

SOLUBILIZATION OF UV FILTERS

5 The present invention relates to the field of solid organic ultraviolet (UV) filters and more particularly to that of the solubilization of these filters. It relates more particularly to a composition comprising a combination of solvents and one or more solid organic UV filter(s). The present invention also relates to a process for the preparation of such a composition and the use of such a
10 composition in the preparation of UV protection products.

 UV filters, also called sunscreens or anti-UV filters, protect against the harmful effects of the ultraviolet rays from the sun. They are commonly used in cosmetic and/or dermatological products in order to protect the skin from UV rays (protection against UV-A and/or UV-B rays). Moreover, more and more
15 textiles containing UV filters are also appearing on the market, aimed at protecting products and human beings.

 There are two types of UV filters: organic filters and mineral filters. The organic filters, also called chemical filters, are substances which absorb ultraviolet rays. The mineral filters, also called physical filters, are inert powders
20 the role of which is to reflect and diffuse light. Among the organic filters, some are in solid form (for example in the form of powder) and others in liquid form under normal temperature and pressure conditions.

 The present invention relates to organic UV filters and more particularly the solid organic UV filters and more particularly the solid organic UV filters that
25 are only slightly soluble or insoluble in water. By "only slightly soluble or insoluble in water", is meant more particularly solid organic UV filters which have a solubility of less than 10g/L in water at 30°C.

 The solid organic UV filters are compounds generally having aromatic structures conjugated with carbonyl groups or with carbon-carbon double
30 bonds. Their UV-protection effect is optimal when these filters are uniformly distributed over the surface to be protected from ultraviolet rays. Moreover, a solid organic UV filter is only effective in absorbing UV rays if it is correctly

solubilized. Complete solubilization of the filters must therefore be obtained for optimum absorption of UV radiation. To this end, the solubilizers of solid organic UV filters will be chosen so as to optimize the quantity of filters that can be solubilized therein and to obtain a good protection/price ratio. Moreover, most
5 solid organic filters are only slightly soluble and have a tendency to crystallize. A good solubilizer of solid organic UV filters must make it possible to avoid recrystallization of the solid organic UV filter in the formulation, which would have the effect of reducing the protection index.

Consequently, there is a strong demand for solubilization compositions
10 having an improved solubilizing power vis-à-vis solid organic UV filters.

Surprisingly, it has been demonstrated that the solubilizing power of esters is significantly increased via the addition of a limited quantity of an alcohol. More particularly, the addition for example of 10% of alcohol to an ester substantially improves the solubility of the solid organic UV filters in the ester. A
15 synergy between the two solvents, alcohol and ester, which makes it possible to obtain high rates of solubilization of solid organic UV filters, has more particularly been demonstrated.

A subject of the invention is a composition comprising:

- a combination of a first solvent and a second solvent,
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 - o the first solvent being chosen from the esters,
 - o the second solvent being chosen from the alcohols, the ratio by weight of the second solvent to the first solvent being comprised between 1:20 and 1:2.3,
- one or more solid organic UV filter(s) in a content greater than or
25 equal to 15% by weight, with respect to the total weight of the combination of the first and second solvent.

By "solvent", is meant a liquid under normal conditions of temperature and pressure (NTP), which has the property of dissolving, diluting or extracting other substances without causing chemical modification of these substances
30 and without itself being modified.

Unless otherwise stipulated, it is considered in the present application that any reference to the "solid" and "liquid" states is understood under normal conditions of temperature and pressure.

5 The first solvent can be constituted by a mixture of esters or more preferentially by a single ester. In particular, insofar as the ester(s) is/are included in the definition of a solvent as indicated above, each ester is liquid under NTP. Furthermore, the liquid ester can have a function other than that of solvent, such as for example octyl methoxycinnate which is a liquid organic UV filter, but which contributes to the solubilization of the solid organic UV filters.

10 By esters, is meant more particularly the esters of carboxylic acid and the diesters of dicarboxylic acid. The esters can be carefully chosen from the group constituted by hexyl laurate, isopropyl myristate, isopropyl stearate, isopropyl palmitate, diethyl succinate, ethylhexyl stearate, dibutyl adipate, diethylhexyl adipate, diisopropyl adipate, diisopropyl sebacate and the isoamyl esters.
15 Preferentially, the esters are chosen from the group constituted by hexyl laurate, isopropyl myristate, isopropyl stearate, isopropyl palmitate, ethylhexyl stearate, dibutyl adipate, diethylhexyl adipate, diisopropyl adipate, diisopropyl sebacate and the isoamyl esters.

By isoamyl esters, is meant more particularly isoamyl caprylate, isoamyl
20 caprate, isoamyl laurate, isoamyl myristate, isoamyl palmitate, diisoamyl sebacate, diisoamyl brassylate, diisoamyl thapsate, diisoamyl fumarate, diisoamyl glutaconate, diisoamyl traumatate and mono- or di-isoamyl malonate, succinate, glutarate, adipate, pimelate, suberate and azelate. Preferentially, the ester is chosen from the group constituted by the isoamyl esters and, even
25 more preferentially, from isoamyl laurate and/or diisoamyl sebacate.

The second solvent can be constituted by a mixture of alcohols or more preferentially by a single alcohol.

The alcohol is an alcohol in the liquid state under normal conditions of temperature and pressure. Preferably, the alcohol is chosen from the group
30 constituted by ethanol, benzyl alcohol, phenoxyethanol and octyldodecanol, more preferentially, ethanol.

The synergy between the alcohol and the ester makes it possible to obtain high levels of solubility of solid organic UV filters. In fact, it has been demonstrated that the solubility obtained by the combination of an ester and an alcohol is greater than that of the weighted sums of the theoretical solubility of the solvents used.

This synergy is more particularly demonstrated in the examples below.

Preferably, the ratio by weight of the second solvent to the first solvent is comprised between 1:20 and 1:2.3, preferentially between 1:20 and 1:4, more preferentially between 1:20 and 1:5, even more preferentially between 1:15 and 1:6, and even more preferentially between 1:13 and 1:7, in particular between 1:10 and 1:8, for example 1:9.

It will be noted that in the context of the present application, and unless otherwise stipulated, the ranges of values indicated are understood to be inclusive.

According to a first preferred embodiment of the invention, the latter relates to a composition comprising:

- a combination of a first solvent and a second solvent,
 - o the first solvent being chosen from the esters,
 - o the second solvent being chosen from the alcohols,
 - o the ratio by weight of the second solvent to the first solvent being comprised between 1:10 and 1:8,
- one or more solid organic UV filter(s) in a content greater than or equal to 15% by weight, with respect to the total weight of the combination of the first and second solvent.

More particularly, according to this embodiment,

- the first solvent is chosen from the group constituted by hexyl laurate, isopropyl myristate, isopropyl stearate, isopropyl palmitate, ethylhexyl stearate, dibutyl adipate, diethylhexyl adipate, diisopropyl adipate, diisopropyl sebacate and/or the isoamyl esters, the group optionally also being able to comprise diethyl succinate;
- the second solvent is chosen from the alcohols, preferably ethanol, benzyl alcohol, phenoxyethanol and/or octyldodecanol.

Still according to this first preferred embodiment, the organic UV filter(s) is/are chosen from the group constituted by diethylamino hydrobenzoyl hexyl benzoate, bis-ethylhexyloxyphenol methoxyphenyl triazine and butyl methoxydibenzoyl methane.

5 More preferentially, the first solvent is chosen from the group constituted by isoamyl laurate, diisoamyl sebacate, isopropyl myristate and/or diethyl succinate, even more preferentially, from the group constituted by isoamyl laurate and/or diisoamyl sebacate.

10 The synergy between an alcohol and an ester makes it possible to obtain a composition with a high content of solid organic UV filter(s), which is more stable over time. In fact, thanks to the combination of solvents as described, the limits of solubility of the solid organic UV filters are pushed. Therefore, it is easy to solubilize large quantities of solid organic UV filters in the combinations of solvents as described, while retaining a stable composition according to the invention, the UV filters not recrystallizing. The composition thus obtained can be stored at ambient temperature.

By high content, is meant at least 15% solid organic UV filter(s), the content of 15% having to be understood as the total content of all of the solid organic UV filters with respect to the total weight of the combination of the first and second solvent. Such a composition can serve as an intermediate solubilization phase before introduction into the formulation. In fact, the composition according to the invention would appear to be particularly suitable for the preparation of products requiring a prior step of solubilization of solid organic UV filters.

25 By intermediate phase, is meant a preparation, in solid or liquid form, containing one or more ingredient(s), intended to be mixed with one or more other intermediate phase(s) with a view to producing another intermediate phase or a final product. By way of example, in Example 2 below, proposing several formulations, each phase A to G is an intermediate phase of the formulation. Moreover, when several intermediate phases are mixed (such as 30 for example phases B, C and D of formulae 1 and 2 of this example), they form

new intermediate phase. The final product is obtained when all of the intermediate phases have been utilized in the formulation.

Thus, the composition, concentrated with one or more solid organic UV filter(s), can be used as intermediate phase and, more particularly, as intermediate solubilization phase. As regulations of certain countries limit the concentrations of UV filters in certain categories of products such as, for example, sun creams, the composition according to the invention as intermediate solubilization phase, is then particularly advantageous. In fact, depending on the desired sun protection of the final product, it is sufficient to take a determined quantity of the composition according to the invention and introduce it into the product preparation. Advantageously, the compositions according to the invention can form an intermediate fatty phase or a final fat product, i.e. an intermediate phase or a final product comprising no water. By "comprising no water", is meant an intermediate phase or a final product in which any presence of water is only due to the presence of water in the different components of the phase or of the product (no added water). By way of example, each of phases B, C, D and E of formulae 1 and 2 of Example 2, as well as the mixtures of two or more of these phases constitute an intermediate fatty phase within the meaning of the present invention. Similarly, each of phases A to C of formula 3 of the example, the mixture of two or three of these phases, and formula 3 itself, constitute an intermediate fatty phase or a final fat product within the meaning of the invention.

The high solubilizing powers obtained with the combination of esters/alcohol solvents according to the invention, make it possible to introduce into the product preparations, a smaller quantity of solid organic UV filters for a similar or higher final efficiency in terms of sun protection index, due to the fact that the solid organic UV filters contained in the products will remain well solubilized and will not crystallize, which would render them ineffective. This is economically attractive to the manufacturer of said product, as the cost of the filters is high. Similarly, for a given quantity of solid organic UV filters, a smaller quantity of solvents is necessary thanks to the use of the combination of solvents according to the invention. This represents an economical and

environmental advantage.

Advantageously, the solid organic UV filter(s) is/are chosen from the group constituted by:

Chemical name	Common name
4-Aminobenzoic acid	PABA
2-Hydroxy-4-methoxybenzophenone / Oxybenzone	Benzophenone-3
1-(4- <i>tert</i> -Butylphenyl)-3-(4-methoxyphenyl)propane-1,3-dione / Avobenzene	Butyl Methoxydibenzoylmethane (BMDBM)
α -(Oxo-2 bornylidene-3)-toluene-4-sulphonic acid and its salts	Benzylidene Camphor Sulphonic Acid
<i>N</i> -{(2 and 4)-[(2-oxoborn-3-ylidene)methyl]benzyl} acrylamide polymer	Polyacrylamidomethyl Benzylidene Camphor
2,4,6-(Trianilino- <i>p</i> -carbo-2'-ethylhexyl-1'-oxy)1,3,5-triazine	Ethylhexyl Triazone (or octyl triazone)
Phenol,2-(2 <i>H</i> -benzotriazol-2-yl)-4-methyl-6-(2-methyl-3-(1,3,3,3-tetramethyl-1-(trimethylsilyl)oxy)-disiloxanyl)propyl)	Drometrisol Trisiloxane
Benzoic acid, 4,4-((6-((4-(((1,1-dimethylethyl)amino)carbonyl)phenyl)amino)-1,3,5-triazine-2,4-diyl)diimino)bis-,bis(2-ethylhexyl)ester)/Iscostrizol (USAN)	Diethylhexyl Butamido Triazone
3-(4-Methylbenzylidene)- <i>d</i> -1 camphor / Enzacamene	4-Methylbenzylidene Camphor
2-hydroxy-4-methoxybenzophenone-5-sulphonic acid and its sodium salt / Sulisobenzene	Benzophenone-4
2-Hydroxy-4-methoxybenzophenone-5-sulphonic acid and its sodium salt / Sulisobenzene sodium	Benzophenone-5
2,2'-methanediylbis[6-(2 <i>H</i> -benzotriazol-2-yl)-4-(2,4,4-trimethylpentan-2-yl)phenol]/Bisocotrisole	Methylene Bis-Benzotriazolyl Tetra-methylbutylphenol
Sodium salt of 2,2'-bis(1,4-phenylene)1 <i>H</i> -benzimidazole-4,6-disulphonic acid / Bisdisulizole disodium	Disodium Phenyl Dibenzimidazole Tetrasulphonate
Benzoic acid, 2-[4-(diethylamino)-2-hydroxybenzoxylester	Diethylamino Hydroxybenzoyl Hexyl Benzoate
2-Phenyl-3 <i>H</i> -benzimidazole-5-sulphonic acid (Ensulizole)	Phenylbenzimidazole Sulphonic Acid
Phenyl-2-hydroxybenzoate (Salol)	Phenyl Salicylate
<i>N,N,N</i> -Trimethyl-4-(2-oxoborn-3-ylidenemethyl)anilinium methyl sulphate	Camphor Benzalkonium Methosulphate
2,2'-Methylene-bis-(6-(2 <i>H</i> -benzotriazol-2-yl)-4-(1,1,3,3-tetramethylbutyl)phenol)	Methylene Bis-Benzotriazolyl Tetramethylbutylphenol
2,4-dihydroxybenzophenone	Benzophenone-1

Chemical name	Common name
2,2',4,4'-tetrahydroxybenzophenone	Benzophenone-2
2,2'-dihydroxy-4,4'-dimethoxybenzophenone	Benzophenone-6
Dioxybenzone	Benzophenone-8
Sodium 2,2'-dihydroxy-4,4'-dimethoxybenzophenone-5,5'-disulphonate	Benzophenone-9
Mexenone, 2-hydroxy-4-methoxy-4'-methylbenzophenone	Benzophenone-10
Octabenzene, used to protect plastics	Benzophenone-12
2,2'-[6-(4-methoxyphenyl)-1,3,5-triazine-2,4-diyl]bis[5-[(2-ethylhexyl)oxy]phenol]/Bemotrizinol	Bis-Ethylhexyloxyphenol Methoxy-phenyl Triazine

Preferably, the solid organic UV filter(s) is/are chosen from the solid organic UV filters that are slightly soluble or insoluble in water, in particular from the group constituted by:

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Chemical name	Common name
4-Aminobenzoic acid	PABA
2-Hydroxy-4-methoxybenzophenone / Oxybenzone	Benzophenone-3
1-(4- <i>tert</i> -Butylphenyl)-3-(4-methoxyphenyl)propane-1,3-dione / Avobenzene	Butyl Methoxydibenzoylmethane (BMDBM)
2,4,6-(Trianilino- <i>p</i> -carbo-2'-ethylhexyl-1'-oxy)1,3,5-triazine	Ethylhexyl Triazone (or octyl triazone)
Phenol,2-(2 <i>H</i> -benzotriazol-2-yl)-4-methyl-6-(2-methyl-3-(1,3,3,3-tetramethyl-1-(trimethylsilyl)oxy)-disiloxanyl)propyl)	Drometrizol Trisiloxane
Benzoic acid, 4,4-((6-((4-(((1,1-dimethylethyl)amino)carbonyl) phenyl)amino)-1,3,5-triazine-2,4-diyl)diimino)bis-,bis(2-ethylhexyl)ester)/Iscotrizinol	Diethylhexyl Butamido Triazone
3-(4-Methylbenzylidene)- <i>d</i> -1 camphor / Enzacamene	4-Methylbenzylidene Camphor
Benzoic acid, 2-[4-(diethylamino)-2-hydroxybenzoyl]hexylester	Diethylamino Hydroxybenzoyl Hexyl Benzoate
Phenyl-2-hydroxybenzoate (Salol)	Phenyl Salicylate
2,2'-Methylene-bis-(6-(2 <i>H</i> -benzotriazol-2-yl)-4-(1,1,3,3-tetramethylbutyl)phenol)	Methylene Bis-Benzotriazolyl Tetramethylbutylphenol
2,4-Dihydroxybenzophenone	Benzophenone-1

Chemical name	Common name
2,2',4,4'-tetrahydroxybenzophenone	Benzophenone-2
Dioxybenzone	Benzophenone-8
2,2'-[6-(4-methoxyphenyl)- 1,3,5-triazine-2,4-diyl] bis{5-[(2-ethylhexyl)oxy]phenol} / Bemotrizinol	Bis-Ethylhexyloxyphenol Methoxy-phenyl Triazine

More preferentially, the solid organic UV filter(s) is/are chosen from the group constituted by the lipophilic solid organic UV filters such as benzophenone-3, butyl methoxydibenzoylmethane (BMDBM), ethylhexyl triazone, 4-methylbenzylidene camphor, diethylamino hydroxybenzoyl hexyl benzoate, phenyl-salicylate, methylene bis-benzotriazolyl tetramethylbutylphenol, benzophenone-8 and bis-ethylhexyloxyphenol methoxy-phenyl triazine.

And even more preferentially, the solid organic UV filter(s) is/are chosen from the group constituted by diethylamino hydrobenzoyl hexyl benzoate, bis-ethylhexyloxyphenol methoxyphenyl triazine and butyl methoxydibenzoyl methane.

According to a second preferred embodiment of the invention, the composition comprises

- a combination of a first solvent and a second solvent,
 - o the first solvent being chosen from the esters,
 - o the second solvent being chosen from the alcohols,
 - o the ratio by weight of the second solvent to the first solvent being comprised between 1:15 and 1:6,
- one or more solid organic UV filter(s) chosen from the group constituted by diethylamino hydrobenzoyl hexyl benzoate, bis-ethylhexyloxyphenol methoxyphenyl triazine and butyl methoxydibenzoyl methane, the solid organic UV filter(s) being in a content greater than or equal to 15% by weight, with respect to the total weight of the combination of the first and second solvent.

Advantageously, the first solvent is chosen from the group constituted by hexyl laurate, isopropyl myristate, isopropyl stearate, isopropyl palmitate,

ethylhexyl stearate, dibutyl adipate, diethylhexyl adipate, diisopropyl adipate, diisopropyl sebacate and/or the isoamyl esters, the group optionally also being able to comprise diethyl succinate; more preferentially, the first solvent is chosen from the isoamyl esters, isopropyl myristate and/or diethyl succinate, even more preferentially, from isoamyl laurate and/or diisoamyl sebacate.

Advantageously, the second solvent is chosen from the group constituted by ethanol, benzyl alcohol, phenoxyethanol and/or octyldodecanol, more preferentially ethanol.

Advantageously, a composition according to the invention can have a content of solid organic UV filter(s) greater than or equal to 20% by weight, with respect to the total weight of the combination of solvents. Preferably, the content of solid organic UV filter(s) is greater than or equal to 25%, more preferentially greater than or equal to 30%, even more preferentially, the content is greater than or equal to 35%.

When the solid organic UV filter is diethylamino hydrobenzoyl hexyl benzoate, a composition according to the invention can have a content of diethylamino hydrobenzoyl hexyl benzoate greater than or equal to 20% by weight, with respect to the total weight of the combination of the first and second solvent. Preferably, the content of this solid organic UV filter is greater than or equal to 25%, more preferentially greater than or equal to 30, 35, 40, 45 or even 50%, even more preferentially, the content of diethylamino hydrobenzoyl hexyl benzoate is greater than or equal to 60%.

When the solid organic UV filter is bis-ethylhexyloxyphenol methoxyphenyl triazine, a composition according to the invention can advantageously have a content of bis-ethylhexyloxyphenol methoxyphenyl triazine greater than or equal to 20% by weight, with respect to the total weight of the combination of solvents.

When the solid organic UV filter is butyl methoxydibenzoyl methane, a composition according to the invention can advantageously have a content of butyl methoxydibenzoyl methane greater than or equal to 20% by weight, with respect to the total weight of the combination of solvents.

These high solid organic UV filter(s) solubilizations can be, for example, obtained with an ester chosen from isoamyl laurate, diisoamyl sebacate and an alcohol chosen from ethanol, benzyl alcohol, phenoxyethanol and octyldodecanol and/or with a ratio by weight of the second solvent to the first solvent of 1:9.

According to a first particular embodiment of the invention, the composition according to the invention consists of an ester, an alcohol and one or more solid organic UV filter(s), preferably at least one solid organic UV filter that is slightly soluble or insoluble in water, more preferentially a lipophilic solid organic UV filter.

According to a second particular embodiment of the invention, the composition according to the invention also comprises at least one additional UV filter.

The additional UV filter(s) can be organic or mineral, solid or liquid.

Advantageously, one or more liquid organic UV filter(s) are introduced into the composition according to the invention. In fact, the liquid organic UV filters have the advantage of increasing the solubility of the solid organic UV filters. Nevertheless, these liquid UV filters can have drawbacks. Their cost is high compared with that of solvents. They are not of renewable origin, as the isoamyl esters can be, for example. In the case of sun creams for example, they can make the products sticky to the touch.

The liquid organic UV filter can be advantageously chosen from the group constituted by octyl methoxycinnamate, octocrylene, homosalate and polysilicone 15.

It will be noted in particular that, in the present invention,

- when the first solvent is chosen from the esters in general (not preferred) and
- when one liquid organic UV filter is an ester,

then the liquid organic UV filter is primarily considered, due to its ester function, as being included in the first solvent.

On the other hand, when the first solvent is chosen from the preferred esters, a liquid organic UV filter which is a non-preferred ester, is considered as a liquid organic UV filter.

As mineral UV filter, titanium dioxide and/or zinc oxide may be mentioned by way of example. The addition of a mineral UV filter can advantageously be accompanied by a mineral UV filter dispersant. In particular, the mineral filter can be previously dispersed in a mineral filter dispersant before introduction into the composition. As examples of mineral UV filter dispersant, C12/C15 alkyl benzoate, isostearyl isostearate and/or pentaerythrityl tetraisostearate may be mentioned.

Advantageously, the composition according to the invention consists of:

- a first solvent, chosen from the esters,
- a second solvent, chosen from the alcohols, the ratio by weight of the second solvent to the first solvent being comprised between 1:20 and 1:2.3,
- one or more solid organic UV filter(s), preferably at least one solid organic UV filter that is slightly soluble or insoluble in water and/or lipophilic, in a content greater than or equal to 15% by weight, with respect to the total weight of the combination of the first and second solvent and, optionally,
- one or more liquid organic UV filter(s) and/or one or more mineral filter(s), the addition of the mineral filter(s) being optionally accompanied by a mineral UV filter dispersant.

The preferred and advantageous embodiments relating to the first and second solvent, the ratio and the solid organic filters are also applicable to this composition.

Finally, according to a third preferred embodiment of the invention, the composition comprises:

- a first solvent chosen from the group constituted by isoamyl laurate, diisoamyl sebacate, isopropyl myristate and/or diethyl succinate, preferentially isoamyl laurate and/or diisoamyl sebacate,

- a second solvent chosen from the group constituted by ethanol, benzyl alcohol, phenoxyethanol, octyldodecanol, preferentially ethanol,
- 5 - one or more solid organic UV filter(s) chosen from the group constituted by diethylamino hydrobenzoyl hexyl benzoate, bis-ethylhexyloxyphenol methoxyphenyl triazine and/or butyl methoxydibenzoyl methane, and
- the ratio of the second solvent to the first solvent comprised between 1:10 and 1:8.

10 The present invention also relates to a process for the preparation of a composition according to the invention, comprising the following steps:

- a) mixing the first solvent, the second solvent and at least one solid organic UV filter, preferably a solid organic UV filter that is only slightly soluble or insoluble in water and/or lipophilic,
- 15 b) heating the mixture to a temperature comprised between 70 and 90°C under stirring.

Preferentially, stage a) comprises mixing the first solvent, the second solvent and the solid organic UV filter(s) of the composition.

20 The characteristics of the composition according to the invention are as described previously.

Preferentially, the mixing is carried out at a temperature comprised between 75 and 85°C, more preferentially at approximately 80°C.

Advantageously, the mixing is carried out under stirring, such as magnetic stirring, for 10 to 40 minutes, preferentially approximately 15 minutes.

25 A composition according to the invention is particularly well suited to a process for the preparation of a cosmetic and/or dermatological product, comprising the following steps:

- i) heating the composition according to the invention,
- 30 ii) mixing the composition heated in step i) with a cosmetic and/or dermatological preparation under stirring.

By cosmetic and/or dermatological preparation, is meant a substance or an intermediate phase for obtaining a cosmetic and/or dermatological product, such as an intermediate fatty phase.

5 The substances introduced into the cosmetic and/or dermatological preparation can advantageously be chosen from the emollients, humectants, surfactants, water-resistance agents, preservatives, anti-microbials, thickeners, pigment/colouring agents for the colouring of the product or of the skin and other ingredients usually used in cosmetics or in dermatology. Such substances can be comprised in an intermediate phase.

10 The combinations of solvents according to the invention are particularly well suited to the solubilization of solid organic UV filter(s), in particular of solid organic UV filter(s) that is/are only slightly soluble or insoluble in water and/or lipophilic.

Thus, a combination of a first solvent and a second solvent,

- 15 a) the first solvent being chosen from the esters,
b) the second solvent being chosen from the alcohols, the ratio by weight of the second solvent to the first solvent being comprised between 1:20 and 1:2.3,

20 is particularly useful for solubilizing one or more solid organic UV filter(s), preferably a solid organic UV filter that is only slightly soluble or insoluble in water and/or lipophilic.

The first solvent can be constituted by a mixture of esters or more preferentially by a single ester.

25 By esters, is meant more particularly the esters of carboxylic acid and the diesters of dicarboxylic acid. The esters can be carefully chosen from the group constituted by hexyl laurate, isopropyl myristate, isopropyl stearate, isopropyl palmitate, diethyl succinate, ethylhexyl stearate, dibutyl adipate, diethylhexyl adipate, diisopropyl adipate, diisopropyl sebacate and the isoamyl esters. Preferentially, the esters are chosen from the group constituted by hexyl
30 laurate, isopropyl myristate, isopropyl stearate, isopropyl palmitate, ethylhexyl stearate, dibutyl adipate, diethylhexyl adipate, diisopropyl adipate, diisopropyl sebacate and the isoamyl esters.

By isoamyl esters, is meant more particularly isoamyl caprylate, isoamyl caprate, isoamyl laurate, isoamyl myristate, isoamyl palmitate, diisoamyl sebacate, diisoamyl brassylate, diisoamyl thapsate, diisoamyl fumarate, diisoamyl glutaconate, diisoamyl traumatate and mono- or di-isoamyl malonate, succinate, glutarate, adipate, pimelate, suberate and azelate.

Preferentially, the ester is chosen from the group constituted by the isoamyl esters, and even more preferentially from isoamyl laurate and/or diisoamyl sebacate.

The second solvent can be constituted by a mixture of alcohols or more preferentially by a single alcohol.

The alcohol is an alcohol in the liquid state under normal conditions of temperature and pressure. Preferably, the alcohol is chosen from the group constituted by ethanol, benzyl alcohol, phenoxyethanol and octyldodecanol, more preferentially, ethanol.

Preferably, the ratio by weight of the second solvent to the first solvent is comprised between 1:20 and 1:2.3, preferentially between 1:20 and 1:4, more preferentially between 1:20 and 1:5, even more preferentially between 1:15 and 1:6, and even more preferentially between 1:13 and 1:7, in particular between 1:10 and 1:8, for example 1:9.

Advantageously, the solid organic UV filter(s) is/are chosen from the group constituted by:

Chemical name	Common name
4-Aminobenzoic acid	PABA
2-Hydroxy-4-methoxybenzophenone / Oxybenzone	Benzophenone-3
1-(4- <i>tert</i> -Butylphenyl)-3-(4-methoxyphenyl)propane-1,3-dione / Avobenzene	Butyl Methoxydibenzoylmethane (BMDBM)
α -(Oxo-2 bornylidene-3)-toluene-4-sulphonic acid and its salts	Benzylidene Camphor Sulphonic Acid
<i>N</i> -{(2 and 4)-[(2-oxoborn-3-ylidene)methyl]benzyl} acrylamide polymer	Polyacrylamidomethyl Benzylidene Camphor
2,4,6-(Trianilino- <i>p</i> -carbo-2'-ethylhexyl-1'-oxy)1,3,5-triazine	Ethylhexyl Triazone (or octyl triazone)
Phenol,2-(2 <i>H</i> -benzotriazol-2-yl)-4-methyl-6-(2-methyl-3-(1,3,3,3-tetramethyl-1-(trimethylsilyl)oxy)-disiloxanyl)propyl)	Drometrizol Trisiloxane

Chemical name	Common name
Benzoic acid, 4,4-((6-((4-(((1,1-dimethylethyl)amino)carbonyl) phenyl)amino)-1,3,5-triazine-2,4-diyl)diimino)bis-,bis(2-ethylhexyl)ester)/Isotrizinol	Diethylhexyl Butamido Triazone
3-(4-Methylbenzylidene)- <i>d</i> -1 camphor / Enzacamene	4-Methylbenzylidene Camphor
2-Hydroxy-4-methoxybenzophenone-5-sulphonic acid and its sodium salt / Sulisobenzone	Benzophenone-4
2-Hydroxy-4-methoxybenzophenone-5-sulphonic acid and its sodium salt / Sulisobenzone sodium	Benzophenone-5
2,2'-methanediylbis[6-(2H-benzotriazol-2-yl)-4-(2,4,4-trimethylpentan-2-yl)phenol]/Bisotrizole	Methylene Bis-Benzotriazolyl Tetra-methylbutylphenol
Sodium salt of 2,2'-bis(1,4-phenylene)1 <i>H</i> -benzimidazole-4,6-disulphonic acid/Bisdisulizole disodium (USAN)	Disodium Phenyl Dibenzenimidazole Tetrasulphonate
Benzoic acid, 2-[4-(diethylamino)-2-hydroxybenzoyloxylester	Diethylamino Hydroxybenzoyl Hexyl Benzoate
2-Phenyl-3 <i>H</i> -benzimidazole-5-sulphonic acid (Ensulizole)	Phenylbenzimidazole Sulphonic Acid
Phenyl-2-hydroxybenzoate (Salol)	Phenyl Salicylate
N,N,N-Trimethyl-4-(2-oxoborn-3-ylidenemethyl) anilinium methyl sulphate	Camphor Benzalkonium Methosulphate
2,2'-Methylene-bis-(6-(2H-benzotriazol-2-yl)-4-(1,1,3,3-tetramethylbutyl)phenol)	Methylene Bis-Benzotriazolyl Tetramethylbutylphenol
2,4-dihydroxybenzophenone	Benzophenone-1
2,2',4,4'-tetrahydroxybenzophenone	Benzophenone-2
2,2'-dihydroxy-4,4'-dimethoxybenzophenone	Benzophenone-6
Dioxybenzone	Benzophenone-8
Sodium 2,2'-dihydroxy-4,4'-dimethoxybenzophenone-5,5'-disulphonate	Benzophenone-9
Mexenone, 2-hydroxy-4-methoxy-4'-methylbenzophenone	Benzophenone-10
Octabenzone, used to protect plastics	Benzophenone-12
2,2'-[6-(4-methoxyphenyl)- 1,3,5-triazine-2,4-diyl] bis{5-[(2-ethylhexyl)oxy]phenol}/Bemotrizinol	Bis-Ethylhexyloxyphenol Methoxy-phenyl Triazine

Preferably, the solid organic UV filter(s) is/are chosen from the group constituted by:

Chemical name	Common name
4-Aminobenzoic acid	PABA
2-Hydroxy-4-methoxybenzophenone / Oxybenzone	Benzophenone-3
1-(4- <i>tert</i> -Butylphenyl)-3-(4-methoxyphenyl)propane-1,3-dione / Avobenzone	Butyl Methoxydibenzoylmethane (BMDBM)
2,4,6-(Trianilino- <i>p</i> -carbo-2'-ethylhexyl-1'-oxy)1,3,5-triazine	Ethylhexyl Triazone (or octyl triazone)
Phenol,2-(2 <i>H</i> -benzotriazol-2-yl)-4-methyl-6-(2-methyl-3-(1,3,3,3-tetramethyl-1-(trimethylsilyl)oxy)-disiloxanyl)propyl)	Drometrizol Trisiloxane
Benzoic acid, 4,4-((6-(((4-(((1,1-dimethylethyl)amino)carbonyl) phenyl)amino)-1,3,5-triazine-2,4-diyl)diimino)bis-,bis(2-ethylhexyl)ester)/Isctrizinol (USAN)	Diethylhexyl Butamido Triazone
3-(4-Methylbenzylidene)- <i>d</i> -1 camphor / Enzacamene	4-Methylbenzylidene Camphor
Benzoic acid, 2-[4-(diethylamino)-2-hydroxybenzoyl]hexylester	Diethylamino Hydroxybenzoyl Hexyl Benzoate
Phenyl-2-hydroxybenzoate (Salol)	Phenyl Salicylate
2,2'-Methylene-bis-(6-(2 <i>H</i> -benzotriazol-2-yl)-4-(1,1,3,3-tetramethylbutyl)phenol)	Methylene Bis-Benzotriazolyl Tetramethylbutylphenol
2,4-dihydroxybenzophenone	Benzophenone-1
2,2',4,4'-tetrahydroxybenzophenone	Benzophenone-2
Dioxybenzone	Benzophenone-8
2,2'-[6-(4-methoxyphenyl)- 1,3,5-triazine-2,4-diyl] bis{5-[(2-ethylhexyl)oxy]phenol}/Bemotrizinol	Bis-Ethylhexyloxyphenol Methoxy-phenyl Triazine

More preferentially, the solid organic UV filter(s) is/are chosen from the group constituted by the lipophilic solid organic UV filters such as benzophenone-3, butyl methoxydibenzoylmethane (BMDBM), ethylhexyl triazone, 4-methylbenzylidene camphor, diethylamino hydroxybenzoyl hexyl benzoate, phenyl-salicylate, methylene bis-benzotriazolyl tetramethylbutylphenol, benzophenone-8 and bis-ethylhexyloxyphenol methoxy-phenyl triazine.

And even more preferentially, the solid organic UV filter(s) is/are chosen from the group constituted by diethylamino hydrobenzoyl hexyl benzoate, bis-

ethylhexyloxyphenol methoxyphenyl triazine and butyl methoxydibenzoyl methane. It will be noted that, more preferentially, when one or more of these filters is/are chosen, the ratio of the second solvent to the first solvent is comprised between 1:15 and 1:6, preferentially between 1:13 and 1:7, and even
 5 more preferentially between 1:10 and 1:8, for example 1:9.

A composition according to the invention can be used for the preparation of UV protection products.

By UV protection products, is meant more particularly:

- the cosmetic and/or dermatological products comprising a UV
 10 protection index, which can be applied to the lips, face, body or hair, such as lipsticks and lip balms, foundations, skincare creams, sun products, in all pharmaceutical forms such as for example, in the form of creams, lotions, sprays, oils, balms, serum, masks etc.
- the anti-UV products for treating the fabrics of outdoor equipment,
 15 such as clothing, footwear, tents and rucksacks.

Other characteristics and advantages of the invention will become apparent from the following examples, given by way of a non-limitative illustration.

20 **Example 1: Combination of solvents**

1. General procedure:

The solubility of the solid organic UV filters is tested in each solvent taken separately as follows: 1% by weight, with respect to the total weight of the composition, of a solid organic UV filter is added to the solvent. The solution is
 25 heated at 80°C for 15 minutes under magnetic stirring, then left to rest for 24 hours. If the solution is clear, then an additional 1% by weight of UV filter is added then treated as previously. The addition of solid organic UV filter is repeated every 24 hours until a cloudiness or a precipitate is observed in the solution. The limit of solubility of the filter is then obtained.

30 A combination of solvents is produced by mixing a% by weight of alcohol and e% by weight of ester; a being comprised between 5 and 20 and e comprised between 80 and 95, with $a + e = 100$.

Then the solubility of the UV filter is tested as previously by adding 1% by weight, with respect to the total weight of the solvent combination, of a solid organic UV filter to the solvent combination.

5 2. Synergy calculation:

The synergy is calculated with respect to the respective and weighted limit of solubility of the UV filters for the solvents involved.

Theoretical solubility = Solubility of the filter (in the ester) x e% + solubility of the filters (in the alcohol) x a%.

10 Synergy = [(solubility observed / theoretical solubility) - 1] x 100

3. Tests with diethylamino hydrobenzoyl hexyl benzoate as solid organic UV filter

- 15 • Solubilization of diethylamino hydrobenzoyl hexyl benzoate in an isoamyl laurate/ethanol mixture

	Limit of solubility in % of diethylamino hydrobenzoyl hexyl benzoate
Isoamyl laurate	25.5
Ethanol	12
Isoamyl laurate + ethanol (ratio 90/10)	45
Synergy (%)	+ 86.3

20 A composition comprising a combination of isoamyl laurate and ethanol, the ratio by weight of the alcohol to the isoamyl laurate being 1:9, solubilizes the solid organic UV filter, the diethylamino hydrobenzoyl hexyl benzoate until a content of 45% by weight with respect to the total weight of the composition is obtained, instead of 25.5% with isoamyl alone or 12% in ethanol alone. The diethylamino hydrobenzoyl hexyl benzoate filter is at a content of 81.8% by weight with respect to the total weight of the combination of solvents. The synergy observed with use of the isoamyl laurate: ethanol combination with a ratio of 1:9 is 86.3%.

25

- Solubilization of diethylamino hydrobenzoyl hexyl benzoate in an isoamyl laurate/ benzyl alcohol mixture

	Limit of solubility in % of diethylamino hydrobenzoyl hexyl benzoate
Isoamyl laurate	25.5
Benzyl alcohol	70
Isoamyl laurate + benzyl alcohol (ratio 90/10)	39
Synergy (%)	+ 30.2

5 The solubility of diethylamino hydrobenzoyl hexyl benzoate in an isoamyl laurate:benzyl alcohol combination of solvents in a ratio of 9:1, reaches 39%. The diethylamino hydrobenzoyl hexyl benzoate filter is at a content of 63.9% by weight with respect to the total weight of the combination of solvents. The synergy of the combination of solvents demonstrated in this case is 30.2%.

- 10
- Solubilization of diethylamino hydrobenzoyl hexyl benzoate in an isoamyl laurate/phenoxyethanol mixture

	Limit of solubility in % of diethylamino hydrobenzoyl hexyl benzoate
Isoamyl laurate	25.5
Phenoxyethanol	20
Isoamyl laurate + phenoxyethanol (ratio 90/10)	45
Synergy (%)	+ 80.3

15 The solubility of diethylamino hydrobenzoyl hexyl benzoate in an isoamyl laurate:phenoxyethanol combination of solvents in a ratio of 9:1, reaches 45%. The diethylamino hydrobenzoyl hexyl benzoate filter is at a content of 81.8% by weight with respect to the total weight of the combination of solvents. The synergy of the combination of solvents demonstrated in this case is 80.3%.

- Solubilization of diethylamino hydrobenzoyl hexyl benzoate in an isoamyl laurate/octyldodecanol mixture

	Limit of solubility in % of diethylamino hydrobenzoyl hexyl benzoate
Isoamyl laurate	25.5
Octyldodecanol	11
Isoamyl laurate + octyldodecanol (ratio 90/10)	31
Synergy (%)	+ 28.9

The solubility of diethylamino hydrobenzoyl hexyl benzoate in an isoamyl laurate:octyl dodecanol combination of solvents in a ratio of 9:1, reaches 31%. The diethylamino hydrobenzoyl hexyl benzoate filter is at a content of 44.9% by weight with respect to the total weight of the combination of solvents. The synergy of the combination of solvents demonstrated in this case is 28.9%.

- Solubilization of diethylamino hydrobenzoyl hexyl benzoate in an isopropyl myristate/ethanol mixture

	Limit of solubility in % of diethylamino hydrobenzoyl hexyl benzoate
Isopropyl myristate	31
Ethanol	12
Isopropyl myristate + ethanol (ratio 90/10)	36
Synergy (%)	+23.1

10

The solubility of diethylamino hydrobenzoyl hexyl benzoate in an Isopropyl myristate:ethanol combination of solvents in a ratio of 9:1, reaches 36%. The diethylamino hydrobenzoyl hexyl benzoate filter is at a content of 56.2% by weight with respect to the total weight of the combination of solvents. The synergy of the combination of solvents demonstrated in this case is 23.1%.

15

- Solubilization of diethylamino hydrobenzoyl hexyl benzoate in a diisoamyl sebacate/ethanol mixture

	Limit of solubility in % of diethylamino hydrobenzoyl hexyl benzoate
Diisoamyl sebacate	30.5
Ethanol	12
Diisoamyl sebacate + ethanol (ratio 90/10)	36
Synergy (%)	+ 25.6

- 5 The solubility of diethylamino hydrobenzoyl hexyl benzoate in a diisoamyl sebacate:ethanol combination of solvents in a ratio of 9:1, reaches 36%. The diethylamino hydrobenzoyl hexyl benzoate filter is at a content of 56.2% by weight with respect to the total weight of the combination of solvents. The synergy of the combination of solvents demonstrated in this case is 25.6%.

- 10
- Solubilization of diethylamino hydrobenzoyl hexyl benzoate in a diisoamyl sebacate/benzyl alcohol mixture

	Limit of solubility in % of diethylamino hydrobenzoyl hexyl benzoate
Diisoamyl sebacate	30.5
Benzyl alcohol	70
Diisoamyl sebacate + benzyl alcohol (ratio 90/10)	52
Synergy (%)	+ 50.9

- 15 The solubility of diethylamino hydrobenzoyl hexyl benzoate in a diisoamyl sebacate:benzyl alcohol combination of solvents in a ratio of 9:1, reaches 52%. The diethylamino hydrobenzoyl hexyl benzoate filter is at a content of 108.3% by weight with respect to the total weight of the combination of solvents. The synergy of the combination of solvents demonstrated in this case is 50.9%.

- 20
- Solubilization of diethylamino hydrobenzoyl hexyl benzoate in a diisoamyl sebacate/phenoxyethanol mixture

	Limit of solubility in % of diethylamino hydrobenzoyl hexyl benzoate
Diisoamyl sebacate	30.5
Phenoxyethanol	20
Diisoamyl sebacate + phenoxyethanol (ratio 90/10)	40
Synergy (%)	+ 35.8

The solubility of diethylamino hydrobenzoyl hexyl benzoate in a diisoamyl sebacate:phenoxyethanol combination of solvents in a ratio of 9:1, reaches 40%. The diethylamino hydrobenzoyl hexyl benzoate filter is at a content of 66.6% by weight with respect to the total weight of the combination of solvents. The synergy of the combination of solvents demonstrated in this case is 35.8%.

- Solubilization of diethylamino hydrobenzoyl hexyl benzoate in a diisoamyl sebacate/octyldodecanol mixture

	Limit of solubility in % of diethylamino hydrobenzoyl hexyl benzoate
Diisoamyl sebacate	30.5
Octyldodecanol	11
Diisoamyl sebacate + octyldodecanol (ratio 90/10)	36
Synergy (%)	+ 26.1

10

The solubility of diethylamino hydrobenzoyl hexyl benzoate in a diisoamyl sebacate:octyldodecanol combination of solvents in a ratio of 9:1, reaches 36%. The diethylamino hydrobenzoyl hexyl benzoate filter is at a content of 56.2% by weight, with respect to the total weight of the combination of solvents. The synergy of the combination of solvents demonstrated in this case is 26.1%.

15

4. Tests with bis-ethylhexyloxyphenol methoxyphenyl triazine as solid organic UV filter

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- Solubilization of bis-ethylhexyloxyphenol methoxyphenyl triazine in an isoamyl laurate/phenoxyethanol mixture

	Limit of solubility in % of bis-ethylhexyloxyphenol methoxyphenyl triazine
Isoamyl laurate	15
Phenoxyethanol	6
Isoamyl laurate + phenoxyethanol (ratio 90/10)	25
Synergy (%)	+ 77.3

The solubility of bis-ethylhexyloxyphenol methoxyphenyl triazine in an isoamyl laurate:phenoxyethanol combination of solvents in a ratio of 9:1, reaches 25%. The bis-ethylhexyloxyphenol methoxyphenyl triazine filter is at a content of 33.3% by weight, with respect to the total weight of the combination of solvents. The synergy of the combination of solvents demonstrated in this case is 77.3%.

- Solubilization of bis-ethylhexyloxyphenol methoxyphenyl triazine in a diethyl succinate/Ethanol mixture

	Limit of solubility in % of bis-ethylhexyloxyphenol methoxyphenyl triazine
Diethyl succinate	11
Ethanol	0.05
Diethyl succinate + ethanol (ratio 90/10)	14
Synergy (%)	+ 41.3

The solubility of bis-ethylhexyloxyphenol methoxyphenyl triazine in a diethyl succinate:ethanol combination of solvents in a ratio of 9:1, reaches 14%. The bis-ethylhexyloxyphenol methoxyphenyl triazine filter is at a content of 16.2% by weight, with respect to the total weight of the combination of solvents. The synergy of the combination of solvents demonstrated in this case is 41.3%.

- Solubilization of bis-ethylhexyloxyphenol methoxyphenyl triazine in a diisoamyl sebacate /ethanol mixture

	Limit of solubility in % of bis-ethylhexyloxyphenol methoxyphenyl triazine
Diisoamyl sebacate	13
Ethanol	0.05
Diisoamyl sebacate + ethanol (ratio 90/10)	21
Synergy (%)	+ 79.4

5 The solubility of bis-ethylhexyloxyphenol methoxyphenyl triazine in a diisoamyl sebacate:ethanol combination of solvents in a ratio of 9:1, reaches 21%. The bis-ethylhexyloxyphenol methoxyphenyl triazine filter is at a content of 26.6% by weight, with respect to the total weight of the combination of solvents. The synergy of the combination of solvents demonstrated in this case is 79.4%.

- Solubilization of bis-ethylhexyloxyphenol methoxyphenyl triazine in a diisoamyl sebacate/benzyl alcohol mixture

	Limit of solubility in % of bis-ethylhexyloxyphenol methoxyphenyl triazine
Diisoamyl sebacate	13
Benzyl alcohol	14
Diisoamyl sebacate + benzyl alcohol (ratio 90/10)	28
Synergy (%)	+ 113.7

15 The solubility of bis-ethylhexyloxyphenol methoxyphenyl triazine in a diisoamyl sebacate:benzyl alcohol combination of solvents in a ratio of 9:1, reaches 28%. The bis-ethylhexyloxyphenol methoxyphenyl triazine filter is at a content of 38.8% by weight, with respect to the total weight of the combination of solvents. The synergy of the combination of solvents demonstrated in this case is 113.7%.

5. Tests with butyl methoxydibenzoyl methane as solid organic UV filter

- Solubilization of butyl methoxydibenzoyl methane in an isoamyl laurate/phenoxyethanol mixture

	Limit of solubility in % of butyl methoxydibenzoyl methane
Isoamyl laurate	17
Phenoxyethanol	20
Isoamyl laurate + phenoxyethanol (ratio 90/10)	24
Synergy (%)	+ 38.7

5

The solubility of butyl methoxydibenzoyl methane in an isoamyl laurate:phenoxyethanol combination of solvents in a ratio of 9:1, reaches 24%. The butyl methoxydibenzoyl methane filter is at a content of 31.6% by weight, with respect to the total weight of the combination of solvents. The synergy of the combination of solvents demonstrated in this case is 38.7%.

10

- Solubilization of butyl methoxydibenzoyl methane in an isoamyl laurate/ethanol mixture

	Limit of solubility in % of butyl methoxydibenzoyl methane
Isoamyl laurate	17
Ethanol	2
Isoamyl laurate + ethanol (ratio 90/10)	19
Synergy (%)	+ 22.6

15

The solubility of butyl methoxydibenzoyl methane in an isoamyl laurate:ethanol combination of solvents in a ratio of 9:1, reaches 19%. The butyl methoxydibenzoyl methane filter is at a content of 23% by weight, with respect to the total weight of the combination of solvents. The synergy of the combination of solvents demonstrated in this case is 22.6%.

20

- Solubilization of butyl methoxydibenzoyl methane in an isopropyl myristate/ethanol mixture

	Limit of solubility in % of butyl methoxydibenzoyl methane
Isopropyl myristate	12
Ethanol	2
Isopropyl myristate + ethanol (ratio 90/10)	17
Synergy (%)	+ 42.8

5 The solubility of butyl methoxydibenzoyl methane in an isopropyl myristate:ethanol combination of solvents in a ratio of 9:1, reaches 17%. The butyl methoxydibenzoyl methane filter is at a content of 20.5% by weight, with respect to the total weight of the combination of solvents. The synergy of the combination of solvents demonstrated in this case is 42.8%.

- Solubilization of butyl methoxydibenzoyl methane in a diisoamyl sebacate/ethanol mixture

10

	Limit of solubility in % of butyl methoxydibenzoyl methane
Diisoamyl sebacate	27
Ethanol	2
Diisoamyl sebacate + ethanol (ratio 90/10)	29
Synergy (%)	+ 18.3

15 The solubility of butyl methoxydibenzoyl methane in a diisoamyl sebacate:ethanol combination of solvents in a ratio of 9:1, reaches 29%. The butyl methoxydibenzoyl methane filter is at a content of 40.8% by weight, with respect to the total weight of the combination of solvents. The synergy of the combination of solvents demonstrated in this case is 18.3%.

- Solubilization of Butyl methoxydibenzoyl methane in a diisoamyl sebacate/phenoxyethanol mixture

	Limit of solubility in % of butyl methoxydibenzoyl methane
Diisoamyl sebacate	27
Phenoxyethanol	20
Diisoamyl sebacate + phenoxyethanol (ratio 90/10)	30
Synergy (%)	+ 14.1

- 5 The solubility of butyl methoxydibenzoyl methane in a diisoamyl sebacate:phenoxyethanol combination of solvents in a ratio of 9:1, reaches 30%. The butyl methoxydibenzoyl methane filter is at a content of 42.9% by weight, with respect to the total weight of the combination of solvents. The synergy of the combination of solvents demonstrated in this case is 14.1%.

10

Example 2: Sunscreen formulations

- 15 With the aim of achieving good solubilization of the solid organic UV filters before introducing them into the cosmetic or dermatological composition or formulation, an intermediate phase is prepared (phase C in the following examples).

- Formula 1:sunscreen emulsion of the oil-in-water type

Phases		Family of materials	%
Aqueous	A	Water	Qsf 100
		Humectant(s) such as propylene glycol, butylene glycol, methylpropane diol, glycerine	3 - 10
		Thickener(s), aqueous and/or film-forming texturizing agent(s) such as acrylic derivatives, polyvinylpyrrolidone (PVP) derivatives, natural gums (xanthan, carrageenan, clays)	0.1 - 3
		Optionally one or more hydrophilic UV filter(s) such as potassium, sodium or triethanolamine salts of 2-phenylbenzimidazol-5-sulphonic acid	1 - 8
		Hydrophilic preservative(s) such as anisic acid, levulinic acid	0.05 - 1
Fatty	B	Emulsifier(s) such as PEG 100 stearate, glyceryl	0.1 - 5

Phases		Family of materials	%
		stearate, polyglycerol ester, a combination of Steareth-2 and Steareth-21	
		Hydrophobic agent(s) ("water-resistance agents") such as silicone waxes, mineral waxes, PVP derivatives	0.5 - 5
		Consistency factor(s) such as cetyl palmitate, cetyl alcohol, stearyl alcohol	0.2 - 2
		Hydrophobic preservative(s) such as paraben, phenoxyethanol	0.1 - 1.5
	C	UV filter solubilizing agent: combination of solvents according to the invention and one or more solid organic UV filter(s) such as butyl methoxydibenzoylmethane (BMDBM), ethylhexyl triazone, 4-aminobenzoic acid (PABA). Optionally, liquid organic UV filter(s) such as octocrylene, octyl methoxycinnamate, polysilicone 15, homosalate.	10 - 50
	D	Mineral UV filter dispersant(s) such as C12/15 alkyl benzoate, isostearyl isostearate, pentaerythrityl tetraistearate	1 - 15
		Mineral UV filter(s) such as titanium dioxide, zinc oxide	1 - 15
	E	Heat-sensitive materials such as volatile silicones (cyclomethicone 5), vegetable oils (argan oil), anti-oxidant(s) (tocopherol)	0.1 - 10
	F	Perfume, active ingredients	0.1 - 5
	G	Acid (citric acid, lactic acid) or base (NaOH) solution	Qsf emulsion pH approximately 7

Qsf: quantity sufficient for

Procedure:

- Mix the phase B ingredients and heat to 75-80°C.
- In parallel, heat phase C to 75°-80°C under stirring, checking that the UV filters are well solubilized (observation of a clear intermediate phase).
- Weigh the phase D ingredients, mix them, homogenize the phase and check that it is well dispersed (absence of aggregates). Heat to 75°-80°C.
- Mix the ingredients of aqueous phase A and heat to 75°-80°C under stirring.
- Mix the previously heated fatty phases C and D then successively introduce phases B then E. Alternatively, it is possible to directly mix phases B, C and D then introduce phase E.

- Pour the phase thus obtained into phase A under stirring (vortex).
 - Once the emulsion is formed, cool.
 - Towards 40°C, introduce the phase F ingredients, optionally pre-mixed.
- 5 - At ambient temperature, check the pH and adjust it with phase G to between pH 6.8-7.5.

In this formulation, the intermediate phases C and (C+D) are compositions according to the invention. It is advantageous to prepare the intermediate solubilization phase of the solid organic filters C before introducing the mineral filter(s). In fact, the introduction of a mineral filter into an intermediate phase results in opacification of said phase. Now, one of the methods for evaluating good solubilization of the solid organic filters is to observe the clear nature of the intermediate phase. Consequently, the presence of a mineral filter in the intermediate phase can make this observation difficult.

15

- Formula 2: sunscreen emulsion of the water-in-oil type

Phases		Family of materials	%
Aqueous	A	Water	Qsf 100
		Humectant(s) such as propylene glycol, butylene glycol, methylpropane diol, glycerine	3 - 10
		Thickener(s), aqueous and/or film-forming texturizing agent(s) such as acrylic derivatives, polyvinylpyrrolidone (PVP) derivatives, natural gums (xanthan, carrageenan, clays)	0.1 - 3
		Hydrophilic preservative(s) such as anisic acid, levulinic acid	0.1 - 1
		Optionally one or more hydrophilic UV filter(s) such as potassium, sodium or triethanolamine salts of 2-phenylbenzimidazol-5-sulphonic acid	1 - 8
Fatty	B	Emulsifier(s) such as PEG-30 dipolyhydroxystearate, polyglycerol ester	0.1 - 5
		Hydrophobic agent(s) ("water-resistance agent") such as silicone waxes, mineral waxes, PVP derivatives	0.5 - 5
		Consistency factor(s) such as cetyl palmitate, cetyl alcohol, stearyl alcohol	0.2 - 2
		Hydrophobic preservative(s) such as paraben, phenoxyethanol	0.1 - 1.5

Phases		Family of materials	%
	C	UV filter solubilizing agent: combination of solvents according to the invention and one or more solid organic UV filter(s) such as butyl methoxydibenzoylmethane (BMDBM), ethylhexyl triazone, 4-aminobenzoic acid (PABA). Optionally, liquid organic UV filter(s) such as octocrylene, octyl methoxycinnamate, polysilicone 15, homosalate.	10 - 50
	D	Mineral UV filter dispersant(s) such as C12/15 alkyl benzoate, isostearyl isostearate, pentaerythrityl tetraisostearate	1 - 15
		Mineral UV filter(s) such as titanium dioxide, zinc oxide	1 - 15
	E	Heat-sensitive materials such as volatile silicones (cyclomethicone 5), vegetable oils (argan oil), anti-oxidant(s) (tocopherol)	0.1 - 10
	F	Perfume, active ingredients	0.1 - 5

Procedure:

- Mix the phase B ingredients and heat to 75°-80°C.
- In parallel, heat phase C to 75°-80°C under stirring, checking that the UV filters are well solubilized (observation of a clear intermediate phase).
- Weigh the phase D ingredients, mix them, homogenize the phase and check that it is well dispersed (absence of aggregates). Heat to 75°-80°C.
- Mix the ingredients of aqueous phase A and heat to 75°-80°C under stirring.
- Mix the previously heated fatty phases B, C, D then introduce E.
- Pour phase A into the fatty phase thus obtained under stirring (vortex).
- Once the emulsion is formed, cool.
- Towards 40°C, introduce phase F.

- Formula 3: sunscreen oil

Phases	Family of materials	%
A	Oil texturizing agent(s) such as dextrin palmitate, silica	0.1 - 3
	Hydrophobic agent(s) such as silicone waxes, polyvinylpyrrolidone derivatives	0.1 - 5
	Hydrophobic preservative(s) such as paraben, phenoxyethanol	0.1 - 1.5
B	Heat-sensitive materials such as the volatile silicones (cyclomethicone 5), vegetable oils (argan oil), anti-oxidant(s) (tocopherol)	0.1 - 30
C	UV filter solubilizing agent: combination of solvents according to the invention and one or more solid organic UV filter(s) such as butyl methoxydibenzoylmethane (BMDBM), ethylhexyl triazone, 4-aminobenzoic acid (PABA). Optionally, liquid organic UV filter(s) such as octocrylene, octyl methoxycinnamate, polysilicone 15, homosalate.	10 - 90
D	Perfume, active ingredients	0.1 - 5

Procedure:

- 5
 - Mix and heat phase C to 75°-80°C. Check for complete solubilization of the UV filters introduced (observation of a clear phase).
 - Introduce phase A and leave to melt.
 - During cooling, introduce phase B, then towards 40°C introduce phase D.

CLAIMS

1. Composition comprising:
 - a combination of a first solvent and a second solvent,
 - the first solvent being chosen from the esters,
 - the second solvent being chosen from the alcohols, the ratio by weight of the second solvent to the first solvent being comprised between 1:20 and 1:2.3,
 - one or more solid organic UV filter(s) in a content greater than or equal to 15% by weight, with respect to the total weight of the combination of the first and second solvent.
2. Composition according to claim 1, in which the solid organic UV filter(s) is/are chosen from the group constituted by diethylamino hydrobenzoyl hexyl benzoate, bis-ethylhexyloxyphenol methoxyphenyl triazine and butyl methoxydibenzoyl methane.
3. Composition according to claim 1 or 2, in which the ratio by weight of the second solvent to the first solvent is comprised between 1:15 and 1:6.
4. Composition according to claim 3, in which the ratio by weight of the second solvent to the first is comprised between 1:10 and 1:8.
5. Composition according to any one of claims 1 to 4, in which the first solvent is chosen from the group constituted by hexyl laurate, isopropyl myristate, isopropyl stearate, isopropyl palmitate, diethyl succinate, ethylhexyl stearate, dibutyl adipate, diethylhexyl adipate, diisopropyl adipate, diisopropyl sebacate and/or the isoamyl esters.
6. Composition according to any one of claims 1 to 5, in which the second solvent is chosen from the group constituted by ethanol, benzyl alcohol, phenoxyethanol and/or octyldodecanol.
7. Composition according to any one of claims 1 to 6, comprising as solid organic UV filter, diethylamino hydrobenzoyl hexyl benzoate, and in which the content of the latter is greater than or equal to 20% by weight, with respect to the total weight of the combination of the first and second solvent.

8. Composition according to any one of claims 1 to 7, comprising as solid organic UV filter, bis-ethylhexyloxyphenol methoxyphenyl triazine.
9. Composition according to any one of claims 1 to 8, also comprising an additional UV filter.
- 5 10. Composition according to claim 1 in which:
 - the first solvent is chosen from the group constituted by isoamyl laurate, diisoamyl sebacate, isopropyl myristate and/or diethyl succinate,
 - the second solvent is chosen from the group constituted by ethanol, 10 benzyl alcohol, phenoxyethanol, octyldodecanol,
 - the solid organic UV filter(s) is/are chosen from the group constituted by diethylamino hydrobenzoyl hexyl benzoate, bis-ethylhexyloxyphenol methoxyphenyl triazine and butyl methoxydibenzoyl methane, and
 - 15 - the ratio of the second solvent to the first solvent is comprised between 1:10 and 1:8.
11. Process for the preparation of a composition according to any one of claims 1 to 10, comprising the following steps:
 - a) mixing the first solvent, the second solvent and at least one solid 20 organic UV filter,
 - b) heating the mixture to a temperature comprised between 70 and 90°C under stirring.
12. Process for the preparation of a cosmetic and/or dermatological product, comprising the following steps:
 - 25 i) heating a composition according to any one of claims 1 to 10,
 - ii) mixing the composition heated in step i) with a cosmetic and/or dermatological preparation under stirring.
13. Use of a combination of a first solvent and a second solvent,
 - a) the first solvent being chosen from the esters,
 - 30 b) the second solvent being chosen from the alcohols, the ratio by weight of the second solvent to the first solvent being comprised between 1:20 and 1:2.3,

in order to solubilize a solid organic UV filter.

14. Use of a composition according to any one of claims 1 to 10, for the preparation of UV protection products.