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(54) Title: ANTI-DANDRUFF COMPOSITIONS CONTAINING PEPTIDES

(57) Abrégé/Abstract:
The present invention relates to the use of special peptides in compositions which can be used in particular in hair and skin cosmetics, and to such peptide-containing compositions. In particular, the present invention relates to the use of such peptides as active ingredient for inhibition or treatment of dandruff which does not accumulate in the body or in the environment. Furthermore, the invention relates to the production of such compositions, to the peptides used themselves, to their production and to coding nucleotide sequences for such peptides, to dispensing systems for such peptides and to screening methods for identifying suitable further peptides.

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(54) Title: ANTI-DANDRUFF COMPOSITIONS CONTAINING PEPTIDES

(57) Abstract: The present invention relates to the use of special peptides in compositions which can be used in particular in hair and skin cosmetics, and to such peptide-containing compositions. In particular, the present invention relates to the use of such peptides as active ingredient for inhibition or treatment of dandruff which does not accumulate in the body or in the environment. Furthermore, the invention relates to the production of such compositions, to the peptides used themselves, to their production and to coding nucleotide sequences for such peptides, to dispensing systems for such peptides and to screening methods for identifying suitable further peptides.

ANTI-DANDRUFF COMPOSITIONS CONTAINING PEPTIDES

The present invention relates to the use of special peptides in compositions which can be used in particular in hair and skin cosmetics, and to such peptide-containing compositions. In particular, the present invention relates to the use of such peptides as preservative or as prevention, active ingredient for inhibition or treatment of dandruff which does not accumulate in the body or in the environment. Furthermore, the invention relates to the production of such compositions, to the peptides used themselves, to their production and to coding nucleotide sequences for such peptides, to dispensing systems for such peptides and to screening methods for identifying suitable further peptides.

Background of the invention

In the cosmetics field, microbial activity can lead to undesired changes, such as body odor, dandruff formation or open inflammations and spots. The prior art discloses the use of antimicrobial and/or antifungal substances in preparations, e.g. in cosmetics or in medicine. However, the development of new antimicrobial and/or antifungal compositions is constantly necessary due to the development of bacterial or fungal strains that are resistant to active ingredients. Of particular interest is the development of novel antimicrobial and anti-fungal compounds, respectively, which do not show negative effects on the human health and which show a good activity spectrum against harmful germs.

Diverse antimicrobial peptides are already described in the literature and summarized in reviews (Hancock, R.E.W. and Lehrer, R. 1998 in Trends in Biotechnology, 16: 82-88; Hancock, R.E.W. and Sahl, H.G. 2006 in Nature Biotechnology, 24: 1551-1557).

Fusion peptides, which combine two effective peptides, are likewise described in the literature. Wade *et al.* report on the antibacterial effect of various fusions of cecropin A from *Hyalophora cecropia* and bee toxin melittin (Wade, D. *et al.,* 1992, International Journal of Peptide and Protein Research, 40: 429-436). Shin *et al.* describe the antibacterial effect of a fusion peptide of cecropin A from *Hyalophora cecropia* and magainin 2 from *Xenopus laevis*, consisting of 20 amino acids. Cecropin A consists of 37 amino acids and exhibits activity toward Gram-negative bacteria, but lower activity toward Gram-positive bacteria. Magainin 2 consists of 23 amino acids and is active against bacteria but also tumor cell lines. Compared to the fusion of cecropin A and melittin, this fusion exhibits considerably lower hemolytic activity for comparable antibacterial effect (Shin, S.Y. Kang, J.H., Lee, M.K., Kim, S.Y., Kim, Y., Hahm, K.S., 1998, Biochemistry and Molecular Biology International, 44: 1119-1126).

US 2003/0096745 A1 and US 6,800,727 B2 claim these fusion peptides consisting of 20 amino acids and variants of this fusion which, as a result of the exchange of amino acids,

in particular of positively charged amino acids and hydrophobic amino acids, are more positively charged and more hydrophobic.

Further developments of this cecropin-A-magainin-2 fusion peptide are described by Shin *et al.* 1999. It is found here that the construct P18 (HT2, SEQ ID NO:3) had lower hemolytic activity compared to the starting fusion, although the antibacterial activity toward *Escherichia coli* and *Bacillus subtilis* was not impaired (Shin *et al.* 1999 Journal of Peptide Research, 53: 82-90).

Furthermore, Shin *et al.* 2001 investigated the activity of the construct P18 and analogous constructs for their antibacterial activity also on other target bacteria such as *Pseudomonas aeruginosa* or *Proteus vulgaris* (Shin *et al.,* 2001, Journal of Peptide Research, 58: 504-514).

First experiments on the effectiveness of P18 against fungi was published in January 2002 by Shin *et al.* Here, better effectiveness of the peptide P18 towards *Candida albicans* compared to magainin 2 was established (Shin et al., 2002, Biochemical and Biophysical Research Communications, 290: 558-562).

In addition to *Candida albicans,* the Ascomycetes *Aspergillus flavus*, *Fusarium oxysporum* and the Basidiomycete *Trichosporon beigelii* were inhibited with P18 and variants of the peptide. However, the most effective inhibition was achieved with P18 (Lee *et al.,* 2004, Biotechnology Letters, 26: 337-341). An inhibition of lipophilic fungi, in particular of the genus *Malassezia* is not taught. Furthermore, no experiments are described which demonstrate a more effective effect of cecropin-magainin fusions compared to known, commercial antifungal substances.

The genus *Malassezia* are lipophilic fungi which in part belong to the normal resident flora on human skin. Many representatives are obligatorily lipophilic, only *M. pachydermatis* is described as optionally lipophilic. Nevertheless disorders which are associated with *Malassezia ssp.* are described. These include pityriasis versicolor, atopic dermatitis, pityriasis capitis, seborrhea and pityrosporum folliculitis or malassezia folliculitis, for which *Malassezia ssp.* are pathogens. (Cutsem *et al.,* 1990, Journal of the American Academy of Dermatology, 22: 993-998, Nenoff *et al.,* 2007, Aktuelle Dermatologie, 33: 26-32). For treatment, antimycotic, fungicidal agents are usually used. Examples thereof are ketokonazole, climbazole, zinc pyrithiones, piroctone olamine, selenium sulfides or some natural extracts (e.g. like juniper oil, rosemary oil), which are often added in the single-digit%, (w/w) range, for example, in antidandruff shampoo formulations.

However, some of the described substances for inhibiting, treating or preventing dandruff are either toxicologically unacceptable, or the cosmetic preparations are not effective enough.

The species *Malassezia furfur* is less sensitive toward several antimycotics compared to other Malassezia species (Nenoff *et al.,* 2007, Aktuelle Dermatologie, 33: 26-32). It is likewise described that substances which considerably inhibit the growth of *Candida albicans* even at low concentrations, only prevent the growth of *Malassezia furfur* at high concentrations, if at all. Thus, Nenoff *et al.* describe the inhibition of *Candida albicans* by phytosphingosines at concentrations of about 152 – 269 µg/ml whereas an inhibition of *M. furfur* only took place at approximately 25-fold higher concentrations (6250 µg/ml) for basic phytosphingosines, or *M. furfur* appeared to be resistant to phytosphingosine salts (Nenoff *et al.,* 2002, Acta Derm Venerol, 82:170-173).

Similar observations were made for the peptide cilofungin by Hanson *et al.* 1989. While 76% of the *C. albicans* strains did not grow at a cilofungin concentration of 0.62 µg/ml, the obligatorily lipophilic *M. furfur* was not inhibited at these concentrations. The minimum inhibitory concentration of cilofungin for *M. furfur* was not stated. It was evidently not within the investigated range between 0.31 µg/ml and 40 µg/ml (Hanson *et al.,* 1989, Antimicrobial agents and chemotherapy, 33:1391-1392).

In 2006, Lopez-Garcia *et al.* describe the growth inhibition of *M. furfur* with Cecropin P1 and magainin 2. Here, a moderate antifungal effect of cecropin P1 and a comparably better effect of magainin 2 at a concentration of 25 µM were found (Lopez-Garcia *et al.,* 2006, Journal of Antimicrobial Chemotherapy, 57:877-882).

EP-A-0 866 804 describes the use of beta-defensins from human skin as active ingredient in cosmetic or pharmaceutical formulations. However, an internal comparison with antifungal active ingredients of the prior art is not made.

WO-A-00/032220 describes the use of a fungal polypeptide as antifungal active ingredient for the treatment of dandruff. However, an internal comparison with antifungal active ingredients of the prior art is not made here either.

US 2003/0096745 describes a polypeptide of the sequence KWKKLLKKPPPLLKKLLKKL with antibacterial and antifungal activity toward certain microorganisms. Antifungal activity was shown toward *Candida albicans* and *Tricosphoron beigelii*. Cosmetic applications, in particular for the treatment of dandruff, are not proposed.

However, the use of antimicrobial substances, particularly regular use, can lead to intolerance in people, or even to health damage. Intolerances may be skin reddening, irritations or sensitizations. Systemic absorption into the human body can lead to impairment of body functions. Particularly regular use of some antimicrobial substances can lead to an increase in their concentration. One known example is parabens (Dabre *et al.*, 2004, Journal of Applied Toxicology, 24: 5-13). Depending on the application, an accumulation in the human body or in the environment may thus result.

In addition, excessive and inappropriate use of antimicrobial substances result time and again in resistance of the target organisms.

There is therefore a need to provide novel cosmetic antimicrobial compositions which firstly have antifungal effectiveness and are suitable for avoiding or treating dandruff. In particular, these should not accumulate in the body since they can be degraded in the natural surroundings.

There is in particular a need to provide antifungal active ingredients which are more effective against dandruff than the customary antidandruff agents known hitherto and in particular are effective against the dandruff fungus *Malassezia furfur* and other *Malassezia ssp.* Preferably, the natural skin flora should not be impaired, and the active ingredients should also not accumulate in the body or in the environment, but be degraded in the natural surroundings.

It was therefore an object of the present invention to provide a novel, effective but biodegradable active ingredient for avoiding, inhibiting and/or treating dandruff, in particular scurf. Advantageously, active ingredient compounds are to be identified which are suitable for producing cosmetic and/or dermatocosmetic formulations or preparations. Furthermore, systemic absorption of the active ingredient should be avoided. Additionally, it should be ensured that the preparations have low or no cytoxicity. In particular, the active ingredient should be effective against the yeast fungus *Malassezia furfur*, and also against other *Malassezia ssp.*, in particular, obligatorily lipophilic species.

Summary of the invention:

This object was achieved by cosmetic compositions according to the definition in the attached patent claims.

Surprisingly, it has been found that the composition comprising at least one peptide with a claimed structure or a structure motif has adequate effectiveness against lipophilic fungal species, in particular *Malassezia furfur*, associated with good skin compatibility. Furthermore, a biodegradability was found which progresses more rapidly compared to customary antidandruff active ingredients such as zinc pyrithiones. Furthermore, it has surprisingly been found that the effect is better than the effect which is achieved with the peptides cecropin A or magainin II on their own.

Detailed description of the invention:

1. General definitions

A "helix breaker" means a section within a peptide according to the invention which, in the region of this section of the peptide chain, inhibits the formation of a helical secondary structure. The formation of a helix structure further away from the helix breaker, however, is not suppressed. Typical helix breakers are known to the person skilled in the art. In particular, the amino acid proline is a peptide building block with the property of a helix breaker. The same is true for proline-containing peptide fragments.

Within the context of the invention, "hydrophobic amino acids" are alanine, valine, leucine, isoleucine, phenylalanine, methionine and tryptophan.

Within the context of the invention, "hydrophilic amino acids" are in particular amino acids with polar side chains, such as serine, threonine, cysteine, tyrosine, asparagine and glutamine; acidic amino acids, such as aspartic acid and glutamic acid; and in particular basic amino acids, such as lysine, arginine and histidine.

"Capable of forming an alpha-helix arms" is a sequence which promotes the formation of a helical structure under suitable conditions. Artificial suitable conditions for forming helix structures are, for example, the solvent systems based on trifluoroacetic acid that promote alpha-helix formation, and also SDS.

"Percentage alpha-helicity" is understood as meaning a measurement value determined with the help of circular dichroism (CD) analysis, where the sample to be measured is obtained under standard conditions, such as, in particular, 50% (v/v) trifluoroacetic acid in 10 mM sodium phosphate buffer, pH 7.0, or 30 mM SDS in 10 mM sodium phosphate buffer, pH 7.0, using a measurement cell with 1 mm path length and at peptide concentration of 100 µg/ml. The calculation is made according to the following formula:

$$\% \text{ helicity} = 100\ ([\Theta] - [\Theta]^0)/[\Theta]^{100}$$

in which

$[\Theta]$ is the experimentally determined ellipticity at 222 nm;

$[\Theta]^0$ is the ellipticity at 222 nm and 0% helicity and

$[\Theta]^{100}$ is the ellipticity at 222 nm and 100% helicity.

Suitable measurement conditions are described, for example, by Shin *et al.*, 1999, Journal of Peptide Research, 53:82-90, to which reference is hereby expressly made.

A "repetitive sequence motif" is understood as meaning the linear arrangement of preferably identical peptide sequences which are linked together directly or indirectly, i.e. via "linker groups", as defined herein.

The terms "mutants" and "variants" are used synonymously. These are understood as meaning in particular "functional" or "functionally equivalent" modifications, as described in

more detail later, which still demonstrate the desired activity and thus applicability as antidandruff peptide.

The terms "cosmetic", dermatocosmetic" or "dermatological" are likewise used synonymously.

A "fusion product" is understood as meaning the covalent or noncovalent linking of peptides and proteins ("fusion peptides") and the covalent or noncovalent linking of peptides and polymers ("fusion polymers"). The linked constituents are cleavably joined together either irreversibly or reversibly, i.e. biologically, in particular enzymatically.

2. Preferred embodiments

The invention provides the use of a peptide which comprises at least one sequence motif of the following general formula I

Hel1 – HB –Hel2 (I)

in which

HB comprises 1 to 5 continuous amino acid residues and is a part sequence motif with the function of a helix breaker, and

Hel1 and Hel2 are identical or different part sequence motifs which each comprise 5 to 15 continuous amino acid residues which are selected from hydrophilic residues and hydrophobic residues different from proline, and are in each case capable of forming an alpha-helix arm where at least one of the helix arms has, in its axial projection, an incomplete separation into a hydrophobic and hydrophilic helix half;

for the treatment or prevention of dandruff.

The present invention provides the use of a peptide which comprises at least one sequence motif of the following general formula I

Hel1 – HB –Hel2 (I)

in which

HB comprises 1 to 5 continuous amino acid residues and is a part sequence motif with the function of a helix breaker, and

Hel1 and Hel2 are identical or different part sequence motifs which each comprise 5 to 15 continuous amino acid residues which are selected from hydrophilic residues and hydrophobic residues different from proline, and are in each case capable of forming an alpha-helix arm,

where the peptide has a percentage alpha-helicity value of from about 25 to 98%, in 50% (v/v) trifluoroacetic acid, pH 7.0, or about 10 to 70% in 30 mM sodium dodecyl sulfate (SDS), pH 7.0, in each case determined by circular dichroism (CD) spectrometry;
for the treatment or prevention of dandruff.

The invention provides the use of at least one peptide with a sequence or a repetitive sequence motif according to SEQ ID NO: 1:

$X_1\ X_2K\ X_3\ X_4\ X_5KIP\ X_{10}\ KFX_6X_7\ X_8\ AX_9KF$ (SEQ ID NO:1)

in which
X_{10} is a peptide bond or one or two arbitrary basic or hydrophobic amino acid residues or one or two proline residues and
X_1 to X_9 are arbitrary basic amino acid residues or hydrophobic amino acid residues different from proline;
where the repetitive sequence motifs may be identical or different;
and/or derivatives thereof wherein the derivatives are aliphatic ester, amides, N-acyl derivatives O-acyl derivatives; or wherein 1 to 5 arbitrary amino acid residues are N- and/or C-terminally added or deleted;
for the treatment or prevention of dandruff.

The invention provides the use of a composition comprising a peptide as defined in the present invention and a cosmetically and/or pharmaceutically acceptable auxiliary for the treatment or prevention of dandruff.

The invention provides the use of a fusion product of at least one cosmetic auxiliary or anti-inflammatory, antimicrobial or sebum-regulating active ingredient and at least one peptide according to the present invention for the treatment or prevention of dandruff.

The invention provides the use of a peptide as defined in the present invention, a composition as defined in the present invention or a fusion product according to the present invention, for the treatment or prevention of scurf.

The invention provides the use of a peptide as defined in the present invention, a composition as defined in the present invention or a fusion product according to the present invention as preservative in a cosmetic composition.

The invention provides the use of a peptide as defined in the present invention, a composition as defined in the present invention or a fusion product according to the present invention for inhibiting the growth and/or the activity of lipophilic fungi.

The invention provides the use of a peptide as defined in the present invention, a composition as defined in the present invention or a fusion product according to the present invention for inhibiting the growth and/or the activity of *Malassezia ssp.*

The present invention provides the use of a peptide as defined in the present invention, a composition as defined in the present invention or a fusion product according to the present invention for inhibiting the growth and/or the activity of *Malassezia furfur.*

The present invention provides a method for producing a cosmetic composition where a peptide as defined in the present invention is formulated together with at least one cosmetically acceptable auxiliary.

The present invention provides a method for producing a cosmetic composition where a peptide as defined in the present invention is formulated together with at least one cosmetically acceptable auxiliary and a further cosmetic or pharmaceutical anti-inflammatory, antimicrobial or sebum-regulating active ingredient.

The present invention provides a screening method for antidandruff peptides, where, using a complementary nucleic acid according to the present invention as probe under stringent conditions of washing in 0.1 x SSC, 0.1% SDS at 50-70°C, a nucleic-acid-containing sample is screened for hybridizing sequences using the probe.

The present invention provides the use of a dispensing system for releasing a peptide as defined in the present invention in cosmetics, wherein the peptide is associated with liposomes, zeolites, cyclodextrins or polyethyleneimine-based vector systems.

The present invention provides the use of the present invention wherein the peptide and further anti-inflammatory, antimicrobial or sebum-regulating active ingredients are associated with liposomes, zeolites, cyclodextrins or polyethyleneimine-based vector systems.

The invention provides a cosmetic composition comprising, in a cosmetic carrier, a peptide which comprises at least one sequence motif of the following general formula I

Hel1 – HB –Hel2 (I)

in which

"HB" comprises 1 to 5, in particular 1, 2 or 3, continuous amino acid residues and is a part sequence motif with the function of a helix breaker, and

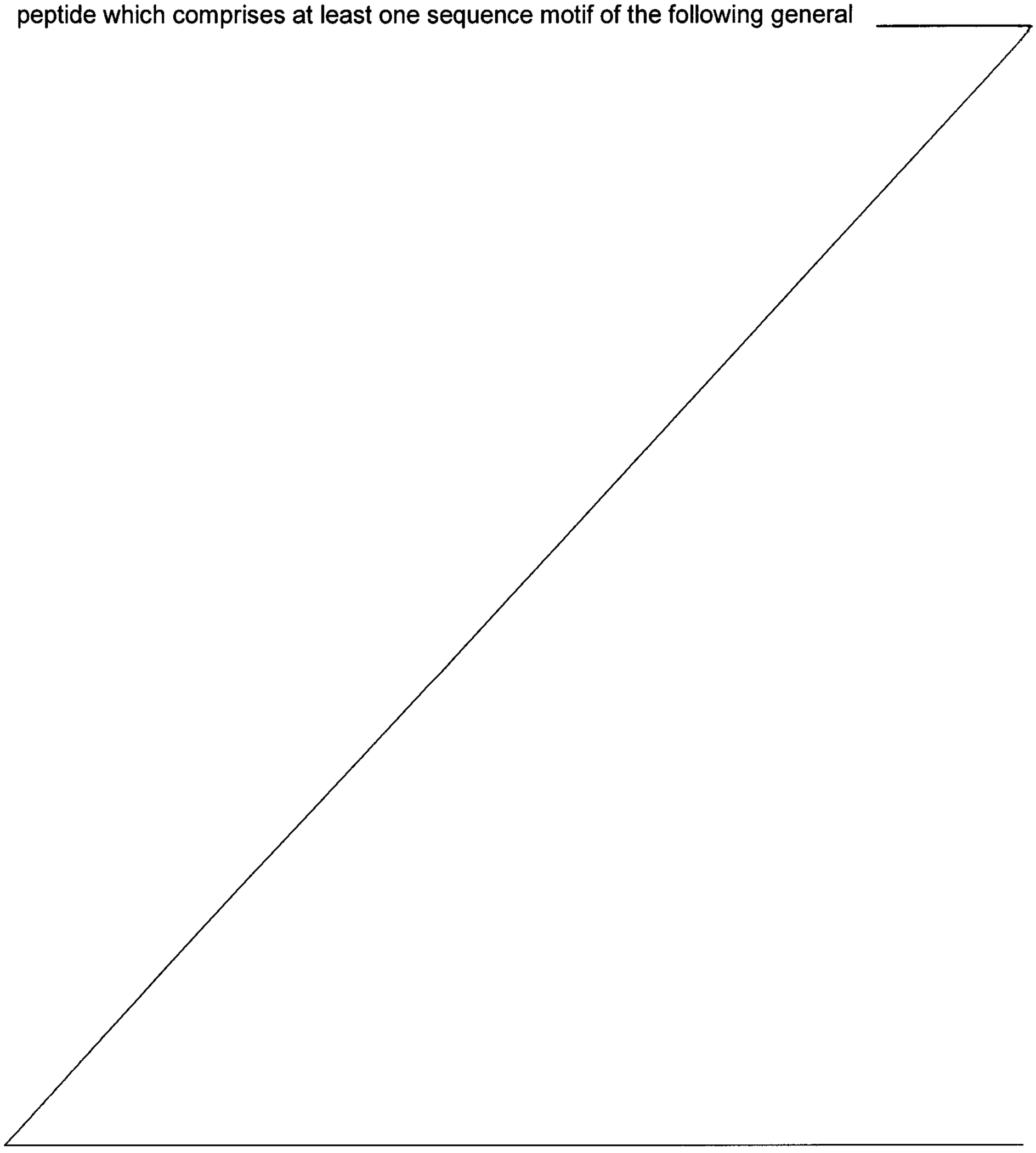
"Hel1" and "Hel2" are identical or different part sequence motifs which each comprise 5 to 15, such as, for example, 6 to 12, in particular 8, 9 or 10, continuous amino acid residues which are essentially selected from hydrophilic residues and hydrophobic, in particular, basic, residues different from proline, and are in each case capable of forming an alpha-helix arm where at least one of the helix arms has, in its axial projection, i.e. in the top view corresponding to a "helical wheel" diagram, an incomplete separation into a hydrophobic, in particular basic, and hydrophilic helix half. Here, for example 1, 2, 3 or 4 positions one half of the type (hydrophobic or hydrophilic) can be occupied by amino acid residues of the other

type (hydrophilic or hydrophobic, respectively).

By contrast, completely separated hydrophobic and hydrophilic helix halves would consist exclusively of hydrophobic or hydrophilic amino acid residues according to the above definition. One example of a completely hydrophilically/hydrophobically separated helix to be mentioned is the sequence motif KLKKLLKK.

A "helix half" is not necessarily to be understood here as meaning the numerical half, i.e. half the total number of amino acids of a helix. The numerical size of two halves can differ, for example, by 1 to 3 amino acids.

The invention provides a cosmetic composition comprising, in a cosmetic carrier, a peptide which comprises at least one sequence motif of the following general



formula I

Hel1 – HB –Hel2 (I)

in which

"HB" comprises 1 to 5, in particular 1, 2 or 3, continuous amino acid residues and is a part sequence motif with the function of a helix breaker, and

"Hel1" and "Hel2" are identical or different part sequence motifs which each comprise 5 to 15, such as, for example, 6 to 12, in particular 8, 9 or 10, continuous amino acid residues which are essentially selected from hydrophilic residues and hydrophobic, in particular, basic, residues different from proline, and are in each case capable of forming an alpha-helix arm, where the peptide has a percentage alpha-helicity (% helicity) of from about 25 to 98%, such as, for example, 30 to 80% or 30 to 60%, in 50% (v/v) trifluoroacetic acid, pH 7.0; or a % helicity value of from about 10 to 70%, or 12 to 55% or 12 to 40%, in 30 mM SDS, pH 7.0, in each case determined by CD spectrometry.

The invention thirdly provides a cosmetic composition comprising, in a cosmetic carrier, at least one peptide with a sequence or a repetitive sequence motif according to SEQ ID NO: 1:

$X_1\ X_2K\ X_3\ X_4\ X_5KIP\ X_{10}\ KFX_6X_7\ X_8\ AX_9KF$ (SEQ ID NO:1)

in which

X_{10} is a peptide bond or one or two arbitrary basic or hydrophobic amino acid residues or one or two proline residues and

X_1 to X_9 are arbitrary basic amino acid residues or hydrophobic amino acid residues different from proline;

where the repetitive sequence motifs may be identical or different;

and/or mutants or derivatives thereof.

In particular, the invention provides compositions according to the above definition comprising at least one peptide with a sequence or a repetitive sequence motif according to SEQ ID NO: 2:

$X_1\ X_2K\ X_3\ X_4\ X_5KIP\ X_{11}\ X_{12}\ KFX_6X_7\ X_8\ AX_9KF$ (SEQ ID NO: 2)

in which

X_1 is lysine, arginine or phenylalanine,

X_2 is lysine or tryptophan,

X_3 is leucine or lysine,

X_4 is phenylalanine or leucine,

X_5 is leucine or lysine,

X_6 is leucine or lysine,

X_7 is histidine or lysine,

X_8 is alanine, leucine, valine or serine,

X_9 is leucine or lysine,

X_{11} is proline or a chemical bond, and

X_{12} is proline or a chemical bond,

where the repetitive sequence motifs are identical or different;

and/or mutants or derivatives thereof.

Nonlimiting examples of the above sequences or repetitive sequence motifs according to SEQ ID NO: 3 are:

P18	KWKLFKKIPKFLHLAKKF-NH_2	(SEQ ID NO: 3)
RP18	RWKLFKKIPKFLHLAKKF	(SEQ ID NO: 4)
KKFP18	FKKLFKKIPKFLHAAKKF	(SEQ ID NO: 5)
KKLP18	KWKLLKKIPKFKKLALKF	(SEQ ID NO: 6)
AP18	KWKLFKKIPKFLHAAKKF	(SEQ ID NO: 7)
KFLP18	KWKKFLKIPKFLHAAKKF	(SEQ ID NO: 8)
KLLP18	KWKKLLKIPKFLHAAKKF	(SEQ ID NO: 9)

and/or a mutant or derivative thereof.

Compositions according to the invention can in particular comprise peptides with a repetitive sequence motif, where a plurality, such as, in particular, 2 to 10 or 3 to 5, of peptides of the general formula I or according to SEQ ID NO: 1 to 9 or mutants or derivatives thereof are peptidically linked together via linker groups.

Here, the "linker groups" can comprise continuous, identical or different amino acid residues, preferably selected from alanine, glycine, threonine and serine, such as, for example, GGSGGT, GGSGGS, or poly-alanine linkers and poly-glycine linkers, where "poly" is 2 to 10; or selected from Asp, Pro, Asn and Gly, for example Asp-Pro and Asn-Gly.

In one aspect, the linker groups comprise 1 to 10 continuous identical or different amino acid residues.

Furthermore, peptides whose C-terminal carboxyl group is amidated can be used.

The invention also provides compositions comprising an, if appropriate, cleavable

fusion polypeptide of at least one cosmetic, preferably peptidic auxiliary or active ingredient and at least one peptide according to the above definition. Examples of such active ingredients are: hydrophobins, keratin binding domains, albumin, lactoferrin, avidin, antibodies, preferably, keratin-binding antibodies, binding peptides for surfaces, preferably keratin-binding peptides, silk proteins, spider silk proteins, preferably C16, collagen, fibronectin, keratin, elastin, other structural proteins, preferably hair and skin structure proteins, binding proteins for skin and hair structure proteins, enamel-building proteins, amelogenin, binding proteins of the enamel-building proteins, binding proteins of amelogenin; where these fusions may be permanent or else cleavable.

The invention also provides fusion polymers of at least one cosmetic polymer and at least one peptide according to the above definition. Examples of such polymers are: polyhydroxyalkanoates, hyaluronic acid, glucan, spheroglucan, cellulose, xanthan, polyethylene glycol, polyglycerol, polylysine and silicones, which are present as covalent or noncovalent linkages.

Furthermore, it is conceivable that the abovementioned peptides can also be present in the compositions as covalent linkage to cosmetically/pharmceutically active ingredients, such as panthenol, bisabolol, retinol, carotenoids, protein hydrolysates.

The invention also provides compositions according to the above definition, additionally comprising at least one further cosmetic or pharmaceutical active ingredient, such as, for example, at least one antiinflammatory active ingredient, an antimicrobial active ingredient for inhibiting the growth and/or the pathophysiological activity of undesired germs, such as, in particular, *Malasezzia furfur*, and/or a sebum-regulating active ingredient.

Examples of antiinflammatory active ingredients are: corticoids (e.g. cortisone), azathioprin, bisabolol, cyclosporin A, acetylsalicylic acid, ibuprofen, panthenol, camomile extract or aloe extracts, etc.

Examples of antimicrobial agents are: customary preservatives known to the person skilled in the art, such as alcohols, p-hydroxybenzoic acid esters, imidazolinylurea, formaldehyde, sorbic acid, benzoic acid, salicylic acid, etc. Such deodorizing substances are, for example, zinc ricinoleate, triclosan, undecylenic acid alkylolamides, triethyl citrate, chlorhexidine, etc. (cf. also section 3.5 below). They also include azoles (Ketoconazole, climbazole), zinc pyrithione, selenium sulfides, etc.

Examples of sebum-regulating active ingredients are: azelaic acid, sebacic acid, potassiumalezaoyldiglycinate, 10-hydroxydecanoic acid, 1,10-decanediol, aluminium salts , like aluminiumchlorohydrate, etc. .

The peptide is present in the compositions according to the invention in a fraction of from 0.0001 to 50% by weight, in particular 0.001 to 10% by weight, and especially 0.005 to 0.1% by weight, in each case based on the total weight of the finished composition.

A further aspect of the present invention relates to compositions containing at least one peptide as defined above which shows for *Malassezia furfur* a minimal inhibitory concentration of about 1500 to 0.1 µM, as for example 500 to 1 µM, 100 to 5 µM or 50 to 10 µM, as determined under standard conditions. Standard conditions in this context relate to a *Malassezia furfur* culture, which shows an initial optical density of 0.1 at 600 nm, and which, after a 24 hour incubation with said peptide, which is contained at said minimum concentration in said culture medium, contains less than one colony-forming unit (CFU) of said microorganism per µl culture medium.

The invention further provides the use of a peptide according to the above definition or of a fusion polypeptide according to the above definition, optionally in combination with at least one further conventional, as for example low-molecular weight, antifungal agent, as for example Ketoconazole, Climbazole, Zincpyrithione or selenosulfides, for producing a cosmetic composition for the treatment or prevention of dandruff, in particular scurf, where the peptide is used in particular for suppressing the growth and/or the pathophysiological activity of lipophilic fungi, in particular *Malassezia furfur* and other species of the genus *Malassezia*, or for producing cosmetic compositions in which the peptide is present as preservative.

In this connection, various natural skin organisms are essentially not or only slightly inhibited in their growth and/or activity during the dandruff treatment.

The invention further provides a method of producing a cosmetic composition according to the above definition, where a peptide according to the above definition is formulated together with at least one customary cosmetic auxiliary and, if appropriate, further cosmetic or pharmaceutical active ingredients to give the desired administration form.

The invention further provides peptides according to the above definition and also nucleic acids coding for such peptides, and also complementary nucleic acids which hybridize with such coding nucleic acids under stringent conditions.

Furthermore, the invention relates to screening methods for antidandruff peptides, where, using a complementary nucleic acid according to the above definition as probe, a nucleic-acid-containing sample is screened for hybridizing sequences using the probe under stringent conditions.

Finally, the invention provides a dispensing system for releasing a peptide according to the above definition, where the peptide and, if appropriate, further ingredients present are associated with liposomes, zeolites, cyclodextrins, polyethyleneimine-based vector systems, which are, for example, present (dissolved, suspended, dispersed) therein.

P18 (SEQ ID NO: 3) is a peptide with a chain length of 18 amino acids which is derived from a fusion peptide from fragments of cecropin A from *Hyalaphora cecropia* and magainin

from *Xenopus laevis*. Fungicidal activity was found for *Candida albicans*, *Trichosporon beigelii, Aspergillus flavus* and *Fusarium oxysporum* in experiments (Lee *et al.,* (2004) Biotechnology Letters, 26:337-341.). However, the person skilled in the art is aware that the effect of fungicidal substances on different organisms can be very different. Particularly the effect on the lipophilic fungus *Malassezia furfur* and the lipophilic species of the genus *Malassezia* can differ for example significantly from the effect on *Candida albicans* (Hanson *et al.,* (1989) Antimicrobial Agents and Chemotherapy, 33:1391-1392; Nenhoff *et al.,* (2002) Acta Derm Venereol., 82:170-173). The effect of P18 observed according to the invention and structurally and functionally related peptides of the species described herein is therefore completely surprising to the person skilled in the art.

In a further particular embodiment, the secondary structure of the peptides according to the invention is a helix which is divided in the middle into two helices by a helix-breaking amino acid. In a depiction as "helical wheel", hydrophobic amino acids, in particular leucine residues, predominate on one side (or half of the helix), and positively charged amino acids, in particular lysine residues, predominate on the other side.

The peptides according to the invention are composed in particular of D- and/or L-amino acids, in particular L-amino acids.

The peptides described herein and/or derivatives thereof can be produced in a manner known per se, such as through chemical solid-phase synthesis, liquid synthesis or biotechnologically using recombinant production strains or cell cultures.

3. Further embodiments of the invention

3.1 Examples of further suitable sequence motifs

3.1.1 Sequence motif X_1 X_2K X_3 X_4 X_5KIP X_{11} X_{12} KF$X_6$$X_7$ X_8 AX_9KF (SEQ ID NO: 2)

variant_0	KKKLFLKIPPPKFLHAALKF	seqid_11
variant_1	RKKLFLKIPPPKFLHAALKF	seqid_12
variant_2	FKKLFLKIPPPKFLHAALKF	seqid_13
variant_3	KWKLFLKIPPPKFLHAALKF	seqid_14
variant_4	RWKLFLKIPPPKFLHAALKF	seqid_15
variant_5	FWKLFLKIPPPKFLHAALKF	seqid_16
variant_6	KKKKFLKIPPPKFLHAALKF	seqid_17
variant_7	RKKKFLKIPPPKFLHAALKF	seqid_18
variant_8	FKKKFLKIPPPKFLHAALKF	seqid_19
variant_9	KWKKFLKIPPPKFLHAALKF	seqid_20
variant_10	RWKKFLKIPPPKFLHAALKF	seqid_21
variant_11	FWKKFLKIPPPKFLHAALKF	seqid_22
variant_12	KKKLLLKIPPPKFLHAALKF	seqid_23
variant_13	RKKLLLKIPPPKFLHAALKF	seqid_24
variant_14	FKKLLLKIPPPKFLHAALKF	seqid_25
variant_15	KWKLLLKIPPPKFLHAALKF	seqid_26
variant_16	RWKLLLKIPPPKFLHAALKF	seqid_27
variant_17	FWKLLLKIPPPKFLHAALKF	seqid_28
variant_18	KKKKLLKIPPPKFLHAALKF	seqid_29
variant_19	RKKKLLKIPPPKFLHAALKF	seqid_30
variant_20	FKKKLLKIPPPKFLHAALKF	seqid_31
variant_21	KWKKLLKIPPPKFLHAALKF	seqid_32
variant_22	RWKKLLKIPPPKFLHAALKF	seqid_33
variant_23	FWKKLLKIPPPKFLHAALKF	seqid_34
variant_24	KKKLFKKIPPPKFLHAALKF	seqid_35
variant_25	RKKLFKKIPPPKFLHAALKF	seqid_36
variant_26	FKKLFKKIPPPKFLHAALKF	seqid_37
variant_27	KWKLFKKIPPPKFLHAALKF	seqid_38
variant_28	RWKLFKKIPPPKFLHAALKF	seqid_39
variant_29	FWKLFKKIPPPKFLHAALKF	seqid_40
variant_30	KKKKFKKIPPPKFLHAALKF	seqid_41
variant_31	RKKKFKKIPPPKFLHAALKF	seqid_42
variant_32	FKKKFKKIPPPKFLHAALKF	seqid_43
variant_33	KWKKFKKIPPPKFLHAALKF	seqid_44
variant_34	RWKKFKKIPPPKFLHAALKF	seqid_45
variant_35	FWKKFKKIPPPKFLHAALKF	seqid_46
variant_36	KKKLLKKIPPPKFLHAALKF	seqid_47
variant_37	RKKLLKKIPPPKFLHAALKF	seqid_48
variant_38	FKKLLKKIPPPKFLHAALKF	seqid_49
variant_39	KWKLLKKIPPPKFLHAALKF	seqid_50
variant_40	RWKLLKKIPPPKFLHAALKF	seqid_51
variant_41	FWKLLKKIPPPKFLHAALKF	seqid_52
variant_42	KKKKLKKIPPPKFLHAALKF	seqid_53
variant_43	RKKKLKKIPPPKFLHAALKF	seqid_54
variant_44	FKKKLKKIPPPKFLHAALKF	seqid_55
variant_45	KWKKLKKIPPPKFLHAALKF	seqid_56
variant_46	RWKKLKKIPPPKFLHAALKF	seqid_57
variant_47	FWKKLKKIPPPKFLHAALKF	seqid_58
variant_48	KKKLFLKIPPKFLHAALKF	seqid_59
variant_49	RKKLFLKIPPKFLHAALKF	seqid_60

variant_50	FKKLFLKIPPKFLHAALKF	seqid_61
variant_51	KWKLFLKIPPKFLHAALKF	seqid_62
variant_52	RWKLFLKIPPKFLHAALKF	seqid_63
variant_53	FWKLFLKIPPKFLHAALKF	seqid_64
variant_54	KKKKFLKIPPKFLHAALKF	seqid_65
variant_55	RKKKFLKIPPKFLHAALKF	seqid_66
variant_56	FKKKFLKIPPKFLHAALKF	seqid_67
variant_57	KWKKFLKIPPKFLHAALKF	seqid_68
variant_58	RWKKFLKIPPKFLHAALKF	seqid_69
variant_59	FWKKFLKIPPKFLHAALKF	seqid_70
variant_60	KKKLLLKIPPKFLHAALKF	seqid_71
variant_61	RKKLLLKIPPKFLHAALKF	seqid_72
variant_62	FKKLLLKIPPKFLHAALKF	seqid_73
variant_63	KWKLLLKIPPKFLHAALKF	seqid_74
variant_64	RWKLLLKIPPKFLHAALKF	seqid_75
variant_65	FWKLLLKIPPKFLHAALKF	seqid_76
variant_66	KKKKLLKIPPKFLHAALKF	seqid_77
variant_67	RKKKLLKIPPKFLHAALKF	seqid_78
variant_68	FKKKLLKIPPKFLHAALKF	seqid_79
variant_69	KWKKLLKIPPKFLHAALKF	seqid_80
variant_70	RWKKLLKIPPKFLHAALKF	seqid_81
variant_71	FWKKLLKIPPKFLHAALKF	seqid_82
variant_72	KKKLFKKIPPKFLHAALKF	seqid_83
variant_73	RKKLFKKIPPKFLHAALKF	seqid_84
variant_74	FKKLFKKIPPKFLHAALKF	seqid_85
variant_75	KWKLFKKIPPKFLHAALKF	seqid_86
variant_76	RWKLFKKIPPKFLHAALKF	seqid_87
variant_77	FWKLFKKIPPKFLHAALKF	seqid_88
variant_78	KKKKFKKIPPKFLHAALKF	seqid_89
variant_79	RKKKFKKIPPKFLHAALKF	seqid_90
variant_80	FKKKFKKIPPKFLHAALKF	seqid_91
variant_81	KWKKFKKIPPKFLHAALKF	seqid_92
variant_82	RWKKFKKIPPKFLHAALKF	seqid_93
variant_83	FWKKFKKIPPKFLHAALKF	seqid_94
variant_84	KKKLLKKIPPKFLHAALKF	seqid_95
variant_85	RKKLLKKIPPKFLHAALKF	seqid_96
variant_86	FKKLLKKIPPKFLHAALKF	seqid_97
variant_87	KWKLLKKIPPKFLHAALKF	seqid_98
variant_88	RWKLLKKIPPKFLHAALKF	seqid_99
variant_89	FWKLLKKIPPKFLHAALKF	seqid_100
variant_90	KKKKLKKIPPKFLHAALKF	seqid_101
variant_91	RKKKLKKIPPKFLHAALKF	seqid_102
variant_92	FKKKLKKIPPKFLHAALKF	seqid_103
variant_93	KWKKLKKIPPKFLHAALKF	seqid_104
variant_94	RWKKLKKIPPKFLHAALKF	seqid_105
variant_95	FWKKLKKIPPKFLHAALKF	seqid_106
variant_144	KKKLFLKIPKFLHAALKF	seqid_107
variant_145	RKKLFLKIPKFLHAALKF	seqid_108
variant_146	FKKLFLKIPKFLHAALKF	seqid_109
variant_147	KWKLFLKIPKFLHAALKF	seqid_110

variant_148	RWKLFLKIPKFLHAALKF	seqid_111
variant_149	FWKLFLKIPKFLHAALKF	seqid_112
variant_150	KKKKFLKIPKFLHAALKF	seqid_113
variant_151	RKKKFLKIPKFLHAALKF	seqid_114
variant_152	FKKKFLKIPKFLHAALKF	seqid_115
variant_153	KWKKFLKIPKFLHAALKF	seqid_116
variant_154	RWKKFLKIPKFLHAALKF	seqid_117
variant_155	FWKKFLKIPKFLHAALKF	seqid_118
variant_156	KKKLLLKIPKFLHAALKF	seqid_119
variant_157	RKKLLLKIPKFLHAALKF	seqid_120
variant_158	FKKLLLKIPKFLHAALKF	seqid_121
variant_159	KWKLLLKIPKFLHAALKF	seqid_122
variant_160	RWKLLLKIPKFLHAALKF	seqid_123
variant_161	FWKLLLKIPKFLHAALKF	seqid_124
variant_162	KKKKLLKIPKFLHAALKF	seqid_125
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variant_165	KWKKLLKIPKFLHAALKF	seqid_128
variant_166	RWKKLLKIPKFLHAALKF	seqid_129
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variant_168	KKKLFKKIPKFLHAALKF	seqid_131
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variant_393	KWKKFLKIPPPKFLKAALKF	seqid_308
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3.1.2 Sequence motif $KX_2KX_3X_4X_5KIPX_{11}X_{12}KFLHX_8AKKF$ (SEQ ID NO: 10)

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variant_51	KWKKLLKIPKFLHAAKKF	seqid_9
variant_52	KLKLFLKIPKFLHAAKKF	seqid_4630
variant_53	KWKLFLKIPKFLHAAKKF	seqid_2413
variant_54	KLKKFLKIPKFLHAAKKF	seqid_4631
variant_55	KWKKFLKIPKFLHAAKKF	seqid_8
variant_56	KLKLLKKIPKFLHAAKKF	seqid_4632
variant_57	KWKLLKKIPKFLHAAKKF	seqid_2445
variant_58	KLKKLKKIPKFLHAAKKF	seqid_4633
variant_59	KWKKLKKIPKFLHAAKKF	seqid_2451
variant_60	KLKLFKKIPKFLHAAKKF	seqid_4634
variant_61	KWKLFKKIPKFLHAAKKF	seqid_7
variant_62	KLKKFKKIPKFLHAAKKF	seqid_4635
variant_63	KWKKFKKIPKFLHAAKKF	seqid_2439
variant_64	KLKLLLKIPPPKFLHVAKKF	seqid_4636
variant_65	KWKLLLKIPPPKFLHVAKKF	seqid_3475
variant_66	KLKKLLKIPPPKFLHVAKKF	seqid_4637
variant_67	KWKKLLKIPPPKFLHVAKKF	seqid_3481
variant_68	KLKLFLKIPPPKFLHVAKKF	seqid_4638
variant_69	KWKLFLKIPPPKFLHVAKKF	seqid_3463
variant_70	KLKKFLKIPPPKFLHVAKKF	seqid_4639
variant_71	KWKKFLKIPPPKFLHVAKKF	seqid_3469
variant_72	KLKLLKKIPPPKFLHVAKKF	seqid_4640
variant_73	KWKLLKKIPPPKFLHVAKKF	seqid_3499
variant_74	KLKKLKKIPPPKFLHVAKKF	seqid_4641
variant_75	KWKKLKKIPPPKFLHVAKKF	seqid_3505
variant_76	KLKLFKKIPPPKFLHVAKKF	seqid_4642
variant_77	KWKLFKKIPPPKFLHVAKKF	seqid_3487
variant_78	KLKKFKKIPPPKFLHVAKKF	seqid_4643

variant_79	KWKKFKKIPPPKFLHVAKKF	seqid_3493
variant_80	KLKLLLKIPPKFLHVAKKF	seqid_4644
variant_81	KWKLLLKIPPKFLHVAKKF	seqid_3523
variant_82	KLKKLLKIPPKFLHVAKKF	seqid_4645
variant_83	KWKKLLKIPPKFLHVAKKF	seqid_3529
variant_84	KLKLFLKIPPKFLHVAKKF	seqid_4646
variant_85	KWKLFLKIPPKFLHVAKKF	seqid_3511
variant_86	KLKKFLKIPPKFLHVAKKF	seqid_4647
variant_87	KWKKFLKIPPKFLHVAKKF	seqid_3517
variant_88	KLKLLKKIPPKFLHVAKKF	seqid_4648
variant_89	KWKLLKKIPPKFLHVAKKF	seqid_3547
variant_90	KLKKLKKIPPKFLHVAKKF	seqid_4649
variant_91	KWKKLKKIPPKFLHVAKKF	seqid_3553
variant_92	KLKLFKKIPPKFLHVAKKF	seqid_4650
variant_93	KWKLFKKIPPKFLHVAKKF	seqid_3535
variant_94	KLKKFKKIPPKFLHVAKKF	seqid_4651
variant_95	KWKKFKKIPPKFLHVAKKF	seqid_3541
variant_112	KLKLLLKIPKFLHVAKKF	seqid_4652
variant_113	KWKLLLKIPKFLHVAKKF	seqid_3571
variant_114	KLKKLLKIPKFLHVAKKF	seqid_4653
variant_115	KWKKLLKIPKFLHVAKKF	seqid_3577
variant_116	KLKLFLKIPKFLHVAKKF	seqid_4654
variant_117	KWKLFLKIPKFLHVAKKF	seqid_3559
variant_118	KLKKFLKIPKFLHVAKKF	seqid_4655
variant_119	KWKKFLKIPKFLHVAKKF	seqid_3565
variant_120	KLKLLKKIPKFLHVAKKF	seqid_4656
variant_121	KWKLLKKIPKFLHVAKKF	seqid_3595
variant_122	KLKKLKKIPKFLHVAKKF	seqid_4657
variant_123	KWKKLKKIPKFLHVAKKF	seqid_3601
variant_124	KLKLFKKIPKFLHVAKKF	seqid_4658
variant_125	KWKLFKKIPKFLHVAKKF	seqid_3583
variant_126	KLKKFKKIPKFLHVAKKF	seqid_4659
variant_127	KWKKFKKIPKFLHVAKKF	seqid_3589
variant_128	KLKLLLKIPPPKFLHLAKKF	seqid_4660
variant_129	KWKLLLKIPPPKFLHLAKKF	seqid_2901
variant_130	KLKKLLKIPPPKFLHLAKKF	seqid_4661
variant_131	KWKKLLKIPPPKFLHLAKKF	seqid_2907
variant_132	KLKLFLKIPPPKFLHLAKKF	seqid_4662

variant_133	KWKLFLKIPPPKFLHLAKKF	seqid_2889
variant_134	KLKKFLKIPPPKFLHLAKKF	seqid_4663
variant_135	KWKKFLKIPPPKFLHLAKKF	seqid_2895
variant_136	KLKLLKKIPPPKFLHLAKKF	seqid_4664
variant_137	KWKLLKKIPPPKFLHLAKKF	seqid_2925
variant_138	KLKKLKKIPPPKFLHLAKKF	seqid_4665
variant_139	KWKKLKKIPPPKFLHLAKKF	seqid_2931
variant_140	KLKLFKKIPPPKFLHLAKKF	seqid_4666
variant_141	KWKLFKKIPPPKFLHLAKKF	seqid_2913
variant_142	KLKKFKKIPPPKFLHLAKKF	seqid_4667
variant_143	KWKKFKKIPPPKFLHLAKKF	seqid_2919
variant_144	KLKLLLKIPPKFLHLAKKF	seqid_4668
variant_145	KWKLLLKIPPKFLHLAKKF	seqid_2949
variant_146	KLKKLLKIPPKFLHLAKKF	seqid_4669
variant_147	KWKKLLKIPPKFLHLAKKF	seqid_2955
variant_148	KLKLFLKIPPKFLHLAKKF	seqid_4670
variant_149	KWKLFLKIPPKFLHLAKKF	seqid_2937
variant_150	KLKKFLKIPPKFLHLAKKF	seqid_4671
variant_151	KWKKFLKIPPKFLHLAKKF	seqid_2943
variant_152	KLKLLKKIPPKFLHLAKKF	seqid_4672
variant_153	KWKLLKKIPPKFLHLAKKF	seqid_2973
variant_154	KLKKLKKIPPKFLHLAKKF	seqid_4673
variant_155	KWKKLKKIPPKFLHLAKKF	seqid_2979
variant_156	KLKLFKKIPPKFLHLAKKF	seqid_4674
variant_157	KWKLFKKIPPKFLHLAKKF	seqid_2961
variant_158	KLKKFKKIPPKFLHLAKKF	seqid_4675
variant_159	KWKKFKKIPPKFLHLAKKF	seqid_2967
variant_176	KLKLLLKIPKFLHLAKKF	seqid_4676
variant_177	KWKLLLKIPKFLHLAKKF	seqid_2997
variant_178	KLKKLLKIPKFLHLAKKF	seqid_4677
variant_179	KWKKLLKIPKFLHLAKKF	seqid_3003
variant_180	KLKLFLKIPKFLHLAKKF	seqid_4678
variant_181	KWKLFLKIPKFLHLAKKF	seqid_2985
variant_182	KLKKFLKIPKFLHLAKKF	seqid_4679
variant_183	KWKKFLKIPKFLHLAKKF	seqid_2991
variant_184	KLKLLKKIPKFLHLAKKF	seqid_4680
variant_185	KWKLLKKIPKFLHLAKKF	seqid_3019
variant_186	KLKKLKKIPKFLHLAKKF	seqid_4681

variant_187	KWKKLKKIPKFLHLAKKF	seqid_3025
variant_188	KLKLFKKIPKFLHLAKKF	seqid_4682
variant_189	KWKLFKKIPKFLHLAKKF	seqid_3
variant_190	KLKKFKKIPKFLHLAKKF	seqid_4683
variant_191	KWKKFKKIPKFLHLAKKF	seqid_3013
variant_192	KLKLLLKIPPPKFLHSAKKF	seqid_4684
variant_193	KWKLLLKIPPPKFLHSAKKF	seqid_4051
variant_194	KLKKLLKIPPPKFLHSAKKF	seqid_4685
variant_195	KWKKLLKIPPPKFLHSAKKF	seqid_4057
variant_196	KLKLFLKIPPPKFLHSAKKF	seqid_4686
variant_197	KWKLFLKIPPPKFLHSAKKF	seqid_4039
variant_198	KLKKFLKIPPPKFLHSAKKF	seqid_4687
variant_199	KWKKFLKIPPPKFLHSAKKF	seqid_4045
variant_200	KLKLLKKIPPPKFLHSAKKF	seqid_4688
variant_201	KWKLLKKIPPPKFLHSAKKF	seqid_4075
variant_202	KLKKLKKIPPPKFLHSAKKF	seqid_4689
variant_203	KWKKLKKIPPPKFLHSAKKF	seqid_4081
variant_204	KLKLFKKIPPPKFLHSAKKF	seqid_4690
variant_205	KWKLFKKIPPPKFLHSAKKF	seqid_4063
variant_206	KLKKFKKIPPPKFLHSAKKF	seqid_4691
variant_207	KWKKFKKIPPPKFLHSAKKF	seqid_4069
variant_208	KLKLLLKIPPKFLHSAKKF	seqid_4692
variant_209	KWKLLLKIPPKFLHSAKKF	seqid_4099
variant_210	KLKKLLKIPPKFLHSAKKF	seqid_4693
variant_211	KWKKLLKIPPKFLHSAKKF	seqid_4105
variant_212	KLKLFLKIPPKFLHSAKKF	seqid_4694
variant_213	KWKLFLKIPPKFLHSAKKF	seqid_4087
variant_214	KLKKFLKIPPKFLHSAKKF	seqid_4695
variant_215	KWKKFLKIPPKFLHSAKKF	seqid_4093
variant_216	KLKLLKKIPPKFLHSAKKF	seqid_4696
variant_217	KWKLLKKIPPKFLHSAKKF	seqid_4123
variant_218	KLKKLKKIPPKFLHSAKKF	seqid_4697
variant_219	KWKKLKKIPPKFLHSAKKF	seqid_4129
variant_220	KLKLFKKIPPKFLHSAKKF	seqid_4698
variant_221	KWKLFKKIPPKFLHSAKKF	seqid_4111
variant_222	KLKKFKKIPPKFLHSAKKF	seqid_4699
variant_223	KWKKFKKIPPKFLHSAKKF	seqid_4117
variant_240	KLKLLLKIPKFLHSAKKF	seqid_4700

variant_241	KWKLLLKIPKFLHSAKKF	seqid_4147
variant_242	KLKKLLKIPKFLHSAKKF	seqid_4701
variant_243	KWKKLLKIPKFLHSAKKF	seqid_4153
variant_244	KLKLFLKIPKFLHSAKKF	seqid_4702
variant_245	KWKLFLKIPKFLHSAKKF	seqid_4135
variant_246	KLKKFLKIPKFLHSAKKF	seqid_4703
variant_247	KWKKFLKIPKFLHSAKKF	seqid_4141
variant_248	KLKLLKKIPKFLHSAKKF	seqid_4704
variant_249	KWKLLKKIPKFLHSAKKF	seqid_4171
variant_250	KLKKLKKIPKFLHSAKKF	seqid_4705
variant_251	KWKKLKKIPKFLHSAKKF	seqid_4177
variant_252	KLKLFKKIPKFLHSAKKF	seqid_4706
variant_253	KWKLFKKIPKFLHSAKKF	seqid_4708
variant_254	KLKKFKKIPKFLHSAKKF	seqid_4707
variant_255	KWKKFKKIPKFLHSAKKF	seqid_4165

3.1.3 Sequence motif HEL1-HB-HEL2

As further non-limiting examples there may be mentioned:

Variant_1	KWKLFKKIGPKFLHLAKKF-NH_2	SEQ ID NO: 4709
Variant_2	KWKLFKKGPGKFLHSAKKF-NH_2	SEQ ID NO: 4710
Variant_3	KWKLFKKIEKVGQGPGKFLHSAKKFG-NH_2	SEQ ID NO: 4711
Variant_4	WKLFKKIPKFLHLAKKF-NH_2	SEQ ID NO: 4712
Variant_5	FKLFLLIPKFLHLAKKF-NH_2	SEQ ID NO: 4713
Variant_6	KWFKKIPKFLHLAKKF-NH_2	SEQ ID NO: 4714
Variant_7	WFKKIPKFLHLAKKF-NH_2	SEQ ID NO: 4715
Variant_8	KWKKIPKFLHLLKKF-NH_2	SEQ ID NO: 4716
Variant_9	WFKKIPKFLHLLKKF-NH_2	SEQ ID NO: 4717
Variant_10	KWKLFKKIPFLHLAKKF-NH_2	SEQ ID NO: 4718
Variant_11	KWKLFKKIPKFLHLAKK-NH_2	SEQ ID NO: 4719
Variant_12	KWKLFKKIPLHLAKKF-NH_2	SEQ ID NO: 4720
Variant_13	KWKLFKKIPKFLHLAK-NH_2	SEQ ID NO: 4721
Variant_14	KWKLFKKIPHLAKKF-NH_2	SEQ ID NO: 4722
Variant_15	KWKLFKKIPKFLHLA-NH_2	SEQ ID NO: 4723
Variant_16	KWKLFKKIPLAKKF-NH_2	SEQ ID NO: 4724
Variant_17	KWKLFKKIPKFLHL-NH_2	SEQ ID NO: 4725
Variant_18	FKKALHLFKPIKKFLKWK-NH_2	SEQ ID NO: 4726
Variant_19	KFLHLAKKFPKWKLFKKI-NH_2	SEQ ID NO: 4727
Variant_20	KWKKLLKKPLLKKLLKKL-NH_2	SEQ ID NO: 4728
Variant_21	KWKLKPLLKKLLKKL-NH_2	SEQ ID NO: 4729
Variant_22	KWKKLLKKPLKLKL-NH_2	SEQ ID NO: 4730
Variant_23	KLLKKPLKLKL-NH_2	SEQ ID NO: 4731

Also comprised by the present invention are the above sequences, wherein, however, the C-terminal end is not amidated and, consequently, such sequences, terminated by a carboxy group (in the form of its salt or as free acid).

3.1.4 Modifications of SEQ ID NO:3

In these modifications the peptide according to SEQ ID NO:3 is elongated by any arbitrary amino acid residue on its N-terminal and/or C-terminal end. Non-limiting examples of additional residues comprise Asp, Pro, Asn and Gly. If the N- and the C-terminal end is elongated simultaneously the additional N-terminal residue preferably is Pro or Gly and the corresponding C-terminal residue is Asp and Asn, respectively.

As further non-limiting examples there may be mentioned:

PKWKLFKKIPKFLHLAKKF- NH_2	(SEQ ID NO: 4732)
KWKLFKKIPKFLHLAKKFD- NH_2	(SEQ ID NO: 4733)
PKWKLFKKIPKFLHLAKKFD- NH_2	(SEQ ID NO: 4734)
GKWKLFKKIPKFLHLAKKF- NH_2	(SEQ ID NO: 4735)
KWKLFKKIPKFLHLAKKFN- NH_2	(SEQ ID NO: 4736)
GKWKLFKKIPKFLHLAKKFN- NH_2	(SEQ ID NO: 4737)
PKWKLFKKIPKFLHLAKKFN- NH_2	(SEQ ID NO: 4738)

Also comprised are the above sequences wherein the C-terminal end is not amidated, and, consequently, sequences which are terminated by a carboxy group (in the form of its salt or free acid).

3.2 Further modifications of peptides according to the invention

Besides the peptide sequences depicted above, preference is also given to functional equivalents, functional derivatives and salts of this sequence.

According to the invention, “functional equivalents” is also understood in particular as meaning mutants which, in at least one sequence position of the abovementioned amino acid sequences, have an amino acid other than the one specifically specified, but nevertheless have the property of preventing, inhibiting and treating dandruff. “Functional equivalents” thus include the mutants obtainable by one or more amino acid additions, substitutions, deletions and/or inversions, where said changes can occur in any sequence position provided they lead to a mutant with the profile of properties according to the invention. Functional equivalence exists in particular also when the reactivity patterns between mutant and unmodified polypeptide are in qualitative agreement.

“Functional equivalents” in the above sense are also “precursors” of the polypeptides described and also “functional derivatives” and “salts” of the polypeptides.

“Precursors” here are natural or synthetic precursors of the polypeptides with or without the desired biological activity.

Examples of suitable amino acid substitutions are given in the table below:

Original residue	Examples of substitution
Ala	Ser
Arg	Lys
Asn	Gln; His
Asp	Glu
Cys	Ser
Gln	Asn
Glu	Asp
Gly	Pro
His	Asn ; Gln
Ile	Leu; Val
Leu	Ile; Val
Lys	Arg ; Gln ; Glu
Met	Leu ; Ile
Phe	Met ; Leu ; Tyr
Ser	Thr
Thr	Ser
Trp	Tyr
Tyr	Trp ; Phe
Val	Ile; Leu

The expression “salts” is understood as meaning both salts of carboxyl groups and also acid addition salts of amino groups of the peptide molecules according to the invention. Salts of carboxyl groups can be produced in a manner known per se and comprise inorganic salts, such as, for example, sodium, calcium, ammonium, iron and zinc salts, and also salts with organic bases, such as, for example, amines, such as triethanolamine, arginine, lysine, piperidine and the like. Acid addition salts, such as, for example, salts with mineral acids, such as hydrochloric acid or sulfuric acid and salts with organic acids, such as acetic acid and oxalic acid, are likewise provided by the invention.

“Functional derivatives” (or “derivatives”) of polypeptides according to the invention can likewise be produced on functional amino acid side groups or on their N or C terminal end using known techniques. Such derivatives comprise, for example, aliphatic esters of carboxylic acid groups, amides of carboxylic acid groups obtainable by reaction with ammonia or with a primary or secondary amine; N-acyl derivatives of free amino groups, prepared by reaction with acyl groups, or O-acyl derivatives of free hydroxy groups, prepared by reaction with acyl groups. Furthermore, 1 to 5, such as, for example, 2, 3 or 4, arbitrary D- or L-amino acid residues can additionally be covalently (peptidically) bonded at the N and/or C terminal end;or 1 to 5, as for example 1, 2, 3 or 4 residues may be missing at the N-terminal and/or C-terminal end.

Non-limiting examples of additional N-terminal and/or C-terminal residues comprise Asp, Pro, Asn, Gly. In case the N-terminal end and the C-terminal end are simultaneously elongated, the N-terminal residue may preferably be Pro or Gly and the corresponding C-terminal residue may preferably be Asp and Asn, respectively.

Through variation of the amino acid sequence of the described antimicrobial peptides and fusing with additional protein or peptide sequences, it is possible to generate structures which specifically recognize certain surfaces, e.g. skin, nails, hair, or are recognized and bonded by these surfaces or the receptors present therein.

Consequently, it is possible to more effectively bring the described antimicrobial peptides to the desired site of action, and/or to improve their absorption. Through coupling and/or fusion of binding proteins to the described antimicrobial peptides, protein-peptide fusion products resulting therefrom would be steered in a more targeted manner to appropriate sites of action, e.g. microorganism surfaces or body compartments, and/or reside longer at these sites, resulting in an extended and improved peptide effect. Furthermore, through variation of the amino acid sequence of the described antimicrobial peptides and/or fusion with additional protein or peptide sequences, it is possible to steer the peptides to desired sites of action in a targeted manner in order to thus achieve, for example, higher peptide specificity, lower peptide consumption or peptide dose, and also more rapid or greater peptide effect.

3.3 Nucleic acids, expression constructs, vectors and microorganisms according to the invention

3.3.1 Nucleic acids:

The invention furthermore comprises the nucleic acid molecules coding for the peptides and fusion peptides used according to the invention.

All of the nucleic acid sequences mentioned herein (single- and double-strand DNA and RNA sequences, such as, for example, cDNA and mRNA) can be prepared in a manner known per se by chemical synthesis from the nucleotide building blocks, such as, for example, by fragment condensation of individual overlapping, complementary nucleic acid building blocks of the double helix. The chemical synthesis of oligonucleotides can take place, for example, in a known manner according to the phosphoamidite method (Voet, Voet, 2nd edition, Wiley Press New York, pages 896–897). The annealing of synthetic oligonucleotides and filling in of gaps with the aid of the Klenow fragment of DNA polymerase, and ligation reactions and also general cloning methods are described in Sambrook et al. (1989), Molecular Cloning: A laboratory manual, Cold Spring Harbor

Laboratory Press.

The invention provides both isolated nucleic acid molecules which code for polypeptides or proteins according to the invention, or biologically active sections thereof, and to nucleic acid fragments which can be used, for example, as hybridization probes or primers for the identification or amplification of coding nucleic acids according to the invention.

The nucleic acid molecules according to the invention can additionally comprise untranslated sequences of the 3' and/or 5' end of the coding region of the gene.

An "isolated" nucleic acid molecule is separated off from other nucleic acid molecules which are present in the natural source of the nucleic acid and can, moreover, be essentially free of other cellular material or culture medium if produced by recombinant techniques, or be free of chemical precursors or other chemicals if chemically synthesized.

A nucleic acid molecule according to the invention can be isolated by means of standard molecular biology techniques and the sequence information provided according to the invention. For example, cDNA can be isolated from a suitable cDNA library by using one of the specifically disclosed complete sequences or a section thereof as hybridization probe and standard hybridization techniques (as described, for example, in Sambrook, J., Fritsch, E.F. and Maniatis, T. Molecular Cloning: A Laboratory Manual. 2nd edition, Cold Spring Harbor Laboratory, Cold Spring Harbor Laboratory Press, Cold Spring Harbor, NY, 1989). Moreover, a nucleic acid molecule comprising one of the disclosed sequences or a section thereof can be isolated by polymerase chain reaction using the oligonucleotide primers generated on the basis of this sequence. The nucleic acid amplified in this way can be cloned into a suitable vector and characterized by DNA sequence analysis. The oligonucleotides according to the invention can also be prepared by standard synthesis methods, e.g. using an automatic DNA synthesizer.

The invention furthermore comprises the nucleic acid molecules complementary to the specifically described nucleotide sequences, or a section thereof.

The nucleotide sequences according to the invention allow the generation of probes and primers which can be used for the identification and/or cloning of homologous sequences in other cell types and organisms. Such probes and primers usually comprise a nucleotide sequence range which, under stringent conditions, hybridizes to at least about 12, preferably at least about 25, such as, for example, about 40, 50 or 75, consecutive nucleotides of a sense strand of a nucleic acid sequence according to the invention or of a corresponding antisense strand.

Also comprised according to the invention are those nucleic acid sequences which comprise so-called silent mutations or which are modified, compared to a specifically specified sequence, according to the codon usage of a specific source organism or host

organism, as are naturally occurring variants, such as, for example, splice variants or allelic variants, thereof. Likewise provided are sequences obtainable by conservative nucleotide substitutions (i.e. the amino acid in question is replaced by an amino acid of identical charge, size, polarity and/or solubility).

The invention also provides the molecules derived from the specifically disclosed nucleic acids by sequence polymorphisms. These genetic polymorphisms can exist between individuals within a population, owing to natural variation. These natural variations usually bring about a variance of from 1 to 5% in the nucleotide sequence of a gene.

Furthermore, the invention also comprises nucleic acid sequences which hybridize with the abovementioned coding sequences or are complementary thereto. These polynucleotides can be found when screening genomic or cDNA libraries and, if appropriate, be replicated therefrom by means of PCR using suitable primers and then isolated using suitable probes, for example. A further possibility is the transformation of suitable microorganisms with polynucleotides or vectors according to the invention, replication of the microorganisms and thus of the polynucleotides and subsequent isolation thereof. Moreover, polynucleotides according to the invention can also be synthesized by a chemical method.

The property of being able to "hybridize" to polynucleotides is understood as meaning the ability of a poly- or oligonucleotide, to bind, under stringent conditions, to a virtually complementary sequence while nonspecific bonds between noncomplementary partners do not take place under these conditions. For this purpose, the sequences should be 70-100%, preferably 90-100%, complementary. The property of complementary sequences of being able to bind specifically to one another is utilized, for example, in the Northern or Southern blot technique or during primer binding in PCR or RT-PCR. Usually, for this purpose, oligonucleotides above a length of 30 base pairs are used. Stringent conditions are understood as meaning, for example in the Northern blot technique, the use of a 50-70°C, preferably 60-65°C hot washing solution, for example 0.1 x SSC buffer with 0.1% SDS (20 x SSC: 3 M NaCl, 0.3 M Na citrate, pH 7.0) for the elution of nonspecific hybridized cDNA probes or oligonucleotides. As mentioned above, in this process, only highly complementary nucleic acids remain bound to one another. Establishing stringent conditions is known to the person skilled in the art and is described, for example, in Ausubel et al., Current Protocols in Molecular Biology, John Wiley & Sons, N.Y. (1989), 6.3.1-6.3.6.

3.3.2 Expression constructs and vectors:

The invention moreover provides expression constructs comprising, under the genetic control of regulatory nucleic acid sequences, a nucleic acid sequence coding for a polypeptide according to the invention, and also vectors comprising at least one of these

expression constructs. Preferably, such constructs according to the invention comprise a promoter 5' upstream of the particular coding sequence and a terminator sequence 3' downstream and also, if appropriate, further customary regulatory elements, in each case operatively linked to the coding sequence. An "operative linkage" is understood as meaning the sequential arrangement of promoter, coding sequence, terminator and, if appropriate further regulatory elements such that each of the regulatory elements can perform its function during the expression of the coding sequence as intended. Examples of operatively linkable sequences are targeting sequences and also enhancers, polyadenylation signals and the like. Further regulatory elements comprise selectable markers, amplification signals, replication origins and the like. Suitable regulatory sequences are described, for example, in Goeddel, Gene Expression Technology: Methods in Enzymology 185, Academic Press, San Diego, CA (1990).

In addition to the artificial regulatory sequences, the natural regulatory sequence may still be present upstream of the actual structural gene. Through genetic modification, this natural regulation can, if appropriate, be switched off and the expression of the genes increased or decreased. However, the gene construct can also be simpler in design, i.e. no additional regulatory signals are inserted upstream of the structure gene and the natural promoter together with its regulation is not removed. Instead, the natural regulatory sequence is mutated such that regulation no longer takes place and gene expression is increased or reduced. The nucleic acid sequences may be present in one or more copies in the gene construct.

Examples of promoters that can be used are: cos, tac, trp, tet, trp-tet, lpp, lac, lpp-lac, laclq, T7, T5, T3, gal, trc, ara, SP6, lambda-PR or in the lambda-PL promoter, which are advantageously used in Gram-negative bacteria; and also the Gram-positive promoters amy and SPO2, the yeast promoters ADC1, MFa, AC, P-60, CYC1, GAPDH or the plant promoters CaMV/35S, SSU, OCS, lib4, usp, STLS1, B33, not or the ubiquitin or phaseolin promoter. Particular preference is given to using inducible promoters, such as, for example, photo- and in particular temperature-inducible promoters, such as the P_rP_l promoter. In principle, all natural promoters with their regulatory sequences can be used. Moreover, synthetic promoters can also be used advantageously.

The specified regulatory sequences are intended to permit the targeted expression of the nucleic acid sequences and protein expression. Depending on the host organism, this may mean, for example, that the gene is expressed or overexpressed only after induction, or that it is immediately expressed and/or overexpressed.

The regulatory sequences or factors can here preferably have a beneficial effect on, and thereby increase or decrease, the expression. Thus, the regulatory elements can advantageously be enhanced at the transcriptional level by using strong transcription signals

such as promoters and/or "enhancers". However, in addition, it is also possible to enhance translation by, for example, improving the stability of the mRNA.

The expression cassette is prepared by fusing a suitable promoter with a suitable coding nucleotide sequence and a terminator signal or polyadenylation signal. For this purpose, customary recombinant and cloning techniques are used, as are described, for example, in T. Maniatis, E.F. Fritsch and J. Sambrook, Molecular Cloning: A Laboratory Manual, Cold Spring Harbor Laboratory, Cold Spring Harbor, NY (1989) and in T.J. Silhavy, M.L. Berman and L.W. Enquist, Experiments with Gene Fusions, Cold Spring Harbor Laboratory, Cold Spring Harbor, NY (1984) and in Ausubel, F.M. et al., Current Protocols in Molecular Biology, Greene Publishing Assoc. and Wiley Interscience (1987).

For expression, the recombinant nucleic acid construct or gene construct is advantageously inserted, in a suitable host organism, into a host-specific vector which facilitates optimal expression of the genes in the host. Vectors are well known to the person skilled in the art and can be found, for example, in “Cloning Vectors” (Pouwels P. H. et al., ed., Elsevier, Amsterdam-New York-Oxford, 1985). Apart from plasmids, vectors are also to be understood as meaning all other vectors known to the person skilled in the art, such as, for example, phages, viruses, such as SV40, CMV, baculovirus and adenovirus, transposons, IS elements, phasmids, cosmids, and linear or circular DNA. These vectors can be replicated autonomously in the host organism or be replicated chromosomally.

3.3.3 Examples of suitable expression vectors which may be mentioned are:

Customary fusion expression vectors, such as pGEX (Pharmacia Biotech Inc; Smith, D.B. and Johnson, K.S. (1988) Gene 67:31-40), pMAL (New England Biolabs, Beverly, MA) and pRIT 5 (Pharmacia, Piscataway, NJ), in which glutathione-S-transferase (GST), maltose E binding protein or protein A is fused to the recombinant target protein.

Non-fusion protein expression vectors such as pTrc (Amann et al., (1988) Gene 69:301-315) and pET 11d (Studier et al. Gene Expression Technology: Methods in Enzymology 185, Academic Press, San Diego, California (1990) 60-89).

Yeast expression vectors for expression in the yeast *S. cerevisiae*, such as pYepSec1 (Baldari et al., (1987) Embo J. 6:229-234), pMFa (Kurjan and Herskowitz (1982) Cell 30:933-943), pJRY88 (Schultz et al., (1987) Gene 54:113-123) and pYES2 (Invitrogen Corporation, San Diego, CA). Vectors and methods for the construction of vectors which are suitable for use in other fungi, such as filamentous fungi, comprise those which are described in detail in: van den Hondel, C.A.M.J.J. & Punt, P.J. (1991) “Gene transfer systems and vector development for filamentous fungi, in: Applied Molecular Genetics of Fungi, J.F. Peberdy et al., eds., S. 1-28, Cambridge University Press: Cambridge.

Baculovirus vectors which are available for the expression of proteins in cultivated insect cells (for example Sf9 cells) comprise the pAc series (Smith et al., (1983) Mol. Cell Biol. 3:2156-2165) and the pVL series (Lucklow and Summers, (1989) Virology 170:31-39).

Plant expression vectors, such as those described in detail in: Becker, D., Kemper, E., Schell, J. and Masterson, R. (1992) "New plant binary vectors with selectable markers located proximal to the left border", Plant Mol. Biol. 20:1195-1197; and Bevan, M.W. (1984) "Binary Agrobacterium vectors for plant transformation", Nucl. Acids Res. 12:8711-8721.

Mammal expression vectors, such as pCDM8 (Seed, B. (1987) Nature 329:840) and pMT2PC (Kaufman et al. (1987) EMBO J. 6:187-195).

Further suitable expression systems for prokaryotic and eukaryotic cells are described in chapter 16 and 17 by Sambrook, J., Fritsch, E.F. and Maniatis, T., Molecular cloning: A Laboratory Manual, 2nd edition, Cold Spring Harbor Laboratory, Cold Spring Harbor Laboratory Press, Cold Spring Harbor, NY, 1989.

3.3.4 Recombinant microorganisms:

With the aid of the vectors according to the invention it is possible to prepare recombinant microorganisms which are transformed, for example, with at least one vector according to the invention and can be used for producing the polypeptides according to the invention. The abovedescribed recombinant constructs according to the invention are advantageously introduced into a suitable host system and expressed. In this context, preference is given to using customary cloning and transfection methods known to the person skilled in the art such as, for example, coprecipitation, protoplast fusion, electroporation, retroviral transfection and the like, in order to express said nucleic acids in the particular expression system. Suitable systems are described, for example, in Current Protocols in Molecular Biology, F. Ausubel et al., ed., Wiley Interscience, New York 1997, or Sambrook et al., Molecular Cloning: A Laboratory Manual. 2nd edition, Cold Spring Harbor Laboratory, Cold Spring Harbor Laboratory Press, Cold Spring Harbor, NY, 1989.

According to the invention, it is also possible to prepare homologously recombinant microorganisms. For this, a vector is prepared which comprises at least one section of a gene according to the invention or of a coding sequence, into which, if appropriate, at least one amino acid deletion, addition or substitution has been introduced in order to modify, for example to functionally disrupt, the sequence according to the invention ("knockout" vector). The introduced sequence may, for example, also be a homolog from a related microorganism or be derived from a mammalian, yeast or insect source. Alternatively, the vector used for homologous recombination may be designed such that the endogenous gene

is mutated or otherwise modified upon homologous recombination, while still encoding the functional protein (for example the upstream regulatory region may be modified in such a way that, as a result, the expression of the endogenous protein is modified). The modified section of the gene according to the invention is in the homologous recombination vector. The construction of suitable vectors for homologous recombination is described, for example, in Thomas, K.R. and Capecchi, M.R. (1987) Cell 51:503.

Suitable host organisms are in principle all organisms which permit an expression of the nucleic acids according to the invention, their allelic variants, their functional equivalents or derivatives. Host organisms are to be understood as meaning, for example, bacteria, fungi, yeasts, plant or animal cells. Preferred organisms are bacteria, such as those of the genera *Escherichia*, such as, for example, *Escherichia coli*, *Streptomyces, Bacillus* or *Pseudomonas*, eukaryotic microorganisms, such as *Saccharomyces cerevisiae*, *Aspergillus*, higher eukaryotic cells from animals or plants, for example Sf9 or CHO cells.

The selection of successfully transformed organisms can take place by marker genes which are likewise present in the vector or in the expression cassette. Examples of such marker genes are genes for antibiotic resistance and for enzymes which catalyze a color-imparting reaction, which results in staining of the transformed cell. These can then be selected by automatic cell sorting. Microorganisms that have been successfully transformed with a vector and carry an appropriate antibiotic resistance gene (e.g. G418 or hygromycin) can be selected by appropriate antibiotic-comprising media or nutrient media. Marker proteins present on the cell surface can be used for selection by means of affinity chromatography.

As alternative preparation methods for sequences according to the invention, reference may be made to the chemical synthesis methods known per se, such as solid-phase synthesis or liquid-phase synthesis.

3.4 Recombinant preparation of the polypeptides:

The peptides used according to the invention can be prepared using recombinant techniques in a manner known per se, where a microorganism producing polypeptides is cultivated, if appropriate the expression of the polypeptides is induced and these are isolated from the culture. The polypeptides can also be produced on an industrial scale in this way if desired.

The recombinant microorganism can be cultured and fermented by known methods. Bacteria can be replicated, for example, in TB or LB medium and at a temperature of from 20 to 40°C and a pH of from 6 to 9. Suitable culturing conditions are described in detail, for example, in T. Maniatis, E.F. Fritsch and J. Sambrook, Molecular Cloning: A Laboratory

Manual, Cold Spring Harbor Laboratory, Cold Spring Harbor, NY (1989).

If the polypeptides are not secreted into the culture medium, the cells are then disrupted and the product is obtained from the lysate by known protein isolation methods. The cells may alternatively be disrupted by high-frequency ultrasound, by high pressure, such as, for example, in a French pressure cell, by osmolysis, by the action of detergents, lytic enzymes or organic solvents, by homogenizers or by a combination of two or more of the methods listed.

The polypeptides can be purified by known chromatographic methods, such as molecular sieve chromatography (gel filtration), such as Q-Sepharose* chromatography, ion exchange chromatography and hydrophobic chromatography, and by other customary methods, such as ultrafiltration, crystallization, salting out, dialysis and native gel electrophoresis. Suitable methods are described, for example, in Cooper, F. G., Biochemische Arbeitsmethoden, Verlag Walter de Gruyter, Berlin, New York or in Scopes, R., Protein Purification, Springer Verlag, New York, Heidelberg, Berlin.

It is particularly advantageous for isolation of the recombinant protein to use vector systems or oligonucleotides which extend the cDNA by specific nucleotide sequences and thus code for modified polypeptides or fusion proteins which serve, for example, for simpler purification. Suitable modifications of this type are, for example, so-called "tags" which act as anchors, such as, for example, the modification known as hexa-histidine anchor, or epitopes which can be recognized as antigens of antibodies (described, for example, in Harlow, E. and Lane, D., 1988, Antibodies: A Laboratory Manual. Cold Spring Harbor (N.Y.) Press). These anchors can be used to attach the proteins to a solid support, such as, for example, a polymer matrix which can, for example, be packed in a chromatography column, or can be used on a microtiter plate or another support.

These anchors can at the same time also be used for recognizing the proteins. Moreover, for recognizing the proteins, it is also possible to use customary markers, such as fluorescent dyes, enzyme markers which form a detectable reaction product following reaction with a substrate, or radioactive labels, alone or in combination with the anchors for derivatizing the proteins.

3.5 Embodiments of compositions according to the invention

3.5.1 General fields of application and formulations

The antimicrobial peptides according to the invention have a broad field of application in human cosmetics, in particular skincare and haircare, and also animal care, but can also be used pharmacologically.

* trademark

The cosmetic compositions according to the invention are in particular skin cosmetic, nail cosmetic, hair cosmetic, dermatological, hygiene or pharmaceutical compositions. In particular, the antimicrobial peptides according to the invention are used for skin cosmetics, nail cosmetics and/or hair cosmetics or as oral care compositions. They permit the growth inhibition of undesired microorganisms which cause damage to hair and to skin, e.g. dandruff formation, to nails, e.g. increased nail brittleness, thickened nails, or which cause itching or burning.

According to a further embodiment, hair cosmetic or skin cosmetic preparations according to the invention serve in particular for the care or the protection of the skin or of the hair and are in the form of an emulsion, a dispersion, a suspension, an aqueous surfactant preparation, a milk, a lotion, a cream, a balsam, an ointment, a gel, granules, a powder, a stick preparation, such as, for example, a lipstick, a foam, an aerosol or a spray. Such formulations are highly suited to topical preparations. Suitable emulsions are oil-in-water emulsions and water-in-oil emulsions or microemulsions.

As a rule, the hair cosmetic or skin cosmetic preparation is used for application to the skin (topically) or to the hair. In this connection, "topical preparations" are to be understood as meaning those preparations which are suitable for applying the active ingredients to the skin in fine distribution. Of suitability for this purpose are, for example, aqueous and aqueous-alcoholic solutions, sprays, foams, foam aerosols, ointments, aqueous gels, emulsions of the O/W or W/O type, microemulsions or cosmetic stick preparations.

According to one embodiment of the cosmetic composition according to the invention, it comprises a carrier. Preferred carriers are water, a gas, a water-based liquid, an oil, a gel, an emulsion or microemulsion, a dispersion or a mixture thereof. Said carriers exhibit good skin compatibility. Aqueous gels, emulsions or microemulsions are particularly advantageous for topical preparations.

Besides customary additives and auxiliaries, the cosmetic compositions according to the invention can additionally comprise cosmetically and/or dermatologically active ingredients.

Examples of suitable further active ingredients are:

Suitable cosmetically and/or dermatologically active ingredients are, for example, coloring active ingredients, skin and hair pigmentation agents, tinting agents, tanning agents, bleaches, keratin-hardening substances, antimicrobial active ingredients, photofilter active ingredients, repellent active ingredients, hyperemic substances, keratolytically and keratoplastically effective substances, antidandruff active ingredients, antiphlogistics,

keratinizing substances, antioxidative active ingredients and active ingredients that act as free-radical scavengers, substances which moisturize the skin or keep the skin moisturized, refatting active ingredients, antierythimatous or antiallergic active ingredients, branched fatty acids, such as 18-methyleicosanoic acid, and mixtures thereof.

Artificially skin-tanning active ingredients which are suitable for tanning the skin without natural or artificial irradiation with UV rays; these are, for example, dihydroxyacetone, alloxan and walnut shell extract. Suitable keratin-hardening substances are generally active ingredients which can also be used as antiperspirants, such as, for example, potassium aluminum sulfate, aluminum hydroxychloride, aluminum lactate, etc.

Antimicrobial active ingredients which are used in order to destroy microorganisms or to inhibit their growth. They thus serve both as preservatives and as deodorizing substance which reduces the formation or the intensity of body odor. These include, for example, customary preservatives known to the person skilled in the art, such as p-hydroxybenzoic acid esters, imidazolinylurea, formaldehyde, sorbic acid, benzoic acid, salicylic acid etc. Such deodorizing substances are, for example, zinc ricinoleate, triclosan, undecylenic acid alkylolamides, triethyl citrate, chlorhexidin etc.

Suitable auxiliaries and additives for the production of hair cosmetic, nail cosmetic or skin cosmetic preparations are familiar to the person skilled in the art and can be found in handbooks on cosmetics, for example Schrader, Grundlagen and Rezepturen der Kosmetika [Fundamentals and formulations of cosmetics], Hüthig Verlag, Heidelberg, 1989, ISBN 3-7785-1491-1. The auxiliaries and additives are preferably cosmetically and/or pharmaceutically acceptable auxiliaries. Of pharmaceutical acceptability are the auxiliaries known for use in the field of pharmacy, food technology and related fields, in particular those listed in the relevant pharmacopeia (e.g. DAB, Ph. Eur., BP, NF), and other auxiliaries whose properties do not preclude a physiological application.

Suitable auxiliaries may be: lubricants, wetting agents, emulsifying and suspending agents, preservatives, antioxidants, antiirritatives, chelating agents, emulsion stabilizers, film formers, gel formers, odor masking agents, hydrocolloids, solvents, solubility promoters, neutralizers, permeation accelerators, pigments, quaternary ammonium compounds, refatting and superfatting agents, ointment, cream or oil base substances, silicone derivatives, stabilizers, sterilants, propellants, drying agents, opacifiers, thickeners, waxes, softeners, white oil. An embodiment in this regard is based on technical knowledge, as presented, for example, in Fiedler, H. P. Lexikon der Hilfsstoffe für Pharmazie, Kosmetik und angrenzende Gebiete [Lexicon of auxiliaries for pharmacy, cosmetics and related fields], 4th edition, Aulendorf: ECV-Editio-Kantor-Verlag, 1996.

Further suitable additives are selected from perfume oils, hair polymers, hair and skin

conditioners, graft polymers, water-soluble or dispersible silicone-containing polymers, photoprotective agents, bleaches, care agents, colorants, tinting agents, tanning agents, dyes, consistency regulators, humectants, refatting agents, collagen, protein hydrolyzates, lipids, antioxidants, antifoams, antistatics, emollients, softeners, peroxide decomposers.

Specific examples of suitable auxiliaries and additives are (these may also be covalently or noncovalently bonded to the peptides according to the invention):

(1) Antioxidants selected from amino acids (e.g. glycine, histidine, tyrosine, tryptophan) and derivatives thereof, imidazoles (e.g. urocanic acid) and derivatives thereof, peptides such as D,L-carnosine, D-carnosine, L-carnosine and derivatives thereof (e.g. anserine), carotinoids, carotenes (e.g. β-carotene, lycopene) and derivatives thereof, chlorogenic acid and derivatives thereof, lipoic acid and derivatives thereof (e.g. dihydrolipoic acid), aurothioglucose, propylthiouracil and other thiols (e.g. thiorodoxin, glutathione, cysteine, cystine, cystamine and the glycosyl, N-acetyl, methyl, ethyl, propyl, amyl, butyl, and lauryl, palmitoyl, oleyl, γ-linoleyl, cholesteryl and glyceryl esters thereof) and salts thereof, dilauryl thiodipropionate, distearyl thiodipropionate, thiodipropionic acid and derivatives thereof (esters, ethers, peptides, lipids, nucleotides, nucleosides and salts), and sulfoximine compounds (e.g. buthionine sulfoximines, homocysteine sulfoximines, buthionine sulfones, penta-, hexa-, heptathionine sulfoximine), in particular in very low tolerated doses (e.g. pmol to μmol/kg range), also (metal) chelating agents (e.g. α–hydroxy fatty acids, palmitic acid, phytic acid, lactoferrin), α-hydroxy acids (e.g. citric acid, lactic acid, malic acid), humic acid, bile acid, bile extracts, bilirubin, biliverdin, EDTA and derivatives thereof, unsaturated fatty acids and derivatives thereof (e.g. γ–linolenic acid, linoleic acid, oleic acid), folic acid and derivatives thereof, ubiquinone and ubiquinol and derivatives thereof, vitamin C and derivatives thereof (e.g. sodium ascorbate, ascorbyl palmitate, Mg ascorbyl phosphate, ascorbyl acetate), tocopherol and derivatives (e.g. vitamin E acetate, tocotrienol), vitamin A and derivatives (vitamin A palmitate), and coniferyl benzoate of benzoin resin, rutinic acid and derivatives thereof, α-glycosylrutin, ferulic acid, furfurylideneglucitol, carnosine, butylhydroxytoluene, butylhydroxyanisole, nordihydroguaiacic acid, nordihydroguaiaretic acid, trihydroxybutyrophenone, uric acid and derivatives thereof, mannose and derivatives thereof, zinc and derivatives thereof (e.g. ZnO, $ZnSO_4$), selenium and derivatives thereof (e.g. selenomethionine), stilbenes and derivatives thereof (e.g. stilbene oxide, trans-stilbene oxide).

(2) Peroxide decomposers, i.e. compounds which are able to decompose peroxides,

particularly preferably lipid peroxides. These are to be understood as including organic substances, such as, for example, pyridine-2-thiol-3-carboxylic acid, 2-methoxy-pyrimidinolcarboxylic acids, 2-methoxypyridinecarboxylic acids, 2-dimethylamino-pyrimidinolcarboxylic acids, 2-dimethylaminopyridinecarboxylic acids.

(3) Thickeners, such as crosslinked polyacrylic acids and derivatives thereof, polysaccharides and derivatives thereof, such as xanthan gum, agar agar, alginates or tyloses, cellulose derivatives, e.g. carboxymethylcellulose or hydroxycarboxymethylcellulose, fatty alcohols, monoglycerides and fatty acids, polyvinyl alcohol and polyvinylpyrrolidone. Preference is given to using nonionic thickeners.

(4) Preservatives which are listed below with their E numbers

E 200	Sorbic acid	E 227	Calcium hydrogensulfite
E 201	Sodium sorbate	E 228	Potassium hydrogensulfite
E 202	Potassium sorbate	E 230	Biphenyl (diphenyl)
E 203	Calcium sorbate	E 231	Orthophenylphenol
E 210	Benzoic acid	E 232	Sodium orthophenylphenoxide
E 211	Sodium benzoate	E 233	Thiabendazole
E 212	Potassium benzoate	E 235	Natamycin
E 213	Calcium benzoate	E 236	Formic acid
E 214	Ethyl p-hydroxybenzoate	E 237	Sodium formate
E 215	Ethyl p-hydroxybenzoate Na salt	E 238	Calcium formate
E 216	n-Propyl p-hydroxybenzoate	E 239	Hexamethylenetetramine
E 217	n-Propyl p-hydroxybenzoate Na salt	E 249	Potassium nitrite
E 218	Methyl p-hydroxybenzoate	E 250	Sodium nitrite
E 219	Methyl p-hydroxybenzoate Na salt	E 251	Sodium nitrate
E 220	Sulfur dioxide	E 252	Potassium nitrate
E 221	Sodium sulfite	E 280	Propionic acid
E 222	Sodium hydrogen sulfite	E 281	Sodium propionate
E 223	Sodium disulfite	E 282	Calcium propionate
E 224	Potassium disulfite	E 283	Potassium propionate
E 226	Calcium sulfite	E 290	Carbon dioxide

Also suitable according to the invention are preservatives or preservative auxiliaries customary in cosmetics, such as dibromodicyanobutane (2-bromo-2-bromomethyl-glutarodinitrile), 3-iodo-2-propynyl butylcarbamate, 2-bromo-2-nitropropane-1,3-diol, imidazolidinylurea, 5-chloro-2-methyl-4-isothiazolin-3-one, 2-chloroacetamide, benzalkonium chloride, benzyl alcohol, formaldehyde donors.

Also suitable as preservatives are phenyl hydroxyalkyl ethers, in particular the compound known under the name phenoxyethanol, on account of their bactericidal and fungicidal effects on a number of microorganisms.

Other antimicrobial agents are also likewise suitable for being incorporated into the preparations according to the invention. Advantageous substances are, for example, 2,4,4'-trichloro-2'-hydroxydiphenyl ether (irgasan), 1,6-di(4-chlorophenylbiguanido)-hexane (chlorhexidine), 3,4,4'-trichlorocarbanilide, quaternary ammonium compounds, oil of cloves, mint oil, thyme oil, triethyl citrate, farnesol (3,7,11-trimethyl-2,6,10-dodecatrien-1-ol), and also the active ingredients and active ingredient combinations described in the patent laid-open specifications DE-37 40 186, DE-39 38 140, DE-42 04 321, DE-42 29 707, DE-43 09 372, DE-44 11 664, DE-195 41 967, DE-195 43 695, DE-195 43 696, DE-195 47 160, DE-196 02 108, DE-196 02 110, DE-196 02 111, DE-196 31 003, DE-196 31 004 and DE-196 34 019 and the patent specifications DE-42 29 737, DE-42 37 081, DE-43 24 219, DE-44 29 467, DE-44 23 410 and DE-195 16 705. Sodium hydrogencarbonate is also to be used advantageously. Antimicrobial polypeptides can likewise also be used.

(5) Photofilter active ingredients which absorbe UV rays in the UV-B and/or UV-A region. Suitable UV filters are, for example, 2,4,6-triaryl-1,3,5-triazines in which the aryl groups can in each case carry at least one substituent which is preferably selected from hydroxy, alkoxy, specifically methoxy, alkoxycarbonyl, specifically methoxycarbonyl and ethoxycarbonyl, and mixtures thereof. Also suitable are p-aminobenzoic acid esters, cinnamic acid esters, benzophenononones, camphor derivatives, and pigments that block UV rays, such as titanium dioxide, talc and zinc oxide.

Suitable UV filter substances are any desired UV-A and UV-B filter substances.

Examples are:

No.	Substance	CAS No. (=acid)
1	4–Aminobenzoic acid	150–13–0
2	3–(4'–Trimethylammonium)benzylidenebornan–2–one	52793–97–2

	methylsulfate	
3	3,3,5–Trimethylcyclohexyl salicylate (homosalate)	118–56–9
4	2–Hydroxy–4–methoxybenzophenone (oxybenzone)	131–57–7
5	2–Phenylbenzimidazole–5–sulfonic acid and its potassium, sodium and triethanolamine salts	27503–81–7
6	3,3'–(1,4–Phenylenedimethine)bis(7,7–dimethyl–2–oxobicyclo[2.2.1]heptane–1–methanesulfonic acid) and its salts	90457–82–2
7	Polyethoxyethyl 4–bis(polyethoxy)aminobenzoate	113010–52–9
8	2-Ethylhexyl 4–dimethylaminobenzoate	21245–02–3
9	2-Ethylhexyl salicylate	118–60–5
10	2-Isoamyl 4–methoxycinnamate	71617–10–2
11	2-Ethylhexyl 4–methoxycinnamate	5466–77–3
12	2–Hydroxy–4–methoxybenzophenone–5–sulfonic acid (sulisobenzone) and the sodium salt	4065–45–6
13	3–(4'–Sulfobenzylidene)bornan–2–one and salts	58030–58–6
14	3–Benzylidenebornan–2–one	16087–24–8
15	1–(4'–Isopropylphenyl)–3–phenylpropane–1,3–dione	63260–25–9
16	4–Isopropylbenzylsalicylate	94134–93–7
17	3–Imidazol–4–ylacrylic acid and its ethyl ester	104–98–3
18	Ethyl 2–cyano–3,3–diphenylacrylate	5232–99–5
19	2'–Ethylhexyl 2–cyano–3,3–diphenylacrylate	6197–30–4
20	Menthyl o–aminobenzoate or: 5–methyl–2–(1–methylethyl)–2–aminobenzoate	134–09–8
21	Glyceryl p–aminobenzoate or: 1–glyceryl 4–aminobenzoate	136–44–7
22	2,2'–Dihydroxy–4–methoxybenzophenone (dioxybenzone)	131–53–3
23	2–Hydroxy–4–methoxy–4–methylbenzophenone (mexenone)	1641–17–4
24	Triethanolaminee salicylate	2174–16–5
25	Dimethoxyphenylglyoxalic acid or: sodium 3,4–dimethoxyphenylglyoxalate	4732–70–1
26	3–(4'Sulfobenzylidene)bornan–2–one and its salts	56039–58–8
27	4-tert-Butyl-4'-methoxy-dibenzoylmethane	70356-09-1

28	2,2',4,4'-Tetrahydroxybenzophenone	131-55-5
29	2,2'–Methylenebis[6–(2H–benzotriazol–2–yl)–4–(1,1,3,3,–tetramethylbutyl)phenol]	103597–45–1
30	2,2'–(1,4–Phenylene)bis–1H–benzimidazole-4,6–disulfonic acid, Na salt	180898–37–7
31	2,4–bis[4–(2–Ethylhexyloxy)–2–hydroxy]phenyl–6–(4–methoxyphenyl)(1,3,5)–triazine	187393–00–6
32	3–(4–Methylbenzylidene)camphor	36861–47–9
33	Polyethoxyethyl 4–bis(polyethoxy)paraaminobenzoate	113010–52–9
34	2,4–Dihydroxybenzophenone	131–56–6
35	2,2'–Dihydroxy–4,4'–dimethoxybenzophenone–5,5'–disodium sulfonate	3121–60–6
36	2-[4-(Diethylamino)-2-hydroxybenzoyl]hexyl benzoate	302776–68–7
37	2-(2H-Benzotriazol-2-yl)-4-methyl-6-[2-methyl-3-[1,3,3,3-tetramethyl-1-[(trimethylsilyl)oxy]disiloxanyl]propyl]phenol	155633-54-8
38	1,1-[(2,2´-Dimethylpropoxy)carbonyl]-4,4-diphenyl-1,3-butadiene	363602-15-7

Furthermore, the cosmetic and dermatological preparations according to the invention can advantageously comprise inorganic pigments which block UV rays and are based on metal oxides and/or other metal compounds that are insoluble or sparingly soluble in water selected from the group of the oxides of zinc (ZnO), titanium (TiO_2), iron (e.g. Fe_2O_3), zirconium (ZrO_2), silicon (SiO_2), manganese (e.g. MnO), aluminum (Al_2O_3), cerium (e.g. Ce_2O_3), mixed oxides of the corresponding metals and mixtures of such oxides.

The inorganic pigments here may be present in coated form, i.e. be surface-treated. This surface treatment can, for example, consist in providing the pigments with a thin hydrophobic layer by the method known per se, as described in DE-A-33 14 742.

(6) Repellent active ingredients, i.e. compounds which are able to keep away or drive away certain animals, in particular insects, from people. These include, for example, 2-ethyl-1,3-hexanediol, N,N-diethyl-m-toluamide etc. Suitable hyperemic substances, which stimulate blood flow through the skin, are, for example, essential oils, such as dwarf-pine needle extract, lavender extract, rosemary extract, juniper berry extract, horse chestnut extract, birch leaf extract, hay flower extract, ethyl acetate, camphor, menthol, peppermint oil, rosemary extract, eucalyptus oil etc. Suitable keratolytic and

keratoplastic substances are, for example, salicylic acid, calcium thioglycolate, thioglycolic acid and its salts, sulfur etc. Suitable antidandruff active ingredients are, for example, sulfur, sulfur polyethylene glycol sorbitan monooleate, sulfur ricinol polyethoxylate, zinc pyrithione, aluminum pyrithione etc. Suitable antiphlogistics, which counteract skin irritations, are, for example, allantoin, bisabolol, dragosantol, camomile extract, panthenol etc.

(7) Cosmetically or pharmaceutically acceptable polymers, such as cationic, amphoteric and neutral polymers.

Suitable polymers are, for example, cationic polymers with the INCI name Polyquaternium, e.g. copolymers of vinylpyrrolidone/N-vinylimidazolium salts (Luviquat* FC, Luviquat HM, Luviquat MS, Luviquat, Care), copolymers of N-vinylpyrrolidone/dimethylaminoethyl methacrylate, quaternized with diethyl sulfate (Luviquat PQ 11), copolymers of N-vinylcaprolactam/N-vinylpyrrolidone/N-vinyl-imidazolium salts (Luviquat E Hold), cationic cellulose derivatives (Polyquaternium-4 and -10), acrylamido copolymers (Polyquaternium-7) and chitosan.

Suitable cationic (quaternized) polymers are also Merquat* (polymer based on dimethyldiallylammonium chloride), Gafquat* (quaternary polymers which are formed by the reaction of polyvinylpyrrolidone with quaternary ammonium compounds), polymer JR (hydroxyethylcellulose with cationic groups) and cationic polymers based on plants, e.g. guar polymers, such as the Jaguar* grades from Rhodia.

Further suitable polymers are also neutral polymers, such as polyvinylpyrrolidones, copolymers of N-vinylpyrrolidone and vinyl acetate and/or vinyl propionate, polysiloxanes, polyvinylcaprolactam and other copolymers with N-vinylpyrrolidone, polyethyleneimines and salts thereof, polyvinylamines and salts thereof, cellulose derivatives, polyaspartic acid salts and derivatives thereof. These include, for example, Luviflex ® Swing (partially saponified copolymer of polyvinyl acetate and polyethylene glycol, BASF).

Suitable polymers are also nonionic, water-soluble or water-dispersible polymers or oligomers, such as polyvinylcaprolactam, e.g. Luviskol ® Plus (BASF), or polyvinylpyrrolidone and copolymers thereof, in particular with vinyl esters, such as vinyl acetate, e.g. Luviskol ® VA 37 (BASF), polyamides, e.g. based on itaconic acid and aliphatic diamines, as are described, for example, in DE-A-43 33 238.

Suitable polymers are also amphoteric or zwitterionic polymers, such as the octylacrylamide/methyl methacrylate/tert-butylaminoethyl methacrylate-hydroxypropyl methacrylate copolymers obtainable under the names Amphomer* (National Starch), and also zwitterionic polymers as are disclosed, for example, in the German patent

* trademark

applications DE 39 29 973, DE 21 50 557, DE 28 17 369 and DE 37 08 451. Acrylamidopropyltrimethylammonium chloride/acrylic acid or methacrylic acid copolymers and the alkali metal and ammonium salts thereof are preferred zwitterionic polymers. Furthermore, suitable zwitterionic polymers are methacroylethyl-betaine/methacrylate copolymers, which are commercially available under the name Amersette (AMERCHOL*), and copolymers of hydroxyethyl methacrylate, methyl methacrylate, N, N-dimethylaminoethyl methacrylate and acrylic acid (Jordapon* (D)).

Suitable polymers are also nonionic, siloxane-containing, water-soluble or dispersible polymers, e.g. polyether siloxanes, such as Tegopren ® (Goldschmidt) and Besi (Wacker).

3.5.2 Particular compositions according to the invention

According to a preferred embodiment, the compositions according to the invention are a skin or hair cleaning composition.

Preferred skin or hair cleaning compositions are soaps of liquid to gel-like consistency, such as transparent soaps, luxury soaps, deodorant soaps, cream soaps, baby soaps, skin protection soaps, abrasive soaps and syndets, pasty soaps, soft soaps and washing pastes, peeling soaps, wet wipes, liquid washing, shower and bathing preparations, such as washing lotions, shower baths and shower gels, foam baths, oil baths and scrub preparations, shaving foams, shaving lotions and shaving creams.

According to a further preferred embodiment, the compositions according to the invention are a shower gel, a shampoo formulation or a bathing preparation. Such formulations comprise at least one antimicrobial peptide and usually anionic surfactants as base surfactants and amphoteric and/or nonionic surfactants as cosurfactants. Further suitable active ingredients and/or auxiliaries are generally selected from lipids, perfume oils, dyes, organic acids, preservatives and antioxidants, and also thickeners/gel formers, skin conditioners and humectants.

i) Specific embodiments for compositions for applying to the skin:

Suitable skin cosmetic compositions are, for example, face tonics, face masks, deodorants and other cosmetic lotions. Compositions for use in decorative cosmetics comprise, for example, concealing sticks, stage make-up, mascara and eye shadows, lipsticks, kohl pencils, eyeliners, blushers, powders and eyebrow pencils.

Furthermore, the dermatological agents according to the invention can be used in

* trademark

nose-strips for pore cleansing, in antiacne compositions, repellents, shaving compositions, aftershave and preshave care compositions, aftersun care compositions, hair removal compositions, hair colorants, intimate care compositions, foot care compositions and in babycare.

The skincare compositions according to the invention are in particular W/O or O/W skin creams, day and night creams, eye creams, face creams, antiwrinkle creams, sunscreen creams, moisturizing creams, bleaching creams, self-tanning creams, vitamin creams, skin lotions, care lotions and moisturizing lotions.

Skin cosmetic and dermatological compositions preferably comprise at least one peptide in an amount of from about 0.0001 to 50% by weight, preferably 0.001 to 10% by weight, very particularly preferably 0.0057 to 0.1% by weight, based on the total weight of the composition.

Depending on the field of application, the skin cosmetic compositions according to the invention can be applied in a form suitable for skincare, such as, for example, as cream, foam, gel, stick, mousse, milk, spray (pump spray or propellant-containing spray).

Besides the peptides according to the invention and suitable carriers, the skin cosmetic preparations can also comprise further active ingredients and auxiliaries customary in skin cosmetics, as described previously. These include, preferably, emulsifiers, preservatives, perfume oils, cosmetic active ingredients, such as phytantriol, vitamin A, E and C, retinol, bisabolol, panthenol, photoprotective agents, bleaches, colorants, tinting agents, tanning agents, collagen, enzymes, protein hydrolyzates, stabilizers, pH regulators, dyes, salts, thickeners, gel formers, consistency regulators, silicones, humectants, refatting agents and further customary additives.

Preferred oil and fat components of the skin cosmetic and dermatological compositions are the abovementioned mineral and synthetic oils, such as, for example, paraffins, silicone oils and aliphatic hydrocarbons with more than 8 carbon atoms, animal and vegetable oils, such as, for example, sunflower oil, coconut oil, avocado oil, olive oil, lanolin, or waxes, fatty acids, fatty acid esters, such as, for example, triglycerides of C_6-C_{30}-fatty acids, wax esters, such as, for example, jojoba oil, fatty alcohols, vaseline, hydrogenated lanolin and acetylated lanolin, and mixtures thereof.

To establish certain properties, such as, for example, improving the feel to the touch, the spreading behavior, the water resistance and/or the binding of active ingredients and auxiliaries, such as pigments, the skin cosmetic and dermatological preparations can additionally also comprise conditioning substances based on silicone compounds. Suitable silicone compounds are, for example, polyalkylsiloxanes, polyarylsiloxanes, polyarylalkylsiloxanes, polyether siloxanes or silicone resins.

The cosmetic or dermatological preparations are produced in accordance with

customary methods known to the person skilled in the art.

To produce the dermatological compositions according to the invention, the active ingredients can be mixed or diluted with a suitable auxiliary (excipient). Excipients can be solid, semisolid or liquid materials which can serve as vehicles, carriers or medium for the active ingredient. The admixing of further auxiliaries takes place if desired in the manner known to the person skilled in the art. Furthermore, the polymers and dispersions are suitable as auxiliaries in pharmacy, preferably as or in (a) coating(s) or (a) binder(s) for solid drug forms. They can also be used in creams and as tablet coatings and tablet binders.

Preferably, the cosmetic and dermatological compositions are present in the form of emulsions, in particular as water-in-oil (W/O) or oil-in-water (O/W) emulsions. However, it is also possible to choose other types of formulation, for example gels, oils, oleogels, multiple emulsions, for example in the form of W/O/W or O/W/O emulsions, anhydrous ointments or ointment bases etc. Emulsifier-free formulations such as hydrodispersions, hydrogels or a Pickering emulsion are also advantageous embodiments.

The preparation of emulsions takes place by known methods. Besides at least one peptide according to the invention, the emulsions generally comprise customary constituents, such as fatty alcohols, fatty acid esters and in particular fatty acid triglycerides, fatty acids, lanolin and derivatives thereof, natural or synthetic oils or waxes and emulsifiers in the presence of water. The selection of additives specific to the type of emulsion and the preparation of suitable emulsions is described, for example, in Schrader, Grundlagen and Rezepturen der Kosmetika [Fundamentals and formulations of cosmetics], Hüthig Buch Verlag, Heidelberg, 2nd edition, 1989, third part, to which reference is hereby expressly made.

A suitable emulsion as W/O emulsion, e.g. for a skin cream etc., generally comprises an aqueous phase which is emulsified in an oil or fatty phase by means of a suitable emulsifier system. A polyelectrolyte complex can be used for producing the aqueous phase.

Preferred fatty components which may be present in the fatty phase of the emulsions are: hydrocarbon oils, such as paraffin oil, Purcellin oil, perhydrosqualene and solutions of microcrystalline waxes in these oils; animal or vegetable oils, such as sweet almond oil, avocado oil, calophylum oil, lanolin and derivatives thereof, castor oil, sesame oil, olive oil, jojoba oil, karite oil, hoplostethus oil, mineral oils whose distillation start under atmospheric pressure is at about 250°C and whose distillation end point is at 410°C, such as, for example, vaselin oil, esters of saturated or unsaturated fatty acids, such as alkyl myristates, e.g. isopropyl, butyl or cetyl myristate, hexadecyl stearate, ethyl or isopropyl palmitate, octanoic acid or decanoic acid triglycerides and cetyl ricinoleate.

The fatty phase can also comprise silicone oils that are soluble in other oils, such as

dimethylpolysiloxane, methylphenylpolysiloxane and the silicone glycol copolymer, fatty acids and fatty alcohols.

Besides the peptides according to the invention, it is also possible to use waxes, such as, for example, carnauba wax, candelilla wax, beeswax, microcrystalline wax, ozokerite wax and Ca, Mg and Al oleates, myristates, linoleates and stearates.

Furthermore, an emulsion according to the invention can be in the form of an O/W emulsion. Such a type of emulsion usually comprises an oil phase, emulsifiers which stabilize the oil phase in the water phase, and an aqueous phase, which is usually present in thickened form. Suitable emulsifiers are preferably O/W emulsifiers, such as polyglycerol esters, sorbitan esters or partially esterified glycerides.

According to a further preferred embodiment, the compositions according to the invention are a shower gel, a shampoo formulation or a bathing preparation.

Such formulations comprise at least one peptide according to the invention and usually anionic surfactants as base surfactants and amphoteric and/or nonionic surfactants as cosurfactants. Further suitable active ingredients and/or auxiliaries are generally selected from lipids, perfume oils, dyes, organic acids, preservatives and antioxidants, and thickeners/gel formers, skin conditioners and moisturizers.

These formulations comprise preferably 2 to 50% by weight, preferably 5 to 40% by weight, particularly preferably 8 to 30% by weight, of surfactants, based on the total weight of the formulation.

All anionic, neutral, amphoteric or cationic surfactants customarily used in body cleaning compositions can be used in the washing, showering and bathing preparations.

Suitable anionic surfactants are, for example, alkyl sulfates, alkyl ether sulfates, alkylsulfonates, alkylarylsulfonates, alkyl succinates, alkyl sulfosuccinates, N-alkoyl sarcosinates, acyl taurates, acyl isothionates, alkyl phosphates, alkyl ether phosphates, alkyl ether carboxylates, alpha-olefinsulfonates, in particular the alkali metal and alkaline earth metal salts, e.g. sodium, potassium, magnesium, calcium, and also ammonium and triethanolamine salts. The alkyl ether sulfates, alkyl ether phosphates and alkyl ether carboxylates can have between 1 and 10 ethylene oxide or propylene oxide units, preferably 1 to 3 ethylene oxide units, in the molecule.

These include, for example, sodium lauryl sulfate, ammonium lauryl sulfate, sodium lauryl ether sulfate, ammonium lauryl ether sulfate, sodium lauryl sarcosinate, sodium oleyl succinate, ammonium lauryl sulfosuccinate, sodium dodecylbenzenesulfonate, triethanolamine dodecylbenzenesulfonate.

Suitable amphoteric surfactants are, for example, alkylbetaines, alkylamidopropylbetaines, alkylsulfobetaines, alkyl glycinates, alkyl carboxyglycinates, alkyl

amphoacetates or -propionates, alkyl amphodiacetates or -dipropionates.

For example, cocodimethylsulfopropylbetaine, laurylbetaine, cocamidopropylbetaine or sodium cocamphopropionate can be used.

Suitable nonionic surfactants are, for example, the reaction products of aliphatic alcohols or alkylphenols having 6 to 20 carbon atoms in the alkyl chain, which may be linear or branched, with ethylene oxide and/or propylene oxide. The amount of alkylene oxide is about 6 to 60 moles per mole of alcohol. Also suitable are alkylamine oxides, mono- or dialkylalkanolamines, fatty acid esters of polyethylene glycols, ethoxylated fatty acid amides, alkyl polyglycosides or sorbitan ether esters.

Furthermore, the washing, showering and bathing preparations can comprise customary cationic surfactants, such as, for example, quaternary ammonium compounds, for example cetyltrimethylammonium chloride.

Furthermore, the shower gel/shampoo formulations can comprise thickeners, such as, for example, sodium chloride PEG-55, propylene glycol oleate, PEG-120 methylglucose dioleate and others, and also preservatives, further active ingredients and auxiliaries and water.

ii) Specific embodiments for hair treatment compositions

According to a further preferred embodiment, the compositions according to the invention are a hair treatment composition.

Hair treatment compositions according to the invention comprise preferably at least one peptide according to the invention in an amount in the range from about 0.0001 to 50% by weight, preferably 0.001 to 10% by weight, particularly preferably 0.0057 to 0.1% by weight, based on the total weight of the composition.

Preferably, the hair treatment compositions according to the invention are in the form of a setting foam, hair mousse, hair gel, shampoo, hairspray, hair foam, end fluid, neutralizer for permanent waves, hair colorant and bleach or "hot-oil treatment". Depending on the field of use, the hair cosmetic preparations can be applied as (aerosol) spray, (aerosol) foam, gel, gel spray, cream, lotion or wax. Hairsprays here comprise both aerosol sprays and also pump sprays without propellant gas. Hair foams comprise both aerosol foams and also pump foams without propellant gas. Hairsprays and hair foams comprise preferably predominantly or exclusively water-soluble or water-dispersible components. If the compounds used in the hairsprays and hair foams according to the invention are water-dispersible, they can be applied in the form of aqueous microdispersions with particle diameters of usually 1 to 350 nm, preferably 1 to 250 nm. The solids contents of these preparations are usually in a range from about 0.5 to 20% by weight. These microdispersions generally require no

emulsifiers or surfactants for their stabilization.

The hair cosmetic formulations according to the invention comprise, in a preferred embodiment, a) 0.0001 to 50% by weight of at least one peptide according to the invention, b) 20 to 99.95% by weight of water and/or alcohol, c) 0 to 50% by weight of at least one propellant gas, d) 0 to 5% by weight of at least one emulsifier, e) 0 to 3% by weight of at least one thickener, and also up to 25% by weight of further constituents.

Alcohol is to be understood as meaning all alcohols customary in cosmetics, for example ethanol, isopropanol, n-propanol.

Also included here are all styling and conditioner polymers known in cosmetics which can be used in combination with the peptides according to the invention if quite specific properties are to be set.

Suitable conventional hair cosmetics polymers are, for example, the aforementioned cationic, anionic, neutral, nonionic and amphoteric polymers, to which reference is hereby made.

To establish certain properties, the preparations can additionally also comprise conditioning substances based on silicone compounds. Suitable silicone compounds are, for example, polyalkylsiloxanes, polyarylsiloxanes, polyarylalkylsiloxanes, polyether siloxanes, silicone resins or dimethicone copolyols (CTFA) and aminofunctional silicone compounds, such as amodimethicones (CTFA).

The polymers according to the invention are suitable in particular as setting agents in hairstyling preparations, in particular hairsprays (aerosol sprays and pump sprays without propellant gas) and hair foams (aerosol foams and pump foams without propellant gas).

In a preferred embodiment, spray preparations comprise a) 0.0001 to 50% by weight of at least one polypeptide according to the invention, b) 20 to 99.9% by weight of water and/or alcohol, c) 0 to 70% by weight of at least one propellant, d) 0 to 20% by weight of further constituents.

Propellants are the propellants customarily used for hairsprays or aerosol foams. Preference is given to mixtures of propane/butane, pentane, dimethyl ether, 1,1-difluoroethane (HFC-152 a), carbon dioxide, nitrogen or compressed air.

A formulation for aerosol hair foams preferred according to the invention comprises a) 0.0001 to 50% by weight of at least one peptide according to the invention, b) 55 to 99.8% by weight of water and/or alcohol, c) 5 to 20% by weight of a propellant, d) 0.1 to 5% by weight of an emulsifier, e) 0 to 10% by weight of further constituents.

Emulsifiers that can be used are all emulsifiers customarily used in hair foams. Suitable emulsifiers may be nonionic, cationic or anionic or amphoteric.

Examples of nonionic emulsifiers (INCI nomenclature) are laureths, e.g. laureth-4 ;

ceteths, e.g. ceteth-1, polyethylene glycol cetyl ether, ceteareths, e.g. ceteareth-25, polyglycol fatty acid glycerides, hydroxylated lecithin, lactyl esters of fatty acids, alkyl polyglycosides.

Examples of cationic emulsifiers are cetyldimethyl-2-hydroxyethylammonium dihydrogenphosphate, cetyltrimonium chloride, cetyltrimmonium bromide, cocotrimonium methyl sulfate, quaternium-1 to x (INCI).

Anionic emulsifiers can be selected, for example, from the group of alkyl sulfates, alkyl ether sulfates, alkylsulfonates, alkylarylsulfonates, alkyl succinates, alkyl sulfosuccinates, N-alkoyl sarcosinates, acyl taurates, acyl isethionates, alkyl phosphates, alkyl ether phosphates, alkyl ether carboxylates, alpha-olefinsulfonates, in particular the alkali metal and alkaline earth metal salts, e.g. sodium, potassium, magnesium, calcium, and also ammonium and triethanolamine salts. The alkyl ether sulfates, alkyl ether phosphates and alkyl ether carboxylates can have between 1 and 10 ethylene oxide or propylene oxide units, preferably 1 to 3 ethylene oxide units, in the molecule.

A preparation suitable according to the invention for styling gels can, for example, have the following composition: a) 0.0001 to 50% by weight of at least one peptide according to the invention, b) 80 to 99.85% by weight of water and/or alcohol, c) 0 to 3% by weight, preferably 0.05 to 2% by weight, of a gel former, d) 0 to 20% by weight of further constituents.

The use of gel formers may be advantageous in order to set specific rheological or other application properties of the gels. Gel formers that can be used are all gel formers customary in cosmetics. These include lightly crosslinked polyacrylic acid, for example carbomer (INCI), cellulose derivatives, e.g. hydroxypropylcellulose, hydroxyethylcellulose, cationically modified celluloses, polysaccharides, e.g. xanthan gum, caprylic/capric triglyceride, sodium acrylate copolymers, polyquaternium-32 (and) paraffinum liquidum (INCI), sodium acrylate copolymers (and) paraffinum liquidum (and) PPG-1 trideceth-6, acrylamidopropyltrimonium chloride/acrylamide copolymers, steareth-10 allyl ether, acrylate copolymers, polyquaternium-37 (and) paraffinum liquidum (and) PPG-1 trideceth-6, polyquaternium 37 (and) propylene glycol dicaprate dicaprylate (and) PPG-1 trideceth-6, polyquaternium-7, polyquaternium-44.

A preparation comprising the peptides according to the invention can preferably be used in shampoo formulations as antidandruff agent. Preferred shampoo formulations comprise a) 0.0001 to 50% by weight of at least one peptide according to the invention, b) 25 to 94.95% by weight of water, c) 5 to 50% by weight of surfactants, c) 0 to 5% by weight of a further conditioner, d) 0 to 10% by weight of further cosmetic constituents.

All anionic, neutral, amphoteric or cationic surfactants customarily used in shampoos can be used in the shampoo formulations.

Suitable anionic surfactants are, for example, alkyl sulfates, alkyl ether sulfates, alkylsulfonates, alkylarylsulfonates, alkyl succinates, alkyl sulfosuccinates, N-alkoyl sarcosinates, acyl taurates, acyl isothionates, alkyl phosphates, alkyl ether phosphates, alkyl ether carboxylates, alpha-olefinsulfonates, in particular the alkali metal and alkaline earth metal salts, e.g. sodium, potassium, magnesium, calcium, and ammonium and triethanolamine salts. The alkyl ether sulfates, alkyl ether phosphates and alkyl ether carboxylates can have between 1 and 10 ethylene oxide or propylene oxide units, preferably 1 to 3 ethylene oxide units, in the molecule.

Of suitability are, for example, sodium lauryl sulfate, ammonium lauryl sulfate, sodium lauryl ether sulfate, ammonium lauryl ether sulfate, sodium lauroyl sarcosinate, sodium oleyl succinate, ammonium lauryl sulfosuccinate, sodium dodecylbenzenesulfonate, triethanolamine dodecylbenzenesulfonate.

Suitable amphoteric surfactants are, for example, alkylbetaines, alkylamidopropylbetaines, alkylsulfobetaines, alkyl glycinates, alkyl carboxyglycinates, alkyl amphoacetates or -propionates, alkyl amphodiacetates or -dipropionates.

For example, cocodimethylsulfopropylbetaine, laurylbetaine, cocamidopropylbetaine or sodium cocamphopropionate can be used.

Suitable nonionic surfactants are, for example, the reaction products of aliphatic alcohols or alkylphenols having 6 to 20 carbon atoms in the alkyl chain, which may be linear or branched, with ethylene oxide and/or propylene oxide. The amount of alkylene oxide is about 6 to 60 moles per mole of alcohol. Also suitable are alkylamine oxides, mono- or dialkylalkanolamides, fatty acid esters of polyethylene glycols, alkyl polyglycosides or sorbitan ether esters.

Furthermore, the shampoo formulations can comprise customary cationic surfactants, such as, for example, quaternary ammonium compounds, for example cetyltrimethylammonium chloride.

To achieve certain effects, customary conditioners can be used in combination with the peptides according to the invention in the shampoo formulations.

These include, for example, the abovementioned cationic polymers with the INCI name Polyquaternium, in particular copolymers of vinylpyrrolidone/N-vinylimidazolium salts (Luviquat FC, Luviquat HM, Luviquat MS, Luviquat Care), copolymers of N-vinylpyrrolidone/dimethylaminoethyl methacrylate, quaternized with diethyl sulfate (Luviquat D PQ 11), copolymers of N-vinylcaprolactam/N-vinylpyrrolidone/N-vinylimidazolium salts (Luviquat D Hold), cationic cellulose derivatives (Polyquaternium-4 and -10), acrylamide copolymers (Polyquaternium-7). In addition, protein hydrolyzates can be used, and also conditioning substances based on silicone compounds, for example polyalkylsiloxanes, polyarylsiloxanes, polyarylalkylsiloxanes, polyether siloxanes or silicone resins. Further

suitable silicone compounds are dimethicone copolyols (CTFA) and aminofunctional silicone compounds such as amodimethicones (CTFA). In addition, cationic guar derivatives, such as guar hydroxypropyltrimonium chloride (INCI) can be used.

The invention will now be illustrated further by reference to the following nonlimiting examples.

Experimental section

1. Test examples A

Example 1: Inhibition of *Malassezia furfur* by P18

Growth medium: M472-*Pitysporum* medium according to DSMZ

40 g/l malt extract
20 g/l ox bile
10 g/l Tween 40

The components were sterilized at 121°C, 1 bar superatmospheric pressure for 20 minutes.

2 g/l of olive oil were sterilized by filtration and, after autoclaving, added to the other components.

Since it was a two-phase medium, the complete medium was treated with sonication in order to enlarge the phase boundary.

For agar plates, if appropriate, 150 g/l of agar agar were added to the medium.

The growth test was carried out as follows: A shake flask with M472-*Pitysporum* medium was inoculated with *M. furfur* and incubated with shaking overnight at 30°C and 200 rpm.

A 96-well microtiter plate was filled with in each case 100 µl of M472-*Pitysporum* medium and inoculated with *M. furfur* suspension of the overnight culture. The *M. furfur* suspension was adjusted at the start of the experiment to an optical density, measured at 620 nm, of 0.02. The concentrates of the inhibitor solutions were 1 mM in water or DMSO.

The growth of the following batches was compared by measuring the optical density:

- *M. furfur* suspension without the addition of an inhibitor.
- *M. furfur* suspension without the addition of an inhibitor, but the addition of 2.5 µl of DMSO, which is comparable with the remaining experiments. This was to exclude that an inhibition is attributable merely to the effect of the DMSO, or a false positive result being observed.
- *M. furfur* suspension and addition of an aqueous P18 solution with a final concentration of 25 µM.
- *M. furfur* suspension and addition of a P18 solution in DMSO with a final concentration of 25 µM.
- *M. furfur* suspension and addition of a zinc pyrithione (ZPT, Sigma-Aldrich) solution in DMSO with a final concentration of 25 µM.
- *M. furfur* suspension and addition of a Ketoconazole (Sigma-Aldrich) solution in DMSO with a final concentration of 25 µM.

The microtiter plate was incubated with shaking at 30°C.

The growth was observed over 40 hours by measuring the optical density. The colony-forming units (CFU) were then determined by plating out 10 µl from each of the suspensions and, after incubation for 6 days, counting the colonies. The CFU was determined in order to exclude an influence of the two-phase medium and also the growth form of *M. furfur* on the optical density. However, in all of the experiments, the CFU correlated with the measured growth curves. The CFU measurement was helpful in order to detect weak growth compared to no measurable growth. The experiments were carried out at least in triple determinations and independently repeated. The results of one example experiment are summarized in Tables 1 and 2.

Table 1: Measurement of the optical density

Incubation time [h]	without inhib.	without inhib. with DMSO	Addition of aqueous P18 solution [25 µM]	Addition of P18 solution in DMSO [25 µM]	Addition of ZPT solution in DMSO [25 µM]	Addition of Ketoconazole solution in DMSO [25 µM]
0	0	0	0	0	0	0
16	0	0	0	0	0	0

24	0.21	0.12	0	0	0	0.004
40	0.42	0.25	0	0	0	0.013

Table 2: Counting the colony-forming units

Incubation time [h]	without inhib.	without inhib. with DMSO	Addition of aqueous P18 solution [25 µM]	Addition of P18 solution in DMSO [25 µM]	Addition of ZPT solution in DMSO [25 µM]	Addition of Ketoconazole solution in DMSO [25 µM]
16	> 10 000	> 10 000	62	8	42	80
24	> 10 000	> 10 000	41	0	22	22
40	> 10 000	> 10 000	120	0	28	90

The measurements for the optical density and the CFU show that the growth of *M. furfur* is effectively inhibited over the observed time period. Up to 40 hours, this inhibition was more effective compared to active ingredients such as zinc pyrithione (ZPT) or Ketoconazole.

Example 2: Inhibition of *Malassezia furfur* by P18 compared to magainin 2 and cecropin A

The fusion peptide P18 is derived from magainin 2 and cecropin A. It was therefore investigated whether P18 more effectively inhibits the growth of *Malassezia furfur* than magainin 2 or cecropin A alone. For this, the procedure was as described in Example 1. 1 mM stock solutions of the fusion peptide P18, magainin 2 and cecropin A in DMSO were prepared. The final concentrations of the peptides in the growth experiments were 25 µM. The same amount of DMSO was likewise added to the suspension without inhibitor in order to exclude a growth-inhibiting effect of the DMSO.

The growth of the following mixtures was compared by measuring the optical density:

- *M. furfur* suspension without the addition of an inhibitor, but with the addition of 2.5 µl of DMSO, which is comparable with the remaining experiments. This was to exclude that an inhibition is attributable merely to the effect of the DMSO.
- *M. furfur* suspension and addition of a magainin 2 solution in DMSO with a final concentration of 25 µM.
- *M. furfur* suspension and addition of a cecropin A solution in DMSO with a final concentration of 25 µM.
- *M. furfur* suspension and addition of a peptide P18 (SEQ ID NO3) solution in DMSO

with a final concentration of 25 µM.

The experimental results of an example experiment are summarized in Table 3 below.

Table 3: CFU comparison of P18, magainin 2 and cecropin A

Incubation time [h]	without inhib. with DMSO	Addition of magainin 2 solution in DMSO [25 µM]	Addition of Cecropin A solution in DMSO [25 µM]	Addition of P18 solution in DMSO [25 µM]
64	> 10 000	> 10 000	> 5000	0
72	> 10 000	> 10 000	> 5000	23

It was found that the peptide P18 inhibits the growth of *M. furfur* more effectively than magainin 2 or cecropin A alone.

Example 3: Long-term stability of P18

The long-term stability of P18 was observed over a period of 2 weeks. For this, a 1 mM P18 solution in water was incubated at 37°C over the entire period. At the start of the experiment and then on these two weeks, the antimicrobial activity was detected through inhibition of the growth of *Escherichia coli*. The growth medium used here was LB medium as complex medium. The medium comprised 10 g of trypton, 5 g of yeast extract and 10 g of NaCl per liter.

The growth test was carried out as follows: A shake flask of LB medium was inoculated with *Escherichia coli* and incubated overnight with shaking at 37°C and 200 rpm. A 96-well microtiter plate was filled with in each case 100 µl of LB medium and inoculated with *E. coli* suspension of the overnight culture. The *E. coli* suspension was adjusted at the start of the experiment to an optical density, measured at 620 nm, of about 0.02. The concentrates of the P18 inhibitor solutions were 1 mM in water.

The growth of the following mixtures was compared by measuring the optical density:

- *E. coli* suspension without the addition of an inhibitor.
- *E. coli* suspension and addition of an aqueous P18 solution with a final concentration of 25 µM. The aqueous P18 solution had been freshly prepared.

- *E. coli* suspension and addition of an aqueous P18 solution with a final concentration of 25 µM. The aqueous stock solution had been incubated for 2 weeks at 37°C.

The growth was observed over a period of 40 hours by measuring the optical density. It was found that the antimicrobial activity was unchanged even after incubation for 2 weeks at 37°C and effectively inhibited the growth of E. coli over a period of 40 hours. The results are summarized in Table 4.

Table 4: Long-term stability, measured via the optical density at 620 nm

Incubation time [h]	Sterile LB medium	*E. coli* suspension without inhib.	Addition of fresh aqueous P18 solution [25 µM]	Addition of stored aqueous P18 solution [25 µM]
0	0	0.017	0.098	0.081
16	0	0.656	0	0
24	0	0.546	0	0
40	0	0.508	0	0

Example 4: Biodegradability of P18

Firstly, the peptide P18 was digested by adding chymotrypsin (from bovine pancreas, Sigma). For this, a 1 mM P18 solution was prepared and treated in accordance with the manufacturer's instructions. The samples were incubated for 16 hours at 37°C. The negative control used was a sample of a P18 solution without addition of chymotrypsin or a control solution which comprised only chymotrypsin, but no P18. The antimicrobial activity of P18 on *E. coli* cells was then investigated. The test was carried out as described in Example 3.

The growth of the following mixtures was compared by measuring the optical density:

- *E. coli* suspension without the addition of an inhibitor.
- *E. coli* suspension and addition of an aqueous P18 solution with a final concentration of 10 µM. The P18 solution had been stored beforehand for 16 hours at 37°C.
- *E. coli* suspension and addition of an aqueous P18 solution with a final concentration of 10 µM. The P18 solution had been stored beforehand in accordance with the manufacturer's instructions for 16 hours at 37°C and treated with chymotrypsin.

- *E. coli* suspension and addition of an aqueous chymotrypsin solution which comprised, as control, the same amount of chymotrypsin as the P18 solution which was digested with chymotrypsin. This solution too had been stored beforehand for 16 hours at 37°C. This mixture was chosen in order to exclude an antimicrobial effect of the chymotrypsin.

The growth was observed over a period of 16 hours by measuring the optical density. It was found that the optical density of all samples developed similarly, i.e. microbial growth took place. Only the mixture to which undigested P18 solution had been added exhibited no or strongly inhibited microbial growth. These results show that a digestion of P18 with a serine protease, such as, for example, chymotrypsin, is possible, and demonstrate the biodegradability of the peptide. The results are summarized in Table 5.

Table 5: Biodegradability measured via the optical density at 620 nm in two independent experiments

Incubation time [h]	*E. coli* suspension without inhib.	Addition of aqueous P18 solution [10 µM]	Addition of aqueous P18 solution [10 µM] digested with chymotrypsin	Addition of chymotrypsin control solution
0	0.01 – 0.008	0 - 0	0.01 - 0	0.02 – 0.01
16	0.6 – 0.49	0.01 – 0.09	0.64 – 0.63	0.58 – 0.54

Example 5: Inhibition of Gram-positive and Gram-negative bacteria

The growth inhibition by P18 was investigated on Gram-positive and Gram-negative bacteria. Shin et al. 1999 (loc.cit.) had already detected an inhibition on the model organisms *Escherichia coli* and *Bacillus subtilis* within a period up to 18 hours. However, growth experiments in this paper showed that an inhibition by P18 acts differently on Gram-positive and Gram-negative bacteria.

The growth medium used for this was LB medium as complex medium for the organisms *Escherichia coli*, *Bacillus subtilis* and *Brevibacterium epidermidis*. The medium comprised 10 g of trypton, 5 g of yeast extract and 10 g of NaCl per liter.

The growth test was carried out as follows: A shake flask with medium was inoculated with *Escherichia coli, Bacillus subtilis* or *Brevibacterium epidermidis* and incubated with shaking overnight at 30°C and 200 rpm. A 96-well microtiter plate was filled with in each case 100 µl LB medium and inoculated with *E.-coli*, *B.-subtilis* or *B. epidermidis* suspensions of

the overnight culture. The bacteria suspension was adjusted at the start of the experiment to an optical density, measured at 620 nm, of about 0.02. The concentrates of the P18 inhibitor solutions were 1 mM in water.

The growth of the following mixtures was compared by measuring the optical density:

- bacteria suspension without the addition of an inhibitor;
- bacteria suspension and addition of an aqueous P18 solution with a final concentration of 25 µM. The aqueous P18 solution had been freshly prepared.

The growth was observed over a period of 40 hours by measuring the optical density. It was found that P18 effectively inhibited the growth of the Gram-negative *E. coli* over this period. The growth of Gram-positive bacteria was inhibited initially. Within the experimental period of 40 hours, however, the model organisms *B. subtilis* and *B. epidermidis* inhibited with P18 achieved growth densities comparable with the noninhibited culture. These results suggest a different effect of P18 on Gram-positive and Gram-negative organisms. This property is advantageous since the human skin flora is preferably populated by Gram-positive bacteria and consequently an application of P18 does not disrupt this in the long term. The results are summarized in Table 6 below.

Table 6: Comparison of the growth of Gram-negative and Gram-positive model organisms, measured by the optical density at 620 nm (n. d. not measured). The values given are mean values from 8 mixtures.

Incubation time [h]	*E. coli* suspension without inhib.	*E. coli* suspension with inhib. [25 µM P18 solution]	*B. subtilis* suspension without inhib.	*B. subtilis* suspension with inhib. [25 µM P18 solution]	*B. epidermidis* suspension without inhib.	*B. epidermidis* suspension with inhib. [25 µM P18 solution]
16	0.5	0.09	0.77	0.25	0.85	0.29
24	0.68	0.06	0.71	0.96	1.11	0.56
40	0.84	0.07	0.76	0.67	1.39	1.24

2. Formulation examples A

Dermocosmetic preparations comprising the peptide P18 are described below. The peptide P18 is specified in the examples below by way of representation of all of the other peptides described above. It will be appreciated by the person skilled in the art that all of the

other specified peptides according to the invention can also be used in the preparations given below.

AI = Active ingredient

Example 6: Use of P18 in an emulsion for day care – O/W type

AI 1%:

	%	Ingredient (INCI)
A	1.7	Ceteareth-6, stearyl alcohol
	0.7	Ceteareth-25
	2.0	Diethylaminohydroxybenzoylhexyl benzoate
	2.0	PEG-14 dimethicon
	3.6	Cetearyl alcohol
	6.0	Ethylhexyl methoxycinnamate
	2.0	Dibutyl adipate
B	5.0	Glycerol
	0.2	Disodium EDTA
	1.0	Panthenol
	q.s.	Preservative
	67.8	Aqua dem.
C	4.0	Caprylic/capric triglyceride, sodium acrylate copolymer
D	0.2	Sodium ascorbyl phosphate
	1.0	Tocopheryl acetate
	0.2	Bisabolol
	1.0	Caprylic/capric triglyceride, sodium ascorbate, tocopherol, retinol
	1.0	Aqueous solution with about 7% P18
E	q.s.	Sodium hydroxide

AI 5%:

	%	Ingredient (INCI)
A	1.7	Ceteareth-6, stearyl alcohol
	0.7	Ceteareth-25
	2.0	Diethylaminohydroxybenzoylhexyl benzoate
	2.0	PEG-14 dimethicone
	3.6	Cetearyl alcohol
	6.0	Ethylhexyl methoxycinnamate
	2.0	Dibutyl adipate
B	5.0	Glycerol
	0.2	Disodium EDTA
	1.0	Panthenol
	q.s.	Preservative
	63.8	Aqua dem.
C	4.0	Caprylic/capric triglyceride, sodium acrylate copolymer
D	0.2	Sodium ascorbyl phosphate

	1.0	Tocopheryl acetate
	0.2	Bisabolol
	1.0	Caprylic/capric triglyceride, sodium ascorbate, tocopherol, retinol
	5.0	Aqueous solution with about 7% P18
E	q.s.	Sodium hydroxide

Preparation: Heat phases A and B separately from one another to about 80°C. Stir phase B into phase A and homogenize. Stir phase C into the combined phases A and B and homogenize again. Cool, with stirring, to about 40°C, add phase D, adjust the pH to about 6.5 with phase E, homogenize and cool to room temperature with stirring.

The formulation is prepared without protective gas. Bottling must be into oxygen-impermeable packagings, e.g. aluminum tubes.

Example 7: Use of P18 in a protective day cream – O/W type

AI 1%:

	%	Ingredient (INCI)
A	1.7	Ceteareth-6, stearyl alcohol
	0.7	Ceteareth-25
	2.0	Diethylaminohydroxybenzoylhexyl benzoate
	2.0	PEG-14 dimethicone
	3.6	Cetearyl alcohol
	6.0	Ethylhexyl methoxycinnamate
	2.0	Dibutyl adipate
B	5.0	Glycerol
	0.2	Disodium EDTA
	1.0	Panthenol
	q.s.	Preservative
	68.6	Aqua dem.
C	4.0	Caprylic/capric triglyceride, sodium acrylate copolymer
D	1.0	Sodium ascorbyl phosphate
	1.0	Tocopheryl acetate
	0.2	Bisabolol
	1.0	Aqueous solution with about 7% P18
E	q.s.	Sodium hydroxide

AI 5%:

	%	Ingredient (INCI)
A	1.7	Ceteareth-6, stearyl alcohol
	0.7	Ceteareth-25
	2.0	Diethylaminohydroxybenzoylhexyl benzoate
	2.0	PEG-14 dimethicone
	3.6	Cetearyl alcohol

	6.0	Ethylhexyl methoxycinnamate
	2.0	Dibutyl adipate
B	5.0	Glycerol
	0.2	Disodium EDTA
	1.0	Panthenol
	q.s.	Preservative
	64.6	Aqua dem.
C	4.0	Caprylic/capric triglyceride, sodium acrylate copolymer
D	1.0	Sodium ascorbyl phosphate
	1.0	Tocopheryl acetate
	0.2	Bisabolol
	5.0	Aqueous solution with about 7% P18
E	q.s.	Sodium hydroxide

Preparation: Heat phases A and B separately from one another to about 80°C. Stir phase B into phase A and homogenize. Incorporate phase C into the combined phases A and B and homogenize. Cool, with stirring, to about 40°C. Add phase D, adjust the pH to about 6.5 with phase E and homogenize. Cool to room temperature with stirring.

Example 8: Use of P18 in a face cleansing lotion – O/W type

AI 1%:

	%	Ingredient (INCI)
A	10.0	Cetearyl ethylhexanoate
	10.0	Caprylic/capric triglyceride
	1.5	Cyclopentasiloxane, cyclohexasiloxane
	2.0	PEG-40-hydrogenated castor oil
B	3.5	Caprylic/capric triglyceride, sodium acrylate copolymer
C	1.0	Tocopheryl acetate
	0.2	Bisabolol
	q.s.	Preservative
	q.s.	Perfume oil
D	3.0	Polyquaternium-44
	0.5	Cocotrimonium methosulfate
	0.5	Ceteareth-25
	2.0	Panthenol, propylene glycol
	4.0	Propylene glycol
	0.1	Disodium EDTA
	1.0	Aqueous solution with about 7% P18
	60.7	Aqua dem.

AI 5%:

	%	Ingredient (INCI)
A	10.0	Cetearyl ethylhexanoate
	10.0	Caprylic/capric triglyceride
	1.5	Cyclopentasiloxane, cyclohexasiloxane

	2.0	PEG-40-hydrogenated castor oil
B	3.5	Caprylic/capric triglyceride, sodium acrylate copolymer
C	1.0	Tocopheryl acetate
	0.2	Bisabolol
	q.s.	Preservative
	q.s.	Perfume oil
D	3.0	Polyquaternium-44
	0.5	Cocotrimonium methosulfate
	0.5	Ceteareth-25
	2.0	Panthenol, propylene glycol
	4.0	Propylene glycol
	0.1	Disodium EDTA
	5.0	Aqueous solution with about 7% P18
	56.7	Aqua dem.

Preparation: Dissolve phase A. Stir phase B into phase A, incorporate phase C into the combined phases A and B. Dissolve phase D, stir into the combined phases A, B and C and homogenize. Afterstir for 15 min.

Example 9: Use of P18 in a daily care body spray

AI 1%:

	%	Ingredient (INCI)
A	3.0	Ethylhexyl methoxycinnamate
	2.0	Diethylaminohydroxybenzoylhexyl benzoate
	1.0	Polyquaternium-44
	3.0	Propylene glycol
	2.0	Panthenol, propylene glycol
	1.0	Cyclopentasiloxane, cyclohexasiloxane
	10.0	Octyldodecanol
	0.5	PVP
	10.0	Caprylic/capric triglyceride
	3.0	C_{12-15}-Alkyl benzoate
	3.0	Glycerol
	1.0	Tocopheryl acetate
	0.3	Bisabolol
	1.0	Aqueous solution with about 7% P18
	59.2	Alcohol

AI 5%:

	%	Ingredient (INCI)
A	3.0	Ethylhexyl methoxycinnamate
	2.0	Diethylaminohydroxybenzoylhexyl benzoate
	1.0	Polyquaternium-44
	3.0	Propylene glycol

	2.0	Panthenol, propylene glycol
	1.0	Cyclopentasiloxane, cyclohexasiloxane
	10.0	Octyldodecanol
	0.5	PVP
	10.0	Caprylic/capric triglyceride
	3.0	C_{12-15}-Alkyl benzoate
	3.0	Glycerol
	1.0	Tocopheryl acetate
	0.3	Bisabolol
	5.0	Aqueous solution with about 7% P18
	55.2	Alcohol

Preparation: Weigh in the components of phase A and dissolve to give a clear solution.

Example 10: Use of P18 in a skincare gel

AI 1%:

	%	Ingredient (INCI)
A	3.6	PEG-40-hydrogenated castor oil
	15.0	Alcohol
	0.1	Bisabolol
	0.5	Tocopheryl acetate
	q.s.	Perfume oil
B	3.0	Panthenol
	0.6	Carbomer
	1.0	Aqueous solution with about 7% P18
	75.4	Aqua dem.
C	0.8	Triethanolamine

AI 5%:

	%	Ingredient (INCI)
A	3.6	PEG-40-hydrogenated castor oil
	15.0	Alcohol
	0.1	Bisabolol
	0.5	Tocopheryl acetate
	q.s.	Perfume oil
B	3.0	Panthenol
	0.6	Carbomer
	5.0	Aqueous solution with about 7% P18
	71.4	Aqua dem.
C	0.8	Triethanolamine

Preparation: Dissolve phase A to give a clear solution. Allow phase B to swell and neutralize with phase C. Stir phase A into the homogenized phase B and homogenize.

Example 11: Use of P18 in an aftershave lotion

AI 1%:

	%	Ingredient (INCI)
A	10.0	Cetearyl ethylhexanoate
	5.0	Tocopheryl acetate
	1.0	Bisabolol
	0.1	Perfume oil
	0.3	Acrylates/C_{10-30} alkyl acrylate crosspolymer
B	15.0	Alcohol
	1.0	Panthenol
	3.0	Glycerol
	1.0	Aqueous solution with about 7% P18
	0.1	Triethanolamine
	63.5	Aqua dem.

AI 5%:

	%	Ingredient (INCI)
A	10.0	Cetearyl ethylhexanoate
	5.0	Tocopheryl acetate
	1.0	Bisabolol
	0.1	Perfume oil
	0.3	Acrylates/C_{10-30} alkyl acrylate crosspolymer
B	15.0	Alcohol
	1.0	Panthenol
	3.0	Glycerol
	5.0	Aqueous solution with about 7% P18
	0.1	Triethanolamine
	59.5	Aqua dem.

Preparation: Mix the components of phase A. Dissolve phase B, incorporate into phase A and homogenize.

Example 12: Use of P18 in an aftersun lotion

AI 1%:

	%	Ingredient (INCI)
A	0.4	Acrylates/C_{10-30}-alkyl acrylate crosspolymer
	15.0	Cetearyl ethylhexanoate
	0.2	Bisabolol
	1.0	Tocopheryl acetate
	q.s.	Perfume oil
B	1.0	Panthenol
	15.0	Alcohol

	3.0	Glycerol
	1.0	Aqueous solution with about 7% P18
	63.2	Aqua dem.
C	0.2	Triethanolamine

AI 5%:

	%	Ingredient (INCI)
A	0.4	Acrylates/C_{10-30} alkyl acrylate crosspolymer
	15.0	Cetearyl ethylhexanoate
	0.2	Bisabolol
	1.0	Tocopheryl acetate
	q.s.	Perfume oil
B	1.0	Panthenol
	15.0	Alcohol
	3.0	Glycerol
	5.0	Aqueous solution with about 7% P18
	59.2	Aqua dem.
C	0.2	Triethanolamine

Preparation: Mix the components of phase A. Stir phase B into phase A with homogenization. Neutralize with phase C and homogenize again.

Example 13: Use of P18 in a sunscreen lotion

AI 1%:

	%	Ingredient (INCI)
A	4.5	Ethylhexyl methoxycinnamate
	2.0	Diethylaminohydroxybenzoylhexyl benzoate
	3.0	Octocrylene
	2.5	Di-C_{12-13}-alkyl malate
	0.5	Tocopheryl acetate
	4.0	Polyglyceryl-3 methylglucose distearate
B	3.5	Cetearyl isononanoate
	1.0	VP/eicosene copolymer
	5.0	Isohexadecane
	2.5	Di-C_{12-13}-alkyl malate
	3.0	Titanium dioxide, trimethoxycaprylylsilane
C	5.0	Glycerol
	1.0	Sodium cetearyl sulfate
	0.5	Xanthan gum
	59.7	Aqua dem.
D	1.0	Aqueous solution with about 7% P18
	1.0	Phenoxyethanol, methyl paraben, ethyl paraben, butyl paraben, propyl paraben, isobutyl paraben
	0.3	Bisabolol

AI 5%:

	%	Ingredient (INCI)
A	4.5	Ethylhexyl methoxycinnamate
	2.0	Diethylaminohydroxybenzoylhexyl benzoate
	3.0	Octocrylene
	2.5	Di-C_{12-13}-alkyl malate
	0.5	Tocopheryl acetate
	4.0	Polyglyceryl-3 methylglucose distearate
B	3.5	Cetearyl isononanoate
	1.0	VP/eicosene copolymer
	5.0	Isohexadecane
	2.5	Di-C_{12-13}-alkyl malate
	3.0	Titanium dioxide, trimethoxycaprylylsilane
C	5.0	Glycerol
	1.0	Sodium cetearyl sulfate
	0.5	Xanthan gum
	55.7	Aqua dem.
D	5.0	Aqueous solution with about 7% P18
	1.0	Phenoxyethanol, methyl paraben, ethyl paraben, butyl paraben, propyl paraben, isobutyl paraben
	0.3	Bisabolol

Preparation: Heat the components of phases A and B separately from one another to about 80°C. Stir phase B into phase A and homogenize. Heat phase C to about 80°C and stir into the combined phases A and B with homogenization. Cool to about 40°C with stirring, add phase D and homogenize again.

Example 14: Use of P18 in a sunscreen lotion – O/W type

AI 1%

	%	Ingredient (INCI)
A	2.0	Ceteareth-6, stearyl alcohol
	2.0	Ceteareth-25
	3.0	Tribehenin
	2.0	Cetearyl alcohol
	2.0	Cetearyl ethylhexanoate
	5.0	Ethylhexyl methoxycinnamate
	1.0	Ethylhexyltriazone
	1.0	VP/eicosene copolymer
	7.0	Isopropyl myristate
B	5.0	Zinc oxide, triethoxycaprylylsilane
C	0.2	Xanthan gum
	0.5	Hydroxyethyl acrylate/sodium acryloyldimethyltaurate copolymer, squalane, polysorbate 60
	0.2	Disodium EDTA

	5.0	Propylene glycol
	0.5	Panthenol
	60.9	Aqua dem.
D	1.0	Aqueous solution with about 7% P18
	0.5	Phenoxyethanol, methyl paraben, ethyl paraben, butyl paraben, propyl paraben, isopropyl paraben
	1.0	Tocopheryl acetate
	0.2	Bisabolol

Al 5%

	%	Ingredient (INCI)
A	2.0	Ceteareth-6, Stearyl alcohol
	2.0	Ceteareth-25
	3.0	Tribehenin
	2.0	Cetearyl alcohol
	2.0	Cetearyl ethylhexanoate
	5.0	Ethylhexyl methoxycinnamate
	1.0	Ethylhexyltriazone
	1.0	VP/eicosene copolymer
	7.0	Isopropyl myristate
B	5.0	Zinc oxide, triethoxycaprylylsilane
C	0.2	Xanthan gum
	0.5	Hydroxyethyl acrylate/sodium acryloyldimethyltaurate copolymer, squalane, polysorbate 60
	0.2	Disodium EDTA
	5.0	Propylene glycol
	0.5	Panthenol
	56.9	Aqua dem.
D	5.0	Aqueous solution with about 7% P18
	0.5	Phenoxyethanol, methyl paraben, ethyl paraben, butyl paraben, propyl paraben, isopropyl paraben
	1.0	Tocopheryl acetate
	0.2	Bisabolol

Preparation: Heat phase A to about 80°C, stir in phase B and homogenize for 3 min. Likewise heat phase C to 80°C and stir into the combined phases A and B with homogenization. Cool to about 40°C, stir in phase D and homogenize again.

Example 15: Use of P18 in a sunscreen lotion – O/W type

Al 1%:

	%	Ingredient (INCI)
A	3.5	Ceteareth-6, stearyl alcohol
	1.5	Ceteareth-25
	7.5	Ethylhexyl methoxycinnamate

	2.0	Diethylaminohydroxybenzoylhexyl benzoate
	2.0	Cyclopentasiloxane, cyclohexasiloxane
	0.5	Beeswax
	3.0	Cetearyl alcohol
	10.0	Caprylic/capric triglyceride
B	5.0	Titanium dioxide, silicon dioxide, methicone, aluminum oxide
C	3.0	Glycerol
	0.2	Disodium EDTA
	0.3	Xanthan gum
	1.0	Decyl glucoside
	2.0	Panthenol, propylene glycol
	56.3	Aqua dem.
D	1.0	Aqueous solution with about 7% P18
	1.0	Tocopheryl acetate
	0.2	Bisabolol
	q.s.	Perfume oil
	q.s.	Preservative

AI 5%:

	%	Ingredient (INCI)
A	3.5	Ceteareth-6, Stearyl alcohol
	1.5	Ceteareth-25
	7.5	Ethylhexyl methoxycinnamate
	2.0	Diethylaminohydroxybenzoylhexyl benzoate
	2.0	Cyclopentasiloxane, cyclohexasiloxane
	0.5	Beeswax
	3.0	Cetearyl alcohol
	10.0	Caprylic/capric triglyceride
B	5.0	Titanium dioxide, silicon dioxide, methicone, aluminum oxide
C	3.0	Glycerol
	0.2	Disodium EDTA
	0.3	Xanthan gum
	1.0	Decyl glucoside
	2.0	Panthenol, propylene glycol
	52.3	Aqua dem.
D	5.0	Aqueous solution with about 7% P18
	1.0	Tocopheryl acetate
	0.2	Bisabolol
	q.s.	Perfume oil
	q.s.	Preservative

Preparation: Heat phase A to about 80°C, stir in phase B and homogenize for 3 min. Likewise heat phase C to 80°C and stir into the combined phases A and B with homogenization. Cool to about 40°C, stir in phase D and homogenize again.

Example 16: Use of P18 in a foot balm

AI 1%:

	%	Ingredient (INCI)
A	2.0	Ceteareth-6, Stearyl alcohol
	2.0	Ceteareth-25
	5.0	Cetearyl ethylhexanoate
	4.0	Cetyl alcohol
	4.0	Glyceryl stearate
	5.0	Mineral oil
	0.2	Menthol
	0.5	Camphor
B	69.3	Aqua dem.
	q.s.	Preservative
C	1.0	Bisabolol
	1.0	Tocopheryl acetate
D	1.0	Aqueous solution with about 7% P18
	5.0	Witch hazel extract

AI 5%:

	%	Ingredient (INCI)
A	2.0	Ceteareth-6, Stearyl alcohol
	2.0	Ceteareth-25
	5.0	Cetearyl ethylhexanoate
	4.0	Cetyl alcohol
	4.0	Glyceryl stearate
	5.0	Mineral oil
	0.2	Menthol
	0.5	Camphor
B	65.3	Aqua dem.
	q.s.	Preservative
C	1.0	Bisabolol
	1.0	Tocopheryl acetate
D	5.0	Aqueous solution with about 7% P18
	5.0	Witch hazel extract

Preparation: Heat the components of phases A and B separately from one another to about 80°C. Stir phase B into phase A with homogenization. With stirring, cool to about 40°C, add phases C and D and briefly afterhomogenize. With stirring, cool to room temperature.

Example 17: Use of P18 in a W/O emulsion with bisabolol

AI 1%:

	%	Ingredient (INCI)
A	6.0	PEG-7-hydrogenated castor oil

	8.0	Cetearyl ethylhexanoate
	5.0	Isopropyl myristate
	15.0	Mineral oil
	0.3	Magnesium stearate
	0.3	Aluminum stearate
	2.0	PEG-45/dodecyl glycol copolymer
B	5.0	Glycerol
	0.7	Magnesium sulfate
	55.6	Aqua dem.
C	1.0	Aqueous solution with about 7% P18
	0.5	Tocopheryl acetate
	0.6	Bisabolol

Al 5%:

	%	Ingredient (INCI)
A	6.0	PEG-7-hydrogenated castor oil
	8.0	Cetearyl ethylhexanoate
	5.0	Isopropyl myristate
	15.0	Mineral oil
	0.3	Magnesium stearate
	0.3	Aluminum stearate
	2.0	PEG-45/dodecyl glycol copolymer
B	5.0	Glycerol
	0.7	Magnesium sulfate
	51.6	Aqua dem.
C	5.0	Aqueous solution with about 7% P18
	0.5	Tocopheryl acetate

Preparation: Heat phases A and B separately from one another to about 85°C. Stir phase B into phase A and homogenize. With stirring, cool to about 40°C, add phase C and briefly homogenize again. With stirring, cool to room temperature.

Example 18: Foam conditioner with setting agent

Al 1%:

	%	Ingredient (INCI)
A	10.0	PVP/VA copolymer
	0.2	Hydroxyethylcetyldimonium phosphate
	0.2	Ceteareth-25
	0.5	Dimethicone copolyol
	q.s.	Perfume oil
	10.0	Alcohol
	1.0	Aqueous solution with about 7% P18
	68.1	Aqua dem.

	10.0	Propane/butane

Al 5%:

	%	Ingredient (INCI)
A	10.0	PVP/VA copolymer
	0.2	Hydroxyethylcetyldimonium phosphate
	0.2	Ceteareth-25
	0.5	Dimethicone copolyol
	q.s.	Perfume oil
	10.0	Alcohol
	5.0	Aqueous solution with about 7% P18
	64.1	Aqua dem.
	10.0	Propane/butane

Preparation: Weigh the components of phase A together, stir until everything has dissolved, and bottle.

Example 19: Foam conditioner

Al 1%:

	%	Ingredient (INCI)
A	1.0	Polyquaternium-4
	0.5	Hydroxyethylcetyldimonium phosphate
	1.0	Aqueous solution with about 7% P18
	q.s.	Perfume oil
	q.s.	Preservative
	91.5	Aqua dem.
	6.0	Propane/butane

Al 5%:

	%	Ingredient (INCI)
A	1.0	Polyquaternium-4
	0.5	Hydroxyethylcetyldimonium phosphate
	5.0	Aqueous solution with about 7% P18
	q.s.	Perfume oil
	q.s.	Preservative
	87.5	Aqua dem.
	6.0	Propane/butane

Preparation: Weigh the components of phase A together, stir until everything has dissolved to give a clear solution, and bottle.

Example 20: Foam conditioner

Al 1%:

	%	Ingredient (INCI)
A	1.0	Polyquaternium-11
	0.5	Hydroxyethylcetyldimonium phosphate
	1.0	Aqueous solution with about 7% P18
	q.s.	Perfume oil
	q.s.	Preservative
	91.5	Aqua dem.
	6.0	Propane/butane

Al 5%:

	%	Ingredient (INCI)
A	1.0	Polyquaternium-11
	0.5	Hydroxyethylcetyldimonium phosphate
	5.0	Aqueous solution with about 7% P18
	q.s.	Perfume oil
	q.s.	Preservative
	87.5	Aqua dem.
	6.0	Propane/butane

Preparation: Weigh the components of phase A together, stir until everything has dissolved to give a clear solution, and bottle.

Example 21: Styling foam

Al 1%:

	%	Ingredient (INCI)
A	0.5	Laureth-4
	q.s.	Perfume oil
B	77.3	Aqua dem.
	10.0	Polyquaternium-28
	1.0	Aqueous solution with about 7% P18
	0.5	Dimethicone copolyol
	0.2	Ceteareth-25
	0.2	Panthenol
	0.1	PEG-25 PABA
	0.2	Hydroxyethylcellulose
C	10.0	HFC 152 A

Al 5%:

	%	Ingredient (INCI)
A	0.5	Laureth-4
	q.s.	Perfume oil

B	73.3	Aqua dem.
	10.0	Polyquaternium-28
	5.0	Aqueous solution with about 7% P18
	0.5	Dimethicone copolyol
	0.2	Ceteareth-25
	0.2	Panthenol
	0.1	PEG-25 PABA
	0.2	Hydroxyethylcellulose
C	10.0	HFC 152 A

Preparation: Mix the components of phase A. Add the components of phase B one after the other and dissolve. Bottle with phase C.

Example 22: Styling foam

AI 1%:

	%	Ingredient (INCI)
A	2.0	Cocotrimonium methosulfate
	q.s.	Perfume oil
B	78.5	Aqua dem.
	6.7	Acrylate copolymer
	0.6	AMP
	1.0	Aqueous solution with about 7% P18
	0.5	Dimethicone copolyol
	0.2	Ceteareth-25
	0.2	Panthenol
	0.1	PEG-25 PABA
	0.2	Hydroxyethylcellulose
C	10.0	HFC 152 A

AI 5%:

	%	Ingredient (INCI)
A	2.0	Cocotrimonium methosulfate
	q.s.	Perfume oil
B	74.5	Aqua dem.
	6.7	Acrylate copolymer
	0.6	AMP
	5.0	Aqueous solution with about 7% P18
	0.5	Dimethicone copolyol
	0.2	Ceteareth-25
	0.2	Panthenol
	0.1	PEG-25 PABA
	0.2	Hydroxyethylcellulose
C	10.0	HFC 152 A

Preparation: Mix the components of phase A. Add the components of phase B one after the other and dissolve. Bottle with phase C.

Example 23: Styling foam

AI 1%:

	%	Ingredient (INCI)
A	2.0	Cocotrimonium methosulfate
	q.s.	Perfume oil
B	7.70	Polyquaternium-44
	1.0	Aqueous solution with about 7% P18
	q.s.	Preservative
	79.3	Aqua dem.
C	10.0	Propane/butane

AI 5%:

	%	Ingredient (INCI)
A	2.0	Cocotrimonium methosulfate
	q.s.	Perfume oil
B	7.70	Polyquaternium-44
	5.0	Aqueous solution with about 7% P18
	q.s.	Preservative
	75.3	Aqua dem.
C	10.0	Propane/butane

Preparation: Mix the components of phase A. Dissolve the components of phase B to give a clear solution, then stir phase B into phase A. Adjust the pH to 6-7, bottle with phase C.

Example 24: Styling foam

AI 1%:

	%	Ingredient (INCI)
A	2.00	Cocotrimonium methosulfate
	q.s.	Perfume oil
B	72.32	Aqua dem.
	2.00	VP/acrylates/lauryl methacrylate copolymer
	0.53	AMP
	1.00	Aqueous solution with about 7% P18
	0.20	Ceteareth-25
	0.50	Panthenol
	0.05	Benzophenone-4
	0.20	Amodimethicone, cetrimonium chloride, trideceth-12

	15.00	Alcohol
C	0.20	Hydroxyethylcellulose
D	6.00	Propane/butane

AI 5%:

	%	Ingredient (INCI)
A	2.00	Cocotrimonium methosulfate
	q.s.	Perfume oil
B	68.32	Aqua dem.
	2.00	VP/acrylates/lauryl methacrylate copolymer
	0.53	AMP
	5.00	Aqueous solution with about 7% P18
	0.20	Ceteareth-25
	0.50	Panthenol
	0.05	Benzophenone-4
	0.20	Amodimethicone, cetrimonium chloride, trideceth-12
	15.00	Alcohol
C	0.20	Hydroxyethylcellulose
D	6.00	Propane/butane

Preparation: Mix the components of phase A. Add the components of phase B one after the other and dissolve. Dissolve phase C in the mixture of A and B, then adjust the pH to 6-7. Bottle with phase D.

Example 25: Styling foam

AI 1%:

	%	Ingredient (INCI)
A	2.00	Cetrimonium chloride
	q.s.	Perfume oil
B	67.85	Aqua dem.
	7.00	Polyquaternium-46
	1.00	Aqueous solution with about 7% P18
	0.20	Ceteareth-25
	0.50	Panthenol
	0.05	Benzophenone-4
	0.20	Amodimethicone, cetrimonium chloride, trideceth-12
	15.00	Alcohol
C	0.20	Hydroxyethylcellulose
D	6.00	Propane/butane

AI 5%:

	%	Ingredient (INCI)
A	2.00	Cetrimonium chloride

	q.s.	Perfume oil
B	63.85	Aqua dem.
	7.00	Polyquaternium-46
	5.00	Aqueous solution with about 7% P18
	0.20	Ceteareth-25
	0.50	Panthenol
	0.05	Benzophenone-4
	0.20	Amodimethicone, cetrimonium chloride, trideceth-12
	15.00	Alcohol
C	0.20	Hydroxyethylcellulose
D	6.00	Propane/butane

Preparation: Mix the components of phase A. Add the components of phase B one after the other and dissolve. Dissolve phase C in the mixture of phase A and B, then adjust the pH to 6-7. Bottle with phase D.

Example 26: Styling foam

AI 1%:

	%	Ingredient (INCI)
A	q.s.	PEG-40-hydrogenated castor oil
	q.s.	Perfume oil
	85.5	Aqua dem.
B	7.0	Sodium polystyrenesulfonate
	1.0	Aqueous solution with about 7% P18
	0.5	Cetrimonium bromide
	q.s.	Preservative
C	6.0	Propane/butane

AI 5%:

	%	Ingredient (INCI)
A	q.s.	PEG-40-hydrogenated castor oil
	q.s.	Perfume oil
	81.5	Aqua dem.
B	7.0	Sodium polystyrenesulfonate
	5.0	Aqueous solution with about 7% P18
	0.5	Cetrimonium bromide
	q.s.	Preservative
C	6.0	Propane/butane

Preparation: Solubilize phase A. Weigh phase B into phase A and dissolve to give a clear solution. Adjust the pH to 6-7, bottle with phase C.

Example 27: Styling foam

AI 1%:

	%	Ingredient (INCI)
A	q.s.	PEG-40-hydrogenated castor oil
	q.s.	Perfume oil
	92.0	Aqua dem.
B	0.5	Polyquaternium-10
	1.0	Aqueous solution with about 7% P18
	0.5	Cetrimonium bromide
	q.s.	Preservative
C	6.0	Propane/butane

AI 5%:

	%	Ingredient (INCI)
A	q.s.	PEG-40-hydrogenated castor oil
	q.s.	Perfume oil
	88.0	Aqua dem.
B	0.5	Polyquaternium-10
	5.0	Aqueous solution with about 7% P18
	0.5	Cetrimonium bromide
	q.s.	Preservative
C	6.0	Propane/butane

Preparation: Solubilize phase A. Weigh phase B into phase A and dissolve to give a clear solution. Adjust the pH to 6-7, bottle with phase C.

Example 28: Styling foam

AI 1%:

	%	Ingredient (INCI)
A	q.s.	PEG-40-hydrogenated castor oil
	q.s.	Perfume oil
	82.5	Aqua dem.
B	10.0	Polyquaternium-16
	1.0	Aqueous solution with about 7% P18
	0.5	Hydroxyethylcetyldimonium phosphate
	q.s.	Preservative
C	6.0	Propane/butane

AI 5%:

	%	Ingredient (INCI)
A	q.s.	PEG-40-hydrogenated castor oil
	q.s.	Perfume oil
	78.5	Aqua dem.

B	10.0	Polyquaternium-16
	5.0	Aqueous solution with about 7% P18
	0.5	Hydroxyethylcetyldimonium phosphate
	q.s.	Preservative
C	6.0	Propane/butane

Preparation: Solubilize phase A. Weigh phase B into phase A and dissolve to give a clear solution. Adjust the pH to 6-7, bottle with phase C.

Example 29: Styling foam

AI 1%:

	%	Ingredient (INCI)
A	2.0	Cocotrimonium methosulfate
	q.s.	Perfume oil
B	84.0	Aqua dem.
	2.0	Chitosan
	1.0	Aqueous solution with about 7% P18
	0.5	Dimethicone copolyol
	0.2	Ceteareth-25
	0.2	Panthenol
	0.1	PEG-25 PABA
	10.0	HFC 152 A

AI 5%:

	%	Ingredient (INCI)
A	2.0	Cocotrimonium methosulfate
	q.s.	Perfume oil
B	80.0	Aqua dem.
	2.0	Chitosan
	5.0	Aqueous solution with about 7% P18
	0.5	Dimethicone copolyol
	0.2	Ceteareth-25
	0.2	Panthenol
	0.1	PEG-25 PABA
	10.0	HFC 152 A

Preparation: Mix the components of phase A. Add the components of phase B one after the other and dissolve. Bottle with phase C.

Example 30: Care shampoo

AI 1%

	%	Ingredient (INCI)
A	30.0	Sodium laureth sulfate
	6.0	Sodium cocoamphoacetate
	6.0	Cocamidopropylbetaine
	3.0	Sodium laureth sulfate, glycol distearate, cocamide-MEA, laureth-10
	1.0	Aqueous solution with about 7% P18
	7.7	Polyquaternium-44
	2.0	Amodimethicone
	q.s.	Perfume oil
	q.s.	Preservative
	1.0	Sodium chloride
	43.3	Aqua dem.
B	q.s.	Citric acid

AI 5%

	%	Ingredient (INCI)
A	30.0	Sodium laureth sulfate
	6.0	Sodium cocoamphoacetate
	6.0	Cocamidopropylbetaine
	3.0	Sodium laureth sulfate, glycol distearate, cocamide-MEA, laureth-10
	5.0	Aqueous solution with about 7% P18
	7.7	Polyquaternium-44
	2.0	Amodimethicone
	q.s.	Perfume oil
	q.s.	Preservative
	1.0	Sodium chloride
	39.3	Aqua dem.
B	q.s.	Citric acid

Preparation: Mix the components of phase A and dissolve. Adjust the pH to 6-7 with citric acid.

Example 31: Shower gel

AI 1%

	%	Ingredient (INCI)
A	40.0	Sodium laureth sulfate
	5.0	Decyl glucoside
	5.0	Cocamidopropylbetaine
	1.0	Aqueous solution with about 7% P18
	1.0	Panthenol
	q.s.	Perfume oil
	q.s.	Preservative
	2.0	Sodium chloride
	46.0	Aqua dem.

B	q.s.	Citric acid

AI 5%

	%	Ingredient (INCI)
A	40.0	Sodium laureth sulfate
	5.0	Decyl glucoside
	5.0	Cocamidopropylbetaine
	5.0	Aqueous solution with about 7% P18
	1.0	Panthenol
	q.s.	Perfume oil
	q.s.	Preservative
	2.0	Sodium chloride
	42.0	Aqua dem.
B	q.s.	Citric acid

Preparation: Mix the components of phase A and dissolve. Adjust the pH to 6-7 with citric acid.

Example 32: Shampoo

AI 1%

	%	Ingredient (INCI)
A	40.0	Sodium laureth sulfate
	5.0	Sodium C_{12-15}-pareth-15-sulfonate
	5.0	Decyl glucoside
	q.s.	Perfume oil
	0.1	Phytantriol
	44.6	Aqua dem.
	1.0	Aqueous solution with about 7% P18
	0.3	Polyquaternium-10
	1.0	Panthenol
	q.s.	Preservative
	1.0	Laureth-3
	2.0	Sodium chloride

AI 5%

	%	Ingredient (INCI)
A	40.0	Sodium laureth sulfate
	5.0	Sodium C_{12-15}-pareth-15-sulfonate
	5.0	Decyl glucoside
	q.s.	Perfume oil
	0.1	Phytantriol
	40.6	Aqua dem.
	5.0	Aqueous solution with about 7% P18
	0.3	Polyquaternium-10

1.0	Panthenol
q.s.	Preservative
1.0	Laureth-3
2.0	Sodium chloride

Preparation: Mix the components of phase A and dissolve. Adjust the pH to 6-7 with citric acid.

Example 33: Shampoo

AI 1%

	%	Ingredient (INCI)
A	15.0	Cocamidopropylbetaine
	10.0	Disodium cocoamphodiacetate
	5.0	Polysorbate 20
	5.0	Decyl glucoside
	q.s.	Perfume oil
	q.s.	Preservative
	1.0	Aqueous solution with about 7% P18
	0.15	Guar hydroxypropyltrimonium chloride
	2.0	Laureth-3
	58.0	Aqua dem.
	q.s.	Citric acid
B	3.0	PEG-150 distearate

AI 5%

	%	Ingredient (INCI)
A	15.0	Cocamidopropylbetaine
	10.0	Disodium cocoamphodiacetate
	5.0	Polysorbate 20
	5.0	Decyl glucoside
	q.s.	Perfume oil
	q.s.	Preservative
	5.0	Aqueous solution with about 7% P18
	0.15	Guar hydroxypropyltrimonium chloride
	2.0	Laureth-3
	54.0	Aqua dem.
	q.s.	Citric acid
B	3.0	PEG-150 distearate

Preparation: Weigh in the components of phase A and dissolve. Adjust the pH to 6-7. Add phase B and heat to about 50°C. With stirring, cool to room temperature.

Example 34: Moisturizing bodycare cream

AI 1%

	%	Ingredient (INCI)
A	2.0	Ceteareth-25
	2.0	Ceteareth-6, stearyl alcohol
	3.0	Cetearyl ethylhexanoate
	1.0	Dimethicone
	4.0	Cetearyl alcohol
	3.0	Glyceryl stearate SE
	5.0	Mineral oil
	4.0	*Simmondsia chinensis* (jojoba) seed oil
	3.0	Mineral oil, lanolin alcohol
B	5.0	Propylene glycol
	1.0	Aqueous solution with about 7% P18
	1.0	Panthenol
	0.5	Magnesium aluminum silicate
	q.s.	Preservative
	65.5	Aqua dem.
C	q.s.	Perfume oil
D	q.s.	Citric acid

AI 5%

	%	Ingredient (INCI)
A	2.0	Ceteareth-25
	2.0	Ceteareth-6, stearyl alcohol
	3.0	Cetearyl ethylhexanoate
	1.0	Dimethicone
	4.0	Cetearyl alcohol
	3.0	Glyceryl stearate SE
	5.0	Mineral oil
	4.0	*Simmondsia chinensis* (jojoba) seed oil
	3.0	Mineral oil, lanolin alcohol
B	5.0	Propylene glycol
	5.0	Aqueous solution with about 7% P18
	1.0	Panthenol
	0.5	Magnesium aluminum silicate
	q.s.	Preservative
	61.5	Aqua dem.
C	q.s.	Perfume oil
D	q.s.	Citric acid

Preparation: Heat phases A and B separately to about 80°C. Briefly prehomogenize phase B, then stir phase B into phase A and homogenize again. Cool to about 40°C, add phase C and homogenize well again. Adjust the pH to 6-7 with citric acid.

Example 35: Moisturizing bodycare cream

AI 1%

	%	Ingredient (INCI)
A	6.0	PEG-7-hydrogenated castor oil
	10.0	Cetearyl ethylhexanoate
	5.0	Isopropyl myristate
	7.0	Mineral oil
	0.5	Shea butter (*Butyrospermum parkii*)
	0.5	Aluminum stearate
	0.5	Magnesium stearate
	0.2	Bisabolol
	0.7	Quaternium-18 hectorite
B	5.0	Dipropylene glycol
	0.7	Magnesium sulfate
	q.s.	Preservative
	62.9	Aqua dem.
	q.s.	Perfume oil
C	1.0	Aqueous solution with about 7% P18

AI 5%

	%	Ingredient (INCI)
A	6.0	PEG-7-hydrogenated castor oil
	10.0	Cetearyl ethylhexanoate
	5.0	Isopropyl myristate
	7.0	Mineral oil
	0.5	Shea butter (*Butyrospermum parkii*)
	0.5	Aluminum stearate
	0.5	Magnesium stearate
	0.2	Bisabolol
	0.7	Quaternium-18 hectorite
B	5.0	Dipropylene glycol
	0.7	Magnesium sulfate
	q.s.	Preservative
	58.9	Aqua dem.
	q.s.	Perfume oil
C	5.0	Aqueous solution with about 7% P18

Preparation: Heat phases A and B separately to about 80°C. Stir phase B into phase A and homogenize. With stirring, cool to about 40°C, add phase C and homogenize again. With stirring, allow to cool to room temperature.

Example 36: Liquid make-up – O/W type

AI 1%

	%	Ingredient (INCI)
A	2.0	Ceteareth-6, stearyl alcohol
	2.0	Ceteareth-25
	6.0	Glyceryl stearate
	1.0	Cetyl alcohol
	8.0	Mineral oil
	7.0	Cetearyl ethylhexanoate
	0.2	Dimethicone
B	3.0	Propylene glycol
	1.0	Panthenol
	q.s.	Preservative
	61.9	Aqua dem.
C	0.1	Bisabolol
	1.0	Aqueous solution with about 7% P18
	q.s.	Perfume oil
D	5.7	C. I. 77 891, titanium dioxide
	1.1	Iron oxides

Al 5%

	%	Ingredient (INCI)
A	2.0	Ceteareth-6, stearyl alcohol
	2.0	Ceteareth-25
	6.0	Glyceryl stearate
	1.0	Cetyl alcohol
	8.0	Mineral oil
	7.0	Cetearyl ethylhexanoate
	0.2	Dimethicone
B	3.0	Propylene glycol
	1.0	Panthenol
	q.s.	Preservative
	57.9	Aqua dem.
C	0.1	Bisabolol
	5.0	Aqueous solution with about 7% P18
	q.s.	Perfume oil
D	5.7	C. I. 77 891, titanium dioxide
	1.1	Iron oxides

Preparation: Heat phases A and B separately to about 80°C. Stir phase B into phase A and homogenize. With stirring, cool to about 40°C, add phases C and D and thoroughly homogenize again. With stirring, allow to cool to room temperature.

Example 37: Dermocosmetic preparations

Dermocosmetic preparations according to the invention comprising the peptide P18 according to the invention are described below. The concentrations can vary according to the

invention.

The data below are parts by weight.

(1) Clear Shampoo

Ingredients (INCI)	1	2	3	4	5
Sodium laureth sulfate	13.00	15.00	10.50	12.50	10.00
Cocamidopropylbetaine	7.50	7.00	5.00	5.50	10.00
PEG-7 glyceryl cocoate	2.00	2.50	3.50	5.00	2.30
Perfume oil	0.10	0.10	0.10	0.10	0.10
P18	1.0	5.0	0.1	0.5	10.0
D-Panthenol USP	1.00	1.50	1.80	1.70	1.40
Preservative	0.10	0.10	0.10	0.10	0.10
Citric acid	0.10	0.10	0.10	0.10	0.10
Luviquat® Ultra Care	1.50	1.00	1.50	1.20	1.10
Sodium chloride	1.50	1.40	1.40	1.30	1.50
Aqua dem.	ad 100	ad 100	ad 100	ad 100	ad 100

(2) Shampoo

Ingredients (INCI)	1	2	3	4	5
Sodium laureth sulfate	35.00	40.00	30.00	45.00	27.00
Decyl glucoside	5.00	5.50	4.90	3.50	7.00
Cocamidopropylbetaine	10.00	5.00	12.50	7.50	15.00
Perfume oil	0.10	0.10	0.10	0.10	0.10
P18	1.0	5.0	0.1	0.5	10.0
D-Panthenol USP	0.50	1.00	0.80	1.50	0.50
Preservative	0.10	0.10	0.10	0.10	0.10
Citric acid	0.10	0.10	0.10	0.10	0.10
Laureth-3	0.50	2.00	0.50	0.50	2.00
Sodium chloride	1.50	1.50	1.50	1.50	1.50
Aqua dem.	ad 100	ad 100	ad 100	ad 100	ad 100

(3) Clear Conditioner-Shampoo

Ingredients (INCI)	1	2	3	4	5
®Disodium Cocoamphodiacetate	10.00	15.00	20.00	12.00	17.00
®Decyl Glucoside	5.00	6.00	7.00	8.00	4.00
®Cocamidopropyl Betaine	15.00	12.00	10.00	18.00	20.00
Luviquat® FC 550	0.30	0.20	0.20	0.20	0.30
Perfume oil	0.10	0.10	0.10	0.10	0.10
P18	20.0	5.0	1.0	0.5	10.0
Cremophor® PS 20	5.00	1.00	1.00	7.00	5.00
Preservative	0.10	0.10	0.10	0.10	0.10
®Laureth-3	2.00	1.00	0.50	2.00	2.00
Citric acid	0.20	0.20	0.20	0.20	0.20
PEG-12 distearate	3.00	2.00	2.00	3.00	2.50
Aqua dem.	ad 100	ad 100	ad 100	ad 100	ad 100

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(4) Foam O/W emulsions

	Emulsion 1		Emulsion 2	
	% by wt.	% by	% by wt.	% by

		vol.		vol.
Stearic acid	5.00		1.00	
Cetyl alcohol	5.50			
Cetearyl alcohol			2.00	
PEG-40 stearate	8.50			
PEG-20 stearate			1.00	
Caprylic/capric triglyceride	4.00		2.00	
C_{12-15}-Alkyl benzoate	10.00		15.00	
Cyclomethicone	4.00			
Dimethicone			0.50	
P18	5.0		10.0	
Ethylhexyl isostearate			5.00	
Myristyl myristate			2.00	
Ceresin	1.50			
Glycerol			3.00	
Hydroxypropyl starch phosphate	1.00		3.50	
BHT			0.02	
Disodium EDTA	0.50		0.10	
Perfume oil, preservative	q.s.		q.s.	
Colorant	q.s.		q.s.	
Potassium hydroxide	q.s.		q.s.	
Aqua dem.	ad 100		ad 100	
	Adjust pH to 6.5-7.5		Adjust pH to 5.0-6.0	
Emulsion 1		70		
Emulsion 2				35
Nitrogen		30		
Propane/butane				65

(5) Conditioner-shampoo with pearlescence

	1	2	3
Polyquaternium-10	0.50	0.50	0.40
Sodium laureth sulfate	9.00	8.50	8.90
Cocamidopropylbetaine	2.50	2.60	3.00
Uvinul® MS 40	1.50	0.50	1.00
P18	1.0	5.0	0.5
Pearlescence solution	2.00	2.50	
Disodium EDTA	0.10	0.15	0.05
Preservative, perfume oil, thickener	q.s.	q.s.	q.s.
Aqua dem.	ad 100	ad 100	ad 100

Adjust pH to 6.0

(6) Clear conditioner-shampoo

	1	2	3
Polyquaternium-10	0.50	0.50	0.50
Sodium laureth sulfate	9.00	8.50	9.50
P18	5.0	0.1	3.0
Uvinul M® 40	1.00	1.50	0.50
Preservative, perfume oil, thickener	q.s.	q.s.	q.s.
Aqua dem.	ad 100	ad 100	ad 100

Adjust pH to 6.0

(7) Clear conditioner-shampoo with volume effect

	1	2	3
Sodium laureth sulfate	10.00	10.50	11.00
Uvinul® MC 80	2.00	1.50	2.30

P18	10.0	0.1	0.5
Cocamidopropylbetaine	2.50	2.60	2.20
Disodium EDTA	0.01	0.10	0.01
Preservative, perfume oil, thickener	q.s.	q.s.	q.s.
Aqua dem.	ad 100	ad 100	ad 100

Adjust pH to 6.0

(8) Gel cream

	1	2	3	4
Acrylates/C_{10-30}–alkyl acrylate crosspolymer	0.40	0.35	0.40	0.35
Carbomer	0.20	0.22	0.20	0.22
Xanthan gum	0.10	0.13	0.10	0.13
Cetearyl alcohol	3.00	2.50	3.00	2.50
C_{12-15}-Alkyl benzoate	4.00	4.50	4.00	4.50
Caprylic/capric triglyceride	3.00	3.50	3.00	3.50
Uvinul® A Plus™	2.00	1.50	0.75	1.00
UvaSorb® k2A Ethylhexylbis-isopentylbenzoxazolylphenylmelamine		3.00		
Uvinul® MC 80	3.00		1.00	
Bis-Ethylhexyloxyphenol methoxyphenyltriazine		1.50		2.00
Butylmethoxydibenzoylmethane			2.00	
Disodium phenyldibenzimidazoletetrasulfonate	2.50		0.50	2.00
Uvinul® T 150	4.00		3.00	4.00
Octocrylene		4.00		
Diethylhexylbutamidotriazone	1.00			2.00
Phenylbenzimidazolesulfonic acid	0.50		3.00	
Methylenebis-benzotriazolyltetramethylbutylphenol	2.00		0.50	1.50
Ethylhexyl salicylate			3.00	
Drometrizole trisiloxane			0.50	
Terephthalidenedicamphorsulfonic acid		1.50		1.00
Diethylhexyl 2,6-naphthalate	3.50	4.00	7.00	9.00
Titanium dioxide-microfine	1.00		3.00	
Zinc oxide-microfine				0.25
P18	0.1	.5	1.0	0.02
Cyclomethicone	5.00	5.50	5.00	5.50
Dimethicone	1.00	0.60	1.00	0.60
Glycerol	1.00	1.20	1.00	1.20
Sodium hydroxide	q.s.	q.s.	q.s.	q.s.
Preservative	0.30	0.23	0.30	0.23
Perfume oil	0.20		0.20	
Aqua dem.	ad 100	ad 100	ad 100	ad 100
Adjust pH to 6.0				

(9) OW Sunscreen formulation

	1	2	3	4	5	6	7
Glyceryl stearate SE	0.50	1.00	3.00			1.50	
Glyceryl stearate citrate	2.00		1.00	2.00	4.00		
Stearic acid		3.00		2.00			
PEG-40 stearate	0.50					2.00	
Cetyl phosphate						1.00	
Sodium cetearyl sulfate							0.75
Stearyl alcohol			3.00			2.00	0.60
Cetyl alcohol	2.50	1.10		1.50	0.60		2.00
P18	10.0	0.5	3.0	5.0	0.1	0.02	7.5
Uvinul® A Plus™	2.00	1.50	0.75	1.00	2.10	4.50	5.00

UvaSorb® k2A Ethylhexylbisisopentyl-benzoxazolylphenylmelamine							
Ethylhexyl methoxycinnamate Uvinul® MC 80					5.00	6.00	8.00
Bisethylhexyloxyphenol methoxyphenyltriazine		1.50		2.00	2.50		2.50
Butylmethoxydibenzoylmethane			2.00		2.00	1.50	
Disodium phenyldibenzimidazole-tetrasulfonate	2.50		0.50	2.00		0.30	
Ethylhexyl Triazone Uvinul® T 150	4.00		3.00	4.00		2.00	
Octocrylene		4.00					7.50
Diethylhexylbutamidotriazone	1.00			2.00	1.00		1.00
Phenylbenzimidazolesulfonic acid	0.50		3.00				
Methylenebis-benzotriazolyltetramethylbutyl-phenol	2.00		0.50	1.50	2.50		
Ethylhexyl salicylate			3.00				5.00
Drometrizole trisiloxane			0.50			1.00	
Terephthalidenedicamphor-sulfonic acid		1.50		1.00	1.00		0.50
Diethylhexyl 2,6-naphthalate	3.50		7.00		6.00	9.00	
Titanium dioxide-microfine	1.00		3.00		3.50		1.50
Zinc oxide-microfine				0.25		2.00	
C_{12-15}-Alkyl benzoate		0.25			4.00	7.00	
Dicapryl ether			3.50		2.00		
Butylene glycol dicaprylate/ dicaprate	5.00		6.00				
Cocoglyceride			6.00		2.00		
Dimethicone	0.50		1.00		2.00		
Cyclomethicone	2.00		0.50		0.50		
Butyrospermum parkii (shea butter)		2.00					
VP/hexadecene copolymer	0.20			0.50		1.00	
Glycerol	3.00	7.50		7.50	5.00		2.50
Xanthan gum	0.15		0.05			0.30	
Sodium carbomer		0.20		0.15	0.25		
Vitamin E acetate	0.60		0.23		0.70	1.00	
Biosaccharide gum-1		3.00	10.00				
Glycine soya (soybean) oil				0.50		1.50	1.00
Ethylhexylglycerol	0.30						
DMDM hydantoin		0.60	0.40	0.20			
Iodopropynyl butylcarbamate				0.18	0.20		
Methyl paraben	0.15		0.25		0.50		
Phenoxyethanol	1.00	0.40			0.40	0.50	0.40
Trisodium EDTA	0.02		0.05				
Tetrasodium iminodisuccinate				0.25	1.00		
Ethanol	2.00	1.50		3.00		1.20	5.00
Perfume oil	0.10	0.25	0.30		0.40	0.20	
Aqua dem.	ad 100	ad 100	ad 100	ad 100	ad 100	ad100	ad 100

(10)
Hydrodispersion

	1	2	3	4	5
Ceteareth-20	1.00			0.50	
Cetyl alcohol			1.00		

Sodium carbomer		0.20		0.30	
Acrylates/C_{10-30}-alkyl acrylate crosspolymer	0.50		0.40	0.10	0.50
Xanthan gum		0.30	0.15		
P18	5.0	0.5	3.0	0.1	10.0
Uvinul® A Plus™	2.00	1.50	0.75	1.00	2.10
UvaSorb® k2A ethylhexylbis-isopentylbenzoxazolylphenylmelamine		3.50			
Ethylhexyl methoxycinnamate Uvinul® MC 80					5.00
Bisethylhexyloxyphenol methoxyphenyltriazine		1.50		2.00	2.50
Butylmethoxydibenzoylmethane			2.00		2.00
Disodium phenyldibenzimidazoletetrasulfonate	2.50		0.50	2.00	
Ethylhexyltriazone Uvinul® T 150	4.00		3.00	4.00	
Octocrylene		4.00			
Diethylhexylbutamidotriazone	1.00			2.00	1.00
Phenylbenzimidazolesulfonic acid	0.50		3.00		
Methylenebis-benzotriazolyltetramethylbutylphenol	2.00		0.50	1.50	2.50
Ethylhexyl salicylate			3.00		
Drometrizole trisiloxane			0.50		
Terephthalidenedicamphorsulfonic acid		1.50		1.00	1.00
Diethylhexyl 2,6-naphthalate			7.00		9.00
Titanium dioxide-microfine	1.00		3.00		3.50
Zinc oxide-microfine				0.25	
C_{12-15}-Alkyl benzoate	2.00	2.50			
Dicapryl ether		4.00			
Butylene glycol dicaprylate/dicaprate	4.00		2.00	6.00	
Dicapryl carbonate		2.00	6.00		
Dimethicone		0.50	1.00		
Phenyltrimethicone	2.00		0.50		
Butyrospermum parkii (shea butter)		2.00		5.00	
VP/hexadecene copolymer	0.50			0.50	1.00
Tricontanyl-PVP	0.50		1.00		
Ethylhexylglycerol			1.00		0.80
Glycerol	3.00	7.50		7.50	8.50
Glycine soya (soybean) oil			1.50		1.00
Vitamin E acetate	0.50		0.25		1.00
Glucosylrutin	0.60			0.25	
Biosaccharide gum-1		2.50	0.50		2.00
DMDM hydantoin		0.60	0.45	0.25	
Iodopropynyl butylcarbamate	0.20				
Methyl paraben	0.50		0.25	0.15	
Phenoxyethanol	0.50	0.40		1.00	
Trisodium EDTA		0.01	0.05		0.10
Ethanol	3.00	2.00	1.50		7.00
Perfume oil	0.20		0.05	0.40	
Aqua dem.	ad 100	ad 100	ad 100	ad 100	ad 100

(11) WO Sunscreen emulsion

	1	2	3	4	5
Cetyldimethicone		2.50		4.00	
Polyglyceryl-2 dipolyhydroxystearate	5.00				4.50
PEG-30 dipolyhydroxystearate			5.00		
P18	5.0	1.0	10.0	0.5	0.1
Uvinul® A Plus™	2.00	1.50	0.75	1.00	2.10

UvaSorb® k2A Ethylhexylbis-isopentylbenzoxazolylphenylmelamine		2.00			
Ethylhexyl methoxycinnamate Uvinul® MC 80					5.00
Bisethylhexyloxyphenol methoxyphenyl-triazine		1.50		2.00	2.50
Butylmethoxydibenzoylmethane			2.00		2.00
Disodium phenyldibenzimidazoletetrasulfonate	2.50		0.50	2.00	
Ethylhexyltriazone Uvinul® T 150	4.00		3.00	4.00	
Octocrylene		4.00			
Diethylhexylbutamidotriazone	1.00			2.00	1.00
Phenylbenzimidazolesulfonic acid	0.50		3.00		
Methylenebisbenzotriazolyltetra-methylbutylphenol	2.00		0.50	1.50	2.50
Ethylhexyl salicylate			3.00		
Drometrizole trisiloxane			0.50		
Terephthalidenedicamphorsulfonic acid		1.50		1.00	1.00
Diethylhexyl 2,6-naphthalate			7.00		4.00
Titanium dioxide-microfine	1.00		3.00		3.50
Zinc oxide-microfine				0.25	
Mineral oil		12.00	10.00		8.00
C_{12-15}-Alkyl benzoate				9.00	
Dicaprylyl ether	10.00				7.00
Butylene glycol dicaprylate/dicaprate			2.00	8.00	4.00
Dicaprylyl carbonate	5.00		6.00		
Dimethicone		4.00	1.00	5.00	
Cyclomethicone	2.00	25.00			2.00
Butyrospermum parkii (shea butter)			3.00		
Petrolatum		4.50			
VP/hexadecene copolymer	0.50			0.50	1.00
Ethylhexylglycerol		0.30	1.00		0.50
Glycerol	3.00	7.50		7.50	8.50
Glycine soya (soybean) oil		1.00	1.50		1.00
Magnesium sulfate $MgSO_4$	1.00	0.50		0.50	
Magnesium chloride $MgCl_2$			1.00		0.70
Vitamin E acetate	0.50		0.25		1.00
Ascorbyl palmitate	0.50			2.00	
Biosaccharide gum-1				3.50	1.00
DMDM hydantoin		0.60	0.40	0.20	
Methyl paraben	0.50		0.25	0.15	
Phenoxyethanol	0.50	0.40		1.00	
Trisodium EDTA	0.12	0.05		0.30	
Ethanol	3.00		1.50		5.00
Perfume oil	0.20		0.40	0.35	
Aqua dem.	ad 100	ad 100	ad 100	ad 100	ad 100

(12) Sticks

	1	**2**	**3**	**4**
Caprylic/capric triglyceride	12.00	10.00	6.00	
Octyldodecanol	7.00	14.00	8.00	3.00
Butylene glycol dicaprylate/dicaprate				12.00
Pentaerythrityl tetraisostearate	10.00	6.00	8.00	7.00
Polyglyceryl-3 diisostearate	2.50			
Bisdiglyceryl polyacyladipate-2	9.00	8.00	10.00	8.00
Cetearyl alcohol	8.00	11.00	9.00	7.00
Myristyl myristate	3.50	3.00	4.00	3.00
Beeswax	5.00	5.00	6.00	6.00

Copernicia cerifera (carnauba) wax	1.50	2.00	2.00	1.50
Cera alba	0.50	0.50	0.50	0.40
C_{16-40} Alkyl stearate		1.50	1.50	1.50
P18	0.5	3.0	1.0	5.0
Uvinul® A Plus™	2.00	1.50	0.75	9.00
UvaSorb® k2A Ethylhexylbis-isopentylbenzoxazolylphenylmelamine		2.00		4.00
Ethylhexyl methoxycinnamate Uvinul® MC 80		3.00		
Bis-Ethylhexyloxyphenol methoxyphenyltriazine		1.50		2.00
Butylmethoxydibenzoylmethane			2.00	
Disodium phenyldibenzimidazole-tetrasulfonate	2.50		0.50	2.00
Ethylhexyltriazone Uvinul® T 150	4.00		3.00	4.00
Octocrylene		4.00		
Diethylhexylbutamidotriazone	1.00			2.00
Phenylbenzimidazolesulfonic acid	0.50		3.00	
Methylenebis-benzotriazolyltetramethylbutylphenol	2.00		0.50	1.50
Ethylhexyl salicylate			3.00	
Drometrizole trisiloxane			0.50	
Terephthalidenedicamphorsulfonic acid		1.50		1.00
Diethylhexyl 2,6-naphthalate			7.00	
Titanium dioxide-microfine	1.00		3.00	
Zinc oxide-microfine				0.25
Vitamin E acetate	0.50	1.00		
Ascorbyl palmitate	0.05		0.05	
Buxux chinensis (jojoba) oil	2.00	1.00		1.00
Perfume oil, BHT	0.10	0.25		0.35
Ricinus communis (castor) oil	ad 100	ad 100	ad 100	ad 100

(13) PIT emulsion

	1	2	3	4	5	6	7	8
Glyceryl monostearate SE	0.50	2.00	3.00	5.00		0.50	4.00	
Glyceryl isostearate					3.50	4.00	2.00	
Isoceteth-20		0.50			2.00			
Ceteareth-12		5.00		1.00			3.50	5.00
Ceteareth-20		5.00		1.00				3.50
PEG-100 stearate				2.80		2.30	3.30	
Cetyl alcohol	5.20		1.20	1.00	1.30		0.50	0.30
Cetyl palmitate	2.50	1.20		1.50		0.50		1.50
Cetyldimethicone copolyol				0.50		1.00		
Polyglyceryl-2 dioleate				0.75	0.30			
P18	0.1	5.0	0.01	0.5	3.0	0.25	10.0	3.0
Uvinul® A Plus™	2.00	1.50	0.75	1.00	2.10	4.50	5.00	2.10
UvaSorb® k2A Ethylhexylbisiso-pentylbenzoxazolyl-phenylmelamine			4.00				1.50	
Ethylhexyl methoxycinnamate Uvinul® MC 80					5.00	6.00	8.00	5.00
Bisethylhexyloxy-phenol methoxy-phenyltriazine		1.50		2.00	2.50		2.50	2.50

Butylmethoxy-dibenzoylmethane			2.00		2.00	1.50		2.00
Disodium phenyldibenzimid-azoletetrasulfonate	2.50		0.50	2.00		0.30		
Ethylhexyltriazone Uvinul® T 150	4.00		3.00	4.00		2.00		
Octocrylene		4.00					7.50	
Diethylhexylbut-amidotriazone	1.00			2.00	1.00		1.00	1.00
Phenylbenzimidazole sulfonic acid	0.50		3.00					
Methylenebis-benzotriazolyltetra-methylbutylphenol	2.00		0.50	1.50	2.50			2.50
Ethylhexyl salicylate			3.00				5.00	
Drometrizole trisiloxane			0.50			1.00		
Terephthalidene-dicamphorsulfonic acid		1.50		1.00	1.00		0.50	1.00
Diethylhexyl 2,6-naphthalate			7.00		10.00	7.50		8.00
Titanium dioxide-microfine	1.00		3.00		3.50		1.50	3.50
Zinc oxide-microfine				0.25		2.00		
C_{12-15}-Alkyl benzoate	3.50			6.35				0.10
Cocoglyceride		3.00		3.00				1.00
Dicapryl ether	4.50							
Dicaprylyl carbonate		4.30		3.00				7.00
Dibutyl adipate				0.50				0.30
Phenyltrimethicone	2.00			3.50		2.00		
Cyclomethicone		3.00						
C_{1-5} Alkylgalactomannan		0.50			2.00			
Hydrogenated cocoglyceride					3.00	4.00		
Behenoxy-dimethicone						1.50	2.00	
VP/hexadecene copolymer				1.00	1.20			
Glycerol	4.00	6.00	5.00		8.00	10.00		
Vitamin E acetate	0.20	0.30	0.40		0.30			
Butyrospermum parkii (shea butter)		2.00		3.60		2.00		
Iodopropyl butylcarbamate	0.12				0.20			
Biosaccharide gum-1				0.10				
DMDM hydantoin	0.10				0.12		0.13	
Methyl paraben		0.50	0.30		0.35			
Phenoxyethanol	0.50	0.40		1.00				
Ethylhexylglycerol		0.30			1.00		0.35	
Ethanol	2.00		2.00			5.00		
Trisodium EDTA	0.40		0.15			0.20		
Perfume oil	0.20		0.20		0.24	0.16	0.10	0.10
Aqua dem.	ad 100	ad 100	ad 100	ad 100	ad 100	ad100	ad 100	ad 100

(14) Gel cream

	1	2	3	4
Acrylates/C_{10-30}-alkyl acrylate crosspolymer	0.40	0.35	0.40	0.35

Carbomer	0.20	0.22	0.20	0.22
Luvigel® EM	1.50	2.50	2.80	3.50
Xanthan gum	0.10	0.13	0.10	0.13
Cetearyl alcohol	3.00	2.50	3.00	2.50
C_{12-15}-Alkyl benzoate	4.00	4.50	4.00	4.50
Caprylic/capric triglyceride	3.00	3.50	3.00	3.50
Titanium dioxide-microfine	1.00		1.50	
Zinc oxide-microfine		2.00		0.25
P18	0.5	10.0	3.0	5.0
Dihydroxyacetone			3.00	5.00
Cyclomethicone	5.00	5.50	5.00	5.50
Dimethicone	1.00	0.60	1.00	0.60
Glycerol	1.00	1.20	1.00	1.20
Sodium hydroxide	q.s.	q.s.	q.s.	q.s.
Preservative	0.30	0.23	0.30	0.23
Perfume oil	0.20		0.20	
Aqua dem.	ad 100	ad 100	ad 100	ad 100
Adjust pH to 6.0				

(15) OW self-tanning formulations

	1	2	3	4	5	6	7
Glyceryl monostearate SE	0.50	1.00	3.00			1.50	
Glyceryl stearate citrate	2.00		1.00	2.00	4.00		
Stearic acid		3.00		2.00			
PEG-40 stearate	0.50					2.00	
Cetyl phosphate						1.00	
Cetearyl sulfate							0.75
Stearyl alcohol			3.00			2.00	0.60
Cetyl alcohol	2.50	1.10		1.50	0.60		2.00
P18	0.1	0.5	0.025	5.0	3.0	10.0	1.0
Dihydroxyacetone			3.00	5.00		4	
Titanium dioxide-microfine	1.00				1.50		1.50
Zinc oxide-microfine				0.25		2.00	
C_{12-15}-Alkyl benzoate		0.25			4.00	7.00	
Dicapryl ether			3.50		2.00		
Butylene glycol dicaprylate/dicaprate	5.00		6.00				
Cocoglyceride			6.00		2.00		
Dimethicone	0.50		1.00		2.00		
Cyclomethicone	2.00		0.50		0.50		
Butyrospermum parkii (shea butter)		2.00					
VP/hexadecene copolymer	0.20			0.50		1.00	
Glycerol	3.00	7.50		7.50	5.00		2.50
Xanthan gum	0.15		0.05			0.30	
Sodium carbomer		0.20		0.15	0.25		
Vitamin E acetate	0.60		0.23		0.70	1.00	
Biosaccharide gum-1		3.00	10.00				
Glycine soya (soybean) oil				0.50		1.50	1.00
Ethylhexylglycerol	0.30						
DMDM hydantoin		0.60	0.40	0.20			
Iodopropynyl butylcarbamate				0.18	0.20		
Methyl paraben	0.15		0.25		0.50		
Phenoxyethanol	1.00	0.40			0.40	0.50	0.40
Trisodium EDTA	0.02		0.05				
Tetrasodium iminodisuccinate				0.25	1.00		

Ethanol	2.00	1.50		3.00		1.20	5.00
Perfume oil	0.10	0.25	0.30		0.40	0.20	
Aqua dem.	ad 100	ad 100	ad 100	ad 100	ad 100	ad100	ad 100

(16) OW make-up

	1	2	3	4	5	6	7
Glyceryl monostearate SE	0.50	1.00	3.00			1.50	
Glyceryl stearate citrate	2.00		1.00	2.00	4.00		
Stearic acid		3.00		2.00			
PEG-40 stearate	0.50					2.00	
Cetyl phosphate						1.00	
Cetearyl sulfate							0.75
Stearyl alcohol			3.00			2.00	0.60
Cetyl alcohol	2.50	1.10		1.50	0.60		2.00
P18	3.0	5.0	2.0	0.5	1.0	5.0	10.0
Titanium dioxide	10.00	12.00	9.00	8.50	11.00	9.50	10.00
Iron oxide	2.00	4.00	3.00	5.00	3.40	6.00	4.40
Zinc oxide		4.00		2.00		3.00	
C_{12-15}-Alkyl benzoate		0.25			4.00	7.00	
Dicapryl ether			3.50		2.00		
Butylene glycol dicaprylate/dicaprate	5.00		6.00				
Cocoglyceride			6.00		2.00		
Dimethicone	0.50		1.00		2.00		
Cyclomethicone	2.00		0.50		0.50		
Butyrospermum parkii (shea butter)		2.00					
VP/hexadecene copolymer	0.20			0.50		1.00	
Glycerol	3.00	7.50		7.50	5.00		2.50
Xanthan gum	0.15		0.05			0.30	
Sodium carbomer		0.20		0.15	0.25		
Vitamin E acetate	0.60		0.23		0.70	1.00	
Glycine soya (soybean) oil				0.50		1.50	1.00
Ethylhexylglycerol	0.30						
DMDM hydantoin		0.60	0.40	0.20			
Iodopropynyl butylcarbamate				0.18	0.20		
Methyl paraben	0.15		0.25		0.50		
Phenoxyethanol	1.00	0.40			0.40	0.50	0.40
Trisodium EDTA	0.02		0.05				
Tetrasodium iminodisuccinate				0.25	1.00		
Ethanol	2.00	1.50		3.00		1.20	5.00
Perfume oil	0.10	0.25	0.30		0.40	0.20	
Aqua dem.	ad 100	ad 100	ad 100	ad 100	ad 100	ad100	ad 100

(17) Self-tanning hydrodispersion

	1	2	3	4	5
Ceteareth-20	1.00			0.50	
Cetyl alcohol			1.00		
Luvigel® EM		2.00		2.50	2.00
Acrylates/C_{10-30}-alkyl acrylate crosspolymer	0.50		0.40	0.10	0.50
Xanthan gum		0.30	0.15		
P18	3.0	1.0	0.5	0.1	5.0
Dihydroxyacetone			3.00	5.00	
Uvinul® A Plus™	2.00	1.50	0.75	1.00	2.10
Titanium dioxide-microfine	1.00		1.00		1.00
Zinc oxide-microfine		1.90		0.25	

C_{12-15}-Alkyl benzoate	2.00	2.50			
Dicapryl ether		4.00			
Butylene glycol dicaprylate/dicaprate	4.00		2.00	6.00	
Dicapryl carbonate		2.00	6.00		
Dimethicone		0.50	1.00		
Phenyltrimethicone	2.00		0.50		
Butyrospermum parkii (shea butter)		2.00		5.00	
VP/hexadecene copolymer	0.50			0.50	1.00
Tricontanyl-PVP	0.50		1.00		
Ethylhexylglycerol			1.00		0.80
Glycerol	3.00	7.50		7.50	8.50
Glycine soya (soybean) oil			1.50		1.00
Vitamin E acetate	0.50		0.25		1.00
Glucosylrutin	0.60			0.25	
DMDM hydantoin		0.60	0.45	0.25	
Iodopropynyl butylcarbamate	0.20				
Methyl paraben	0.50		0.25	0.15	
Phenoxyethanol	0.50	0.40		1.00	
Trisodium EDTA		0.01	0.05		0.10
Ethanol	3.00	2.00	1.50		7.00
Perfume oil	0.20		0.05	0.40	
Aqua dem.	ad 100	ad 100	ad 100	ad 100	ad 100

(18) Aftersun hydrodispersion

	1	2	3	4	5
Ceteareth-20	1.00			0.50	
Cetyl alcohol			1.00		
Luvigel® EM		2.00		2.50	2.00
Acrylates/C_{10-30}-alkyl acrylate crosspolymer	0.50	0.30	0.40	0.10	0.50
Xanthan gum		0.30	0.15		
P18	0.1	5.0	0.5	3.0	1.0
C_{12-15}-Alkyl benzoate	2.00	2.50			
Dicapryl ether		4.00			
Butylene glycol dicaprylate/dicaprate	4.00		2.00	6.00	
Dicapryl carbonate		2.00	6.00		
Dimethicone		0.50	1.00		
Phenyltrimethicone	2.00		0.50		
Tricontanyl-PVP	0.50		1.00		
Ethylhexylglycerol			1.00		0.80
Glycerol	3.00	7.50		7.50	8.50
Glycine soya (soybean) oil			1.50		1.00
Vitamin E acetate	0.50		0.25		1.00
Glucosylrutin	0.60			0.25	
Trisodium EDTA		0.01	0.05		0.10
Ethanol	15.00	10.00	8.00	12.00	9.00
Perfume oil	0.20		0.05	0.40	
Aqua dem.	ad 100	ad 100	ad 100	ad 100	ad 100

(19) WO emulsions

	1	2	3	4	5
Cetyldimethicone		2.50		4.00	
Polyglyceryl-2 dipolyhydroxystearate	5.00				4.50
PEG-30 dipolyhydroxystearate			5.00		
P18	5.0	10.0	0.1	0.5	1.0
Uvinul® A Plus™	2.00	1.50	0.75	1.00	2.10
Titanium dioxide-microfine	1.00		3.00		3.50
Zinc oxide-microfine		0.90		0.25	
Mineral oil		12.00	10.00		8.00

C_{12-15}-Alkyl benzoate				9.00	
Dicaprylyl ether	10.00				7.00
Butylene glycol dicaprylate/dicaprate			2.00	8.00	4.00
Dicaprylyl carbonate	5.00		6.00		
Dimethicone		4.00	1.00	5.00	
Cyclomethicone	2.00	25.00			2.00
Butyrospermum parkii (shea butter)			3.00		
Vaseline		4.50			
VP/hexadecene copolymer	0.50			0.50	1.00
Ethylhexylglycerol		0.30	1.00		0.50
Glycerol	3.00	7.50		7.50	8.50
Glycine soya (soybean) oil		1.00	1.50		1.00
Magnesium sulfate	1.00	0.50		0.50	
Magnesium chloride			1.00		0.70
Vitamin E acetate	0.50		0.25		1.00
Ascorbyl palmitate	0.50			2.00	
Biosaccaride gum-1				3.50	7.00
DMDM hydantoin		0.60	0.40	0.20	
Methyl paraben	0.50		0.25	0.15	
Phenoxyethanol	0.50	0.40		1.00	
Trisodium EDTA	0.12	0.05		0.30	
Ethanol	3.00		1.50		5.00
Perfume oil	0.20		0.40	0.35	
Aqua dem.	ad 100	ad 100	ad 100	ad 100	ad 100

(20) Solids-stabilized emulsion (Pickering emulsions)

	1	2	3	4	5
Mineral oil			16.00	16.00	
Octyldodecanol	9.00	9.00	5.00		
Caprylic/capric triglyceride	9.00	9.00	6.00		
C_{12-15}-Alkyl benzoate				5.00	8.00
Butylene glycol dicaprylate/dicaprate					8.00
Dicaprylyl ether	9.00			4.00	
Dicaprylyl carbonate		9.00			
Hydroxyoctacosanyl hydroxystearate	2.00	2.00	2.20	2.50	1.50
Disteardimonium hectorite	1.00	0.75		0.50	0.25
Cera microcristallina + paraffinum liquidum		0.35			5.00
Hydroxypropylmethylcellulose			0.10		0.05
Dimethicone					3.00
P18	1.0	0.5	0.1	3.0	5.0
Titanium dioxide + aluminum oxide + simethicone + aqua		3.00			
Titanium dioxide + trimethoxycaprylylsilane		2.00	4.00	2.00	4.00
Silicon dimethylsilylate	2.50			6.00	2.50
Boron nitride			1.00		
Starch/sodium metaphosphate polymer	2.00				
Manioc starch or tapioca		0.50			
Sodium chloride	5.00	7.00	8.50	3.00	4.50
Glycerol				1.00	
Trisodium EDTA	1.00	1.00	1.00	1.00	1.00
Vitamin E acetate	5.00	10.00	3.00	6.00	10.00
Ascorbyl palmitate	1.00	1.00		1.00	
Methyl paraben		0.60			0.20
Propyl paraben					0.20
Phenoxyethanol			0.20		

Hexamidine diisethionate			0.40	0.50	0.40
Diazolidinylurea					0.08
Ethanol			0.23	0.20	
Perfume oil	5.00		3.00	4.00	
Aqua dem.	0.20		0.30	0.10	
	ad 100	ad 100	ad 100	ad 100	ad 100

(21) Sticks

	1	2	3	4
Caprylic/capric triglyceride	12.00	10.00	6.00	
Octyldodecanol	7.00	14.00	8.00	3.00
Butylene glycol dicaprylate/dicaprate				12.00
Pentaerythrityl tetraisostearate	10.00	6.00	8.00	7.00
Polyglyceryl-3 diisostearate	2.50			
Bisdiglyceryl polyacyladipate-2	9.00	8.00	10.00	8.00
Cetearyl alcohol	8.00	11.00	9.00	7.00
Myristyl myristate	3.50	3.00	4.00	3.00
Beeswax	5.00	5.00	6.00	6.00
Copernicia cerifera (carnauba) wax	1.50	2.00	2.00	1.50
Cera Alba	0.50	0.50	0.50	0.40
C_{16-40}-Alkyl stearate		1.50	1.50	1.50
P18	10.0	1.0	3.0	0.1
Uvinul® A Plus™	2.00	1.50	0.75	9.00
Titanium dioxide-microfine	1.00		3.00	
Zinc oxide-microfine		1.00		0.25
Vitamin E acetate	0.50	1.00		
Ascorbyl palmitate	0.05		0.05	
Buxux chinensis (jojoba) oil	2.00	1.00		1.00
Perfume oil, BHT	0.10	0.25		0.35
Ricinus communis (castor) oil	ad 100	ad 100	ad 100	ad 100

(22) Self-tanning PIT emulsions

	1	2	3	4	5	6	7	8
Glyceryl monostearate SE	0.50	2.00	3.00	5.00		0.50	4.00	
Glyceryl isostearate					3.50	4.00	2.00	
Isoceteth-20		0.50			2.00			
Ceteareth-12		5.00		1.00			3.50	5.00
Ceteareth-20		5.00		1.00				3.50
PEG-100 stearate				2.80		2.30	3.30	
Cetyl alcohol	5.20		1.20	1.00	1.30		0.50	0.30
Cetyl palmitate	2.50	1.20		1.50		0.50		1.50
Cetyldimethicone copolyol				0.50		1.00		
Polyglyceryl-2				0.75	0.30			
P18	0.1	0.5	0.01	5.0	0.5	3.0	0.025	10.0
Dihydroxyacetone			3.00	5.00			4.00	
Uvinul® A Plus™	2.00	1.50	0.75	1.00	2.10	4.50	5.00	2.10
Titanium dioxide-microfine	1.00		1.50		3.50		1.50	1.00
Zinc oxide-microfine		1.00		0.25		2.00		1.50
C_{12-15}-Alkyl benzoate	3.50			6.35				0.10
Cocoglyceride		3.00		3.00				1.00
Dicapryl ether	4.50							
Dicaprylyl carbonate		4.30		3.00				7.00
Dibutyl adipate				0.50				0.30
Phenyltrimethicone	2.00			3.50		2.00		
Cyclomethicone		3.00						
C_{1-5}-Alkylgalactomannan		0.50			2.00			
Hydrogenated cocoglyceride					3.00	4.00		
Behenoxydimethicone						1.50	2.00	

VP/hexadecene copolymer				1.00	1.20			
Glycerol	4.00	6.00	5.00		8.00	10.00		
Vitamin E acetate	0.20	0.30	0.40		0.30			
Butyrosperumu parkii (shea butter)		2.00		3.60		2.00		
Iodopropyl butylcarbamate	0.12				0.20			
DMDM hydantoin	0.10				0.12		0.13	
Methyl paraben		0.50	0.30		0.35			
Phenoxyethanol	0.50	0.40		1.00				
Ethylhexylglycerol		0.30			1.00		0.35	
Ethanol	2.00		2.00			5.00		
Trisodium EDTA	0.40		0.15			0.20		
Perfume oil	0.20		0.20		0.24	0.16	0.10	0.10
Aqua dem.	ad 100	ad 100	ad 100	ad 100	ad 100	ad 100	ad 100	ad 100

(23) Oil gel

	1	2	3	4
Caprylic/capric triglycerides	12.00	10.00	6.00	
Octyldodecanol	7.00	14.00	8.00	3.00
Butylene glycol dicaprylate/dicaprate				12.00
Pentaerythrityl tetraisostearate	10.00	6.00	8.00	7.00
Polyglyceryl-3 diisostearate	2.50			
Bisdiglyceryl polyacyladipate-2	9.00	8.00	10.00	8.00
Myristyl myristate	3.50	3.00	4.00	3.00
Quaternium-18 bentonite	5.00	5.00	6.00	6.00
Propylene carbonate	15.00	20.00	18.00	19.50
P18	1.0	0.5	3.0	5.0
Vitamin acetate	0.50	1.00		
Ascorbyl palmitate	0.05		0.05	
Buxus chinensis (jojoba) oil	2.00	1.00		1.00
Perfume oil, BHT	0.10	0.25		0.35
Ricinus communis (castor) oil	ad 100	ad 100	ad 100	ad 100

Example 38: Cosmetic sunscreen preparations

The formulations below describe cosmetic sunscreen preparations comprising a combination of at least one inorganic pigment, preferably zinc oxide and/or titanium dioxide, and organic UV-A and UV-B filters.

The formulations given below are prepared in a customary manner known to the person skilled in the art.

The content of P18 refers to 100% of active ingredient. The active ingredient according to the invention can either be used in pure form or in the form of an aqueous solution. In the case of the aqueous solution, the content of water dem. in the particular formulation has to be adjusted.

(1)

A	7.50	Uvinul MC 80	Ethylhexyl cinnamate
	2.00	Uvinul M 40	Benzophenone-3

	0.80 Rylo PG 11	Polyglyceryl dimer soyate
	1.00 Span 60*	Sorbitan stearate
	0.50 Vitamin E acetate	Tocopheryl acetate
	3.00 Dracorin 100 SE	Glyceryl stearate, PEG-100 stearate
	1.00 Cremophor CO 410	PEG-40-hydrogenated castor oil
B	3.00 T-Lite* SF	Titanium dioxide, aluminum oxide hydrate, dimethicone/methicone copolymer
	1.00 Cetiol* SB 45	*Butyrospermum parkii* (shea butter)
	6.50 Finsolv TN	C_{12-15}-Alkyl benzoate
C	5.00 Butylene glycol	Butylene glycol
	0.30 Keltrol*	Xanthan gum
	0.10 Edeta BD	Disodium EDTA
	0.10 Allantoin	Allantoin
	66.20 Water dem.	Aqua dem.
D	1.00 Sepigel 305	Polyacrylamide, C_{13-14}-isoparaffin, laureth-7
1% P18		
	q.s.	Preservative

(2)

A	7.50 Uvinul MC 80	Ethylhexyl cinnamate
	2.00 Uvinul M 40	Benzophenone-3
	0.80 Rylo PG 11	Polyglyceryl dimer soyate
	1.00 Span 60	Sorbitan stearate
	0.50 Vitamin E acetate	Tocopheryl acetate
	3.00 Dracorin 100 SE	Glyceryl stearate, PEG-100 stearate
	1.00 Cremophor CO 410	PEG-40-hydrogenated castor oil
B	3.00 Z-COTE MAX*	Zinc oxide (and) diphenylcaprylmethicone
	1.00 Cetiol SB 45	*Butyrospermum parkii* (shea butter)
	6.50 Finsolv TN	C_{12-15}-Alkyl benzoate
C	5.00 Butylene glycol	Butylene glycol
	0.30 Keltrol	Xanthan gum
	0.10 Edeta BD	Disodium EDTA
	0.10 Allantoin	Allantoin
	66.20 Water dem.	Aqua dem.
D	2.00 Simulgel NS	Hydroxyethyl acrylate/sodium acryloyldimethyltaurate copolymer, squalane, polysorbate 60
1% P18		
	q.s.	Preservative

(3)

A	7.50 Uvinul MC 80	Ethylhexyl cinnamate
	2.00 Uvinul A Plus	Diethylaminohydroxybenzoylhexyl benzoate
	0.80 Rylo PG 11	Polyglyceryl dimer soyate
	1.00 Span 60	Sorbitan stearate
	0.50 Vitamin E acetate	Tocopheryl acetate
	3.00 Dracorin 100 SE	Glyceryl stearate, PEG-100 stearate
	1.00 Cremophor CO 410	PEG-40-hydrogenated castor oil
B	3.00 Z-COTE MAX	Zinc oxide (and) diphenylcaprylmethicone
	1.00 Cetiol SB 45	*Butyrospermum parkii* (shea butter)
	6.50 Finsolv TN	C_{12-15}-Alkyl benzoate

*** Trademarks**

C 5.00 Butylene glycol	Butylene glycol
0.30 Keltrol	Xanthan gum
0.10 Edeta BD	Disodium EDTA
0.10 Allantoin	Allantoin
66.20 Water dem.	Aqua dem.
D 2.00 Simulgel NS	Hydroxyethyl acrylate/sodium acryloyldimethyltaurate copolymer, squalane, polysorbate 60
1% P18	
q.s.	Preservative

(4)

A 4.00 Uvinul MC 80	Ethylhexyl cinnamate
2.00 Uvinul T 150	Ethylhexyltriazone
2.00 Uvinul A Plus	Diethylaminohydroxybenzoylhexyl benzoate
0.80 Rylo PG 11	Polyglyceryl dimer soyate
1.00 Span 60	Sorbitan stearate
0.50 Vitamin E acetate	Tocopheryl acetate
3.00 Dracorin 100 SE	Glyceryl stearate, PEG-100 stearate
1.00 Cremophor CO 410	PEG-40-hydrogenated castor oil
B 3.00 Z-COTE MAX	Zinc oxide (and) diphenylcaprylmethicone
1.00 Cetiol SB 45	*Butyrospermum parkii* (shea butter)
6.50 Finsolv TN	C_{12-15}-Alkyl benzoate
C 5.00 Butylene glycol	Butylene glycol
0.30 Keltrol	Xanthan gum
0.10 Edeta BD	Disodium EDTA
0.10 Allantoin	Allantoin
66.20 Water dem.	Aqua dem.
D 2.00 Simulgel NS	Hydroxyethyl acrylate/sodium acryloyldimethyltaurate copolymer, squalane, polysorbate 60
1% P18	
q.s.	Preservative

(5)

A 4.00 Uvinul MC 80	Ethylhexyl cinnamate
2.00 Uvinul T 150	Ethylhexyltriazone
2.00 Uvinul A Plus	Diethylaminohydroxybenzoylhexyl benzoate
0.80 Rylo PG 11	Polyglyceryl dimer soyate
1.00 Span 60	Sorbitan stearate
0.50 Vitamin E acetate	Tocopheryl acetate
3.00 Dracorin 100 SE	Glyceryl stearate, PEG-100 stearate
1.00 Cremophor CO 410	PEG-40-hydrogenated castor oil
B 3.00 T-Lite SF	Titanium dioxide, aluminum hydrate, dimethicone/methicone copolymer
1.00 Cetiol SB 45	*Butyrospermum parkii* (shea butter)
6.50 Finsolv TN	C_{12-15}-Alkyl benzoate
C 5.00 Butylene glycol	Butylene glycol
0.30 Keltrol	Xanthan gum
0.10 Edeta BD	Disodium EDTA
0.10 Allantoin	Allantoin

66.20 Water dem.	Aqua dem.
D 2.00 Simulgel NS	Hydroxyethyl acrylate/sodium acryloyldimethyltaurate copolymer, squalane, polysorbate 60
1% P18	
q.s.	Preservative

(6)

A 4.00 Uvinul MC 80	Ethylhexyl cinnamate
2.00 Uvinul T 150	Ethylhexyltriazone
2.00 Uvinul A Plus	Diethylaminohydroxybenzoylhexyl benzoate
0.80 Rylo PG 11	Polyglyceryl dimer soyate
1.00 Span 60	Sorbitan stearate
0.50 Vitamin E acetate	Tocopheryl acetate
3.00 Dracorin 100 SE	Glyceryl stearate, PEG-100 stearate
1.00 Cremophor CO 410	PEG-40-hydrogenated castor oil
B 3.00 Z-COTE MAX	Zinc oxide (and) diphenylcaprylmethicone
1.00 Cetiol SB 45	*Butyrospermum parkii* (shea butter)
6.50 Finsolv TN	C_{12-15}-Alkyl benzoate
C 5.00 Butylene glycol	Butylene glycol
0.30 Keltrol	Xanthan gum
0.10 Edeta BD	Disodium EDTA
0.10 Allantoin	Allantoin
66.20 Water dem.	Aqua dem.
D 2.00 Simulgel NS	Hydroxyethyl acrylate/sodium acryloyldimethyltaurate copolymer, squalane, polysorbate 60
1% P18	
q.s.	Preservative

(7)

A 4.00 Uvinul MC 80	Ethylhexyl cinnamate
1.00 Uvinul T 150	Ethylhexyltriazone
2.00 Parsol* 1789	Butylmethoxydibenzoylmethane
0.80 Rylo PG 11	Polyglyceryl dimer soyate
1.00 Span 60	Sorbitan stearate
0.50 Vitamin E acetate	Tocopheryl acetate
3.00 Dracorin 100 SE	Glyceryl stearate, PEG-100 stearate
1.00 Cremophor CO 410	PEG-40-hydrogenated castor oil
B 3.00 T-Lite SF-S	Titanium dioxide, silicon hydrate, aluminum hydrate, methicone/dimethicone copolymer
1.00 Cetiol SB 45	*Butyrospermum parkii* (shea butter)
6.50 Finsolv TN	C_{12-15}-Alkyl benzoate
C 5.00 Butylene glycol	Butylene glycol
0.30 Keltrol	Xanthan gum
0.10 Edeta BD	Disodium EDTA
0.10 Allantoin	Allantoin
66.70 Water dem.	Aqua dem.
D 2.00 Simulgel NS	Hydroxyethyl acrylate/sodium acryloyldimethyltaurate copolymer, squalane, polysorbate 60

*** Trademark**

0.5% P18	
q.s.	Preservative

(8)

A	4.00 Uvinul MC 80	Ethylhexyl cinnamate
	1.00 Uvinul T 150	Ethylhexyltriazone
	2.00 Parsol 1789	Butylmethoxydibenzoylmethane
	0.80 Rylo PG 11	Polyglyceryl dimer soyate
	1.00 Span 60	Sorbitan stearate
	0.50 Vitamin E acetate	Tocopheryl acetate
	3.00 Dracorin 100 SE	Glyceryl stearate, PEG-100 stearate
	1.00 Cremophor CO 410	PEG-40-hydrogenated castor oil
B	3.00 Z-COTE MAX	Zinc oxide (and) diphenylcaprylmethicone
	1.00 Cetiol SB 45	*Butyrospermum parkii* (shea butter)
	6.50 Finsolv TN	C_{12-15}-Alkyl benzoate
C	5.00 Butylene glycol	Butylene glycol
	0.30 Keltrol	Xanthan gum
	0.10 Edeta BD	Disodium EDTA
	0.10 Allantoin	Allantoin
	67.10 Water dem.	Aqua dem.
D	2.00 Simulgel NS	Hydroxyethyl acrylate/sodium acryloyldimethyltaurate copolymer, squalane, polysorbate 60
0.1% P18		
q.s.		Preservative

(9)

A	5.00 Uvinul N 539 T	Octocrylene
	2.00 Parsol 1789	Butylmethoxydibenzoylmethane
	0.80 Rylo PG 11	Polyglyceryl dimer soyate
	1.00 Span 60	Sorbitan stearate
	0.50 Vitamin E acetate	Tocopheryl acetate
	3.00 Dracorin 100 SE	Glyceryl stearate, PEG-100 stearate
	1.00 Cremophor CO 410	PEG-40-hydrogenated castor oil
B	3.00 T-Lite SF-S	Titanium dioxide, silicon hydrate, aluminum hydrate, methicone/dimethicone copolymer
	1.00 Cetiol SB 45	*Butyrospermum parkii* (shea butter)
	6.50 Finsolv TN	C_{12-15}-Alkyl benzoate
C	5.00 Butylene glycol	Butylene glycol
	0.30 Keltrol	Xanthan gum
	0.10 Edeta BD	Disodium EDTA
	0.10 Allantoin	Allantoin
	66.20 Water dem.	Aqua dem.
D	2.00 Simulgel NS	Hydroxyethyl acrylate/sodium acryloyldimethyltaurate copolymer, squalane, polysorbate 60
1% P18		
q.s.		Preservative

(10)

A	5.00	Uvinul N 539 T	Octocrylene
	2.00	Uvinul A Plus	Diethylaminohydroxybenzoylhexyl benzoate
	0.80	Rylo PG 11	Polyglyceryl dimer soyate
	1.00	Span 60	Sorbitan stearate
	0.50	Vitamin E acetate	Tocopheryl acetate
	3.00	Dracorin 100 SE	Glyceryl stearate, PEG-100 stearate
	1.00	Cremophor CO 410	PEG-40-hydrogenated castor oil
B	3.00	T-Lite SF	Titanium dioxide, aluminum hydrate, dimethicone/methicone copolymer
	1.00	Cetiol SB 45	*Butyrospermum parkii* (shea butter)
	6.50	Finsolv TN	C_{12-15}-Alkyl benzoate
C	5.00	Butylene glycol	Butylene glycol
	0.30	Keltrol	Xanthan gum
	0.10	Edeta BD	Disodium EDTA
	0.10	Allantoin	Allantoin
	65.20	Water dem.	Aqua dem.
D	2.00	Simulgel NS	Hydroxyethyl acrylate/sodium acryloyldimethyltaurate copolymer, squalane, polysorbate 60
2% P18			
	q.s.		Preservative

(11)

A	5.00	Uvinul N 539 T	Octocrylene
	2.00	Uvinul A Plus	Diethylaminohydroxybenzoylhexyl benzoate
	0.80	Rylo PG 11	Polyglyceryl dimer soyate
	1.00	Span 60	Sorbitan stearate
	0.50	Vitamin E acetate	Tocopheryl acetate
	3.00	Dracorin 100 SE	Glyceryl stearate, PEG-100 stearate
	1.00	Cremophor CO 410	PEG-40-hydrogenated castor oil
B	3.00	Z-COTE MAX	Zinc oxide (and) diphenylcaprylmethicone
	1.00	Cetiol SB 45	*Butyrospermum parkii* (shea butter)
	6.50	Finsolv TN	C_{12-15}-Alkyl benzoate
C	5.00	Butylene glycol	Butylene glycol
	0.30	Keltrol	Xanthan gum
	0.10	Edeta BD	Disodium EDTA
	0.10	Allantoin	Allantoin
	66.70	Water dem.	Aqua dem.
D	2.00	Simulgel NS	Hydroxyethyl acrylate/sodium acryloyldimethyltaurate copolymer, squalane, polysorbate 60
0.5% P18			
	q.s.		Preservative

(12)

A	5.00	Uvinul N 539 T	Octocrylene
	2.00	Uvinul A Plus	Diethylaminohydroxybenzoylhexyl benzoate
	0.80	Rylo PG 11	Polyglyceryl dimer soyate
	1.00	Span 60	Sorbitan stearate
	0.50	Vitamin E acetate	Tocopheryl acetate
	3.00	Dracorin 100 SE	Glyceryl stearate, PEG-100 stearate

1.00 Cremophor CO 410	PEG-40-hydrogenated castor oil
B 3.00 Z-COTE MAX	Zinc oxide (and) diphenylcaprylmethicone
1.00 Cetiol SB 45	*Butyrospermum parkii* (shea butter)
6.50 Finsolv TN	C_{12-15}-Alkyl benzoate
C 5.00 Butylene glycol	Butylene glycol
0.30 Keltrol	Xanthan gum
0.10 Edeta BD	Disodium EDTA
0.10 Allantoin	Allantoin
2.0 Mexoryl* SX	Terephthalidenedicamphorsulfonic acid
66.20 Water dem.	Aqua dem.
D 2.00 Simulgel NS	Hydroxyethyl acrylate/sodium acryloyldimethyltaurate copolymer, squalane, polysorbate 60
1% P18	
q.s.	Preservative

(13)

A 5.00 Uvinul N 539 T	Octocrylene
2.00 Uvinul A Plus	Diethylaminohydrobenzoylhexyl benzoate
0.80 Rylo PG 11	Polyglyceryl dimer soyate
1.00 Span 60	Sorbitan stearate
0.50 Vitamin E acetate	Tocopheryl acetate
3.00 Dracorin 100 SE	Glyceryl stearate, PEG-100 stearate
1.00 Cremophor CO 410	PEG-40-hydrogenated castor oil
B 3.00 Z-COTE MAX	Zinc oxide (and) diphenylcaprylmethicone
1.00 Cetiol SB 45	*Butyrospermum parkii* (shea butter)
6.50 Finsolv TN	C_{12-15}-Alkyl benzoate
C 5.00 Butylene glycol	Butylene glycol
0.30 Keltrol	Xanthan gum
0.10 Edeta BD	Disodium EDTA
0.10 Allantoin	Allantoin
2.0 Mexoryl SX	Terephthalidenedicamphorsulfonic acid
65.20 Water dem.	Aqua dem.
D 2.00 Simulgel NS	Hydroxyethyl acrylate/sodium acryloyldimethyltaurate copolymer, squalane, polysorbate 60
2% P18	
q.s.	Preservative

(14)

A 5.00 Uvinul N 539 T	Octocrylene
2.00 Uvinul A Plus	Diethylaminohydroxybenzoylhexyl benzoate
2.00 Mexoryl XL	Drometrizole trisiloxane
0.80 Rylo PG 11	Polyglyceryl dimer soyate
1.00 Span 60	Sorbitan stearate
0.50 Vitamin E acetate	Tocopheryl acetate
3.00 Dracorin 100 SE	Glyceryl stearate, PEG-100 stearate
1.00 Cremophor CO 410	PEG-40-hydrogenated castor oil
B 3.00 Z-COTE MAX	Zinc oxide (and) diphenylcaprylmethicone
1.00 Cetiol SB 45	*Butyrospermum parkii* (shea butter)
6.50 Finsolv TN	C_{12-15}-Alkyl benzoate

*** Trademark**

C 5.00 Butylene glycol	Butylene glycol
0.30 Keltrol	Xanthan gum
0.10 Edeta BD	Disodium EDTA
0.10 Allantoin	Allantoin
67.10 Water dem.	Aqua dem.
D 2.00 Simulgel NS	Hydroxyethyl acrylate/sodium acryloyldimethyltaurate copolymer, squalane, polysorbate 60
0.1% P18	
q.s.	Preservative

(15)

A 5.00 Uvinul N 539 T	Octocrylene
2.00 Tinosorb* S	Bisethylhexyloxyphenol methoxyphenyltriazine
0.80 Rylo PG 11	Polyglyceryl dimer soyate
1.00 Span 60	Sorbitan stearate
0.50 Vitamin E acetate	Tocopheryl acetate
3.00 Dracorin 100 SE	Glyceryl stearate, PEG-100 stearate
1.00 Cremophor CO 410	PEG-40-hydrogenated castor oil
B 3.00 Z-COTE MAX	Zinc oxide (and) diphenylcaprylmethicone
1.00 Cetiol SB 45	*Butyrospermum parkii* (shea butter)
6.50 Finsolv TN	C_{12-15}-Alkyl benzoate
C 5.00 Butylene glycol	Butylene glycol
0.30 Keltrol	Xanthan gum
0.10 Edeta BD	Disodium EDTA
0.10 Allantoin	Allantoin
66.20 Water dem.	Aqua dem.
D 2.00 Simulgel NS	Hydroxyethyl acrylate/sodium acryloyldimethyltaurate copolymer, squalane, polysorbate 60
1% P18	
q.s.	Preservative

(16)

A 7.50 Uvinul MC 80	Ethylhexyl methoxycinnamate
5.00 Uvinul N 539 T	Octocrylene
3.00 Emulgade PL 68/50	Cetearyl glucoside, cetearyl alcohol
2.00 Dracorin 100 SE	Glyceryl stearate, PEG-100 stearate
1.00 Fitoderm	Squalane
0.50 Cremophor WO 7	PEG-7-hydrogenated castor oil
0.50 Cremophor PS 20	Polysorbate 20
2.00 Dry Flo Pure*	Aluminum starch octenyl succinate
B 5.00 Z-COTE MAX	Zinc oxide (and) diphenylcaprylmethicone
C 4.00 1,2-Propylene glycol Care	Propylene glycol
0.20 Keltrol	Xanthan gum
0.50 Simulgel 600	Acrylamide/sodium acryloyldimethyltaurate copolymer, isohexadecane, polysorbate 80
ad 100 Water dem.	Aqua dem.
q.s. Preservative	

*** Trademarks**

0.50 Vitamin E acetate	Tocopheryl acetate
2% P18	
1.00 RetiSTAR	Caprylic/capric triglyceride, sodium ascorbate, tocopherol, retinol

(17)

A 7.50 Uvinul MC 80	Ethylhexyl methoxycinnamate
2.00 Uvinul N 539 T	Octocrylene
3.00 Emulgade PL 68/50	Cetearyl glucoside, cetearyl alcohol
2.00 Dracorin 100 SE	Glyceryl stearate, PEG-100 stearate
1.00 Fitoderm	Squalane
0.50 Cremophor WO 7	PEG-7-hydrogenated castor oil
0.50 Cremophor PS 20	Polysorbate 20
2.00 Dry Flo Pure	Aluminum starch octenyl succinate
B 5.00 T-Lite SF-S	Titanium dioxide, silicon hydrate, aluminum hydrate, methicone/dimethicone copolymer
C 4.00 1,2-Propylene glycol Care	Propylene glycol
0.20 Keltrol	Xanthan gum
0.50 Simulgel 600	Acrylamide/sodium acryloyldimethyltaurate copolymer, isohexadecane, polysorbate 80
ad 100 Water dem.	Aqua dem.
q.s. Preservative	
0.50 Vitamin E acetate	Tocopheryl acetate
1% P18	
2.00 RetiSTAR	Caprylic/capric triglyceride, sodium ascorbate, tocopherol, retinol

(18)

A 7.50 Uvinul MC 80	Ethylhexyl methoxycinnamate
5.00 Uvinul N 539 T	Octocrylene
3.00 Emulgade PL 68/50	Cetearyl glucoside, cetearyl alcohol
2.00 Dracorin 100 SE	Glyceryl stearate, PEG-100 stearate
1.00 Fitoderm	Squalane
0.50 Cremophor WO 7	PEG-7-hydrogenated castor oil
0.50 Cremophor PS 20	Polysorbate 20
2.00 Dry Flo Pure	Aluminum starch octenyl succinate
B 5.00 T-Lite SF	Titanium dioxide, aluminum hydrate, dimethicone/methicone copolymer
C 4.00 1,2-Propylene glycol Care	Propylene glycol
1.00 D-Panthenol 50 P	Panthenol, propylene glycol
0.20 Keltrol	Xanthan gum
0.50 Simulgel 600	Acrylamide/sodium acryloyldimethyltaurate copolymer, isohexadecane, polysorbate 80
ad 100 Water dem.	Aqua dem.
q.s. Preservative	
0.50 Vitamin E acetate	Tocopheryl acetate
1% P18	
1.00 RetiSTAR	Caprylic/capric triglyceride, sodium ascorbate, tocopherol, retinol

5

(19)

A	5.50 Uvinul MC 80	Ethylhexyl methoxycinnamate
	2.00 Uvinul A Plus	Diethylaminohydroxybenzoylhexyl benzoate
	3.00 Uvinul N 539 T	Octocrylene
	3.00 Emulgade PL 68/50	Cetearyl glucoside, cetearyl alcohol
	2.00 Dracorin 100 SE	Glyceryl stearate, PEG-100 stearate
	1.00 Fitoderm	Squalane
	0.50 Cremophor WO 7	PEG-7-hydrogenated castor oil
	0.50 Cremophor PS 20	Polysorbate 20
	2.00 Dry Flo Pure	Aluminum starch octenyl succinate
B	5.00 T-Lite SF	Titanium dioxide, aluminum hydrate, dimethicone/methicone copolymer
C	4.00 1,2-Propylene glycol Care	Propylene glycol
	0.20 Keltrol	Xanthan gum
	0.50 Simulgel 600	Acrylamide/sodium acryloyldimethyltaurate copolymer, isohexadecane, polysorbate 80
	ad 100 Water dem.	Aqua dem.
q.s.	Preservative	
	0.50 Vitamin E acetate	Tocopheryl acetate
2% P18		

1.00 RetiSTAR	Caprylic/capric triglyceride, sodium ascorbate, tocopherol, retinol

(20)

A	1.00 Abil Care 85	Bis-PEG-/PPG-16-/16 PEG-/PPG-16-/16-dimethicone, caprylic/capric triglyceride
	3.00 Cremophor CO 40	PEG-40-hydrogenated castor oil
	0.30 Cremophor WO 7	PEG-7-hydrogenated castor oil
	2.00 Parsol 1789	Butylmethoxydibenzoylmethane
	2.00 Mexoryl XL	Drometrizoletrisiloxane
	10.00 Witconol* APM	PPG-3 myristyl ether
	1.00 Uvinul T 150	Ethylhexyltriazone
	1.00 Dow Corning 345 Fluid	Cyclopentasiloxane, cyclohexasiloxane
	5.00 Uvinul N 539 T	Octocrylene
B	3.00 Z-COTE MAX	Zinc oxide (and) diphenylcaprylmethicone
C	5.00 1,2-Propylene glycol	Propylene glycol
	1.00 Mexoryl SX	Terephthalidenedicamphorsulfonic acid
	0.20 Keltrol	Xanthan gum
	0.06 Edeta BD	Disodium EDTA
	0.04 TEA	Triethanolamine
	0.30 Carbopol* Ultrez 10P	Carbomer
	63.50 Water dem.	Aqua dem.
1% P18		
D	q.s. Perfume oil	
	0.50 Glydant	DMDM hydantoin

(21)

A	5.50 Uvinul MC 80	Ethylhexyl methoxycinnamate

*** Trademarks**

2.00 Uvinul A Plus	Diethylaminohydroxybenzoylhexyl benzoate
3.00 Uvinul N 539 T	Octocrylene
3.00 Emulgade PL 68/50	Cetearyl glucoside, cetearyl alcohol
2.00 Dracorin 100 SE	Glyceryl stearate, PEG-100 stearate
1.00 Fitoderm	Squalane
0.50 Cremophor WO 7	PEG-7-hydrogenated castor oil
0.50 Cremophor PS 20	Polysorbate 20
2.00 Dry Flo Pure	Aluminum starch octenyl succinate
B 5.00 T-Lite SF-S	Titanium dioxide, silicon hydrate, aluminum hydrate, methicone/dimethicone copolymer
C 4.00 1,2-Propylene glycol Care	Propylene glycol
0.20 Keltrol	Xanthan gum
2.00 Simulgel NS	Hydroxyethyl acrylate/sodium acryloyldimethyltaurate copolymer, squalane, polysorbate 60
66.30 Water dem.	Aqua dem.
q.s. Preservative	
0.50 Vitamin E acetate	Tocopheryl acetate
0.5% P18	
1.00 RetiSTAR	Caprylic/capric triglyceride, sodium ascorbate, tocopherol, retinol

(22)

A 2.00 Cremophor A 6	Ceteareth-6, stearyl alcohol
2.00 Cremophor A 25	Ceteareth-25
3.00 Syncrowax HRC	Tribehenin
2.00 Lanette* O	Cetearyl alcohol
2.00 Luvitol EHO	Cetearyl ethylhexanoate
5.00 Uvinul MC 80	Ethylhexyl methoxycinnamate
1.00 Ganex* V-220	VP/eicosene copolymer
7.00 Isopropyl palmitate	Isopropyl palmitate
B 3.00 Z-COTE MAX	Zinc oxide (and) diphenylcaprylmethicone
C 0.20 Keltrol	Xanthan gum
0.50 Simulgel NS	Hydroxyethyl acrylate/sodium acryloyldimethyltaurate copolymer, squalane, polysorbate 60
65.10 Water dem.	Aqua dem.
0.20 Edeta BD	Disodium EDTA
5.00 1,2-Propylene glycol Care	Propylene glycol
0.5% P18	
D 1.00 Vitamin E acetate	Tocopheryl acetate
q.s. Preservative	

(23)

A 2.00 Cremophor A 6	Ceteareth-6, stearyl alcohol
2.00 Cremophor A 25	Ceteareth-25
3.00 Syncrowax HRC	Tribehenin
2.00 Lanette O	Cetearyl alcohol

*** Trademarks**

2.00 Luvitol EHO	Cetearyl ethylhexanoate
5.00 Uvinul MC 80	Ethylhexyl methoxycinnamate
1.00 Ganex V-220	VP/eicosene copolymer
7.00 Isopropyl palmitate	Isopropyl palmitate
B 3.00 T-Lite SF	Titanium dioxide, aluminum hydrate, dimethicone/methicone copolymer
C 0.50 Keltrol	Xanthan gum
0.50 Simulgel NS	Hydroxyethyl acrylate/sodium acryloyldimethyltaurate copolymer, squalane, polysorbate 60
65.10 Water dem.	Aqua dem.
0.20 Edeta BD	Disodium EDTA
5.00 1,2-Propylene glycol Care	Propylene glycol
0.5% P18	
D 1.00 Vitamin E acetate	Tocopheryl acetate
q.s. Preservative	

(24)

A 2.00 Cremophor A 6	Ceteareth-6, stearyl alcohol
2.00 Cremophor A 25	Ceteareth-25
3.00 Syncrowax HRC	Tribehenin
2.00 Lanette O	Cetearyl alcohol
2.00 Luvitol EHO	Cetearyl ethylhexanoate
5.00 Uvinul MC 80	Ethylhexyl methoxycinnamate
1.00 Ganex V-220	VP/eicosene copolymer
7.00 Isopropyl palmitate	Isopropyl palmitate
B 3.00 T-Lite SF-S	Titanium dioxide, silicon hydrate, aluminum hydrate, methicone/dimethicone copolymer
C 0.50 Keltrol	Xanthan gum
0.50 Simulgel NS	Hydroxyethyl acrylate/sodium acryloyldimethyltaurate copolymer, squalane, polysorbate 60
64.60 Water dem.	Aqua dem.
0.20 Edeta BD	Disodium EDTA
5.00 1,2-Propylene glycol Care	Propylene glycol
1% P18	
D 1.00 Vitamin E acetate	Tocopheryl acetate
q.s. Preservative	

(25)

A 2.00 Cremophor A 6	Ceteareth-6, stearyl alcohol
2.00 Cremophor A 25	Ceteareth-25
3.00 Syncrowax HRC	Tribehenin
2.00 Lanette O	Cetearyl alcohol
2.00 Luvitol EHO	Cetearyl ethylhexanoate
5.00 Uvinul MC 80	Ethylhexyl methoxycinnamate
1.00 Ganex V-220	VP/eicosene copolymer
7.00 Isopropyl palmitate	Isopropyl palmitate
B 3.00 T-Lite SF-S	Titanium dioxide, silicon hydrate, aluminum hydrate,

	methicone/dimethicone copolymer
C 0.50 Keltrol	Xanthan gum
0.50 Simulgel NS	Hydroxyethyl acrylate/sodium acryloyldimethyltaurate copolymer, squalane, polysorbate 60
64.10 Water dem.	Aqua dem.
2.00 Neoheliopan AP	Disodium phenyldibenzimidazoletetrasulfonate
0.20 Edeta BD	Disodium EDTA
5.00 1,2-Propylene glycol Care	Propylene glycol
D 1.00 Vitamin E acetate	Tocopheryl acetate
1% P18	
q.s. Preservative	

(26)

A 2.00 Cremophor A 6	Ceteareth-6, stearyl alcohol
2.00 Cremophor A 25	Ceteareth-25
3.00 Syncrowax HRC	Tribehenin
2.00 Lanette O	Cetearyl alcohol
2.00 Luvitol EHO	Cetearyl ethylhexanoate
7.00 Uvinul N 539 T	Octocrylene
1.00 Ganex V-220	VP/eicosene copolymer
7.00 Isopropyl palmitate	Isopropyl palmitate
B 3.00 T-Lite SF-S	Titanium dioxide, silicon hydrate, aluminum hydrate, methicone/dimethicone copolymer
C 0.50 Keltrol	Xanthan gum
0.50 Simulgel NS	Hydroxyethyl acrylate/sodium acryloyldimethyltaurate copolymer, squalane, polysorbate 60
64.60 Water dem.	Aqua dem.
1.00 Mexoryl SX	Terephthalidenedicamphorsulfonic acid
0.20 Edeta BD	Disodium EDTA
5.00 1,2-Propylene glycol Care	Propylene glycol
D 1.00 Vitamin E acetate	Tocopheryl acetate
1% P18	
q.s. Preservative	

(27)

A 2.00 Cremophor A 6	Ceteareth-6, stearyl alcohol
2.00 Cremophor A 25	Ceteareth-25
3.00 Syncrowax HRC	Tribehenin
2.00 Lanette O	Cetearyl alcohol
2.00 Luvitol EHO	Cetearyl ethylhexanoate
2.00 Mexoryl XL	Drometrizole trisiloxane
5.00 Uvinul N 539 T	Octocrylene
1.00 Ganex V-220	VP/eicosene copolymer
7.00 Isopropyl palmitate	Isopropyl palmitate
B 3.00 T-Lite SF	Titanium dioxide, aluminum hydrate, dimethicone/methicone copolymer
C 0.50 Keltrol	Xanthan gum

0.50 Simulgel NS	Hydroxyethyl acrylate/sodium acryloyldimethyltaurate copolymer, squalane, polysorbate 60
65.10 Water dem.	Aqua dem.
0.20 Edeta BD	Disodium EDTA
5.00 1,2-Propylene glycol Care	Propylene glycol
D 1.00 Vitamin E acetate	Tocopheryl acetate
0.5% P18	
q.s. Preservative	

(28)

1.00 Urea	Urea
2.00 Neoheliopan AP	Disodium phenyldibenzimidazoletetrasulfonate
2.00 Glycerol 87%	Glycerol
1.20 Aristoflex* AVC	Ammonium acryloyldimethyltaurate/VP copolymer
71.30 Water dem.	Aqua dem.
B 3.00 Cremophor CO 40	PEG-40-hydrogenated castor oil
q.s. Perfume oil	
5.00 Miglyol* 812	Caprylic/capric triglyceride
2.00 Uvinul N 539 T	Octocrylene
8.00 Z-COTE MAX	Zinc oxide (and) diphenylcaprylmethicone
0.1% P18	
q.s. Preservative	

(29)

5.00 Z-COTE MAX	Zinc oxide (and) diphenylcaprylmethicone
2.00 Parsol 1789	Butylmethoxydibenzoylmethane
1.00 Uvinul T150	Ethylhexyltriazone
5.00 Uvinul MC 80	Ethylhexyl methoxycinnamate
2.00 Uvinul T 539 N	Octocrylene
0.50 Abil 350	Dimethicone
2.75 Carnico wax LT 20	Carnauba (*Copernica cerifera*) wax, paraffins
3.70 Candelilla wax LT 281 LJ	Candelilla (*Euphorbia cerifera*) wax
1.80 Beeswax 3050 PH	Beeswax
3.20 TeCero-wax 30445	Microcrystalline wax
3.20 TeCero-wax 1030 K	Microcrystalline wax
1.34 Cutina* CP	Cetyl palmitate
6.40 Vaseline*	Petrolatum
7.30 Softisan* 100	Hydrogenated cocoglycerides
10.00 Luvitol EHO	Cetearyl ethylhexanoate
0.17 Bisabolol nat.	Bisabolol
1.84 Vitamin E acetate	Tocopheryl acetate
0.42 D,L-Alpha-Tocopherol	Tocopherol
1% P18	
40.38 Castor oil	Castor (*Ricinus communis*) oil

*** Trademarks**

(30)

5.00 T-Lite SF	Titanium dioxide, aluminum hydrate, dimethicone/methicone copolymer
2.00 Parsol 1789	Butylmethoxydibenzoylmethane
1.00 Uvinul T150	Ethylhexyltriazone
3.00 Uvinul MC 80	Ethylhexyl methoxycinnamate
2.00 Uvinul N 539 T	Octocrylene
0.50 Abil 350	Dimethicone
2.75 Carnico wax LT 20	Carnauba (*Copernica cerifera*) wax, paraffin
3.70 Candelilla wax LT 281 LJ	Candelilla (*Euphorbia cerifera*) wax
1.80 Beeswax 3050 PH	Beeswax
3.20 TeCero-wax 30445	Microcrystalline wax
3.20 TeCero-wax 1030 K	Microcrystalline wax
1.34 Cutina CP	Cetyl palmitate
6.40 Vaseline	Petrolatum
7.30 Softisan 100	Hydrogenated cocoglycerides
10.00 Luvitol EHO	Cetearyl ethylhexanoate
0.17 Bisabolol nat.	Bisabolol
1.84 Vitamin E acetate	Tocopheryl acetate
0.42 D,L-Alpha-Tocopherol	Tocopherol
1% P18	
40.38 Castor oil	Castor (*Ricinus communis*) oil

(31)

5.00 T-Lite SF-S	Titanium dioxide, silicon hydrate, aluminum hydrate, methicone/dimethicone copolymer
2.00 Uvinul A Plus	Diethylaminohydroxybenzoylhexyl benzoate
2.00 Mexoryl XL	Drometrizole trisiloxane
3.00 Uvinul MC 80	Ethylhexyl methoxycinnamate
0.50 Abil 350	Dimethicone
2.75 Carnico wax LT 20	Carnauba (*Copernica cerifera*) wax, paraffins
3.70 Candelilla wax LT 281 LJ	Candelilla (*Euphorbia cerifera*) wax
1.80 Beeswax 3050 PH	Beeswax
3.20 TeCero-wax 30445	Microcrystalline wax
3.20 TeCero-wax 1030 K	Microcrystalline wax
1.34 Cutina CP	Cetyl palmitate
6.40 Vaseline	Petrolatum
7.30 Softisan 100	Hydrogenated cocoglycerides
10.00 Luvitol EHO	Cetearyl ethylhexanoate
0.17 Bisabolol nat.	Bisabolol
1.84 Vitamin E acetate	Tocopheryl acetate
0.42 D,L-Alpha-Tocopherol	Tocopherol
2% P18	
39.38 Castor oil	Castor (*Ricinus communis*) oil

(32)

A	6.00 Cremophor WO 7	PEG-7-hydrogenated castor oil
	2.00 Elfacos ST 9	PEG-45-/dodecyl glycol copolymer
	3.00 Isopropyl myristate	Isopropylmyristate
	8.00 Jojoba oil	*Simmondsia chinensis* (jojoba) seed oil
	4.00 Uvinul MC 80	Ethylhexyl methoxycinnamate
	2.00 Uvinul A Plus	Diethylaminohydroxybenzoylhexyl benzoate
	1.00 Abil 350	Dimethicone
B	5.00 Z-COTE MAX	Zinc oxide (and) diphenylcaprylmethicone
	3.00 T-Lite SF	Titanium dioxide, aluminum hydrate, dimethicone/methicone copolymer
C	0.20 Edeta BD	Disodium EDTA
	5.00 Glycerol 87%	Glycerol
	0.30 Chemag 2000	Imidazolidinylurea
	59.00 Water dem.	Aqua dem.
D	q.s. Perfume oil	
1% P18		
q.s. Preservative		

(33)

2.00 Cremophor A 6	Ceteareth-6, stearyl alcohol
2.00 Cremophor A 25	Ceteareth-25
3.00 Syncrowax HRC	Tribehenin
2.00 Lanette O	Cetearyl alcohol
2.00 Luvitol EHO	Cetearyl ethylhexanoate
5.00 Uvinul MC 80	Ethylhexyl methoxycinnamate
1.00 Uvinul T 150	Ethylhexyltriazone
1.00 Ganex V-220	VP/eicosene copolymer
7.00 Isopropyl myristate	Isopropyl myristate
B 5.00 Z-COTE MAX	Zinc oxide (and) diphenylcaprylmethicone
C 0.20 Keltrol	Xanthan gum
0.50 Simulgel NS	Hydroxyethyl acrylate/sodium acryloyldimethyltaurate copolymer, squalane, polysorbate 60
61.10 Water dem.	Aqua dem.
0.20 Edeta BD	Disodium EDTA
5.00 1,2-Propylene glycol Care	Propylene glycol
D 1.00 Vitamin E acetate	Tocopheryl acetate
1.5% P18	
q.s. Preservative	

(34)

A	2.00 Luvitol EHO	Cetearyl ethylhexanoate
	5.00 Paraffin oil	Mineral oil
	5.00 Z-COTE MAX	Zinc oxide (and) diphenylcaprylmethicone
B	1.00 Cremophor A 6	Ceteareth-6, stearyl alcohol
	2.00 Cremophor A 25	Ceteareth-25
	3.00 Glycerol monostearate	Glyceryl stearate
	4.00 Cetylstearyl alcohol	Cetearyl alcohol

C 5.00 1,2-Propylene glycol Care	Propylene glycol
7.50 Luviquat Care	Polyquaternium-44
q.s. Preservative	
q.s. Perfume oil	
1% P18	
64.50 Water dem.	Aqua dem.

(35)

5.00 T-Lite SF	Titanium dioxide, aluminum hydrate, dimethicone/methicone copolymer
10.00 Z-COTE MAX	Zinc oxide (and) diphenylcaprylmethicone
12.00 Beeswax 3044 PH	Beeswax
8.00 Candelilla wax LT 281 LJ	Candelilla (*Euphorbia cerifera*) wax
5.00 Tegin	Glyceryl stearate SE
5.00 Dow Corning 345 Fluid	Cyclopentasiloxane, cyclohexasiloxane
5.00 Witconol APM	PPG-3 myristyl ether
5.00 Softisan 154	Hydrogenated palm oil
8.00 Paraffin oil, thick-liquid	Mineral oil
3.00 Vaseline	Petrolatum
2% P18	
32.00 Castor oil	Castor (*Ricinus communis*) oil

(36)

3.00 Uvinul MC 80	Ethylhexyl methoxycinnamate
2.00 Uvinul T 150	Ethylhexyltriazone
2.00 Uvinul A Plus	Diethylaminohydroxybenzoylhexyl benzoate
10.00 Z-COTE MAX	Zinc oxide (and) diphenylcaprylmethicone
12.00 Beeswax 3044 PH	Beeswax
3.00 Vaseline	Petrolatum
8.00 Candelilla wax LT 281 LJ	Candelilla (*Euphorbia cerifera*) wax
8.00 Paraffin oil, thick-liquid	Mineral oil
5.00 Tegin*	Glyceryl stearate SE
5.00 Softisan 154	Hydrogenated palm oil
5.00 Witconol APM	PPG-3 myristyl ether
5.00 Dow Corning 345 Fluid	Cyclopentasiloxane, cyclohexasiloxane
0.1% P18	
28.90 Castor oil	Castor (*Ricinus communis*) oil

(37)

5.00 T-Lite SF	Titanium dioxide, aluminum hydrate, dimethicone/methicone copolymer
6.00 Finsolv TN	C_{12-15}-Alkyl benzoate

*** Trademark**

10.00 Uvinul MC 80	Ethylhexyl methoxycinnamate
6.00 Miglyol 812	Caprylic/capric triglyceride
5.00 Arlacel* P 135	PEG-30 dipolyhydroxystearate
2.00 Ganex V 216	PVP/hexadecene copolymer
2.00 Elfacos ST 9	PEG-45/dodecyl glycol copolymer
B 3.00 1,2-Propylene glycol Care	Propylene glycol
0.10 Edeta BD	Disodium EDTA
1.00 Magnesium sulfate 7-hydrate	Magnesium sulfate
59.40 Water dem.	Aqua dem.
0.5% P18	
q.s. Preservative	

(38)

A 4.00 Dehymuls SBL	Polyglyceryl-2 dipolyhydroxystearate, dicaprylyl ether, cocoglycerides, sorbitan sesquioleate, Cera alba, aluminum stearate, dicocoylpentaerythrityldistearyl citrate
1.00 Dehymuls PGPH	Polyglyceryl-2 dipolyhydroxystearate
8.00 Finsolv TN	C_{12-15}-Alkyl benzoate
4.00 Miglyol 812	Caprylic/capric triglyceride
4.00 Uvinul MC 80	Ethylhexyl methoxycinnamate
2.00 Uvinul N 539 T	Octocrylene
B 5.00 Z-COTE MAX	Zinc oxide (and) diphenylcaprylmethicone
C 3.00 1,2-Propylene glycol Care	Propylene glycol
0.30 Abiol	Imidazolidinylurea
1.00 Magnesium sulfate 7-hydrate	Magnesium sulfate
ad 100 Water dem.	Aqua dem.
1.5% P18	
D q.s. Preservative	

(39)

A 4.00 Dehymuls SBL	Polyglyceryl-2 dipolyhydroxystearate, dicaprylyl ether, cocoglycerides, sorbitan sesquioleate, Cera alba, aluminum stearate, dicocoylpentaerythrityldistearyl citrate
1.00 Dehymuls PGPH	Polyglyceryl-2 dipolyhydroxystearate
8.00 Finsolv TN	C_{12-15}-Alkyl benzoate
4.00 Miglyol 812	Caprylic/capric triglyceride
4.00 Uvinul MC 80	Ethylhexyl methoxycinnamate
2.00 Uvinul N 539 T	Octocrylene
B 5.00 T-Lite SF-S	Titanium dioxide, silicon hydrate, aluminum hydrate, methicone/dimethicone copolymer
C 3.00 1,2-Propylene glycol Care	Propylene glycol
0.30 Abiol	Imidazolidinylurea
1.00 Magnesium sulfate 7-hydrate	Magnesium sulfate
1.0% P18	
ad 100 Water dem.	Aqua dem.

*** Trademark**

D q.s. Preservative	

(40)

A 4.00 Dehymuls SBL	Polyglyceryl-2 dipolyhydroxystearate, dicaprylyl ether, cocoglycerides, sorbitan sesquioleate, Cera alba, aluminum stearate, dicocoylpentaerythrityldistearyl citrate
1.00 Dehymuls PGPH	Polyglyceryl-2 dipolyhydroxystearate
8.00 Finsolv TN	C_{12-15}-Alkyl benzoate
4.00 Miglyol 812	Caprylic/capric triglyceride
8.00 Uvinul A Plus B	Ethylhexyl methoxycinnamate and diethylaminohydroxybenzoylhexyl benzoate
2.00 Uvinul N 539 T	Octocrylene
B 5.00 Z-COTE MAX	Zinc oxide (and) diphenylcaprylmethicone
C 3.00 1,2-Propylene glycol Care	Propylene glycol
0.30 Abiol	Imidazolidinylurea
1.00 Magnesium sulfate 7-hydrate	Magnesium sulfate
0.1% P18	
ad 100 Water dem.	Aqua dem.
q.s. Preservative	

(41)

A 4.00 Dehymuls SBL	Polyglyceryl-2 dipolyhydroxystearate, dicaprylyl ether, cocoglycerides, sorbitan sesquioleate, Cera alba, aluminum stearate, dicocoylpentaerythrityldistearyl citrate
1.00 Dehymuls PGPH	Polyglyceryl-2 dipolyhydroxystearate
8.00 Finsolv TN	C_{12-15}-Alkyl benzoate
4.00 Miglyol 812	Caprylic/capric triglyceride
8.00 Uvinul A Plus B	Ethylhexyl methoxycinnamate and diethylaminohydroxybenzoylhexyl benzoate
2.00 Uvinul N 539 T	Octocrylene
B 5.00 T-Lite SF	Titanium dioxide, aluminum hydrate, dimethicone/methicone copolymer
C 3.00 1,2-Propylene glycol Care	Propylene glycol
0.30 Abiol	Imidazolidinylurea
1.00 Magnesium sulfate 7-hydrate	Magnesium sulfate
ad 100 Water dem.	Aqua dem.
0.2% P18	
q.s. Preservative	

(42)

A 4.00 Dehymuls SBL	Polyglyceryl- 2 dipolyhydroxystearate, dicaprylyl ether, cocoglycerides, sorbitan sesquioleate, Cera alba,

	aluminum stearate, dicocoylpentaerythrityldistearyl citrate
1.00 Dehymuls PGPH	Polyglyceryl-2 dipolyhydroxystearate
8.00 Finsolv TN	C_{12-15}-Alkyl benzoate
4.00 Miglyol 812	Caprylic/capric triglyceride
8.00 Uvinul A Plus B	Ethylhexyl methoxycinnamate and diethylaminohydroxybenzoylhexyl benzoate
2.00 Uvinul N 539 T	Octocrylene
B 5.00 T-Lite SF-S	Titanium dioxide, silicon hydrate, aluminum hydrate, methicone/dimethicone copolymer
C 3.00 1,2-Propylene glycol Care	Propylene glycol
0.30 Abiol	Imidazolidinylurea
1.00 Magnesium sulfate 7-hydrate	Magnesium sulfate
0.5% P18	
ad 100 Water dem.	Aqua dem.
q.s. Preservative	

(43)

A 4.00 Dehymuls SBL	Polyglyceryl- 2 dipolyhydroxystearate, dicaprylyl ether, cocoglycerides, sorbitan sesquioleate, Cera alba, aluminum stearate, dicocoylpentaerythrityldistearyl citrate
1.00 Dehymuls PGPH	Polyglyceryl-2 dipolyhydroxystearate
8.00 Finsolv TN	C_{12-15}-Alkyl benzoate
4.00 Miglyol 812	Caprylic/capric triglyceride
7.00 Uvinul MC 80	Ethylhexyl methoxycinnamate
2.00 Mexoryl XL	Drometrizole trisiloxane
B 5.00 Z-COTE MAX	Titanium dioxide, aluminum hydrate, dimethicone/methicone copolymer
C 3.00 1,2-Propylene glycol Care	Propylene glycol
0.30 Abiol	Imidazolidinylurea
1.00 Magnesium sulfate 7-hydrate	Magnesium sulfate
ad 100 Water dem.	Aqua dem.
0.01% P18	
q.s. Preservative	

(44)

A 7.50 Uvinul MC 80	Ethylhexyl methoxycinnamate
3.00 Uvinul N 539 T	Octocrylene
2.00 Uvinul A Plus	Diethylaminohydroxybenzoylhexyl benzoate
1.00 Cremophor CO 40	PEG-40 hydrogenated castor oil
10.00 Miglyol 812	Caprylic/capric triglyceride
1.50 Dow Corning 345 Fluid	Cyclopentasiloxane, cyclohexasiloxane
B 3.50 Luvigel EM	Caprylic/capric triglyceride, sodium acrylate copolymer
C 46.00 Water dem.	Aqua dem.

D 5.00 1,2-Propylene glycol Care	Propylene glycol
0.50 Cremophor A 25	Ceteareth-25
0.05% P18	
20.00 Ethanol 96%	Alcohol

(45)

A 1.00 Uvinul A Plus	Diethylaminohydroxybenzoylhexyl benzoate
1.00 Tinosorb S	Bisethylhexyloxyphenol methoxyphenyltriazine
3.00 Uvinul MC 80	Ethylhexyl methoxycinnamate
8.00 Miglyol 812	Caprylic/capric triglyceride
1.50 Dow Corning 350 Fluid	Dimethicone
3.00 Z-COTE MAX	Titanium dioxide, aluminum hydrate, dimethicone/methicone copolymer
3.00 Finsolv TN	C_{12-15}-Alkyl benzoate
1.00 Cremophor CO 40	PEG-40 hydrogenated castor oil
B 2.00 Luvigel EM	Caprylic/capric triglyceride, sodium acrylate copolymer
C 54.80 Water dem.	Aqua dem.
D 15.00 Ethanol 96%	Alcohol
5.00 1,2-Propylene glycol Care	Propylene glycol
0.50 Cremophor A 25	Ceteareth-25
1.0% P18	
1.00 Vitamin E acetate	Tocopheryl acetate
0.20 Bisabolol rac.	Bisabolol

(46)

A 4.00 Dehymuls SBL	Polyglyceryl-2 dipolyhydroxystearate, dicaprylyl ether, cocoglycerides, sorbitan sesquioleate, Cera alba, aluminum stearate, dicocoylpentaerythrityldistearyl citrate
1.00 Dehymuls PGPH	Polyglyceryl-2 dipolyhydroxystearate
6.00 Finsolv TN	C_{12-15}-Alkyl benzoate
6.00 Miglyol 812	Caprylic/capric triglyceride
5.00 Uvinul MC 80	Ethylhexyl methoxycinnamate
3.00 Neoheliopan HMS	Homosalate
B 5.00 Z-COTE MAX	Zinc oxide (and) diphenylcaprylmethicone
C 3.00 1,2-Propylene glycol Care	Propylene glycol
0.30 Chemag 2000	Imidazolidinylurea
1.00 Magnesium sulfate 7-hydrate	Magnesium sulfate
65.10 Water dem.	Aqua dem.
0.1% P18	
q.s. Preservative	

(47)

A 4.00 Tego Care 450	Polyglyceryl-3 methylglucose distearate
4.50 Uvinul MC 80	Ethylhexyl methoxycinnamate
3.00 Uvinul N 539 T	Octocrylene
2.00 Uvinul T 150	Ethylhexyltriazone

0.50 Vitamin E acetate	Tocopheryl acetate
B 5.00 Isohexadecane	Isohexadecane
5.00 Cosmacol EMI	Di-C_{12-13}-alkyl malate
3.50 Cetiol SN	Cetearyl isononanoate
1.00 Ganex V-220	VP/eicosene copolymer
5.00 T-Lite SF	Titanium dioxide, aluminum hydrate, dimethicone/methicone copolymer
C 60.00 Water dem.	Water
5.00 Glycerol 87%	Glycerol
1.00 Lanette E	Sodium cetearyl sulfate
0.30 Keltrol	Xanthan gum
0.2% P18	
D q.s. Preservative	

(48)

A 4.00 Tego Care 450	Polyglyceryl-3 methylglucose distearate
4.50 Uvinul MC 80	Ethylhexyl methoxycinnamate
3.00 Uvinul N 539 T	Octocrylene
2.00 Neoheliopan HMS	Homosalate
0.50 Vitamin E acetate	Tocopheryl acetate
B 5.00 Isohexadecane	Isohexadecane
5.00 Cosmacol EMI	Di-C_{12-13}-alkyl malate
3.50 Cetiol SN	Cetearyl isononanoate
1.00 Ganex V-220	VP/eicosene copolymer
5.00 T-Lite SF	Titanium dioxide, aluminum hydrate, dimethicone/methicone copolymer
C 59.20 Water dem.	Aqua dem.
5.00 Glycerol 87%	Glycerol
1.00 Lanette E	Sodium cetearyl sulfate
0.30 Keltrol	Xanthan gum
1.0% P18	
D q.s. Preservative	

(49)

A 4.00 Tego Care 450	Polyglyceryl-3 methylglucose distearate
4.50 Uvinul MC 80	Ethylhexyl methoxycinnamate
3.00 Neoheliopan OS	Octisalate
2.00 Neoheliopan HMS	Homosalate
0.50 Vitamin E acetate	Tocopheryl acetate
B 5.00 Isohexadecane	Isohexadecane
5.00 Cosmacol EMI	Di-C_{12-13}-alkyl malate
3.50 Cetiol SN	Cetearyl isononanoate
1.00 Ganex V-220	VP/eicosene copolymer
5.00 Z-COTE MAX	Zinc oxide (and) diphenylcaprylmethicone
C 60.15 Water dem.	Aqua dem
5.00 Glycerol 87%	Glycerol
1.00 Lanette E	Sodium cetearyl sulfate
0.30 Keltrol	Xanthan gum
0.05% P18	
D q.s. Preservative	

(50)

A	4.00	Tego Care 450	Polyglyceryl-3 methylglucose distearate
	4.50	Uvinul N 539 T	Octocrylene
	3.00	Neoheliopan OS	Octisalate
	2.00	Neoheliopan HMS	Homosalate
	0.50	Vitamin E acetate	Tocopheryl acetate
B	5.00	Isohexadecane	Isohexadecane
	5.00	Cosmacol EMI	Di-C_{12-13}-alkyl malate
	3.50	Cetiol SN	Cetearyl isononanoate
	1.00	Ganex V-220	VP/eicosene copolymer
	5.00	Z-COTE MAX	Zinc oxide (and) diphenylcaprylmethicone
C	60.19	Water dem.	Aqua dem.
	5.00	Glycerol 87%	Glycerol
	1.00	Lanette E	Sodium cetearyl sulfate
	0.30	Keltrol	Xanthan gum
0.01% P18			
D	q.s.	Preservative	

(51)

A	4.00	Tego Care 450	Polyglyceryl-3 methylglucose distearate
	4.50	Uvinul N 539 T	Octocrylene
	3.00	Neoheliopan OS	Octisalate
	2.00	Neoheliopan HMS	Homosalate
	0.50	Vitamin E acetate	Tocopheryl acetate
B	5.00	Isohexadecane	Isohexadecane
	5.00	Cosmacol EMI	Di-C_{12-13}-alkyl malate
	3.50	Cetiol SN	Cetearyl isononanoate
	1.00	Ganex V-220	VP/eicosene copolymer
	5.00	T-Lite SF-S	Titanium dioxide, silicon hydrate, aluminum hydrate, methicone/dimethicone copolymer
C	59.20	Water dem.	Aqua dem.
	5.00	Glycerol 87%	Glycerol
	1.00	Lanette E	Sodium cetearyl sulfate
	0.30	Keltrol	Xanthan gum
1.0% P18			
D	q.s.	Preservative	

(52)

A	8.00	Cetiol B	Dibutyl adipate
	8.00	Finsolv TN	C_{12-15}-Alkyl benzoate
	12.00	Myritol* 331	Cocoglycerides
	1.00	Lanette E	Sodium cetearyl sulfate
	4.00	Eumulgin* VL 75	Lauryl glucoside, polyglyceryl-2 dipolyhydroxystearate, glycerol
	2.00	Lanette O	Cetearyl alcohol
	3.00	Tinosorb S	Bisethylhexyloxyphenol methoxyphenyltriazine
	1.00	Vitamin E acetate	Tocopheryl acetate

*** Trademarks**

B 4.00 Z-COTE MAX	Zinc oxide (and) diphenylcaprylmethicone
C 3.00 Glycerol 87%	Glycerol
0.05 Edeta BD	Disodium EDTA
0.20 Allantoin	Allantoin
0.30 Keltrol	Xanthan gum
1.50 Veegum* Ultra	Magnesium aluminum silicate
49.45 Water dem.	Aqua dem.
1.0% P18	
D q.s. Preservative	

(53)

A 8.00 Cetiol B	Dibutyl adipate
8.00 Finsolv TN	C_{12-15}-Alkyl benzoate
12.00 Myritol 331	Cocoglycerides
1.00 Lanette E	Sodium cetearyl sulfate
4.00 Eumulgin VL 75	Laurylglucosid, polyglyceryl-2 dipolyhydroxystearate, glycerol
2.00 Lanette O	Cetearyl alcohol
3.00 Tinosorb S	Bisethylhexyloxyphenol methoxyphenyltriazine
1.00 Vitamin E acetate	Tocopheryl acetate
B 4.00 T-Lite SF	Titanium dioxide, aluminum hydrate, dimethicone/methicone copolymer
C 3.00 Glycerol 87%	Glycerol
0.05 Edeta BD	Disodium EDTA
0.20 Allantoin	Allantoin
0.30 Keltrol	Xanthan gum
1.50 Veegum Ultra	Magnesium aluminum silicate
50.25 Water dem.	Aqua dem.
D 0.50 Citric acid	Citric acid
q.s. Perfume oil	
0.2% P18	
q.s. Preservative	

(54)

A 5.00 Cosmacol EMI	Di-C_{12-13}-alkyl malate
4.50 Uvinul MC 80	Ethylhexyl methoxycinnamate
3.00 Uvinul N 539 T	Octocrylene
2.00 Uvinul T 150	Ethylhexyltriazone
B 4.00 Tego Care 450	Polyglyceryl-3 methylglucose distearate
5.00 Isohexadecane	Isohexadecane
3.50 Cetiol SN	Cetearyl isononanoate
0.50 Vitamin E acetate	Tocopheryl acetate
1.00 Ganex V-220	VP/eicosene copolymer
2.50 T-Lite SF	Titanium dioxide, aluminum hydrate, dimethicone/methicone copolymer
C 5.00 Glycerol 87%	Glycerol
2.00 Lanette E	Sodium cetearyl sulfate
0.30 Keltrol	Xanthan gum
1.00 Pationic 138 C	Sodium lauroyl lactylate
1.00 Pationic SSL	Sodium stearoyl lactylate
42.00 Water dem.	Aqua dem.

*** Trademark**

D 5.00 Eusolex 232	Phenylbenzimidazolesulfonic acid
10.00 Water dem.	Aqua dem
E 0.70 Sodium hydroxide	Sodium hydroxide
1.0% P18	
q.s. Preservative	

(55)

A 5.00 Cosmacol EMI	Di-C_{12-13}Alkyl malate
4.50 Uvinul MC 80	Ethylhexyl methoxycinnamate
3.00 Uvinul N 539 T	Octocrylene
2.00 Uvinul A Plus	Diethylaminohydrobenzoylhexyl benzoate
B 4.00 Tego Care 450	Polyglyceryl-3 methylglucose distearate
5.00 Isohexadecane	Isohexadecane
3.50 Cetiol SN	Cetearyl isononanoate
0.50 Vitamin E acetate	Tocopheryl acetate
1.00 Ganex V-220	VP/eicosene copolymer
2.50 T-Lite SF	Titanium dioxide, aluminum hydrate, dimethicone/methicone copolymer
C 5.00 Glycerol 87%	Glycerol
2.00 Lanette E	Sodium cetearyl sulfate
0.30 Keltrol	Xanthan gum
1.00 Pationic 138 C	Sodium lauroyl lactylate
1.00 Pationic SSL	Sodium stearoyl lactylate
41.00 Water dem.	Aqua dem
D 5.00 Eusolex 232	Phenylbenzimidazolesulfonic acid
2.0% P18	
10.00 Water dem.	Aqua dem
E 0.70 Sodium hydroxide	Sodium hydroxid
q.s. Preservative	

(56)

A 5.00 Cosmacol EMI	Di-C_{12-13}Alkyl malate
4.50 Uvinul MC 80	Ethylhexyl methoxycinnamate
3.00 Uvinul N 539 T	Octocrylene
2.00 Uvinul A Plus	Diethylaminohydrobenzoylhexyl benzoate
B 4.00 Tego Care 450	Polyglyceryl-3 methylglucose distearate
5.00 Isohexadecane	Isohexadecane
3.50 Cetiol SN	Cetearyl isononanoate
0.50 Vitamin E acetate	Tocopheryl acetate
1.00 Ganex V-220	VP/eicosene copolymer
2.50 Z-COTE MAX	Zinc oxide (and) diphenylcaprylmethicone
C 5.00 Glycerol 87%	Glycerol
2.00 Lanette E	Sodium cetearyl sulfate
0.30 Keltrol	Xanthan gum
1.00 Pationic 138 C	Sodium lauroyl lactylate
1.00 Pationic SSL	Sodium stearoyl lactylate

42.50 Water dem.	Aqua dem
D 5.00 Eusolex 232	Phenylbenzimidazolesulfonic acid
0.5% P18	
10.00 Water dem.	Aqua dem
E 0.70 Sodium hydroxide	Sodium hydroxide
q.s. Preservative	

(57)

A 5.00 Cosmacol EMI	Di-C_{12-13}Alkyl malate
7.50 Uvinul N 539 T	Octocrylene
2.00 Mexoryl XL	Drometrizole trisiloxane
B 4.00 Tego Care 450	Polyglyceryl-3 methylglucose distearate
5.00 Isohexadecane	Isohexadecane
3.50 Cetiol SN	Cetearyl isononanoate
0.50 Vitamin E acetate	Tocopheryl acetate
1.00 Ganex V-220	VP/eicosene copolymer
5.00 Z-COTE MAX	Zinc oxide (and) diphenylcaprylmethicone
C 5.00 Glycerol 87%	Glycerol
2.00 Lanette E	Sodium cetearyl sulfate
0.30 Keltrol	Xanthan gum
1.00 Pationic 138 C	Sodium lauroyl lactylate
1.00 Pationic SSL	Sodium stearoyl lactylate
40.50 Water dem.	Aqua dem
D 5.00 Eusolex 232	Phenylbenzimidazolesulfonic acid
1.0% P18	
10.00 Water dem.	Aqua dem
E 0.70 Sodium hydroxide	Sodium hydroxide
q.s. Preservative	

(58)

A 5.00 Cosmacol EMI	Di-C_{12-13}Alkyl malate
5.50 Uvinul N 539 T	Octocrylene
2.00 Uvinul A Plus	Diethylaminohydrobenzoylhexyl benzoate
2.00 Mexoryl XL	Drometrizole trisiloxane
B 4.00 Tego Care 450	Polyglyceryl-3 methylglucose distearate
5.00 Isohexadecane	Isohexadecane
3.50 Cetiol SN	Cetearyl isononanoate
0.50 Vitamin E acetate	Tocopheryl acetate
1.00 Ganex V-220	VP/eicosene copolymer
5.00 Z-COTE MAX	Zinc oxide (and) diphenylcaprylmethicone
C 5.00 Glycerol 87%	Glycerol
2.00 Lanette E	Sodium cetearyl sulfate
0.30 Keltrol	Xanthan gum
1.00 Pationic 138 C	Sodium lauroyl lactylate
1.00 Pationic SSL	Sodium stearoyl lactylate
41.50 Water dem.	Aqua dem

D 5.00 Eusolex 232	Phenylbenzimidazolesulfonic acid
0.5% P18	
9.50 Water dem.	Aqua dem
E 0.70 Sodium hydroxide	Sodium hydroxide
q.s. Preservative	

(59)

A 5.00 Cosmacol EMI	Di-C_{12-13}Alkyl malate
5.50 Uvinul N 539 T	Octocrylene
2.00 Uvinul A Plus	Diethylaminohydrobenzoylhexyl benzoate
2.00 Mexoryl XL	Drometrizole trisiloxane
B 4.00 Tego Care 450	Polyglyceryl-3 methylglucose distearate
5.00 Isohexadecane	Isohexadecane
3.50 Cetiol SN	Cetearyl isononanoate
0.50 Vitamin E acetate	Tocopheryl acetate
1.00 Ganex V-220	VP/eicosene copolymer
5.00 T-Lite SF-S	Titanium dioxide, silicon hydrate, aluminum hydrate, methicone/dimethicone copolymer
C 5.00 Glycerol 87%	Glycerol
2.00 Lanette E	Sodium cetearyl sulfate
0.30 Keltrol	Xanthan gum
1.00 Pationic 138 C	Sodium lauroyl lactylate
1.00 Pationic SSL	Sodium stearoyl lactylate
40.50 Water dem.	Aqua dem
D 5.00 Eusolex 232	Phenylbenzimidazolesulfonic acid
1.0% P18	
10.00 Water dem.	Aqua dem
E 0.70 Sodium hydroxide	Sodium hydroxide
q.s. Preservative	

(60)

A 8.00 Cetiol B	Dibutyl adipate
8.00 Finsolv TN	C_{12-15}-Alkyl benzoate
10.00 Myritol 331	Cocoglycerides
1.00 Lanette E	Sodium cetearyl sulfate
4.00 Eumulgin VL 75	Lauryl glucoside, polyglyceryl-2 dipolyhydroxystearate, glycerol
2.00 Lanette O	Cetearyl alcohol
1.00 Tinosorb S	Bisethylhexyloxyphenol methoxyphenyltriazine
1.00 Uvinul T 150	Ethylhexyltriazone
1.00 Vitamin E acetate	Tocopheryl acetate
B 5.00 T-Lite SF	Titanium dioxide, aluminum hydrate, dimethicone/methicone copolymer
C 3.00 Glycerol 87%	Glycerol
0.05 Edeta BD	Disodium EDTA
0.20 Allantoin	Allantoin
0.30 Keltrol	Xanthan gum
2.0% P18	
1.50 Veegum Ultra	Magnesium aluminum silicate

ad 100 Water dem.	Aqua dem
D q.s. Perfume oil	
q.s. Preservative	

(61)

A 8.00 Cetiol B	Dibutyl adipate
8.00 Finsolv TN	C_{12-15}-Alkyl benzoate
10.00 Myritol 331	Cocoglycerides
1.00 Lanette E	Sodium cetearyl sulfate
4.00 Eumulgin VL 75	Lauryl glucoside, polyglyceryl-2 dipolyhydroxystearate, glycerol
2.00 Lanette O	Cetearyl alcohol
1.00 Tinosorb S	Bisethylhexyloxyphenol methoxyphenyltriazine
1.00 Uvinul T 150	Ethylhexyltriazone
1.00 Vitamin E acetate	Tocopheryl acetate
B 5.00 Z-COTE MAX	Zinc oxide (and) diphenylcaprylmethicone
C 3.00 Glycerol 87%	Glycerol
0.05 Edeta BD	Disodium EDTA
0.20 Allantoin	Allantoin
0.30 Keltrol	Xanthan gum
1.0% P18	
1.50 Veegum Ultra	Magnesium aluminum silicate
ad 100 Water dem.	Aqua dem
D q.s. Perfume oil	
q.s. Preservative	

(62)

A 3.00 Glycerol 87%	Glycerol
0.20 Edeta BD	Disodium EDTA
0.30 Abiol	Imidazolidinylurea
1.00 Plantacare* 2000	Decyl glucoside
0.30 Keltrol T	Xanthan gum
57.00 Water dem.	Aqua dem.
B 5.00 T-Lite SF-S	Titanium dioxide, silicon hydrate, aluminum hydrate, methicone/dimethicone copolymer
C 7.50 Uvinul MC 80	Ethylhexyl methoxycinnamate
2.00 Uvinul A Plus	Diethylaminohydroxybenzoylhexyl benzoate
2.00 Dow Corning 345 Fluid	Cyclopentasiloxane, cyclohexasiloxane
3.50 Cremophor A 6	Ceteareth-6, stearyl alcohol
1.50 Cremophor A 25	Ceteareth-25
0.50 Beeswax 3044 PH	Beeswax
3.00 Lanette O	Cetearyl alcohol
10.00 Miglyol 812	Caprylic/capric triglyceride
D 1.00 Vitamin E acetate	Tocopheryl acetate
2.0% P18	
0.20 Bisabolol rac.	Bisabolol

(63)

A 3.00 Glycerol 87%	Glycerol
0.20 Edeta BD	Disodium EDTA

*** Trademark**

0.30 Abiol	Imidazolidinylurea
1.00 Plantacare 2000	Decyl glucoside
0.30 Keltrol T	Xanthan gum
58.00 Water dem.	Aqua dem.
B 5.00 Z-COTE MAX	Zinc oxide (and) diphenylcaprylmethicone
C 7.50 Uvinul MC 80	Ethylhexyl methoxycinnamate
2.00 Uvinul A Plus	Diethylaminohydroxybenzoylhexyl benzoate
2.00 Dow Corning 345 Fluid	Cyclopentasiloxane, cyclohexasiloxane
3.50 Cremophor A 6	Ceteareth-6, stearyl alcohol
1.50 Cremophor A 25	Ceteareth-25
0.50 Beeswax 3044 PH	Beeswax
3.00 Lanette O	Cetearyl alcohol
10.00 Miglyol 812	Caprylic/capric triglyceride
D 1.00 Vitamin E acetate	Tocopheryl acetate
1.0% P18	
0.20 Bisabolol rac.	Bisabolol

(64)

A 3.00 Glycerol 87%	Glycerol
0.20 Edeta BD	Disodium EDTA
0.30 Abiol	Imidazolidinylurea
1.00 Plantacare 2000	Decyl glucoside
0.30 Keltrol T	Xanthan gum
58.50 Water dem.	Aqua dem.
B 5.00 T-Lite SF-S	Titanium dioxide, silicon hydrate, aluminum hydrate, methicone/dimethicone copolymer
C 7.50 Uvinul MC 80	Ethylhexyl methoxycinnamate
5.00 Uvinul N 539 T	Octocrylene
2.00 Parsol 1789	Butylmethoxydibenzoylmethane
2,00 Dow Corning 345 Fluid	Cyclopentasiloxane, cyclohexasiloxane
3.50 Cremophor A 6	Ceteareth-6, stearyl alcohol
1.50 Cremophor A 25	Ceteareth-25
0.50 Beeswax 3044 PH	Beeswax
3.00 Lanette O	Cetearyl alcohol
10.00 Miglyol 812	Caprylic/capric triglyceride
D 1.00 Vitamin E acetate	Tocopheryl acetate
0.5% P18	
0.20 Bisabolol rac.	Bisabolol

(65)

A 3.00 Glycerol 87%	Glycerol
0.20 Edeta BD	Disodium EDTA
0.30 Abiol	Imidazolidinylurea
1.00 Plantacare 2000	Decyl glucoside
0.30 Keltrol T	Xanthan gum
2.00 Mexoryl SL	Terephthalidenedicamphorsulfonic acid
58.40 Water dem.	Aqua dem.
B 6.00 T-Lite SF-S	Titanium dioxide, silicon hydrate, aluminum hydrate, methicone/dimethicone copolymer

C 6.00 Uvinul N 539 T	Octocrylene
2.00 Parsol 1789	Butylmethoxydibenzoylmethane
2.00 Dow Corning 345 Fluid	Cyclopentasiloxane, cyclohexasiloxane
3.50 Cremophor A 6	Ceteareth-6, stearyl alcohol
1.50 Cremophor A 25	Ceteareth-25
0.50 Beeswax 3044 PH	Beeswax
3.00 Lanette O	Cetearyl alcohol
10.00 Miglyol 812	Caprylic/capric triglyceride
D 1.00 Vitamin E acetate	Tocopheryl acetate
0.1% P18	
0.20 Bisabolol rac.	Bisabolol

(66)

A 3.00 Glycerol 87%	Glycerol
0.20 Edeta BD	Disodium EDTA
0.30 Abiol	Imidazolidinylurea
1.00 Plantacare 2000	Decyl glucoside
0.30 Keltrol T	Xanthan gum
2.00 Mexoryl SL	Terephthalidenedicamphorsulfonic acid
58.45 Water dem.	Aqua dem.
B 6.00 Z-COTE MAX	Zinc oxide (and) diphenylcaprylmethicone
6.00 Uvinul N 539 T	Octocrylene
2.00 Parsol 1789	Butylmethoxydibenzoylmethane
2.00 Dow Corning 345 Fluid	Cyclopentasiloxane, cyclohexasiloxane
3.50 Cremophor A 6	Ceteareth-6, stearyl alcohol
1.50 Cremophor A 25	Ceteareth-25
0.50 Beeswax 3044 PH	Beeswax
3.00 Lanette O	Cetearyl alcohol
10.00 Miglyol 812	Caprylic/capric triglyceride
D 1.00 Vitamin E acetate	Tocopheryl acetate
0.05% P18	
0.20 Bisabolol rac.	Bisabolol

(67)

A 3.00 Glycerol 87%	Glycerol
0.20 Edeta BD	Disodium EDTA
0.30 Abiol	Imidazolidinylurea
1.00 Plantacare 2000	Decyl glucoside
0.30 Keltrol T	Xanthan gum
2.00 Neoheliopan AP	Disodium phenyldibenzimidazoletetrasulfonate
57.50 Water dem.	Aqua dem.
B 6.00 Z-COTE MAX	Zinc oxide (and) diphenylcaprylmethicone
6.00 Uvinul N 539 T	Octocrylene
2.00 Parsol 1789	Butylmethoxydibenzoylmethane
2.00 Dow Corning 345 Fluid	Cyclopentasiloxane, cyclohexasiloxane
3.50 Cremophor A 6	Ceteareth-6, stearyl alcohol
1.50 Cremophor A 25	Ceteareth-25
0.50 Beeswax 3044 PH	Beeswax
3.00 Lanette O	Cetearyl alcohol
10.00 Miglyol 812	Caprylic/capric triglyceride
D 1.00 Vitamin E acetate	Tocopheryl acetate

1.0% P18	
0.20 Bisabolol rac.	Bisabolol

(68)

A 25.00 Dow Corning 345 Fluid	Cyclopentasiloxane, cyclohexasiloxane
20.00 Dow Corning 245 Fluid	Cyclopentasiloxane
8.00 Uvinul MC 80	Ethylhexyl methoxycinnamate
4.00 Abil EM 90	Cetyl-PEG-/PPG-10-/1-dimethicone
7.00 T-Lite SF	Titanium dioxide, aluminum hydrate, dimethicone/methicone copolymer
B 17.00 Ethanol 95%	Alcohol
10.00 Z-COTE MAX	Zinc oxide (and) diphenylcaprylmethicone
4.50 Water dem.	Aqua dem.
3.00 Glycerol 87%	Glycerol
0.5% P18	
1.00 Talc	Talc

(69)

A 25.00 Dow Corning 345 Fluid	Cyclopentasiloxane, cyclohexasiloxane
20.00 Dow Corning 245 Fluid	Cyclopentasiloxane
8.00 Uvinul MC 80	Ethylhexyl methoxycinnamate
4.00 Abil EM 90	Cetyl-PEG-/PPG-10-/1-dimethicone
7.00 T-Lite SF-S	Titanium dioxide, silicon hydrate, aluminum hydrate, methicone/dimethicone copolymer
B 17.00 Ethanol 95%	Alcohol
9.99 Z-COTE MAX	Zinc oxide (and) diphenylcaprylmethicone
5.00 Water dem.	Aqua dem.
3.00 Glycerol 87%	Glycerol
0.01% P18	
1.00 Talc	Talc

(70)

A 20.00 Dow Corning 345 Fluid	Cyclopentasiloxane, cyclohexasiloxane
10.00 Dow Corning 245 Fluid	Cyclopentasiloxane
7.50 Uvinul MC 80	Ethylhexyl methoxycinnamate
2.00 Uvinul T 150	Ethylhexyltriazone
12.00 Cosmacol EMI	Di-C_{12-13}-alkyl malate
4.00 Abil EM 90	Cetyl-PEG-/PPG-10-/1-dimethicone
B 7.00 T-Lite SF	Titanium dioxide, aluminum hydrate, dimethicone/methicone copolymer
C 15.00 Ethanol 95%	Alcohol
10.00 Z-COTE MAX	Zinc oxide (and) diphenylcaprylmethicone
3.00 Glycerol 87%	Glycerol
1.5% P18	
8.00 Water dem.	Aqua dem.

(71)

A 20.00 Dow Corning 345 Fluid	Cyclopentasiloxane, cyclohexasiloxane
10.00 Dow Corning 245 Fluid	Cyclopentasiloxane

	7.50 Uvinul MC 80	Ethylhexyl methoxycinnamate
	2.00 Tinosorb S	Bisethylhexyloxyphenol methoxyphenyltriazine
	12.00 Cosmacol EMI	Di-C_{12-13}-alkyl malate
	4,00 Abil EM 90	Cetyl-PEG-/PPG-10-/1-dimethicone
B	7.00 T-Lite SF	Titanium dioxide, aluminum hydrate, dimethicone/methicone copolymer
C	15.00 Ethanol 95%	Alcohol
	10.00 Z-COTE MAX	Zinc oxide (and) diphenylcaprylmethicone
	3.00 Glycerol 87%	Glycerol
0.5% P18		
	9.00 Water dem.	Aqua dem.

(72)

A	2.00 Cremophor WO 7	PEG-7-hydrogenated castor oil
	6.00 Abil B 8839	Cyclopentasiloxane, cyclohexasiloxane
	3.00 T-Lite SF	Titanium dioxide, aluminum hydrate, dimethicone/methicone copolymer
	4.00 Isopropyl palmitate	Isopropyl palmitate
	1.00 Abil 350	Dimethicone
B	7.00 Uvinul MC 80	Ethylhexyl methoxycinnamate
	1.00 Uvinul T 150	Ethylhexyltriazone
	7.00 Finsolv TN	C_{12-15}-Alkyl benzoate
	4.00 Abil WE 09	Polyglyceryl-4 isostearate, cetyl-PEG-/PPG-10-/1-dimethicone, hexyl laurate
C	0.50 Sodium chloride	Sodium chloride
	0.20 Edeta BD	Disodium EDTA
	61.30 Water dem.	Aqua dem
D	1.00 Vitamin E acetate	Tocopheryl acetate
1.0% P18		
q.s. Preservative		

(73)

A	2.00 Cremophor WO 7	PEG-7-hydrogenated castor oil
	6.00 Abil B 8839	Cyclopentasiloxane, cyclohexasiloxane
	3.00 Z-COTE MAX	Zinc oxide (and) diphenylcaprylmethicone
	4.00 Isopropyl palmitate	Isopropyl palmitate
	1.00 Abil 350	Dimethicone
B	7.00 Uvinul MC 80	Ethylhexyl methoxycinnamate
	1.00 Uvinul T 150	Ethylhexyltriazone
	7.00 Finsolv TN	C_{12-15}-Alkyl benzoate
	4.00 Abil WE 09	Polyglyceryl-4 isostearate, cetyl-PEG-/PPG-10-/1-dimethicone, hexyl laurate
C	0.50 Sodium chloride	Sodium chloride
	0.20 Edeta BD	Disodium EDTA
	62.20 Water dem.	Aqua dem
D	1.00 Vitamin E acetate	Tocopheryl acetate
0.1% P18		
q.s. Preservative		

(74)

A	2.00 Cremophor WO 7	PEG-7-hydrogenated castor oil
	6.00 Abil B 8839	Cyclopentasiloxane, cyclohexasiloxane
	3.00 Z-COTE MAX	Zinc oxide (and) diphenylcaprylmethicone
	4.00 Isopropyl palmitate	Isopropyl palmitate
	1.00 Abil 350	Dimethicone
B	7.00 Uvinul MC 80	Ethylhexyl methoxycinnamate
	1.00 Tinosorb S	Bisethylhexyloxyphenol methoxyphenyltriazine
	7.00 Finsolv TN	C_{12-15}-Alkyl benzoate
	4.00 Abil WE 09	Polyglyceryl-4 isostearate, cetyl-PEG-/PPG-10-/1-dimethicone, hexyl laurate
C	0.50 Sodium chloride	Sodium chloride
	0.20 Edeta BD	Disodium EDTA
	60.30 Water dem.	Aqua dem
D	1.00 Vitamin E acetate	Tocopheryl acetate
2.0% P18		
q.s. Preservative		

(75)

A	2.00 Cremophor WO 7	PEG-7-hydrogenated castor oil
	6.00 Abil B 8839	Cyclopentasiloxane, cyclohexasiloxane
	6.00 Z-COTE MAX	Zinc oxide (and) diphenylcaprylmethicone
	4.00 Isopropyl palmitate	Isopropyl palmitate
	1.00 Abil 350	Dimethicone
B	4.00 Uvinul N 539 T	Octocrylene
	1.00 Tinosorb S	Bisethylhexyloxyphenol methoxyphenyltriazine
	7.00 Finsolv TN	C_{12-15}-Alkyl benzoate
	4.00 Abil WE 09	Polyglyceryl-4 isostearate, cetyl-PEG-/PPG-10-/1-dimethicone, hexyl laurate
C	0.50 Sodium chloride	Sodium chloride
	0.20 Edeta BD	Disodium EDTA
	62.10 Water dem.	Aqua dem
D	1.00 Vitamin E acetate	Tocopheryl acetate
0.2% P18		
q.s. Preservative		

(76)

A	2.00 Cremophor WO 7	PEG-7-hydrogenated castor oil
	6.00 Abil B 8839	Cyclopentasiloxane, cyclohexasiloxane
	6.00 Z-COTE MAX	Zinc oxide (and) diphenylcaprylmethicone
	4.00 Isopropyl palmitate	Isopropyl palmitate
	1.00 Abil 350	Dimethicone
B	3.00 Uvinul N 539 T	Octocrylene
	1.00 Mexoryl XL	Drometrizole trisiloxane
	1.00 Tinosorb S	Bisethylhexyloxyphenol methoxyphenyltriazine
	7.00 Finsolv TN	C_{12-15}-Alkyl benzoate
	4.00 Abil WE 09	Polyglyceryl-4 isostearate, cetyl-PEG-/PPG-10-/1-dimethicone, hexyl laurate
C	0.50 Sodium chloride	Sodium chloride
	0.20 Edeta BD	Disodium EDTA
1.0% P18		
	61.30 Water dem.	Aqua dem

D	1.00 Vitamin E acetate	Tocopheryl acetate
q.s.	Preservative	

(77)

A	2.00 Cremophor WO 7	PEG-7-hydrogenated castor oil
	6.00 Abil B 8839	Cyclopentasiloxane, cyclohexasiloxane
	6.00 T-Lite SF-S	Titanium dioxide, silicon hydrate, aluminum hydrate, methicone/dimethicone copolymer
	4.00 Isopropyl palmitate	Isopropyl palmitate
	1.00 Abil 350	Dimethicone
B	3.00 Uvinul N 539 T	Octocrylene
	1.00 Mexoryl XL	Drometrizole trisiloxane
	1.00 Tinosorb S	Bisethylhexyloxyphenol methoxyphenyltriazine
	7.00 Finsolv TN	C_{12-15}-Alkyl benzoate
	4.00 Abil WE 09	Polyglyceryl-4 isostearate, cetyl-PEG-/PPG-10-/1-dimethicone, hexyl laurate
C	0.50 Sodium chloride	Sodium chloride
	0.20 Edeta BD	Disodium EDTA
	61.80 Water dem.	Aqua dem
D	1.00 Vitamin E acetate	Tocopheryl acetate
0.5% P18		
q.s.	Preservative	

(78)

A	4.50 Uvinul MC 80	Ethylhexyl methoxycinnamate
	3.00 Uvinul N 539 T	Octocrylene
	1.00 Uvinul T 150	Ethylhexyltriazone
	2.50 Cosmacol EMI	Di-C_{12-13}-alkyl malate
B	0.50 Vitamin E acetate	Tocopheryl acetate
	4.00 Tego Care 450	Polyglyceryl-3 methylglucose distearate
C	3.50 Cetiol SN	Cetearyl isononanoate
	1.00 Ganex V-220	VP/eicosene copolymer
	5.00 Isohexadecane	Isohexadecane
	2.50 Cosmacol EMI	Di-C_{12-13}-alkyl malate
	5.00 Z-COTE MAX	Zinc oxide (and) diphenylcaprylmethicone
D	44.00 Water dem.	Aqua dem.
	5.00 Glycerol 87%	Glycerol
	1.00 Lanette E	Sodium cetearyl sulfate
	15.00 Luviquat Care	Polyquaternium-44
1.0% P18		
	0.50 Keltrol	Xanthan gum
E	1.00 Phenonip*	

(79)

A	4.50 Uvinul MC 80	Ethylhexyl methoxycinnamate
	3.00 Uvinul N 539 T	Octocrylene
	1.00 Tinosorb S	Bisethoxyhexyloxyphenol methoxyphenyltriazine
	2.50 Cosmacol EMI	Di-C_{12-13}-alkyl malate
B	0.50 Vitamin E acetate	Tocopheryl acetate
	4.00 Tego Care 450	Polyglyceryl-3 methylglucose distearate

*** Trademark**

C	3.50	Cetiol SN	Cetearyl isononanoate
	1.00	Ganex V-220	VP/eicosene copolymer
	5.00	Isohexadecane	Isohexadecane
	2.50	Cosmacol EMI	Di-C_{12-13}-alkyl malate
	5.00	Z-COTE MAX	Zinc oxide (and) diphenylcaprylmethicone
D	44.90	Water dem.	Aqua dem.
	5.00	Glycerol 87%	Glycerol
	1.00	Lanette E	Sodium cetearyl sulfate
	15.00	Luviquat Care	Polyquaternium-44
0.1% P18			
	0.50	Keltrol	Xanthan gum
E	1.00	Phenonip	

(80)

A	1.50	Mexoryl XL	Drometrizole trisiloxane
	5.00	Uvinul N 539 T	Octocrylene
	1.00	Tinosorb S	Bisethylhexyloxyphenol methoxyphenyltriazine
	2.50	Cosmacol EMI	Di-C_{12-13}-alkyl malate
B	0.50	Vitamin E acetate	Tocopheryl acetate
	4.00	Tego Care 450	Polyglyceryl-3 methylglucose distearate
C	3.50	Cetiol SN	Cetearyl isononanoate
	1.00	Ganex V-220	VP/eicosene copolymer
	5.00	Isohexadecane	Isohexadecane
	2.50	Cosmacol EMI	Di-C_{12-13}-alkyl malate
	5.00	Z-COTE MAX	Zinc oxide (and) diphenylcaprylmethicone
D	44.50	Water dem.	Aqua dem.
	5.00	Glycerol 87%	Glycerol
	1.00	Lanette E	Sodium cetearyl sulfate
	15.00	Luviquat Care	Polyquaternium-44
1.5% P18			
	0,50	Keltrol	Xanthan gum
E	1.00	Phenonip	

(81)

A	1.50	Mexoryl XL	Drometrizole trisiloxane
	5.00	Uvinul N 539 T	Octocrylene
	1.00	Tinosorb S	Bisethylhexyloxyphenol methoxyphenyltriazine
	2.50	Cosmacol EMI	Di-C_{12-13}-alkyl malate
B	0.50	Vitamin E acetate	Tocopheryl acetate
	4.00	Tego Care 450	Polyglyceryl-3 methylglucose distearate
C	3.50	Cetiol SN	Cetearyl isononanoate
	1.00	Ganex V-220	VP/eicosene copolymer
	5.00	Isohexadecane	Isohexadecane
	2.50	Cosmacol EMI	Di-C_{12-13}-alkyl malate
	5.00	T-Lite SF	Titanium dioxide, aluminum hydrate, dimethicone/methicone copolymer
D	45.00	Water dem.	Aqua dem.
	5.00	Glycerol 87%	Glycerol
	1.00	Lanette E	Sodium cetearyl sulfate
	15.00	Luviquat Care	Polyquaternium-44
1.0% P18			

0.50 Keltrol	Xanthan gum
E 1.00 Phenonip	

(82)

A 1.00 Abil Care 85	Bis-PEG-/PPG-16-/16-PEG-/PPG-16-/16-dimethicone, caprylic/capric triglyceride
3.00 Cremophor CO 40	PEG-40-hydrogenated castor oil
0.30 Cremophor WO 7	PEG-7-hydrogenated castor oil
5.00 Uvinul MC 80	Ethylhexyl methoxycinnamate
10.00 Witconol APM	PPG-3 myristyl ether
2.00 Uvinul T 150	Ethylhexyltriazone
1.00 Dow Corning 345 Fluid	Cyclopentasiloxane, cyclohexasiloxane
5.00 Uvinul N 539 T	Octocrylene
B 5.00 Z-COTE MAX	Zinc oxide (and) diphenylcaprylmethicone
C 5.00 1,2-Propylene glycol	Propylene glycol
0.20 Keltrol	Xanthan gum
0.10 Edeta BD	Disodium EDTA
2.0% P18	
1.50 Simulgel 600	Acrylamide/sodium acryloyldimethyltaurate copolymer, isohexadecane, polysorbate 80
58.40 Water dem.	Aqua dem.
D q.s. Perfume oil	
0.50 Glydant*	DMDM hydantoin

(83)

A 2.00 Abil Care 85	Bis-PEG-/PPG-16-/16-PEG-/PPG-16-/16-dimethicone, caprylic/capric triglyceride
4.00 Finsolv TN	C_{12-15}-Alkyl benzoate
1.50 Miglyol 812	Caprylic/capric triglyceride
0.50 Vitamin E acetate	Tocopheryl acetate
7.50 Uvinul MC 80	Ethylhexyl methoxycinnamate
4.00 Cetiol B	Dibutyl adipate
3.00 Luvitol EHO	Cetearyl ethylhexanoate
1.00 Cremophor CO 40	PEG-40-hydrogenated castor oil
1.00 Paraffin oil, thin-liquid	Mineral oil
3.00 Plantacare 2000	Decyl glucoside
0.50 Phenonip	
q.s. Perfume oil	
B 4.00 Z-COTE MAX	Zinc oxide (and) diphenylcaprylmethicone
C 2.00 Simulgel NS	Hydroxyethyl acrylate/sodium acryloyldimethyltaurate copolymer, squalane, polysorbate 60
0.20 Keltrol	Xanthan gum
0.10 Edeta BD	Disodium EDTA
1.0% P18	
64.20 Water dem.	Aqua dem

(84)

A 6.00 Gilugel SIL 5	Cyclomethicone (and) aluminum-/magnesium hydroxide stearate

*** Trademark**

	5.00 Uvinul MC 80	Ethylhexyl methoxycinnamate
	2.00 Uvinul A Plus	Diethylaminohydroxybenzoylhexyl benzoate
	1.00 Uvinul T 150	Ethylhexyltriazone
	7.00 Finsolv TN	C_{12-15}-Alkyl benzoate
	4.00 Abil WE 09	Polyglyceryl-4 isostearate, cetyl-PEG-/PPG-10-/1-dimethicone, hexyl laurate
	2.00 Cosmacol EMI	Di-C_{12-13}-alkyl malate
	3.00 Isopropyl palmitate	Isopropyl palmitate
	5.00 Abil B 8839	Cyclopentasiloxane, cyclohexasiloxane
	0.50 Abil 350	Dimethicone
B	0.50 Sodium chloride	Sodium chloride
	0.20 Edeta BD	Disodium EDTA
0.2% P18		
	62.10 Water dem.	Aqua dem.
C	1.00 Vitamin E acetate	Tocopheryl acetate
	0.50 Phenonip	

(85)

A	4.50 Uvinul MC 80	Ethylhexyl methoxycinnamate
	2.00 Tinosorb S	Bisethylhexyloxyphenol methoxyphenyltriazine
	3.00 Uvinul N 539 T	Octocrylene
	2.50 Cosmacol EMI	Di-C_{12-13}-alkyl malate
	0.50 Vitamin E acetate	Tocopheryl acetate
	4.00 Tego Care 450	Polyglyceryl-3 methylglucose distearate
B	3.50 Cetiol SN	Cetearyl isononanoate
	1.00 Ganex V-220	VP/eicosene copolymer
	5.00 Isohexadecane	Isohexadecane
	2.50 Cosmacol EMI	Di-C_{12-13}-alkyl malate
	3.00 T-Lite SF	Titanium dioxide, aluminum hydrate, dimethicone/methicone copolymer
C	5.00 Glycerol 87%	Glycerol
	1.00 Lanette E	Sodium cetearyl sulfate
	0.50 Keltrol	Xanthan gum
1.0% P18		
	59.70 Water dem.	Aqua dem.
D	1.00 Phenonip	
	0.30 Bisabolol rac.	Bisabolol

(86)

A	2.00 Abil Care 85	Bis-PEG-/PPG-16-/16-PEG-/PPG-16-/16-dimethicone, caprylic/capric triglyceride
	4.00 Finsolv TN	C_{12-15}-Alkyl benzoate
	1.50 Miglyol 812	Caprylic/capric triglyceride
	0.50 Vitamin E acetate	Tocopheryl acetate
	7.50 Uvinul MC 80	Ethylhexyl methoxycinnamate
	4.00 Cetiol B	Dibutyl adipate
	1.00 Luvitol EHO	Cetearyl ethylhexanoate
	1.00 Cremophor CO 40	PEG-40 hydrogenated castor oil
	1.00 Paraffin oil, thin-liquid	Mineral oil
	3.00 Plantacare 2000	Decyl glucoside
	1.00 Uvinul A Plus	Diethylaminohydroxybenzoylhexyl benzoate

0.50 Phenonip	
2.50 Uvinul T 150	Ethylhexyltriazone
q.s. Perfume oil	
B 4.00 Z-COTE MAX	Zinc oxide (and) diphenylcaprylmethicone
C 2.00 Simulgel NS	Hydroxyethyl acrylate/sodium acryloyldimethyltaurate copolymer, squalane, polysorbate 60
0.10 Keltrol	Xanthan gum
0.10 Edeta BD	Disodium EDTA
0.5% P18	
59.90 Water dem	Aqua dem.

(87)

A 4.00 Eumulgin VL 75	Lauryl glucoside, polyglyceryl-2 dipolyhydroxystearate, glycerol
2.00 Lanette O	Cetearyl alcohol
12.00 Myritol 331	Cocoglycerides
8.00 Finsolv TN	C_{12-15}-Alkyl benzoate
8.00 Cetiol B	Dibutyl adipate
B 6.00 T-Lite SF	Titanium dioxide, aluminum hydrate, dimethicone/methicone copolymer
5.00 Z-COTE MAX	Zinc oxide (and) diphenylcaprylmethicone
C 3.00 Glycerol 87%	Glycerol
0.10 Edeta BD	Disodium EDTA
1.50 Veegum Ultra	Magnesium aluminum silicate
1.50 Lanette E	Sodium cetearyl sulfate
2.0% P18	
0.30 Keltrol	Xanthan gum
45.10 Water dem.	Water
D 1.00 Phenonip	Phenoxyethanol, methyl paraben, ethyl paraben, butyl paraben, propyl paraben, isobutyl paraben

(88)

A 4.00 Eumulgin VL 75	Lauryl glucoside, polyglyceryl-2 dipolyhydroxystearate, glycerol
2.00 Lanette O	Cetearyl alcohol
12.00 Myritol 331	Cocoglycerides
8.00 Finsolv TN	C_{12-15}-Alkyl benzoate
8.00 Cetiol B	Dibutyl adipate
B 6.00 Uvinul N 539 T	Octocrylene
5.00 Z-COTE MAX	Zinc oxide (and) diphenylcaprylmethicone
C 3.00 Glycerol 87%	Glycerol
0.10 Edeta BD	Disodium EDTA
1.50 Veegum Ultra	Magnesium aluminum silicate
1.50 Lanette E	Sodium cetearyl sulfate
0.30 Carbopol Ultrez 10 P	Carbomer
1.0% P18	
46.10 Water dem.	Aqua dem.
D 1.00 Phenonip	Phenoxyethanol, methyl paraben, ethyl paraben, butyl paraben, propyl paraben, isobutyl paraben

(89)

A	4.00	Eumulgin VL 75	Lauryl glucoside, polyglyceryl-2 dipolyhydroxystearate, glycerol
	2.00	Lanette O	Cetearyl alcohol
	10.00	Myritol 331	Cocoglycerides
	8.00	Finsolv TN	C_{12-15}-Alkyl benzoate
	8.00	Cetiol B	Dibutyl adipate
B	2.00	Uvinul A Plus	Diethylaminohydroxybenzoylhexyl benzoate
	5.00	Z-COTE MAX	Zinc oxide (and) diphenylcaprylmethicone
C	3.00	Glycerol 87%	Glycerol
	0.10	Edeta BD	Disodium EDTA
	1.50	Veegum Ultra	Magnesium aluminum silicate
	1.50	Lanette E	Sodium cetearyl sulfate
5.0% P18			
	0.30	Carbopol Ultrez 10 P	Carbomer
	ad	Water dem.	Water
D	1.00	Phenonip	Phenoxyethanol, methyl paraben, ethyl paraben, butyl paraben, propyl paraben, isobutyl paraben

(90)

A	3.50	Cremophor A 6	Ceteareth-6, stearyl alcohol
	1.50	Cremophor A 25	Ceteareth-25
	7.50	Uvinul MC 80	Ethylhexyl methoxycinnamate
	2.00	Uvinul A Plus	Diethylaminohydroxybenzoylhexyl benzoate
	2.00	Dow Corning 345	Cyclopentasiloxane, cyclohexasiloxane fluid
	0.50	Beeswax 3044 PH	Beeswax
	3.00	Lanette O	Cetearyl alcohol
	10.00	Miglyol 812	Caprylic/capric triglyceride
B	5.00	T-Lite SF-S	Titanium dioxide, silicon hydrate, aluminum hydrate, methicone/dimethicone copolymer
C	3.00	Glycerol 87%	Glycerol
	0.20	Edeta BD	Disodium EDTA
	0.30	Keltrol T	Xanthan gum
	1.00	Plantacare 2000	Decyl glucoside
2.0% P18			
	57.30	Water dem.	Aqua dem.
D	1.00	Vitamin E acetate	Tocopheryl acetate
	0.20	Bisabolol rac.	Bisabolol

5

(91)

A	10.00	Uvinul A Plus B	Ethylhexyl methoxycinnamate, diethylaminohydroxybenzoylhexyl benzoate
	10.00	Uvinul N 539 T	Octocrylene
	4.00	Eumulgin VL 75	Lauryl glucoside, polyglyceryl-2 dipolyhydroxystearate, glycerol
	8.00	Cetiol B	Dibutyl adipate
	8.00	Finsolv TN	C_{12-15}-Alkyl benzoate
	12.00	Myritol 331	Cocoglycerides
	1.00	Lanette E	Sodium cetearyl sulfate

2.00 Lanette O	Cetearyl alcohol
B 3.00 Z-COTE MAX	Zinc oxide (and) diphenylcaprylmethicone
C 35.08 Water dem.	Aqua dem.
0.38 Citric acid	Citric acid
2.9 Glycerol 87%	Glycerol
0.05 Edeta BD	Disodium EDTA
0.20 Allantoin	Allantoin
0.30 Keltrol	Xanthan gum
0.1% P18	
1.50 Veegum Ultra	Magnesium aluminum silicate
D 0.50 Phenonip	
1.00 Vitamin E acetate	Tocopheryl acetate

(92)

A 0.70 Cremophor A 25	Ceteareth-25
1.70 Cremophor A 6	Ceteareth-6, stearyl alcohol
2.00 Uvinul A Plus	Diethylaminohydroxybenzoylhexyl benzoate
3.00 Uvinul N 539 T	Octocrylene
3.00 Z-COTE MAX	Zinc oxide (and) diphenylcaprylmethicone
2.00 Abil B 8843	PEG-14 dimethicone
3.60 Lanette O	Cetearyl alcohol
4.00 Uvinul MC 80	Ethylhexyl methoxycinnamate
2.00 Cetiol B	Dibutyl adipate
B 4.00 Glycerol 87%	Glycerol
0.20 Edeta BD	Disodium EDTA
71.00 Water dem.	Panthenol
C 4.00 Luvigel EM	Caprylic/capric triglyceride, sodium acrylate copolymer
D 1.00 Vitamin E acetate	Tocopheryl acetate
1.0% P18	
0.20 Bisabolol rac.	Bisabolol
q.s. Preservative	

(93)

A 7.50 Uvinul MC 80	Ethylhexyl methoxycinnamate
5.00 Uvinul N 539 T	Octocrylene
3.00 Emulgade PL 68/50	Cetearyl glucoside, cetearyl alcohol
2.00 Dracorin 100 SE	Glyceryl stearate, PEG-100 stearates
1.00 Fitoderm	Squalane
0.50 Cremophor WO 7	PEG-7 hydrogenated castor oil
0.50 Cremophor PS 20	Polysorbate 20
2.00 Dry Flo Pure	Aluminum starch octenyl succinate
B 5.00 Z-COTE MAX	Zinc oxide (and) diphenylcaprylmethicone
0.03 Sicomet* Blue P 77 007	C.I. 77 007, Ultramarine
C 4.00 1,2-Propylene glycol Care	Propylene glycol
2.00 D-Panthenol 50 P	Panthenol, propylene glycol
0.20 Keltrol	Xanthan gum
0.50 Simulgel 600	Acrylamide/sodium acryloyldimethyltaurate copolymer, isohexadecane, polysorbate 80
0.5% P18	
65.27 Water dem.	Aqua dem.

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q.s. Preservative	
0.50 Vitamin E acetate	Tocopheryl acetate

(94)

A 6.00 Gilugel SIL 5	Cyclomethicone (and) aluminum/magnesium hydroxide stearate
5.00 Uvinul N 539 T	Octocrylene
2.00 Mexoryl XL	Drometrizole trisiloxane
1.00 Uvinul T 150	Ethylhexyltriazone
3.00 T-Lite SF-S	Titanium dioxide, silicon hydrate, aluminum hydrate, methicone/dimethicone copolymer
5.00 Finsolv TN	C_{12-15}-Alkyl benzoate
4.00 Abil WE 09	Polyglyceryl-4 isostearate, cetyl-PEG-/PPG-10-/1-dimethicone, hexyl laurate
2.00 Cosmacol EMI	Di-C_{12-13}-alkyl malate
3.00 Isopropyl palmitate	Isopropyl palmitate
5.00 Abil B 8839	Cyclopentasiloxane, cyclohexasiloxane
0.50 Abil 350	Dimethicone
B 0.50 Sodium chloride	Sodium chloride
0.20 Edeta BD	Disodium EDTA
1.0% P18	
61.30 Water dem.	Aqua dem.
C 1.00 Vitamin E acetate	Tocopheryl acetate
0.50 Phenonip	

(95)

A 1.00 Abil Care 85	Bis-PEG-/PPG-16-/16-PEG-/PPG-16-/16-dimethicone, caprylic/capric triglyceride
3.00 Cremophor CO 40	PEG-40 hydrogenated castor oil
0.30 Cremophor WO 7	PEG-7 hydrogenated castor oil
5.00 Uvinul N 539 T	Octocrylene
10.00 Witconol APM	PPG-3 myristyl ether
2.00 Uvinul T 150	Ethylhexyltriazone
1.00 Dow Corning 345 Fluid	Cyclopentasiloxane, cyclohexasiloxane
2.00 Uvinul A Plus	Diethylaminohydroxybenzoylhexyl benzoate
B 5.00 Z-COTE MAX	Zinc oxide (and) diphenylcaprylsilane
C 5.00 1,2-Propylene glycol	Propylene glycol
0.20 Keltrol	Xanthan gum
0.10 Edeta BD	Disodium EDTA
1.0% P18	
1.50 Simulgel 600	Acrylamide/sodium acryloyldimethyltaurate copolymer, isohexadecane, polysorbate 80
59.40 Water dem.	Aqua dem.
D q.s. Perfume oil	
0.50 Glydant	DMDM hydantoin

5

(96)

A 7.00 Uvinul A Plus B	Ethylhexyl methoxycinnamate, diethylaminohydroxybenzoylhexyl benzoate
1.00 Tinosorb S	Bisethylhexyloxyphenol methoxyphenyltriazine

1.00 Uvinul T 150	Ethylhexyltriazone
7.00 Uvinul N 539 T	Octocrylene
4.00 Eumulgin VL 75	Lauryl glucoside, polyglyceryl-2 dipolyhydroxystearate, glycerol
8.00 Cetiol B	Dibutyl adipate
8.00 Finsolv TN	C_{12-15}-Alkyl benzoate
12.00 Myritol 331	Cocoglycerides
1.00 Lanette E	Sodium cetearyl sulfate
2.00 Lanette O	Cetearyl alcohol
B 5.00 Z-COTE MAX	Zinc oxide (and) diphenylcaprylmethicone
C 35.35 Water dem.	Aqua dem.
3.00 Glycerol 87%	Glycerol
0.05 Edeta BD	Disodium EDTA
0.20 Allantoin	Allantoin
0.30 Keltrol	Xanthan gum
0.1% P18	
1.50 Veegum Ultra	Magnesium aluminum silicate
D 0.50 Phenonip	
1.00 Vitamin E acetate	Tocopheryl acetate

(97)

A 7.00 Uvinul A Plus B	Ethylhexyl methoxycinnamate, diethylaminohydroxybenzoylhexyl benzoate
1.00 Tinosorb S	Bisethylhexyloxyphenol methoxyphenyltriazine
1.00 Uvinul T 150	Ethylhexyltriazone
7.00 Uvinul N 539 T	Octocrylene
4.00 Eumulgin VL 75	Lauryl glucoside, polyglyceryl-2 dipolyhydroxystearate, glycerol
8.00 Cetiol B	Dibutyl adipate
8.00 Finsolv TN	C_{12-15}-Alkyl benzoate
12.00 Myritol 331	Cocoglycerides
1.00 Lanette E	Sodium cetearyl sulfate
2.00 Lanette O	Cetearyl alcohol
B 5.00 T-Lite SF	Titanium dioxide, aluminum hydrate, dimethicone/methicone copolymer
C 30.45 Water dem.	Aqua dem.
3.00 Glycerol 87%	Glycerol
0.05 Edeta BD	Disodium EDTA
0.20 Allantoin	Allantoin
0.30 Keltrol	Xanthan gum
5.0% P18	
1.50 Veegum Ultra	Magnesium aluminum silicate
D 0.50 Phenonip	
1.00 Vitamin E acetate	Tocopheryl acetate

(98)

5.00 Z-COTE MAX	Zinc oxide (and) diphenylcaprylmethicone
2.00 Uvinul A Plus	Diethylaminohydroxybenzoylhexyl benzoate
2.00 Mexoryl XL	Drometrizole trisiloxane
3.00 Uvinul MC 80	Ethylhexyl methoxycinnamate
0.50 Abil 350	Dimethicone

2.75 Carnico wax LT 20	Carnauba (*Copernica cerifera*) wax, paraffin
3.70 Candelilla wax LT 281 LJ	Candelilla (*Euphorbia cerifera*) wax
1.80 Beeswax 3050 PH	Beeswax
3.20 TeCero-wax 30445	Microcrystalline wax
3.20 TeCero-wax 1030 K	Microcrystalline wax
1.34 Cutina CP	Cetyl palmitate
6.40 Vaseline	Petrolatum
7.30 Softisan 100	Hydrogenated cocoglycerides
10.00 Luvitol EHO	Cetearyl ethylhexanoate
0.17 Bisabolol nat.	Bisabolol
1.84 Vitamin E acetate	Tocopheryl acetate
1.0% P18	
0.42 D,L-Alpha-tocopherol	Tocopherol
40.38 Castor oil	Castor (*Ricinus communis*) oil

(99)

A 1.00 Abil Care 85	Bis-PEG-/PPG-16-/16-PEG-/PPG-16-/16-dimethicone, caprylic/capric triglyceride
3.00 Cremophor CO 40	PEG-40 hydrogenated castor oil
0.30 Cremophor WO 7	PEG-7 hydrogenated castor oil
2.00 Mexoryl XL	Drometrizole trisiloxane
10.00 Witconol APM	PPG-3 myristyl ether
1.00 Uvinul T 150	Ethylhexyltriazone
1.00 Dow Corning 345 Fluid	Cyclopentasiloxane, cyclohexasiloxane
5.00 Uvinul N 539 T	Octocrylene
B 3.00 T-Lite SF-S	Titanium dioxide, silicon hydrate, aluminum hydrate, methicone/dimethicone copolymer
C 5.00 1,2-Propylene glycol	Propylene glycol
1.00 Mexoryl SX	Terephthalidenedicamphorsulfonic acid
0.20 Keltrol	Xanthan gum
0.10 Edeta BD	Disodium EDTA
1.0% P18	
1.50 Simulgel 600	Acrylamide/sodium acryloyldimethyltaurate copolymer, isohexadecane, polysorbate 80
69.50 Water dem.	Aqua dem.
D q.s. Perfume oil	
0.50 Glydant	DMDM hydantoin

(100)

A 1.00 Abil Care 85	Bis-PEG-/PPG-16-/16-PEG-/PPG-16-/16-dimethicone, caprylic/capric triglyceride
3.00 Cremophor CO 40	PEG-40 hydrogenated castor oil
0.30 Cremophor WO 7	PEG-7 hydrogenated castor oil
2.00 Parsol 1789	Butylmethoxydibenzoylmethane
2.00 Mexoryl XL	Drometrizole trisiloxane
10.00 Witconol APM	PPG-3 myristyl ether
1.00 Uvinul T 150	Ethylhexyltriazone
1.00 Dow Corning 345 Fluid	Cyclopentasiloxane, cyclohexasiloxane
5.00 Uvinul N 539 T	Octocrylene
B 3.00 T-Lite SF-S	Titanium dioxide, silicon hydrate, aluminum hydrate, methicone/dimethicone copolymer

C 5.00 1,2-Propylene glycol	Propylene glycol
1.00 Mexoryl SX	Terephthalidenedicamphorsulfonic acid
0.20 Keltrol	Xanthan gum
0.10 Edeta BD	Disodium EDTA
0.2% P18	
1.50 Simulgel 600	Acrylamide/sodium acryloyldimethyltaurate copolymer, isohexadecane, polysorbate 80
68.30 Water dem.	Aqua dem.
D q.s. Perfume oil	
0.50 Glydant	DMDM hydantoin

(101)

A 0.70 Cremophor A 25	Ceteareth-25
1.70 Cremophor A 6	Ceteareth-6, stearyl alcohol
2.00 Parsol 1789	Butylmethoxydibenzoylmethane
5.00 Uvinul N 539 T	Octocrylene
4.00 Z-COTE MAX	Zinc oxide (and) diphenylcaprylmethicone
2.00 Abil B 8843	PEG-14 dimethicone
3.60 Lanette O	Cetearyl alcohol
1.00 Uvinul T150	Ethylhexyltriazone
2.00 Cetiol B	Dibutyl adipate
B 4.00 Glycerol 87%	Glycerol
0.20 Edeta BD	Disodium EDTA
71.00 Water dem.	Panthenol
C 4.00 Luvigel EM	Caprylic/capric triglyceride, sodium acrylate copolymer
1.0% P18	
D 1.00 Vitamin E acetate	Tocopheryl acetate
0.20 Bisabolol rac.	Bisabolol
q.s. Preservative	

Example 39: Use of P18 in a hair tonic

AI 5%:

	%	Ingredient (INCI)
A	q.s.	Perfume oil
	1.00	PEG-40 Hydrogenated Castor Oil
B	65.0	Alcohol
	1.0	Panthenol
	0.5	Polyquarternium-16
	0.1	Menthol
	27.4	Aqua dem.
	5.00	Aqueous solution with about 7% P18

Preparation: Mix phase A. Add phase B and stir until everything has dissolved. Adjust

pH to pH 7.0.

Example 40: Use of P18 in a hair gel

AI 5%:

	%	Ingredient (INCI)
A	45.00	Carbopol 940 1% in water
	0.70	Aminomethyl Propanol
B	7.50	VP/Methacrylamide/Vinyl Imidazole Copolymer
	0.10	Perfume oil
	0.30	PEG-40 Hydrogenated Castor Oil
	0.30	Preservative
	0.05	Disodium EDTA
	0.30	Panthenol
	8.00	Alcohol
	5.00	Aqueous solution with about 7% P18
	32.75	Aqua dem.

Preparation: Weigh in the components of phase A and homogenize. Dissolve phase B and stir into phase A. Adjust pH to pH 6.9.

3. Test examples B

Example 41: Long-term stability of P18 tested on *Malassezia furfur*

Since storage over longer time periods may be necessary, in the following a 1 mM P18 peptide solution (P18 sequence H-KWKLFKKIPKFLHLAKKF – NH_2) was stored for 12 weeks at 37°C and the antifungal activity of the stored solution on *Malassezia furfur* was compared to the activity of a freshly prepared 1 mM P18 peptide solution. This was done through a growth test, which was carried out as follows:

Growth medium: M472-Pityrosporum medium according to DSMZ

40 g/L malt extract

20 g/L ox bile

10 g/L Tween* 40

The components were sterilized at 121°C, 1 bar superatmospheric pressure for 20 minutes.

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2 g/L of olive oil (sterilized by filtration and, after autoclaving, added to the other components)

Since it was a two-phase medium, the complete medium was treated with sonication in order to enlarge the phase boundary.

For agar plates, if appropriate, 150 g/L of agar agar were added to the medium.

The growth test was carried out as follows: A shake flask with M472-*Pityrosporum* medium was inoculated with *M. furfur* and incubated with shaking overnight at 30°C and 200 rpm.

A 96-well microtiter plate was filled with in each case 100 µl of M472-*Pityrosporum* medium and inoculated with *M. furfur* suspension of the overnight culture. The *M. furfur* suspension was adjusted at the start of the experiment to an optical density, measured at 600 nm, of 0.02. The concentrates of the inhibitor solutions were 1 mM in water.

The growth of the following batches was compared:

- *M. furfur* suspension without the addition of an inhibitor.
- *M. furfur* suspension and addition of a fresh aqueous P18 solution with a final concentration of 50 µM.
- *M. furfur* suspension and addition of a fresh aqueous P18 solution with a final concentration of 25 µM.
- *M. furfur* suspension and addition of a P18 solution that had been stored at 37°C for 12 weeks, with a final concentration of 50 µM.
- *M. furfur* suspension and addition of a P18 solution that had been stored at 37°C for 12 weeks, with a final concentration of 25 µM.

The microtiter plate was incubated with shaking at 30°C.

The growth was observed over 24 hours by measuring the optical density. The colony-forming units (CFU) were then determined by plating out 1 µl and 5 µl from each of the suspensions and, after incubation for 6 days, counting the colonies. The CFU was determined in order to exclude an influence of the two-phase medium and also the growth form of *M. furfur* on the optical density. The experiments were carried out at least in triple determinations.

Table 7: Counting the colony-forming units (the values given are mean values with standard deviation)

Incubation time [h]	without inhib.	addition of aqueous P18 solution [50 µM final conc.]	addition of stored aqueous P18 solution [50 µM final conc.]	addition of aqueous P18 solution [25 µM final conc.]	addition of stored aqueous P18 solution [25 µM final conc.]
16 - 18	> 1000	0±0	0±0	5±8	6±7
24	> 1000	1±1	1±1	1±2	5±5

The results of the growth test show that the growth of *M. furfur,* measured as colony forming unit, was effectively inhibited by the P18 peptide solution that had been stored for 12 weeks as well as by the fresh P18 peptide solution. This means that the storage of the P18 peptide solution has not influenced the activity of the solution and, consequently, that the solution was storable over this time period.

Example 42: Formulability of P18

The formulability of the peptide P18 was tested in three shampoo basic formulations. For this, in a first step the formulations with the following compositions were prepared:

Table 8: composition of the basic formulations

Trade name (INCI)	formulation 31-1	formulation 31-2	formulation 31-3
Texapon* NSO (Sodium Laureth Sulfate)	40 %	30 %	20 %
Tego Betain L7 (Cocamidopropyl Betaine)	10 %	10 %	20 %

The components were mixed and dissolved. The pH was adjusted to pH 6-7 with NaOH. In the following, two 100 mM solutions of the peptide P18 (P18 sequence H-KWKLFKKIPKFLHLAKKF – NH_2) were prepared. One solution was prepared using DMSO as solvent, the other solution was prepared using water. A corresponding volume of 100 mM peptide solution was added to each of the formulations, so that the final concentration in

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formulations 31-1 and 31-2 was 10mM, the final concentration of the peptide P18 in formulation 31-3 was 5 mM. The formulations thus obtained were clear and homogenic.

Example 43: Effect of shampoo basic formulations containing P18 as ingredient

The aim of the experiment was to analyze the effect of a shampoo basic formulation containing the peptide P18 as ingredient (P18 sequence H-KWKLFKKIPKFLHLAKKF – NH_2). For this, in this experiment the peptide P18 was directly added to the formulation. In a first step, formulations with the following compositions were prepared:

Table 9: Composition of the shampoo basic formulation and the shampoo basic formulation containing P18 as ingredient.

Trade name (INCI)	shampoo basic formulation 31-3	shampoo basic formulation 31-3 containing P18 as ingredient
Texapon NSO (Sodium Laureth Sulfate)	20 %	20 %
Tego Betain L7 (Cocamidopropyl Betaine)	20 %	20 %
peptide P18 (H-KWKLFKKIPKFLHLAKKF-NH_2)	-	5 mM (~ 1%)

The components Texapon NSO and Tego Betain L7 were mixed and dissolved. The pH was adjusted to pH 6-7 with NaOH. In the following, a 100 mM aqueous solution of the peptide P18 (P18 sequence H-KWKLFKKIPKFLHLAKKF – NH_2) was prepared. A corresponding volume of the 100 mM P18 peptide solution was added to the formulation, so that the final concentration of the peptide P18 in formulation 31-3 was 5 mM. As described above, the formulation thus obtained was clear and homogenic. The effectiveness of the formulations against the fungus *Malassezia furfur* was then compared to the shampoo basic formulation containing no peptide P18.

In summary, the test was carried out as follows:

Growth medium: M472-Pityrosporum medium according to DSMZ

40 g/L malt extract
20 g/L ox bile

10 g/L Tween 40

The components were sterilized at 121°C, 1 bar superatmospheric pressure for 20 minutes.

2 g/L of olive oil (sterilized by filtration and, after autoclaving, added to the other components)

Since it was a two-phase medium, the complete medium was treated with sonication in order to enlarge the phase boundary.

For agar plates, if appropriate, 150 g/L of agar agar were added to the medium.

The growth test was carried out as follows: A shake flask with M472-*Pityrosporum* medium was inoculated with *M. furfur* and incubated with shaking overnight at 30°C and 200 rpm.

A 96-well microtiter plate was filled with in each case 170 µl of M472-*Pityrosporum* medium and inoculated with 10µl of *M. furfur* suspension of the overnight culture. This corresponded to an optical density, measured at 620nm, of of 0.02 – 0.1. 20 µl of shampoo basic formulation and 20 µl of shampoo basic formulation 31-3 containing P18 as ingredient, respectively, were added to this mixture.

Thus, in summary, the following mixtures were compared in this experiment:

- *M. furfur* suspension
- *M. furfur* suspension and addition of 20 µl of shampoo basic formulation 31-3
- *M. furfur* suspension and addition of 20 µl of shampoo basic formulation 31-3 containing P18 as ingredient.

The microtiter plate was incubated with shaking at 30°C.

After 24 hours of incubation, the colony-forming units (CFU) were determined by resuspending 1 µl of each suspension in 10 µl of medium and then plating out the obtained suspension. After incubation for 6 days, the colonies on the plate were counted. The CFU was determined in order to exclude an influence of the two-phase medium and also the growth form of *M. furfur* on the optical density. The experiments were carried out in at least two independent experiments, each with double determination.

Table 10: Counting the colony-forming units after incubation for 24 hours

	M. furfur suspension	*M. furfur* suspension and addition of shampoo basic formulation 31-3	*M. furfur* suspension and addition of shampoo basic formulation 31-3 containing P18 as ingredient
24 h	> 2000	300±199	0±0

The results show that shampoo basic formulation 31-3 per se already has a measurable growth inhibiting effect against *Malassezia furfur.* However, with shampoo basic formulation 31-3 containing P18 as ingredient there is no measurable growth at all. This shows that the antifungal effect of the peptide P18 is maintained in this formulation. Since no growth of *M. furfur* could be measured, it can actually be assumed that even lower concentrations of the ingredient P18 or comparable peptides or other comparable formulations can be used to inhibit the growth of *Malassezia furfur* and other *Malassezia ssp.*.

Example 44: Growth inhibition of *Malassezia furfur* with equal concentrations of the peptide P18, Zincpyrithione, Climbazole and Ketoconazole, based on % by weight (%(weigth/weight)

The molar masses of the peptide P18 (P18 peptide sequence H – KWKLFKKIPKFLHLAKKF – NH_2) and the current commercial ingredients of antidandruff shampoos inhibiting the growth of the fungus *Malassezia furfur* differ considerably. The peptide P18 has a molar mass of 2300 g/mol, Zincpyrithione has 317 g/mol, Ketokonazol has 531 g/mol and Climbazole has a molar mass of 292 g/mol. Since the experiments analyzing growth inhibition of *M. furfur* had been carried out with comparable molarities in the preceding examples, in this example growth inhibition of *Malassezia furfur* was analyzed using equal concentrations of the peptide P18, Zincpyrithione, Climbazole and Cetoconazol, based on % by weight (%(weigth/weight). For this, the procedure was as follows:

Growth medium: M472-Pityrosporum medium according to DSMZ

40 g/L malt extract

20 g/L ox bile
10 g/L Tween 40

The components were sterilized at 121°C, 1 bar superatmospheric pressure for 20 minutes.

2 g/L of olive oil (sterilized by filtration and, after autoclaving, added to the other components)

Since it was a two-phase medium, the complete medium was treated with sonication in order to enlarge the phase boundary.

For agar plates, if appropriate, 150 g/L of agar agar were added to the medium.

The growth test was carried out as follows: A shake flask with M472-*Pityrosporum* medium was inoculated with *M. furfur* and incubated with shaking overnight at 30°C and 200 rpm.

A 96-well microtiter plate was filled with in each case 100 µl of M472-*Pityrosporum* medium and inoculated with *M. furfur* suspension of the overnight culture. The *M. furfur* suspension was adjusted at the start of the experiment to an optical density, measured at 600 nm, of 0.02. The concentrates of the inhibitor solutions were 1 mM in DMSO for the peptide P18 and 10 mM in DMSO for Zincpyrithione, Ketoconazole and Climbazole. The DMSO final concentrations were maintained the same in all experiments. This means that a corresponding volume of DMSO was added to the mixture in the case of a higher concentration of Zincpyrithione, Ketoconazole or Climbazole concentrate in order to ensure comparability to the mixtures containing P18.

The growth of the following batches was compared by measuring the optical density:

- *M. furfur* suspension and addition of P18 solution with a final concentration of 50 µM (equal to 0.0115 %(w/w))
- *M furfur* suspension and addition of Zincpyrithione (ZPT) solution with a final concentration of 362 µM (comparison to the mixture containing 50 µM of the peptide P18)
- *M furfur* suspension and addition of Ketoconazole solution with a final concentration of 216 µM (comparison to the mixture containing 50 µM of the peptide P18)
- *M furfur* suspension and addition of Climbazole solution with a final concentration of 390 µM (comparison to the mixture containing 50 µM of the peptide P18)

The microtiter plate was incubated with shaking at 30°C.

After 24 hours of incubation, the colony-forming units (CFU) were determined by plating out 10 µl of medium from each of the suspensions on agar plates. After incubation for 6 days, the colonies on the plates were counted. The CFU was determined in order to exclude an influence of the two-phase medium and also the growth form of *M. furfur* on the optical density. The experiments were carried out in at least two independent experiments, each with double determination.

Table 11: Counting the colony-forming units (the values given are mean values from the experiments with standard deviation)

Incubation time [h]	addition of P18 peptide solution [50 µM final conc.]	addition of Zincpyrithione solution [362 µM final conc.]	addition of Climbazole solution [390 µM final conc.]	addition of Ketoconazole solution [216 µM final conc.]
24	1±1	60±40	137±33	84±76
40	0±0	26±7	35±15	9±5

It was observed that within the experimental period the addition of the peptide P18 reduced the CFU and, consequently, the growth of *Malassezia furfur* more effectively than the reference substances Zincpyrithione, Climbazole and Ketoconazole.

These results show effective, at least comparable growth inhibition of *Malassezia furfur* by the peptide P18 compared to Zincpyrithione, Climbazole and Ketoconazole with equal concentrations, based on % by weight (%(w/w)).

Example 45: Incubation times with the peptide P18 from 5 minutes to 1 hour

Since growth inhibition of *M. furfur* by the peptide P18 (P18 peptide sequence H – KWKLFKKIPKFLHLAKKF – NH_2) had so far only been analyzed over incubation times of more than one hour, now the effect of the peptide P18 within the first minutes of incubation (5 minutes, 10 minutes and 20 minutes) up to the first hour after adding to the *M. furfur*

overnight culture was tested and compared to the reference substance Zincpyrithione (Sigma Aldrich). For this, the peptide P18 and the reference substance Zincpyrithione were used in concentrations of 100 µM, 200 µM and 500 µM. The experiments were carried out as follows:

Growth medium: M472-Pityrosporum medium according to DSMZ

40 g/L malt extract
20 g/L ox bile
10 g/L Tween 40

The components were sterilized at 121°C, 1 bar superatmospheric pressure for 20 minutes.

2 g/L of olive oil (sterilized by filtration and, after autoclaving, added to the other components)

Since it was a two-phase medium, the complete medium was treated with sonication in order to enlarge the phase boundary.

For agar plates, if appropriate, 150 g/L of agar agar were added to the medium.

The growth test was carried out as follows: A shake flask with M472-*Pityrosporum* medium was inoculated with *M. furfur* and incubated with shaking overnight at 30°C and 200 rpm.

A 96-well microtiter plate was filled with in each case 100 µl of M472-*Pityrosporum* medium and inoculated with *M. furfur* suspension of the overnight culture. The *M. furfur* suspension was adjusted at the start of the experiment to an optical density, measured at 600 nm, of 0.1.

The growth of the following batches was compared:

- *M. furfur* suspension and addition of the peptide P18 with a final concentration of 100 µM, plating out after 5 minutes, 10 minutes, 20 minutes and 60 minutes
- *M. furfur* suspension and addition of the peptide P18 with a final concentration of 200 µM plating out after 5 minutes, 10 minutes, 20 minutes and 60 minutes
- *M. furfur* suspension and addition of the peptide P18 with a final concentration of 500 µM plating out after 5 minutes, 10 minutes, 20 minutes and 60 minutes

- *M. furfur* suspension and addition of Zincpyrithione with a final concentration of 100 µM plating out after 5 minutes, 10 minutes, 20 minutes and 60 minutes
- *M. furfur* suspension and addition of Zincpyrithione with a final concentration of 200 µM plating out after 5 minutes, 10 minutes, 20 minutes and 60 minutes
- *M. furfur* suspension and addition of Zincpyrithione with a final concentration of 500 µM plating out after 5 minutes, 10 minutes, 20 minutes and 60 minutes

The microtiter plate was incubated with shaking at 30°C.

After the incubation times indicated above, the colony-forming units (CFU) were determined by plating out 50 µl from each of the suspensions and, after incubation for 6 days, counting the colonies. The CFU was determined in order to exclude an influence of the two-phase medium and also the growth form of *M. furfur* on the optical density. The experiments were independently repeated. Below, those colony-forming units are indicated which showed less than 1000 colonies and thus a significant growth inhibition.

Table 12: Counting the colony-forming units after the indicated incubation time

Substance	**final concentration in the experiment [µM]**	**colony-forming units after the indicated incubation time**			
		5 minutes	10 minutes	20 minutes	60 minutes
P18	100	> 1000	> 1000	604	149±60
	200	> 1000	> 1000	> 1000	52±16
	500	> 1000	398±290	26±6	1±1
ZPT (Zincpyrithione)	100	> 1000	> 1000	> 1000	> 1000
	200	> 1000	> 1000	> 1000	> 1000
	500	> 1000	> 1000	> 1000	> 1000

The results show that after the first 10 minutes of incubation with the peptide P18 the number of living *Malassezia furfur* cells was already considerably reduced as compared to incubation with Zincpyrithione. After 60 minutes of incubation with even lower peptide P18 concentrations the colony-forming units were considerably reduced as compared to shorter incubation times. This means that the mechanism of action of the peptide P18 clearly differs from the mechanism of action of Zincpyrithione and that the peptide P18 is effective against *M. furfur* even after short incubation times.

Example 46: Effect of P18 variants

The inhibitory effect of the following P18 variants against *M. furfur* was analyzed:

H-KWKLFKKIPKFLHLAKKF – NH_2	(P18; carboxy-terminal end amidated)
H-KWKLFKKIPKFLHLAKKF – OH	(P18-OH; carboxy-terminal end not modified)
H-PKWKLFKKIPKFLHLAKKFD – OH	(P18AC-OH; carboxy-terminal end not modified)
H-PKWKLFKKIPKFLHLAKKFN – NH_2	(P18AC-NH_2; carboxy-terminal end amidated)

The experiments were carried out as follows:

Growth medium: M472-Pityrosporum medium according to DSMZ

40 g/L malt extract
20 g/L ox bile
10 g/L Tween 40

The components were sterilized at 121°C, 1 bar superatmospheric pressure for 20 minutes.

2 g/L of olive oil (sterilized by filtration and, after autoclaving, added to the other components)

Since it was a two-phase medium, the complete medium was treated with sonication in order to enlarge the phase boundary.

For agar plates, if appropriate, 150 g/L of agar agar were added to the medium.

The growth test was carried out as follows: A shake flask with M472-*Pityrosporum* medium was inoculated with *M. furfur* and incubated with shaking overnight at 30°C and 200 rpm.

A 96-well microtiter plate was filled with in each case 100 µl of M472-*Pityrosporum* medium and inoculated with *M. furfur* suspension of the overnight culture. The *M. furfur* suspension was adjusted at the start of the experiment to an optical density, measured at 600 nm, of 0.1.

The peptide variants were dissolved in Dimethylsulfoxide (DMSO) with a final concentration of 1 mM. Optionally, DMSO can be omitted and a pure aqueous peptide

solution can be used instead. 5 µl of said solution were added to 100 µl of *M. furfur* suspension (peptide P18 having a final concentration of 50 µM). In a reference mixture the same amount of DMSO containing no peptide P18 was added.

The microtiter plate was incubated with shaking at 30°C.

After 24 hours, the colony-forming units (CFU were determined by plating out 10 µl from each of the suspensions and, after incubation for 6 days, counting the colonies. Two independent experiments with in each case three identical mixtures were carried out and the number of colony-forming units was averaged.

Table 13: Averaged number of colony-forming units (CFU) after incubation of *M. furfur* with 50 µM of different P18 variants

mixtures	**CFU**
M.furfur suspension without additives	1377
suspension + DMSO	150
suspension + DMSO + P18	0
suspension + DMSO + P18-OH	3
suspension + DMSO + P18AC-OH	37

The experiment shows that the solvent DMSO per se already reduces the CFU. However, all P18 variants show an increased inhibitory effect against *M. furfur* as compared to DMSO, with effectiveness increasing in the order P18AC-OH; P18-OH; P18. Following the same order, the number of negatively charged carboxylic groups decreases in the peptide molecule. It can therefore be concluded that peptide variants carrying a weak negative charge are most effective.

Example 47: Kinetics of the effect of the peptide P18 on *M. furfur* in the presence of a shampoo basic formulation

The effect of the peptide P18 (H-KWKLFKKIPKFLHLAKKF–NH_2; carboxy-terminal end amidated) as compared to Zincpyrithione and Climbazole was tested in the presence of the shampoo basic formulation and at different incubation times (table 14). The experiments were carried out as follows:

The following shampoo basic formulation was prepared:

Table 14: composition of the shampoo basic formulation

Trade name (INCI)	Shampoo basic fomulation 31-3
Texapon NSO (Sodium Laureth Sulfate)	20 %
Tego Betain L7 (Cocamidopropyl Betaine)	20 %

The components Texapon NSO and Tego Betain L7 were mixed and dissolved. The pH was adjusted to pH 6-7 with NaOH.

The effect of P18, ZPT and Climbazole against *M. furfur* was analyzed as follows:

Growth medium: M472-Pityrosporum medium according to DSMZ

40 g/L malt extract
20 g/L ox bile
10 g/L Tween 40

The components were sterilized at 121°C, 1 bar superatmospheric pressure for 20 minutes.

2 g/L of olive oil (sterilized by filtration and, after autoclaving, added to the other components)

Since it was a two-phase medium, the complete medium was treated with sonication in order to enlarge the phase boundary.

For agar plates, if appropriate, 150 g/L of agar agar were added to the medium.

The growth test was carried out as follows: A shake flask with M472-*Pityrosporum* medium was inoculated with *M. furfur* and incubated with shaking overnight at 30°C and 200 rpm.

A 96-well microtiter plate was filled with in each case 100 µl of M472-*Pityrosporum*

medium and inoculated with *M. furfur* suspension of the overnight culture. The *M. furfur* suspension was adjusted at the start of the experiment to an optical density, measured at 600 nm, of 0.1. 10% (v/v) of shampoo basic formulation 31-3 were added to the *M. furfur* suspension (see table 14).

The peptide P18 was dissolved in water with a concentration of 230g/l. The active ingredients Zincpyrithione and Climbazole were dissolved in DMSO with a concentration of 230 g/l, with the active ingredients partially remaining insolubly suspended. The peptide solution and the active ingredient solutions, respectively, were added to the *M. furfur* suspension containing shampoo basic formulation, with a final concentration of 2.3g/l; 1.15g/l; 0.46g/l and 0.23g/l.

The microtiter plate was incubated with shaking at 30°C.

After incubation of the mixtures for 5 min; 10 min; 20 min; 60 min and 24 hours, the colony-forming units were determined by plating out 1 µl from each of the suspensions and, after incubation for 6 days, counting the colonies.

It was observed that in this test P18 shows superior characteristics as compared to Zincpyrithione or Climbazole.

Example 48: Long-term stability of the peptide P18 in shampoo basic formulations tested on *M. furfur*

Long-term stability of the peptide P18 (H – KWKLFKKIPKFLHLAKKF – NH_2; carboxy-terminal end amidated) in shampoo basic formulations was tested.

The following shampoo basic formulations were prepared:

Table 15: Composition of the formulations

Trade name (INCI)	formulation 31-1-10	formulation 31-3-5	formulation 31-3-2
Texapon NSO (Sodium Laureth Sulfate)	40 %	20 %	20 %
Tego Betain L7 (Cocamidopropyl Betaine)	10 %	20 %	20 %
peptide P18	10 mM	5 mM	2 mM

The components Texapon NSO and Tego Betain L7 were mixed and dissolved. The pH was adjusted to pH 6-7 with NaOH. In the following, 100 mM of aqueous P18 peptide solution were prepared. A corresponding volume of 100 mM P18 peptide solution was added to each formulation in order to obtain peptide P18 final concentrations as indicated in table 15.

The formulations were stored at 40°C.

After 0; 12 and 22 days, the effect of the formulations against *M. furfur* was analyzed.

Growth medium: M472-Pityrosporum medium according to DSMZ

40 g/L malt extract
20 g/L ox bile
10 g/L Tween 40

The components were sterilized at 121°C, 1 bar superatmospheric pressure for 20 minutes.

2 g/L of olive oil (sterilized by filtration and, after autoclaving, added to the other components)

Since it was a two-phase medium, the complete medium was treated with sonication in order to enlarge the phase boundary.

For agar plates, if appropriate, 150 g/L of agar agar were added to the medium.

The growth test was carried out as follows: A shake flask with M472-*Pityrosporum* medium was inoculated with *M. furfur* and incubated with shaking overnight at 30°C and 200 rpm.

A 96-well microtiter plate was filled with in each case 100 µl of M472-*Pityrosporum* medium and inoculated with *M. furfur* suspension of the overnight culture. The *M. furfur* suspension was adjusted at the start of the experiment to an optical density, measured at 600 nm, of 0.1.

10% (v/v) of the stored formulations 31-1-10; 31-3-5; 31-3-2 (table 15) were added to the *M. furfur* suspension.

The microtiter plate was incubated with shaking at 30°C.

After 24 hours, the colony-forming units (CFU) were determined. For this, 1 µl and 10 µl were plated out from each of the suspensions and, after incubation for 6 days, the colonies were counted.

It was observed that P18 shows stable characteristics at the tested conditions.

Example 49: Determining the minimum inhibitory concentration (MIC) of P18 peptide in the presence of a shampoo basic formulation

The minimum inhibitory concentration (MIC) of the peptide P18 (H – KWKLFKKIPKFLHLAKKF - NH_2; carboxy-terminal end amidated) in the presence of the shampoo basic formulation 31-3 (table 16) was tested as follows:

The following shampoo basic formulation was prepared:

Table 16: composition of the shampoo basic formulation

Trade name (INCI)	shampoo basic formulation 31-3 containing P18 as ingredient
Texapon NSO (Sodium Laureth Sulfate)	20 %
Tego Betain L7 (Cocamidopropyl Betaine)	20 %

The shampoo basic formulation was prepared by mixing and dissolving the components Texapon NSO and Tego Betain L7. The pH was adjusted to pH 6-7 with NaOH.

The effect of the peptide against *M. furfur* was analyzed as follows:

Growth medium: M472-Pityrosporum medium according to DSMZ

40 g/L malt extract

20 g/L ox bile

10 g/L Tween 40

The components were sterilized at 121°C, 1 bar superatmospheric pressure for 20 minutes.

2 g/L of olive oil (sterilized by filtration and, after autoclaving, added to the other components)

Since it was a two-phase medium, the complete medium was treated with sonication in order to enlarge the phase boundary.

For agar plates, if appropriate, 150 g/L of agar agar were added to the medium.

The growth test was carried out as follows: A shake flask with M472-*Pityrosporum* medium was inoculated with *M. furfur* and incubated with shaking overnight at 30°C and 200 rpm.

A 96-well microtiter plate was filled with in each case 170 µl of M472-*Pityrosporum* medium and inoculated with 10 µl of *M. furfur* suspension of the overnight culture. This corresponded to an optical density of 0.02 – 0.1, measured at 620 nm. 20 µl of shampoo basic formulation 31-3 were added to this mixture. Peptide P18 was dissolved in DMSO with a concentration of 10 mM. Corresponding amounts of P18 solution were added in order to obtain final concentrations as indicated in table 17.

The microtiter plate was incubated with shaking at 30°C.

After incubation for 24 hours, the colony-forming units (CFU) were determined by resuspending 1 µl of each of the suspensions in 10 µl of medium and then plating out the obtained suspensions. After incubation for 6 days, the colonies on the plate were counted. The experiment was carried out in double determination.

Table 17: Counting the colony-forming units (CFU) after 24 hours of incubation

P18 concentration	**CFU**
0µM	538
25µM	80
50µM	32

100µM	0
200µM	0
300µM	0
400µM	0
500µM	0

The results show that growth of *M. furfur* is completely inhibited by P18 concentrations above 100 µM. The minimum inhibitory concentration in the presence of shampoo basic formulation 31-3 is therefore between 50 µM and 100 µM. This shows that the antifungal effect of the peptide P18 is maintained in this formulation, even though, as compared to mixtures containing no shampoo formulation (see example 41), the activity is slightly reduced by the shampoo basic formulation used.

Example 50: Combination of the peptide P18 with conventional fungicidal active ingredients.

The effect of combinations of active ingredients comprising proportions of the conventional fungicidal active ingredient Zincpyrithion, Ketoconazole or Climbazole and of the peptide P18 (H – KWKLFKKIPKFLHLAKKF – NH_2; carboxy-terminal end amidated) was tested in aqueous solution and in the presence of shampoo formulation 31-3 as follows:

The following shampoo basic formulation was prepared:

Table 18: Composition of the shampoo basic formulation:

Trade name (INCI)	**shampoo basic formulation 31-3**
Texapon NSO (Sodium Laureth Sulfate)	20 %
Tego Betain L7 (Cocamidopropyl Betaine)	20 %

The shampoo basic formulation was prepared by mixing and dissolving the components Texapon NSO and Tego Betain L7. The pH was adjusted to pH 6-7 with NaOH.

The effect of the peptide P18 and of said conventional agents against *M. furfur* was analyzed as follows:

Growth medium: M472-Pityrosporum medium according to DSMZ

40 g/L malt extract
20 g/L ox bile
10 g/L Tween 40

The components were sterilized at 121°C, 1 bar superatmospheric pressure for 20 minutes.

2 g/L of olive oil (sterilized by filtration and, after autoclaving, added to the other components)

Since it was a two-phase medium, the complete medium was treated with sonication in order to enlarge the phase boundary.

For agar plates, if appropriate, 150 g/L of agar agar were added to the medium.

The growth test was carried out as follows: A shake flask with M472-*Pityrosporum* medium was inoculated with *M. furfur* and incubated with shaking overnight at 30°C and 200 rpm.

A 96-well microtiter plate was filled with in each case 170 µl of M472-*Pityrosporum* medium and inoculated with 10 µl of *M. furfur* suspension of the overnight culture. This corresponded to an optical density of 0.02 – 0.1, measured at 620 nm. 20 µl of shampoo basic formulation 31-3 or alternatively water were added to this mixture. The peptide P18 was dissolved in water with a concentration of 10 mM. The conventional fungicidal active ingredient was dissolved in DMSO with a concentration of 10 mM. Corresponding amounts of P18 solution and conventional fungicidal active ingredient solution were added to the mixtures in order to obtain final concentrations as indicated in table 19.

Table 19: Concentrations of conventional fungicidal active ingredients and P18

Mixture no.	conventional fungicidal active ingredient concentration	P18 concentration [µM]
1	500 µM Zincpyrithione	1000
2	500 µM Zincpyrithione	200
3	500 µM Zincpyrithione	50
4	500 µM Zincpyrithione	0
5	100 µM Zincpyrithione	1000

6	100 µM Zincpyrithione	200
7	100 µM Zincpyrithione	50
8	100 µM Zincpyrithione	0
9	20 µM Zincpyrithione	1000
10	20 µM Zincpyrithione	200
11	20 µM Zincpyrithione	50
12	20 µM Zincpyrithione	0
13	0 µM Zincpyrithione	1000
14	0 µM Zincpyrithione	200
15	0 µM Zincpyrithione	50
16	0 µM Zincpyrithione	0
17	500 µM Ketoconazole	1000
18	500 µM Ketoconazole	200
19	500 µM Ketoconazole	50
20	500 µM Ketoconazole	0
21	100 µM Ketoconazole	1000
22	100 µM Ketoconazole	200
23	100 µM Ketoconazole	50
24	100 µM Ketoconazole	0
25	20 µM Ketoconazole	1000
26	20 µM Ketoconazole	200
27	20 µM Ketoconazole	50
28	20 µM Ketoconazole	0
29	0 µM Ketoconazole	1000
30	0 µM Ketoconazole	200
31	0 µM Ketoconazole	50
32	0 µM Ketoconazole	0
33	500 µM Climbazole	1000
34	500 µM Climbazole	200
35	500 µM Climbazole	50
36	500 µM Climbazole	0
37	100 µM Climbazole	1000
38	100 µM Climbazole	200
39	100 µM Climbazole	50
40	100 µM Climbazole	0
41	20 µM Climbazole	1000
42	20 µM Climbazole	200
43	20 µM Climbazole	50
44	20 µM Climbazole	0
45	0 µM Climbazole	1000
46	0 µM Climbazole	200
47	0 µM Climbazole	50
48	0 µM Climbazole	0

The microtiter plate was incubated with shaking at 30°C.

After incubation for 24 hours, the colony-forming units (CFU) were determined by resuspending 1 µl of each of the suspensions in 10 µl of medium and then plating out the obtained suspensions. After incubation for 6 days, the colonies on the plate were counted.

It turns out that combinations of P18 with conventional fungicidal active ingredients show superior characteristics as compared to conventional fungicidal active ingredients taken alone.

4. Formulation examples B

Cosmetic antidandruff shampoo preparations comprising the peptide P18 are described below. The peptide P18 is specified in the examples below by way of representation of all of the other peptides described above. It will be appreciated by the person skilled in the art that all of the other specified peptides according to the invention can also be used in the preparations given below.

The peptide P18 can be the sole active ingredient contained in the preparations or it can be used in combination with other antidandruff active ingredients (see description).

Example 51:

		1	2	3	4
	Ingredients (INCI)	**%**	**%**	**%**	**%**
A	Ammonium Laureth Sulfate	8,7	8,7	8,7	8,7
	Ammonium Lauryl Sulfate	7,2	7,2	7,2	7,2
	Glycol Distearate	1,5	1,5	1,5	1,5
	Dimethicone	1,2	1,2	1,2	1,2
	Peptid P18	0,05	0,3	0,05	0,3
	Zinc Pyrithione	0	0	1	0,7
	Ammonium Xylenesulfonate	0,8	0,8	0,8	0,8
	Cetyl Alcohol	0,7	0,7	0,7	0,7
	Cocamide MEA	0,6	0,6	0,6	0,6
	Hydrogenated Polydecene	0,5	0,5	0,5	0,5
	Polyquaternium-10	0,4	0,4	0,4	0,4
	PEG-7M	0,3	0,3	0,3	0,3
	Panthenol	0,3	0,3	0,3	0,3
	Panthenyl Ethyl Ether	0,3	0,3	0,3	0,3
	Methyl Tyrosinate HCl	0,2	0,2	0,2	0,2
	Histidine	0,15	0,15	0,15	0,15
	Trimethylolpropane Tricaprylate/Tricaprate	0,15	0,15	0,15	0,15
	Lysine HCl	0,1	0,1	0,1	0,1
	Sodium Polynaphthalenesulfonate	0,1	0,1	0,1	0,1
	Tocopherol	0,1	0,1	0,1	0,1
	Aqua	ad 100	ad 100	ad 100	ad 100
	Preservative	q.s.	q.s.	q.s.	q.s.
	Parfum	q.s.	q.s.	q.s.	q.s.
	Tetrasodium EDTA	q.s.	q.s.	q.s.	q.s.

	Sodium Chloride	q.s.	q.s.	q.s.	q.s.
B	Citric Acid	q.s.	q.s.	q.s.	q.s.
	Sodium Citrate	q.s.	q.s.	q.s.	q.s.

Preparation: Mix and dissolve the components of phase A. Adjust the pH to pH 5-7 with phase B. Viscosity can be adjusted through Tetrasodium EDTA and/or Sodium Chloride. Preferred viscosity is between 5000 – 15000 mPas.

Example 52:

		1	**2**	**3**	**4**
	Ingredients (INCI)	**%**	**%**	**%**	**%**
A	Sodium Laureth Sulfate	9	9	9	9
	Cocamidopropyl Betaine	6	6	6	6
	Sodium Chloride	3	3	3	3
	PEG-3 Distearate	1,5	1,5	1,5	1,5
	Propylene Glycol	1,5	1,5	1,5	1,5
	Zinc Pyrithione	0	0	1	0,7
	Piroctone Olamine	0	0	0,8	0,6
	Climbazolee	0	0	0,5	0,3
	Peptid P18	0,05	0,3	0,05	0,3
	Guar Hydroxypropyltrimonium Chloride	0,2	0,2	0,2	0,2
	Panthenol	0,3	0,3	0,3	0,3
	Sodium Polynaphthalenesulfonate	0,2	0,2	0,2	0,2
	Glucose	0,2	0,2	0,2	0,2
	Tocopherol	0,1	0,1	0,1	0,1
	Aqua	ad 100	ad 100	ad 100	ad 100
	Acrylates/Beheneth-25 Methacrylate Copolymer	q.s.	q.s.	q.s.	q.s.
	Cellulose Gum	q.s.	q.s.	q.s.	q.s.
	Parfum	q.s.	q.s.	q.s.	q.s.
	Preservative	q.s.	q.s.	q.s.	q.s.
B	Sodium Citrate	q.s.	q.s.	q.s.	q.s.
	Lactic Acid	q.s.	q.s.	q.s.	q.s.

Preparation: Mix and dissolve components of phase A. Adjust the pH to pH 5-7 with phase B. Viscosity can be adjusted through Cellulose Gum and/or Acrylates/Beheneth-25 Methacrylate Copolymer. Preferred viscosity is between 5000-15000 mPas.

Example 53:

		1	**2**	**3**	**4**
	Ingredients (INCI)	**%**	**%**	**%**	**%**
A	Sodium Laureth Sulfate	7	7	7	7

	Disodium Laureth Sulfosuccinate	5,5	5,5	5,5	5,5
	Cocamidopropyl Betaine	3	3	3	3
	Glycerin	1,5	1,5	1,5	1,5
	Zinc Pyrithione	0	0	1	0,7
	Zinc Sulfate	0	0	0,7	0,5
	Peptid P18	0,05	0,3	0,05	0,3
	Sodium Chloride	0,8	0,8	0,8	0,8
	Dimethiconol	0,8	0,8	0,8	0,8
	PPG-12	0,8	0,8	0,8	0,8
	Guar Hydroxypropyltrimonium Chloride	0,3	0,3	0,3	0,3
	TEA-Dodecylbenzenesulfonate	0,4	0,4	0,4	0,4
	Sodium Polynaphthalenesulfonate	0,1	0,1	0,1	0,1
	Ascorbyl Palmitate	0,15	0,15	0,15	0,15
	Tocopherol	0,1	0,1	0,1	0,1
	Lysine HCl	0,15	0,15	0,15	0,15
	Aqua	ad 100	ad 100	ad 100	ad 100
	Parfum	q.s.	q.s.	q.s.	q.s.
	Carbomer	q.s.	q.s.	q.s.	q.s.
	Preservative	q.s.	q.s.	q.s.	q.s.
B	Sodium Hydroxide	q.s.	q.s.	q.s.	q.s.
	Citric Acid	q.s.	q.s.	q.s.	q.s.

Preparation: Mix and dissolve components of phase A. Adjust the pH to pH 5-7 with phase B. Viscosity can be adjusted through Carbomer and/or Sodium Hydroxide. Preferred viscosity is between 5000-15000 mPas.

Example 54:

		1	**2**	**3**	**4**
	Ingredients (INCI)	**%**	**%**	**%**	**%**
A	Ammonium Lauryl Sulfate	8,1	8,1	8,1	8,1
	Ammonium Laureth Sulfate	5,8	5,8	5,8	5,8
	Cocamide MEA	4	4	4	4
	Cocamidopropyl Betaine	2,3	2,3	2,3	2,3
	Dimethiconol	1	1	1	1
	PEG-5 Cocamide	0,95	0,95	0,95	0,95
	Zinc Pyrithione	0	0	0,5	0,3
	Peptid P18	0,05	0,3	0,05	0,3
	Glycol Distearate	0,5	0,5	0,5	0,5
	PPG-9	0,7	0,7	0,7	0,7
	Guar Hydroxypropyltrimonium Chloride	0,25	0,25	0,25	0,25
	TEA-Dodecylbenzenesulfonate	0,3	0,3	0,3	0,3
	Ammonium Chloride	0,2	0,2	0,2	0,2
	Ammonium Xylenesulfonate	0,1	0,1	0,1	0,1
	Aqua	ad 100	ad 100	ad 100	ad 100
	Carbomer	q.s.	q.s.	q.s.	q.s.

	Preservative	q.s.	q.s.	q.s.	q.s.
	Parfum	q.s.	q.s.	q.s.	q.s.

Preparation: Mix and dissolve components of phase A. Adjust the pH to pH 5-7 with phase B. Viscosity can be adjusted through Carbomer. Preferred viscosity is between 5000-15000 mPas.

Example 55:

		1	2	3	4
	Ingredients (INCI)	%	%	%	%
A	Sodium Myreth Sulfate	7,4	7,4	7,4	7,4
	Sodium Laureth Sulfate	6,1	6,1	6,1	6,1
	Cocamidopropyl Betaine	4,3	4,3	4,3	4,3
	Disodium PEG-5 Laurylcitrate Sulfosuccinate	3,4	3,4	3,4	3,4
	PEG-3 Distearate	1,5	1,5	1,5	1,5
	PEG-40 Hydrogenated Castor Oil	0,1	0,1	0,1	0,1
	Tetrasodium Iminodisuccinate	0,6	0,6	0,6	0,6
	Peptid P18	0,05	0,3	0,05	0,3
	Piroctone Olamine	0	0	1	0,7
	Polyquaternium-10	0,2	0,2	0,2	0,2
	Sodium Chloride	0,8	0,8	0,8	0,8
	Panthenol	0,4	0,4	0,4	0,4
	Guar Hydroxypropyltrimonium Chloride	0,7	0,7	0,7	0,7
	Oryzanol	0,3	0,3	0,3	0,3
	Aqua	ad 100	ad 100	ad 100	ad 100
	Parfum	q.s.	q.s.	q.s.	q.s.
	Preservatives	q.s.	q.s.	q.s.	q.s.
B	Citric Acid	q.s.	q.s.	q.s.	q.s.

Preparation: Mix and dissolve components of phase A. Adjust the pH to pH 5-7 with phase B. Preferred viscosity is between 5000-15000 mPas.

Example 56:

		1	2	3	4
	Ingredients (INCI)	%	%	%	%
A	Sodium Laureth Sulfate	11	11	11	11
	Cocamidopropyl Betaine	6	6	6	6
	PEG-3 Distearate	2	2	2	2

	Peptid P18	0,05	0,3	0,05	0,3
	Piroctone Olamine	0	0	1	0,7
	Polyquaternium-10	0,2	0,2	0,2	0,2
	PEG-40 Hydrogenated Castor Oil	0,2	0,2	0,2	0,2
	Sodium Chloride	0,8	0,8	0,8	0,8
	Propylene Glycol	0,4	0,4	0,4	0,4
	Trideceth-9	0,6	0,6	0,6	0,6
	Aqua	ad 100	ad 100	ad 100	ad 100
	Parfum	q.s.	q.s.	q.s.	q.s.
	Preservatives	q.s.	q.s.	q.s.	q.s.
B	Citric Acid	q.s.	q.s.	q.s.	q.s.

Preparation: Mix and dissolve components of phase A. Adjust the pH to pH 5-7 with phase B. Preferred viscosity is between 5000-15000 mPas.

Example 57:

		1	**2**	**3**	**4**
	Ingredients (INCI)	**%**	**%**	**%**	**%**
A	Alcohol denat.	3	3	3	3
	VP/VA Copolymer	2,9	2,9	2,9	2,9
	PEG 32	1,5	1,5	1,5	1,5
	PEG-40 Hydrogenated Castor Oil	0,1	0,1	0,1	0,1
	Amino Methyl Propanol	0,4	0,4	0,4	0,4
	PEG-12 Dimethicone	0,2	0,2	0,2	0,2
	Panthenol	0,3	0,3	0,3	0,3
	Peptid P18	0,05	0,3	0,05	0,3
	Piroctone Olamine	0	0	1	0,7
	Benzophenone-4	0,05	0,05	0,05	0,05
	VP/Methacrylamide/Vinyl Imidazole Copolymer	0,9	0,9	0,9	0,9
	Aqua	ad 100	ad 100	ad 100	ad 100
	Preservatives	q.s.	q.s.	q.s.	q.s.
	Parfum	q.s.	q.s.	q.s.	q.s.
	Carbomer	q.s.	q.s.	q.s.	q.s.

Preparation: Mix and dissolve components of phase A. Adjust the pH to pH 5-7 with phase B. Viscosity can be adjusted through Carbomer. Preferred viscosity is between 5000-15000 mPas.

Example 58:

		1	2	3	4
	Ingredients (INCI)	**%**	**%**	**%**	**%**
A	Sodium Laureth Sulfate	13	13	13	13
	Disodium Cocoamphodiacetate	3,3	3,3	3,3	3,3
	Sodium Chloride	1,2	1,2	1,2	1,2
	Glycol Distearate	0,7	0,7	0,7	0,7
	Peptid P18	0,05	0,3	0,05	0,3
	Climbazole	0	0	0,5	0,3
	PEG-7 Glyceryl Cocoate	0,2	0,2	0,2	0,2
	Salicylic Acid	0,4	0,4	0,4	0,4
	Styrene/Acrylates Copolymer	0,36	0,36	0,36	0,36
	Laureth-4	0,2	0,2	0,2	0,2
	Panthenol	0,3	0,3	0,3	0,3
	PEG-40 Hydrogenated Castor Oil	0,3	0,3	0,3	0,3
	Hydrogenated Castor Oil	0,6	0,6	0,6	0,6
	Cocamidopropyl Betaine	0,9	0,9	0,9	0,9
	Polyquaternium-10	0,3	0,3	0,3	0,3
	Glycerin	0,8	0,8	0,8	0,8
	Aqua	ad 100	ad 100	ad 100	ad 100
	Preservatives	q.s.	q.s.	q.s.	q.s.
	Parfum	q.s.	q.s.	q.s.	q.s.
B	Citric Acid	q.s.	q.s.	q.s.	q.s.

Preparation: Mix and dissolve components of phase A. Adjust the pH to pH 5-7 with phase B. Preferred viscosity is between 5000-15000 mPas.

Example 59:

		1	2	3	4
	Ingredients (INCI)	**%**	**%**	**%**	**%**
A	Sodium Laureth Sulfate	11	11	11	11
	Coco-Betaine	5	5	5	5
	Dimethicone	0,9	0,9	0,9	0,9
	Cetyl Alcohol	0,4	0,4	0,4	0,4
	Hydroxystearyl Cetyl Ether	0,4	0,4	0,4	0,4
	Sodium Chloride	0,3	0,3	0,3	0,3
	Cocamide MIPA	0,4	0,4	0,4	0,4
	Polyquaternium 10	0,3	0,3	0,3	0,3
	Propylene Glycol	0,3	0,3	0,3	0,3
	Pyridoxine HCL	0,1	0,1	0,1	0,1
	Peptid P18	0,05	0,3	0,05	0,3

	Zinc Pyrithione	0	0	1	0,7
	Aqua	ad 100	ad 100	ad 100	ad 100
	Preservatives	q.s.	q.s.	q.s.	q.s.
	Carbomer	q.s.	q.s.	q.s.	q.s.
	Parfum	q.s.	q.s.	q.s.	q.s.

Preparation: Mix and dissolve components of phase A. Adjust the pH to pH 5-7 with phase B. Viscosity can be adjusted through Carbomer. Preferred viscosity is between 5000-15000 mPas.

Example 60:

		1	**2**	**3**	**4**
	Ingredients (INCI)	**%**	**%**	**%**	**%**
A	Sodium Laureth Sulfate	13	13	13	13
	Polysorbate (21)	5	5	5	5
	Dimethicone	0,8	0,8	0,8	0,8
	Cocamidopropyl Betaine	0,9	0,9	0,9	0,9
	Cetyl Alcohol	0,4	0,4	0,4	0,4
	Hexylene Glycol	0,3	0,3	0,3	0,3
	Guar Hydroxypropyltrimonium Chloride	0,2	0,2	0,2	0,2
	Cocamide MIPA	0,5	0,5	0,5	0,5
	Hydroxystearyl Cetyl Ether	0,6	0,6	0,6	0,6
	Sodium Chloride	0,3	0,3	0,3	0,3
	Propylene Glycol	0,3	0,3	0,3	0,3
	Peptid P18	0,05	0,3	0,05	0,3
	Pyroctone Olamine	0	0	1	0,7
	Aqua	ad 100	ad 100	ad 100	ad 100
	Preservatives	q.s.	q.s.	q.s.	q.s.
	Carbomer	q.s.	q.s.	q.s.	q.s.
	Parfum	q.s.	q.s.	q.s.	q.s.

Preparation: Mix and dissolve components of phase A. Adjust the pH to pH 5-7 with phase B. Viscosity can be adjusted through Carbomer. Preferred viscosity is between 5000-15000 mPas.

Example 61:

		1	**2**	**3**	**4**
	Ingredients (INCI)	**%**	**%**	**%**	**%**
A	Sodium Laureth Sulfate	9	9	9	9
	Disodium Cocoamphodiacetate	6	6	6	6

	Glycerin	2,1	2,1	2,1	2,1
	Glycol Distearate	1,2	1,2	1,2	1,2
	Sodium Chloride	0,9	0,9	0,9	0,9
	Sodium Laureth-8 Sulfate	0,9	0,9	0,9	0,9
	Hexylene Glycol	0,3	0,3	0,3	0,3
	Polyquaternium-10	0,1	0,1	0,1	0,1
	Magnesium Laureth-8 Sulfate	0,3	0,3	0,3	0,3
	Propylene Glycol	0,8	0,8	0,8	0,8
	Magnesium Laureth Sulfate	0,6	0,6	0,6	0,6
	Sodium Oleth Laureth	0,7	0,7	0,7	0,7
	PEG-55 Propylene Glycol Oleate	0,7	0,7	0,7	0,7
	Peptid P18	0,05	0,3	0,05	0,3
	Salicylic Acid	0	0	0,5	0,3
	Polyquaternium-30	0,35	0,35	0,35	0,35
	Magnesium Oleth Sulfate	0,65	0,65	0,65	0,65
	2-Oleamido-1,3-Octadecanediol	0,4	0,4	0,4	0,4
	Aqua	ad 100	ad 100	ad 100	ad 100
	Preservatives	q.s.	q.s.	q.s.	q.s.
	Carbomer	q.s.	q.s.	q.s.	q.s.
	Parfum	q.s.	q.s.	q.s.	q.s.

Preparation: Mix and dissolve components of phase A. Adjust the pH to pH 5-7 with phase B. Viscosity can be adjusted through Carbomer. Preferred viscosity is between 5000-15000 mPas.

Example 62:

		1	**2**	**3**	**4**
	Ingredients (INCI)	**%**	**%**	**%**	**%**
A	Sodium Laureth Sulfate	10,5	10,5	10,5	10,5
	Cocamidopropyl Betaine	8	8	8	8
	Glycerin	3	3	3	3
	Peptid P18	0,05	0,3	0,05	0,3
	Zinc pyrithone	0	0	1	0,7
	PEG-55 Propylene Glycol Oleate	0,7	0,7	0,7	0,7
	Disodium ricinoleamido MEA-sulfosuccinate	0,6	0,6	0,6	0,6
	Propylene Glycol	0,7	0,7	0,7	0,7
	Glyceryl Laurate	0,4	0,4	0,4	0,4
	PPG-5-Ceteth-20	0,32	0,32	0,32	0,32
	Acrylates Copolymer	0,2	0,2	0,2	0,2
	Disodium Cocoamphodipropionate	0,54	0,54	0,54	0,54
	Lecithin	0,4	0,4	0,4	0,4

	Aqua	ad 100	ad 100	ad 100	ad 100
	Preservatives	q.s.	q.s.	q.s.	q.s.
	Parfum	q.s.	q.s.	q.s.	q.s.
B	Phosphoric Acid	q.s.	q.s.	q.s.	q.s.

Preparation: Mix and dissolve components of phase A. Adjust the pH to pH 5-7 with phase B. Preferred viscosity is between 5000-15000 mPas.

Example 63:

		1	**2**	**3**	**4**
	Ingredients (INCI)	**%**	**%**	**%**	**%**
A	Sodium Laureth Sulfate	9,3	9,3	9,3	9,3
	Sodium Lauryl Sulfate	7,6	7,6	7,6	7,6
	Cocamide MEA	1	1	1	1
	Zinc Carbonate	0,6	0,6	0,6	0,6
	Glycol Distearate	0,8	0,8	0,8	0,8
	Peptid P18	0,05	0,3	0,05	0,3
	Zinc Pyrithione	0	0	1	0,7
	Cetyl Alcohol	0,36	0,36	0,36	0,36
	Dimethicone	0,42	0,42	0,42	0,42
	Sodium Xylenesulfonate	0,23	0,23	0,23	0,23
	Magnesium Sulfate	0,37	0,37	0,37	0,37
	Ammonium Laureth Sulfate	0,9	0,9	0,9	0,9
	Sodium Diethylenetriamine Pentamethylene Phosphonate	0,6	0,6	0,6	0,6
	Etidronic Acid	0,2	0,2	0,2	0,2
	Sodium Polynaphthalenesulfonate	0,35	0,35	0,35	0,35
	Aqua	ad 100	ad 100	ad 100	ad 100
	Preservatives	q.s.	q.s.	q.s.	q.s.
	Sodium Chloride	q.s.	q.s.	q.s.	q.s.
	Magnesium Carbonate Hydroxide	q.s.	q.s.	q.s.	q.s.
	Tetrasodium EDTA	q.s.	q.s.	q.s.	q.s.
	Parfum	q.s.	q.s.	q.s.	q.s.

Preparation: Mix and dissolve components of phase A. Adjust the pH to pH 5-7 with phase B. Viscosity can be adjusted through Tetrasodium EDTA and/or Sodium Chloride. Preferred viscosity is between 5000-15000 mPas.

Example 64:

		1	2	3	4
	Ingredients (INCI)	**%**	**%**	**%**	**%**
A	Sodium Laureth Sulfate	9,3	9,3	9,3	9,3
	Sodium Lauryl Sulfate	7,6	7,6	7,6	7,6
	Cocamide MEA	1	1	1	1
	Zinc Carbonate	0,6	0,6	0,6	0,6
	Glycol Distearate	0,8	0,8	0,8	0,8
	Sodium Chloride	0,7	0,7	0,7	0,7
	Peptid P18	0,05	0,3	0,05	0,3
	Zinc Pyrithione	0	0	1	0,7
	Dimethicone	0,42	0,42	0,42	0,42
	Cetyl Alcohol	0,36	0,36	0,36	0,36
	Sodium Xylenesulfonate	0,23	0,23	0,23	0,23
	Magnesium Sulfate	0,37	0,37	0,37	0,37
	Guar Hydroxypropyltrimonium Chloride	0,3	0,3	0,3	0,3
	Ammonium Laureth Sulfate	0,9	0,9	0,9	0,9
	Sodium Diethylenetriamine Pentamethylene Phosphonate	0,6	0,6	0,6	0,6
	Etidronic Acid	0,2	0,2	0,2	0,2
	Paraffinum Liquidum	0,3	0,3	0,3	0,3
	Tocopheryl Acetate	0,3	0,3	0,3	0,3
	Aqua	ad 100	ad 100	ad 100	ad 100
	Preservatives	q.s.	q.s.	q.s.	q.s.
	Parfum	q.s.	q.s.	q.s.	q.s.
	Magnesium Carbonate Hydroxide	q.s.	q.s.	q.s.	q.s.
	Sodium Polynaphthalenesulfonate	q.s.	q.s.	q.s.	q.s.

Preparation: Mix and dissolve components of phase A. Adjust the pH to pH 5-7 with phase B. Viscosity can be adjusted through Magnesium Carbonate Hydroxide and/or Sodium Polynaphthalenesulfonate. Preferred viscosity is between 5000-15000 mPas.

Example 65:

		1	2	3	4
	Ingredients (INCI)	**%**	**%**	**%**	**%**
A	Ammonium Laureth Sulfate	11,2	11,2	11,2	11,2
	Ammonium Lauryl Sulfate	8,6	8,6	8,6	8,6
	Glycol Distearate	0,8	0,8	0,8	0,8
	Dimethicone	0,9	0,9	0,9	0,9
	Peptid P18	0,05	0,3	0,05	0,3
	Zinc Pyrithione	0	0	1	0,7
	Cetyl Alcohol	0,3	0,3	0,3	0,3

	Ammonium Xylenesulphonate	0,23	0,23	0,23	0,23
	Cocamide MEA	0,8	0,8	0,8	0,8
	Hydrogenated Polydecene	0,3	0,3	0,3	0,3
	PEG-7M	0,1	0,1	0,1	0,1
	Trimethylolpropane Tricaprylate/Tricaprate	0,2	0,2	0,2	0,2
	Sodium Polynaphthalenesulphonate	0,35	0,35	0,35	0,35
	Tocopherol	0,8	0,8	0,8	0,8
	Aqua	ad 100	ad 100	ad 100	ad 100
	Preservatives	q.s.	q.s.	q.s.	q.s.
	Parfum	q.s.	q.s.	q.s.	q.s.
	Sodium Chloride	q.s.	q.s.	q.s.	q.s.
	Tetrasodium EDTA	q.s.	q.s.	q.s.	q.s.
B	Citric Acid	q.s.	q.s.	q.s.	q.s.
	Sodium citrate	q.s.	q.s.	q.s.	q.s.

Preparation: Mix and dissolve components of phase A. Adjust the pH to pH 5-7 with phase B. Viscosity can be adjusted through Tetrasodium EDTA and/or Sodium Chloride. Preferred viscosity is between 5000-15000 mPas.

Example 66:

		1	**2**	**3**	**4**
	Ingredients (INCI)	**%**	**%**	**%**	**%**
A	Ammonium Laureth Sulfate	11,2	11,2	11,2	11,2
	Ammonium Lauryl Sulfate	8,6	8,6	8,6	8,6
	Dimethicone	1	1	1	1
	Glycol Distearate	0,8	0,8	0,8	0,8
	Peptid P18	0,05	0,3	0,05	0,3
	Zinc Pyrithione	0	0	1	0,7
	Cetyl Alcohol	0,3	0,3	0,3	0,3
	Cocamide MEA	0,8	0,8	0,8	0,8
	Hydrogenated Polydecene	0,3	0,3	0,3	0,3
	Trimethylolpropane Tricaprylate/tricaprate	0,2	0,2	0,2	0,2
	Ammonium Xylenesulfonate	0,23	0,23	0,23	0,23
	Sodium Polynapthalenesulfonate	0,35	0,35	0,35	0,35
	Aqua	ad 100	ad 100	ad 100	ad 100
	Preservatives	q.s.	q.s.	q.s.	q.s.
	Sodium Chloride	q.s.	q.s.	q.s.	q.s.
	Tetrasodium EDTA	q.s.	q.s.	q.s.	q.s.

	Parfum	q.s.	q.s.	q.s.	q.s.
B	Citric Acid	q.s.	q.s.	q.s.	q.s.
	Sodium citrate	q.s.	q.s.	q.s.	q.s.

Preparation: Mix and dissolve components of phase A. Adjust the pH to pH 5-7 with phase B. Viscosity can be adjusted through Tetrasodium EDTA and/or Sodium Chloride. Preferred viscosity is between 5000-15000 mPas.

Unless otherwise stated the term P18 refers to a peptide of SEQ ID NO:3.

WHAT IS CLAIMED IS:

1. Use of at least one peptide with a sequence or a repetitive sequence motif according to SEQ ID NO: 1:

$X_1\ X_2K\ X_3\ X_4\ X_5KIP\ X_{10}\ KFX_6X_7\ X_8\ AX_9KF$ (SEQ ID NO:1)

in which

X_{10} is a peptide bond or one or two arbitrary basic or hydrophobic amino acid residues or one or two proline residues and

X_1 to X_9 are arbitrary basic amino acid residues or hydrophobic amino acid residues different from proline;

where the repetitive sequence motifs may be identical or different;

and/or derivatives thereof wherein the derivatives are aliphatic ester, amides, N-acyl derivatives O-acyl derivatives; or wherein 1 to 5 arbitrary amino acid residues are N- and/or C-terminally added or deleted;

for the treatment or prevention of dandruff.

2. The use according to claim 1, comprising at least one peptide with a sequence or a repetitive sequence motif according to SEQ ID NO: 2:

$X_1\ X_2K\ X_3\ X_4\ X_5KIP\ X_{11}\ X_{12}\ KFX_6X_7\ X_8\ AX_9KF$ (SEQ ID NO: 2)

in which

X_1 is lysine, arginine or phenylalanine,

X_2 is lysine or tryptophan,

X_3 is leucine or lysine,

X_4 is phenylalanine or leucine,

X_5 is leucine or lysine,

X_6 is leucine or lysine,

X_7 is histidine or lysine,

X_8 is alanine, leucine, valine or serine,

X_9 is leucine or lysine,

X_{11} is proline or a chemical bond, and

X_{12} is proline or a chemical bond,

where the repetitive sequence motifs are identical or different;
and/or derivatives thereof wherein the derivatives are aliphatic ester, amides, N-acyl derivatives O-acyl derivatives; or wherein 1 to 5 arbitrary amino acid residues are N- and/or C-terminally added or deleted;
for the treatment or prevention of dandruff.

3. The use according to claim 2, comprising at least one peptide with a sequence or a repetitive sequence motif according to SEQ ID NO: 10:

$KX_2KX_3X_4X_5KIPX_{11}X_{12}KFLHX_8AKKF$ (SEQ ID NO: 10)

wherein X_2, X_3, X_4, X_5, X_8, X_{11} and X_{12} are as defined in claim 2,

and/or derivatives thereof wherein the derivatives are aliphatic ester, amides, N-acyl derivatives O-acyl derivatives; or wherein 1 to 5 arbitrary amino acid residues are N- and/or C-terminally added or deleted;
for the treatment or prevention of dandruff.

4. The use according to claim 2, comprising at least one peptide with a sequence or a repetitive sequence motif according to SEQ ID NO: 3

KWKLFKKIPKFLHLAKKF (SEQ ID NO: 3)

and/or derivatives thereof wherein the derivatives are aliphatic ester, amides, N-acyl derivatives O-acyl derivatives; or wherein 1 to 5 arbitrary amino acid residues are N- and/or C-terminally added or deleted;
for the treatment or prevention of dandruff.

5. The use according to any one of claims 1 to 4, comprising at least one peptide with a repetitive sequence motif, where a plurality of peptides of the general formula I or according to SEQ ID NO: 1, 2 or 3 or derivatives thereof are peptidically linked together via linker groups, wherein the derivatives are aliphatic ester, amides, N-acyl derivatives O-acyl derivatives or wherein 1 to 5 arbitrary amino acid residues are N- and/or C-terminally are added or deleted.

6. The use according to claim 5, where the linker groups comprise 1 to 10 continuous identical or different amino acid residues.

7. The use according to claim 6 wherein the amino acid residues are alanine, glycine, threonine or serine.

8. The use according to any one of claims 1 to 7, where the C-terminal carboxyl group of the peptide is amidated.

9. The use according to any one of claims 1 to 8, wherein the peptide as defined in any one of claims 1 to 8 shows a minimum inhibitory concentration for Malassezia furfur of about 1500 to 0,1 µM.

10. Use of a composition comprising a peptide as defined in any one of claims 1 to 9 and a cosmetically and/or pharmaceutically acceptable auxiliary for the treatment or prevention of dandruff.

11. Use of a fusion product of at least one cosmetic auxiliary or anti-inflammatory, antimicrobial or sebum-regulating active ingredient and at least one peptide according to any one of claims 1 to 9 for the treatment or prevention of dandruff.

12. The use according to any one of claims 1 to 11, comprising at least one anti-inflammatory, antimicrobial or sebum-regulating active ingredient.

13. The use according to any one of claims 1 to 12, comprising at least one antiinflammatory active ingredient.

14. The use according to any one of claims 1 to 13, comprising an antimicrobial active ingredient for inhibiting the growth and/or the activity of undesired germs.

15. The use according to any one of claims 1 to 14, comprising a sebum-regulating active ingredient.

16. The use according to any one of claims 1 to 15, wherein, when the peptide is used in a composition, the peptide is present in a fraction of from 0.0001 to 50% by weight, based on the total weight of the composition.

17. Use of a peptide as defined in any one of claims 1 to 9, a composition as defined in claim 10 or a fusion product according to claim 11, for the treatment or prevention of scurf.

18. Use of a peptide as defined in any one of claims 1 to 9, a composition as defined

in claim 11 or a fusion product according to claim 12 as preservative in a cosmetic composition.

19. The use according to any one of claims 1 to 18 in combination with a further antifungal agent.

20. Use of a peptide as defined in any one of claims 1 to 9, a composition as defined in claim 10 or a fusion product according to claim 11 for inhibiting the growth and/or the activity of lipophilic fungi.

21. Use of a peptide as defined in any one of claims 1 to 9, a composition as defined in claim 10 or a fusion product according to claim 11 for inhibiting the growth and/or the activity of *Malassezia ssp.*

22. Use of a peptide as defined in any one of claims 1 to 9, a composition as defined in claim 10 or a fusion product according to claim 11 for inhibiting the growth and/or the activity of *Malassezia furfur.*

23. The use according to any one of claims 1 to 22 where natural skin organisms are essentially not inhibited in their growth and/or their activity during treatment.

24. A method for producing a cosmetic composition where a peptide as defined in any one of claims 1 to 9 is formulated together with at least one cosmetically acceptable auxiliary.

25. A method for producing a cosmetic composition where a peptide as defined in any one of claims 1 to 9 is formulated together with at least one cosmetically acceptable auxiliary and a further cosmetic or pharmaceutical anti-inflammatory, antimicrobial or sebum-regulating active ingredient.

26. A screening method for antidandruff peptides, where, using a complementary nucleic acid which hybridizes under stringent conditions with a nucleic acid encoding a peptide as defined in any one of claims 1 to 9 as probe under stringent conditions of washing in 0.1 x SSC, 0.1% SDS at 50-70°C, a nucleic-acid-containing sample is screened for hybridizing sequences using the probe.

27. Use of a dispensing system for releasing a peptide as defined in any one of claims 1 to 9 in cosmetics, wherein the peptide is associated with liposomes, zeolites, cyclodextrins or polyethyleneimine-based vector systems.

28. The use of claim 27 wherein the peptide and further anti-inflammatory, antimicrobial or sebum-regulating active ingredients are associated with liposomes, zeolites, cyclodextrins or polyethyleneimine-based vector systems.