.6
Water/ethanol Misc	50 to 95 ad 100	50 to 95 ad 100	60 to 90 ad 100	60 to 90 ad 100	65 to 85 ad 100
	Formula 51b	Formula 52b	Formula 53b	Formula 54b	Formula 55b
Luvigel ® Fit Up (specified as solids content)	0.1 to 15	0.2 to 10	0.2 to 10	0.5 to 7.0	0.5 to 7.0
Aquaflex ® FX 64 (specified as solids content)	0.1 to 15	0.1 to 15	0.2 to 10	0.2 to 10	0.5 to 7.0
Polyvinylpyrrolidone	1.0 to 10	2.0 to 8.5	2.0 to 8.5	3.0 to 7.0	3.0 to 7.0
PEG-40 Hydrogenated Castor Oil	0.05 to 1.5	0.1 to 1.0	0.2 to 0.8	0.3 to 0.8	0.3 to 0.6
Water/ethanol Misc	50 to 95 ad 100	50 to 95 ad 100	60 to 90 ad 100	60 to 90 ad 100	65 to 85 ad 100
	Formula 56	Formula 57	Formula 58	Formula 59	Formula 60
Copolymer a)	0.1 to 15	0.2 to 10	0.2 to 10	0.5 to 7.0	0.5 to 7.0
Copolymer b)	0.1 to 15	0.1 to 15	0.2 to 10	0.2 to 10	0.5 to 7.0
Vinylpyrrolidone/vinyl acetate copolymer	1.0 to 10	2.0 to 8.5	2.0 to 8.5	3.0 to 7.0	3.0 to 7.0
PEG-40 Hydrogenated Castor Oil	0.05 to 1.5	0.1 to 1.0	0.2 to 0.8	0.3 to 0.8	0.3 to 0.6
Water/ethanol Misc	50 to 95 ad 100	50 to 95 ad 100	60 to 90 ad 100	60 to 90 ad 100	65 to 85 ad 100
	Formula 56a	Formula 57a	Formula 58a	Formula 59a	Formula 60a
Acrylates/C ₁₀₋₃₀ Alkyl Methacrylate Copolymer	0.1 to 15	0.2 to 10	0.2 to 10	0.5 to 7.0	0.5 to 7.0
Isobutylene/ Ethylmaleimide/ Hydroxyethyl Maleimide Copolymer	0.1 to 15	0.1 to 15	0.2 to 10	0.2 to 10	0.5 to 7.0
Vinylpyrrolidone/vinyl acetate copolymer	1.0 to 10	2.0 to 8.5	2.0 to 8.5	3.0 to 7.0	3.0 to 7.0

-continued

	Formula 56b	Formula 57b	Formula 58b	Formula 59b	Formula 60b
PEG-40 Hydrogenated Castor Oil	0.05 to 1.5	0.1 to 1.0	0.2 to 0.8	0.3 to 0.8	0.3 to 0.6
Water/ethanol Misc	50 to 95 ad 100	50 to 95 ad 100	60 to 90 ad 100	60 to 90 ad 100	65 to 85 ad 100
Luvigel ® Fit Up (specified as solids content)	0.1 to 15	0.2 to 10	0.2 to 10	0.5 to 7.0	0.5 to 7.0
Aquaflex ® FX 64 (specified as solids content)	0.1 to 15	0.1 to 15	0.2 to 10	0.2 to 10	0.5 to 7.0
Vinylpyrrolidone/vinyl acetate copolymer	1.0 to 10	2.0 to 8.5	2.0 to 8.5	3.0 to 7.0	3.0 to 7.0
PEG-40 Hydrogenated Castor Oil	0.05 to 1.5	0.1 to 1.0	0.2 to 0.8	0.3 to 0.8	0.3 to 0.6
Water/ethanol Misc	50 to 95 ad 100	50 to 95 ad 100	60 to 90 ad 100	60 to 90 ad 100	65 to 85 ad 100

20

As contemplated herein, "Misc" is understood to mean a cosmetic carrier, in particular (unless stated separately) water and optionally further customary constituents of styling products.

The cosmetic composition of the present disclosure may be formulated in the shapes customary for the temporary shaping of hair, e.g., as a hair gel, hair spray, hair mousse or hair wax. Preference is given to the preparation as a hair gel.

Both hair mousses and hair sprays require the presence of foaming agents. As contemplated herein, however, preferably no or only small amounts of hydrocarbons should be used for this purpose. Propane, propane/butane mixtures and dimethyl ether are particularly suitable foaming agents as contemplated herein.

The present disclosure also relates to the use of cosmetic compositions as contemplated herein for the temporary shaping of keratinic fibers, in particular of human hair, and a method for the temporary deformation of keratinic fibers, in particular human hair, in which the keratinic fibers are acted upon by a cosmetic composition as contemplated herein and temporarily fixed in their shape.

A further subject of this patent application is the use of a cosmetic composition as contemplated herein for improving the holding of temporarily deformed keratinic fibers.

A final subject of this patent application is the use of a cosmetic composition as contemplated herein for improving the moisture resistance of temporarily deformed keratinic fibers.

EXAMPLES

The following hair gels were produced:

Component/ raw material	INCI name or chemical name	V1	V2	E1
Luvigel ® Fit UP ¹	Acrylates (C10-30) Alkyl Methacrylate Copolymer	3.33	—	1.66
Aquaflex ® FX 64 ²	Isobutylene/Ethylmaleimide/ Hydroxyethyl Maleimide Copolymer	—	2.50	1.25
AMP-ULTRA PC 2000	Aminomethyl propanol	0.45	—	0.23
Water		96.22	—	48.11
Ethanol		—	97.50	48.75
Total		100	100	100

¹30% by weight of active substance in water

²40% by weight of active substance in water

The quantities in the table are specified in % by weight of the respective raw material, based on the total composition. The polymer content in each of the compositions V1, V2 and E1 was 1.0% by weight.

For the styling agents obtained, the moisture resistance was determined on purified Kerling hair strands by employing an HHCR test (High Humidity Curl Retention Test: 6 h) (mean value for determining each 5 hair strands):

	V1	V2	E1
HHCR	62%	41%	79%

The polymer combination E1 as contemplated herein therefore showed a clearly super additive, synergistic effect with respect to the moisture resistance.

While at least one exemplary embodiment has been presented in the foregoing detailed description, it should be appreciated that a vast number of variations exist. It should also be appreciated that the exemplary embodiment or exemplary embodiments are only examples, and are not intended to limit the scope, applicability, or configuration of the various embodiments in any way. Rather, the foregoing detailed description will provide those skilled in the art with a convenient road map for implementing an exemplary embodiment as contemplated herein. It being understood that various changes may be made in the function and arrangement of elements described in an exemplary embodiment without departing from the scope of the various embodiments as set forth in the appended claims.

The invention claimed is:

1. A cosmetic composition for the temporary shaping of keratinic fibers, comprising:

a) at least one non-crosslinked, hydrophobically modified (meth)acrylic acid copolymer a), wherein the copolymer a) has the INCI name Acrylates/C10-30 Alkyl Methacrylate Copolymer; and

b) at least one, at least partially imidized maleic anhydride copolymer b), wherein the copolymer b) has the INCI name Isobutylene/Ethylmaleimide/Hydroxyethyl Maleimide Copolymer;

wherein the proportions of each of copolymers a) and b) are about 0.5% by weight of the total composition.

2. The cosmetic composition according to claim 1, wherein the cosmetic composition further comprises

c) polyvinylpyrrolidone and/or vinylpyrrolidone/vinyl acetate copolymer.

3. The cosmetic composition according to claim 2, wherein the proportion by weight of the polyvinylpyrrolidone and/or vinylpyrrolidone/vinyl acetate copolymer c) in the total weight of the cosmetic composition is from about 0.1 to about 10% by weight. 5

4. The cosmetic composition according to claim 2, wherein the proportion by weight of the polyvinylpyrrolidone and/or vinylpyrrolidone/vinyl acetate copolymer c) in the total weight of the cosmetic composition is from about 0.2 to about 8.5% by weight. 10

5. The cosmetic composition according to claim 2, wherein the proportion by weight of the polyvinylpyrrolidone and/or vinylpyrrolidone/vinyl acetate copolymer c) in the total weight of the cosmetic composition is from about 3.0 to about 7.0% by weight. 15

6. The cosmetic composition according to claim 1, wherein the composition comprises, based on its total weight, at least about 20% by weight of water. 20

7. The cosmetic composition according to claim 1 further comprising polyvinylpyrrolidone.

8. The cosmetic composition according to claim 1, wherein the composition comprises, based on its total weight, at least about 40% by weight of water. 25

9. The cosmetic composition according to claim 1, wherein the composition comprises, based on its total weight, at least about 70% by weight of water.

10. A method for the temporary deformation of keratin-containing fibers, in which the keratinic fibers are acted upon by a cosmetic composition according to claim 1 and temporarily fixed in their shape. 30

* * * * *