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(71) Applicant (for all designated States except AE, AG, AU, BB, BH, BN, BW, BZ, CA, CL, CR, CY, DE, DJ, DM, DO, EC, EG, GB, GD, GH, GM, GT, HN, IE, IL, IN, IQ, IR, IT, JM, JO, KE, KH, KN, KR, KW, LA, LC, LK, LS, MA, MD, MT, MU, MW, MY, MZ, NA, NG, NI, NZ, OM, PA, PE, PG, QA, RS, RU, RW, SA, SC, SD, SG, SL, SV, SZ, TH, TN, TR, TT, TZ, UG, US, VC, VN, WS, ZA, ZM, ZW): **UNILEVER IP HOLDINGS B.V.** [NL/NL]; Weena 455, 3013 AL Rotterdam (NL).

(71) Applicant (for all designated States except AL, AO, AT, BA, BE, BF, BG, BJ, BR, CF, CG, CH, CI, CM, CN, CO, CU, CV, CZ, DK, DZ, EE, ES, FI, FR, GA, GE, GN, GQ, GR, GW, HR, HU, ID, IS, JP, KM, KP, LR, LT, LU, LV, LY, MC, ME, MG, MK, ML, MN, MR, MX, NE, NL, NO, PH, PL, PT, RO, SE, SI, SK, SM, SN, ST, SY, TD, TG, UA, US, UZ): **UNILEVER GLOBAL IP LIMITED** [GB/GB]; Port Sunlight, Wirral Merseyside CH62 4ZD (GB).

(71) Applicant (for US only): **CONOPCO, INC., D/B/A UNILEVER** [US/US]; 700 Sylvan Avenue, Englewood Cliffs, New Jersey 07632 (US).

(72) Inventors: **KULKARNI, Aditi**; Unilever Innovation Centre Wageningen B.V., Bronland 14, 6708 WH Wageningen (NL). **PAWAR, Ankita, Rutu**; Unilever Innovation Centre Wageningen B.V., Bronland 14, 6708 WH Wageningen (NL).

(74) Agent: **JAMES, Helen, Sarah**; Unilever Patent Group, Bronland 14, 6708 WH Wageningen (NL).

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(54) Title: A PERSONAL CARE COMPOSITION

(57) Abstract: The present invention relates to a personal care composition. Particularly, the present invention relates to a personal are composition comprising one or more alpha hydroxy acids, one or more beta hydroxy acids; and one or more polyhydroxy acids, with pH around the pH of the skin that provides improved skin radiance/ luminosity. Particularly, the composition comprises low amounts of alpha hydroxy acids.

A PERSONAL CARE COMPOSITION

Field of the invention

5 The present invention relates to a personal care composition. Particularly, the present invention relates to a personal care composition that enhances luminosity/ radiance of the skin.

Background of the invention

10 Despite several personal care compositions are known in the art, consumers tend to look forward to technologies that provide enhanced benefits e.g. enhanced luminosity or radiance of the skin, hydration of the skin, elasticity, and firmness of the skin. These benefits are often delivered by benefit agents, may also be called as actives that are contained in such personal care compositions.

15 One of the means of taking care of the skin includes exfoliating the skin, i.e. removing the layer of dead skin cells from the skin's outermost surface, using compositions comprising actives like hydroxy acids (HAs) e.g. alpha hydroxy acids (AHAs) such as lactic acid and glycolic acid. Several products are available in markets that help carry out exfoliation. They typically tend to contain AHAs. Moreover, they tend to contain such acids in relatively high amount e.g. more than 5% by
20 weight of composition. Additionally, for optimum function of such AHAs, pH of the composition is an important factor where lower the pH e.g. about 2.0 and 3.0 of the composition, better it is for functioning of these AHAs.

25 However, such high amounts of these acids used in a composition and/or lower pH of compositions comprising such acids tend to give rise to undesired conditions e.g. skin irritation, which are not liked by consumers.

Need therefore exists to provide a composition that provides consumer desired benefits e.g. luminosity/radiance of the skin, without causing irritation to skin.

30 It has now been found that compositions comprising select amount of AHAs along with select amounts of beta hydroxy acids (BHAs) and polyhydroxy acids (PHAs), luminous / radiant skin was obtained. Moreover, it has also been found that such benefit is delivered around the pH of the skin thereby leading to no or low skin irritation despite the composition contained actives like
35 AHAs. It has also been found that when the composition further contained humectants e.g.

glycerol, butylene glycol, pentylene glycol, in combination with the HAs, a further improved radiance was obtained.

Summary of the invention

5 Accordingly, in a first aspect, the present invention relates to a personal care composition comprising:

- a. from 0.01 to 5 wt% one or more alpha hydroxy acids,
- b. from 0.01 to 2 wt% one or more beta hydroxy acids; and
- c. from 0.01 to 5 wt% one or more polyhydroxy acids,

10 wherein the pH of composition is in the range from 4 to 6,
wherein the one or more alpha hydroxy acids are selected from lactic acid, malic acid, tartaric acid, citric acid, hydroxycaprylic acid, hydroxycapric acid and mixtures thereof.

Detailed description of the invention

15 These and other aspects, features and advantages will become apparent to those of ordinary skill in the art from a reading of the following detailed description and the appended claims. For the avoidance of doubt, any feature of one aspect of the present invention may be utilized in any other aspect of the invention. The word "comprising" is intended to mean "including" but not necessarily "consisting of" or "composed of." In other words, the listed steps or options need not
20 be exhaustive. It is noted that the examples given in the description below are intended to clarify the invention and are not intended to limit the invention to those examples per se. Similarly, all percentages are weight/weight percentages unless otherwise indicated. Except in the operating and comparative examples, or where otherwise explicitly indicated, all numbers in this description and claims indicating amounts of material or conditions of reaction, physical properties of
25 materials and/or use are to be understood as modified by the word "about". Numerical ranges expressed in the format "from x to y" are understood to include x and y. When for a specific feature multiple preferred ranges are described in the format "from x to y", it is understood that all ranges combining the different endpoints are also contemplated.

30 Skin, as used herein, means skin on the feet, face, neck, chest, arms (including under arms), hands, legs, buttocks, back and scalp (including hair). The composition of the present invention (the composition) can be a leave-on or a wash-off composition, preferably a leave-on composition that includes creams, lotions, serums, gels, balms, deodorants and antiperspirants (including aerosols). In one aspect, the end use composition of the present invention is a personal wash
35 composition, a face-wash product or a leave-on product, such as a cosmetic cream or lotion to be applied to the face, body or hands. 'Personal care compositions' or 'cosmetic compositions'

or 'skin care compositions' as used herein mean the same and may be used interchangeably. The terms 'radiance' or 'glow' or 'brightness' or 'luminous/luminosity' as used herein mean the same and may be used interchangeably.

5 In a first aspect, the present invention relates to a personal care composition comprising:

- a. from 0.01 to 5 wt% one or more alpha hydroxy acids,
- b. from 0.01 to 2 wt% one or more beta hydroxy acids; and
- c. from 0.01 to 5 wt% one or more polyhydroxy acids,

wherein the pH of composition is in the range from 4 to 6

10 wherein the one or more alpha hydroxy acids are selected from lactic acid, malic acid, tartaric acid, citric acid, hydroxycaprylic acid, hydroxycapric acid and mixtures thereof.

The composition comprises one or more AHAs selected from lactic acid, malic acid, tartaric acid, citric acid, hydroxycaprylic acid, hydroxycapric acid and mixtures thereof. More preferably, the
15 one or more AHAs are selected from lactic acid, citric acid and mixtures thereof. Even more preferably, the AHA selected is lactic acid.

It is particularly preferred that lactic acid is used as the AHA in combination with BHAs and PHAs described below, in the composition. When lactic acid is selected as the AHA in the composition,
20 it provides better hydration /moisturization effect as compared to when glycolic acid may be used as the AHA in the composition. Preferably, hydration/ moisturization may be studied using any known methods; and the study may be carried out for appropriate time points e.g. starting with 30 minutes, 2 hours, 4 hours, etc., or every 2 hours for up to 24 hours.

25 The composition with lactic acid as the AHA is intended / is suitable for a daily use composition than an occasional use composition as it exhibits lesser irritation compared to when glycolic acid may be used as the AHA in the composition. Preferably, irritation potential of a personal care composition may be measured by any known methods e.g. Zein Number.

30 When lactic acid is selected as the AHA instead of glycolic acid in the composition, improved skin brightening is obtained. Skin brightening may be measured using in-vitro assays e.g. using 3D skin, vitro-skin, skin constructs or cell culture-based methods e.g. reduction in melanin content.

Preferably, the composition is substantially free of glycolic acid. By substantially free, it is
35 preferably meant that the composition comprises less than 0.01 wt% glycolic acid, preferably less

than 0.001 wt% glycolic acid. More preferably, the composition is free of glycolic acid. Preferably, the composition comprises from 0 to 0.001 wt%, preferably from 0 to 0.01 wt% glycolic acid.

5 The composition comprises from 0.01 to 5 wt% of one or more AHAs. Preferably, the composition comprises from 0.05 to 4 wt%, more preferably from 0.1 to 3 wt%, even more preferably from 0.5 to 2 wt%, further more preferably from 1 to 1.5 wt% one or more AHAs.

10 Further, the composition comprises one or more BHAs. Preferably, the one or more BHAs is selected from salicylic acid, beta hydroxybutanoic acid, tropic acid, trethocanic acid, salicylic acid, and mixtures thereof. More preferably, the BHA selected is salicylic acid.

15 The composition comprises from 0.01 to 2 wt% of one or more BHAs. Preferably, the composition comprises from 0.05 to 1.75 wt%, more preferably from 0.1 to 1.5 wt%, even more preferably from 0.5 to 1 wt% one or more BHAs.

20 Further, the composition also comprises one or more poly hydroxy acids (PHAs). Preferably, the one or more poly hydroxy acids are selected from lactobionic acid, glucono delta-lactone, mixtures thereof. More preferably, the one or more PHAs are selected from lactobionic acid, glucono delta-lactone. Even more preferably, the PHA selected is glucono delta-lactone.

25 The composition comprises from 0.01 to 5 wt% of one or more PHAs. Preferably, the composition comprises from 0.05 to 4.5 wt%, more preferably from 0.1 to 4 wt%, even more preferably from 0.5 to 3 wt%, further more preferably from 1 to 2 wt% one or more PHAs.

30 The pH of the composition is in the range from 4 to 6, preferably in the range from 4.5 to 5.5 e.g. 5.0. It is required that the pH of the composition is in the range specified as the lower pH e.g. 2.5, tend to give rise to problems e.g. skin irritation, that are not desired by consumers. The present invention therefore specifically relates to a personal care composition that on one hand does make use of HAs like AHAs, BHAs and PHAs, but still delivers benefits e.g. skin radiance, at pH that are closer to the pH of the skin. The pH of the composition may be adjusted to the required pH, using the known pH adjusters e.g. sodium hydroxide and hydrochloric acid.

35 Preferably, the total amount of the AHAs, BHAs and PHAs that may be present in the composition, is maximum 12 wt%, more preferably, maximum 11 wt%, even more preferably, maximum 10 wt%, further more preferably, maximum 9 wt%, still more preferably, maximum 8 wt%, yet more preferably, maximum 7 wt% and still further more preferably, maximum 6 wt%.

Preferably, the total amount of AHAs, BHA and PHAs are in the range from 0.03 to 12 wt%, more preferably from 0.03 to 11 wt%, even more preferably from 0.03 to 10 wt%, further more preferably from 0.03 to 9 wt%, yet more preferably from 0.03 to 8 wt%, still more preferably from 0.03 to 7 wt% and still further more preferably from 0.03 to 6 wt%.

Preferably, the composition further comprises a humectant selected from glycerol, propylene glycol, butylene glycol, propanediol, pentylene glycol, hexylene glycol, hyaluronic acid, sorbitol and mixtures thereof. More preferably, a humectant is selected from glycerol, pentylene glycol, butylene glycol and mixtures thereof.

It has been found that when a humectant e.g. glycerol, pentylene glycol, butylene glycol and mixtures thereof, were combined with the HAs of the present invention, improved radiance was obtained. Without wishing to be bound by theory, it is believed that a humectant aids in providing soothing effect to the skin.

Preferably, the composition comprises from 0.1 to 20 wt%, more preferably from 1 to 18 wt%, even more preferably from 3 to 15 wt%, further more preferably from 5 to 12 wt% and still more preferably 7 to 10 wt% of one or more humectants described above.

Preferably, the composition further comprises a nonionic surfactant. Examples of a nonionic surfactant that may be suitable for use in the composition of the present invention includes polysorbate types e.g. polysorbate 20, polysorbate 80, Peg 40 hydrogenated castor oil and its derivatives.

Preferably, the composition comprises a nonionic surfactant in an amount from 0.01 to 5 wt%, more preferably from 0.1 to 4 wt%, further more preferably from 0.5 to 3 wt% and still more preferably from 1 to 2 wt% of one or more nonionic surfactants described above.

Preferably, the composition further comprises a saccharide-based polymer. Examples of a saccharide-based polymers that used in the present invention includes xanthan gum, carrageenan gum, guar gum, gellan gum, chitosan gum and mixtures thereof. Preferably, the saccharide-based polymer selected is xanthan gum.

Preferably, such polymers may be present in the composition from 0.01 to 5 wt%, more preferably from 0.1 to 4 wt%, further more preferably from 1 to 3 wt% e.g. 2 wt%.

Preferably, the composition comprises one or more vitamins selected from vitamin B3, vitamin C, vitamin E, Vitamin A and derivatives thereof. Examples of derivatives of vitamin C includes sodium ascorbyl phosphate, magnesium ascorbyl phosphate, 2-o-ethyl ascorbic acid, tetrahexyldecyl ascorbate, ascorbyl Tetraisopalmitate. Examples of derivatives of vitamin E include vitamin E acetate. Examples of vitamin A include Retinol, Retinyl propionate, Retinyl palmitate.

Preferably, the composition is in the form of an emulsion, preferably an oil-in-water emulsion. Alternatively, it may be in the form of silicone oil-in-water emulsion.

If the composition is in the form of a silicone oil-in-water emulsion, it preferably comprises dimethicone which is also known as polydimethylsiloxane (PDMS). Examples of PDMS include dimethicone 10 cSt (commercially available as DC-200 dimethicone 10 cSt), dimethicone 50 cSt (commercially available as DC-200 dimethicone 50cSt). Silicone oils are known to provide smooth feel to the surface they are applied on to.

Preferably, the composition further comprises skin benefit agents selected from resorcinol, phenyl ethyl resorcinol, 4-alkyl resorcinol e.g. 4-ethyl resorcinol, 4-butyl resorcinol, 4-hexyl resorcinol, ceramides, hyaluronic acid, peptides and mixtures thereof.

If present, one or more of these agents may preferably be present in an amount from 0.1 to 5 wt%, more preferably from 0.5 to 4 wt%, even more preferably from 1 to 3 wt%.

Preferably, the composition is in the form of a leave-on personal care composition. For example, the composition may be in the form of a cream, a lotion, a gel, or a serum. By the term 'leave-on' it is preferably meant that the composition once applied on to a surface e.g. skin, is not removed from the surface.

Preferably, the composition is an aqueous composition, i.e. it contains water. Preferably, the composition comprises water in an amount from 50 to 80 wt%, more preferably from 55 to 75 wt%, even more preferably from 60 to 65 wt% water.

Preferably, the composition further comprises viscosity modifying polymers. Such polymers may be selected from: Ammonium Acryloyldimethyltaurate/Beheneth-25 Methacrylate C, Ammonium acryloyldimethyl taurate / VP copolymer, acrylate polymers, and mixtures thereof. Preferably, viscosity of the composition is in the range from 2000 to 6500 cP.

Preferably, the composition further comprises ingredients such as emollients, colorants, fragrances and preservatives. Suitable preservatives include alkyl esters of p-hydroxybenzoic acid, hydantoin derivatives, propionate salts, and a variety of quaternary ammonium compounds. Particularly preferred preservatives are phenoxyethanol and benzyl alcohol. Preservatives are preferably used in amounts from 0.1 to 2 wt%.

The invention is now further described with the help of the following non-limiting compositions:

Examples

The personal care composition of the invention, as shown in table 1 below, was prepared as follows:

Xanthan gum was dispersed in glycerin in a container. In a main vessel, water, disodium EDTA, polysorbate 20 were heated up to 70 to 75°C and xanthan gum was added to this main vessel. In another vessel, glycerin, butylene glycol, and pentylene glycol were heated to 70 to 70°C and salicylic acid was added to it. Separately, oil phase ingredients like stearic acid, cetyl alcohol, dimethicone, CCTG, were melted in a separate vessel by heating to 70 to 75°C. Thickeners Aristoflex AVC and HMB were added to this oil phase. Post this oil phase was transferred to main vessel that contained the water phase and mixing was carried out at 70 to 75°C. Post mixing, salicylic acid phase was added to the main vessel under stirring and ingredients like niacinamide, vitamin C, biosaccharide gum-1, sodium PCA and vitamin E and preservatives were added. The AHA and PHA were then added under mixing and pH of the product was adjusted to 4.5 to 5.5 with known pH adjusters. Finally fragrances were added; and the composition was cooled to room temperature.

Table 1: A personal care composition as per the present invention

Ingredients	Example 1 (Wt%)
Water	To 100
Xanthan Gum	0.35
Sodium L-PCA (50% in Water)	0.1
Glycerine	6.5
Pentylene Glycol	3
Disodium EDTA	0.05
Butylene Glycol	2
Polysorbate 20	0.5
Hystric Acid (C16:C18 55:45)	0.1

Cetyl Alcohol	0.01
Capric/Caprylic Triglyceride 60:40	2
Butylhydroxytoluene	0.05
DC-200 (Dimethicone 10 cSt)	6
DC-200 (Dimethicone 50 cSt)	0.25
Ammonium Acryloyldimethyltaurate/ Beheneth- 25 Methacrylate C	0.4
Ammonium acryloyldimethyl taurate / VP copolymer	0.4
Niacinamide	3
Sodium Ascorbyl Phosphate	0.01
Vitamin E acetate	0.1
Fragrance and colourants	0.5
Phenoxyethanol	0.6
Iodopropynyl Butylcarbamate 10% Liquid	0.07
Lactic Acid (AHA)	1
Salicylic Acid (BHA)	0.5
Glucono delta-lactone (PHA)	4
Biosaccharide Gum-1	1

pH= 4.5 to 5.5

Luminosity / Radiance measurements for the composition shown in example 1 in the table above, were measured as follows:

- 5 In a consumer trial, 100 volunteers were asked to apply the composition of example 1, daily once for 21 days. Volunteers were asked to rate the composition on skin radiance / luminosity at the end of 10 days and 21 days after applying the composition. The volunteers were asked to rate the composition using the scale 1 to 5 where 1 = strongly disagree, 2 = somewhat disagree, 3 = neither agree nor disagree, 4 = somewhat agree and 5 = strongly agree. The data obtained was
- 10 as provided in table 2 below:

Table 2:

Attributes Summary (T2B)	After 10 days of usage	After 21 days of usage
Improves skin radiance	98.0%	98.0%
Skin looks luminous	98.0%	98.0%

(T2B): Top2box indicating scores 4 and 5.

- 15 The data in table 2 above shows that at the end of both time-points, 10 and 21 days, 98% volunteers reported that the skin radiance / luminous appearance was improved.

Further, the composition shown in table 1 above was further subjected to a clinical study where 35 volunteers participated. Baseline data (either L* or expert dermatologists scores as described more below) was recorded; and thereafter, volunteers were asked to apply the composition daily once for up to 4 weeks. After time intervals 7 days (week 1), 14 days (week 2) and 28 days (week 4) after application, radiance/luminance was assessed by expert dermatologists (visual assessment) where the experts assessed luminosity / radiance for volunteers using scale 0 to 9 where 0 means extremely radiant, luminous skin; and 9 means significantly sallowness and dull, matte appearance. Lower the mean value, it indicates improvement in skin luminosity/radiance. The data obtained was as provided in table 3 below:

Table 3: Skin luminosity /radiance measured by exert dermatologists:

N=35	Baseline	Week 1	Week 2	Week 4
Change from baseline	-	-1.31***	-2.05***	-2.86***

***p<0.05

The data in table 3 above shows that upon application of the composition of the present invention, radiance improved at all the tested time-points.

Further, in addition to the assessment by expert dermatologists described above, L* readings, an indicator of luminosity/ radiance, were recorded using a spectrophotometer (CM-2600d). The spectrophotometric measurements were based on the absorption and reflectance of light from the surface (volunteer's forehead in this case). The instrument provided data on L*, a* and b* color coordinates, out of which L* shows luminance / brightness/ radiance. Higher the L* value, higher is the improvement in skin brightness / radiance. The data obtained was as provided in table 4 below:

Table 4: Skin luminosity /radiance measured in terms of average L* values:

N=35	Baseline	Week 1	Week 2	Week 4
Change from baseline	-	0.36***	0.65***	1.04***

***p<0.05

The data in table 3 above shows that the composition showed a significant improvement as compared to the baseline, in skin radiance for all the time-points tested.

Lastly, firmness of the skin was also measured after 1, 2 and 4 weeks of applying the composition of the invention. Firmness of the skin was measure using cutometer[®] where the measuring principle is based on the suction method, where negative pressure deforms the skin mechanically. Briefly, pressure is created in the device and draws the skin into the aperture of the probe and after a defined time, releases it again. The resistance of the skin to the negative pressure (firmness) and its ability to return into its original position (elasticity) are displayed as curves (penetration depth in mm/time) in real time during the measurement. From these curves a variety of measurement parameters can be calculated related to elastic and visco-elastic properties of skin surface and skin aging. The data obtained was as provided in table 5 below where *Higher mean value indicates improvement.

Table 5: Skin firmness data as measured using Cutometer[®]:

N=35	Baseline	Week 1	Week 2	Week 4
Change from baseline	-	0.05	0.1	0.14

Thus, the data in tables abos shows that the composition of the invention that comprises AHAs, BHAs and PHAs where the pH of the composition is in the range from 4 to 6 e.g. 5, skin radiance / luminous appearance is improved. Importantly, such benefits were delivered using the composition that had pH closer to the pH of the skin.

Claims

1. A personal care composition comprising:
 - a. from 0.01 to 5 wt% one or more alpha hydroxy acids,
 - b. from 0.01 to 2 wt% one or more beta hydroxy acids; and
 - c. from 0.01 to 5 wt% one or more polyhydroxy acids,wherein the pH of composition is in the range from 4 to 6,
wherein the one or more alpha hydroxy acids are selected from lactic acid, malic acid, tartaric acid, citric acid, hydroxycaprylic acid, hydroxycapric acid and mixtures thereof.
2. The composition as claimed in claim 1 wherein the composition comprises from 0.1 to 2 wt% one or more alpha hydroxy acids.
3. The composition as claimed in any one of claims 1 or 2 wherein the alpha hydroxy acid is lactic acid.
4. The composition as claimed in any one of claims 1 to 3 wherein the one or more beta hydroxy acids are selected from salicylic acid, beta hydroxybutanoic acid, tropic acid, trethocanic acid, salicylic acid, and mixtures thereof.
5. The composition as claimed in any one of claims 1 to 4 wherein the one or more beta hydroxy acids is salicylic acid.
6. The composition as claimed in any one of claims 1 to 5 wherein the one or more poly hydroxy acids are selected from lactobionic acid, glucono delta-lactone and mixtures thereof.
7. The composition as claimed in any one of claims 1 to 6 wherein the one or more poly hydroxy acids is glucono delta-lactone.
8. The composition as claimed in any one of claims 1 to 7 wherein the total amount of alpha hydroxy acids, beta hydroxy acids, and polyhydroxy acids is maximum 12 wt%.
9. The composition as claimed in any one of claims 1 to 8 wherein the composition further comprises from 0.1 to 20 wt% humectant selected from glycerol, propylene glycol, butylene glycol, propanediol, pentylene glycol, hexylene glycol, hyaluronic acid, sorbitol and mixtures thereof.

10. The composition as claimed in any one of claims 1 to 9 wherein the composition further comprises a nonionic surfactant.
11. The composition as claimed in any one of claims 1 to 10 wherein the composition further comprises a saccharide-based polymer, preferably xanthan gum.
12. The composition as claimed in any one of claims 1 to 11 wherein the composition comprises one or more vitamins selected from vitamin B3, vitamin C, vitamin E and derivatives thereof.
13. The composition as claimed in any one of claims 1 to 12 wherein the composition is in the form of an emulsion, preferably an oil-in-water emulsion.
14. The composition as claimed in any one of claims 1 to 13 wherein the composition is a leave-on personal care composition.

INTERNATIONAL SEARCH REPORT

International application No
PCT/EP2024/068463

A. CLASSIFICATION OF SUBJECT MATTER				
INV.	A61K8/365	A61K8/368	A61K8/49	A61Q19/08
ADD.				
According to International Patent Classification (IPC) or to both national classification and IPC				
B. FIELDS SEARCHED				
Minimum documentation searched (classification system followed by classification symbols)				
A61K A61Q				
Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched				
Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)				
EPO-Internal				
C. DOCUMENTS CONSIDERED TO BE RELEVANT				
Category*	Citation of document, with indication, where appropriate, of the relevant passages			Relevant to claim No.
X	US 2023/139888 A1 (LIAO ZHENGZHENG [US] ET AL) 4 May 2023 (2023-05-04)			1 - 14
Y	paragraph [0002] paragraph [0004] paragraph [0006] paragraph [0041] paragraph [0054] examples INV10, INV11; table 3 -----			3
X	LT 6 974 B (UAB KOSMETIKOS TYRIMU CENTRAS [LT]) 25 January 2023 (2023-01-25)			1, 2, 4 - 14
Y	abstract table; pages 3-4 claim 1 ----- - / - -			3
☒ Further documents are listed in the continuation of Box C.				
☒ See patent family annex.				
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"X" document of particular relevance;; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone				
"Y" document of particular relevance;; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art				
"&" document member of the same patent family				
Date of the actual completion of the international search			Date of mailing of the international search report	
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Name and mailing address of the ISA/ European Patent Office, P.B. 5818 Patentlaan 2 NL - 2280 HV Rijswijk Tel. (+31-70) 340-2040, Fax: (+31-70) 340-3016			Authorized officer Ovens, Annabel	

INTERNATIONAL SEARCH REPORT

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