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(54) Title: SOLUBILIZING AGENTS FOR ACTIVE OR FUNCTIONAL ORGANIC COMPOUNDS

(57) Abstract: An active or functional organic compound is solubilized in a diaryl organic compound having a polar or polarizable functional group therein, as a solvent, cosolvent or additive, to form a composition thereof. Representative active or functional organic compounds include those present in personal care products, e.g., sunscreens containing UVA/UVB absorbing compounds, such as avobenzone, benzophenone-3, and 4-methylbenzylidene camphor. Such compositions also show increased SPF, UVA/UVB absorbance ratio, and critical wavelength performance properties.



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SOLUBILIZING AGENTS FOR ACTIVE OR FUNCTIONAL ORGANIC COMPOUNDS

BACKGROUND OF THE INVENTION

1. Field of the Invention

This invention relates to compositions containing an active or functional organic compound which requires solubilization, and more particularly, to such compositions which are effectively solubilized by addition of a diaryl organic compound containing a polar or polarizable functional group as solvent, cosolvent or additive.

2. Description of the Prior Art

Many commercial products, e.g., personal care (e.g., sunscreens or UV-filters), pharmaceutical, agricultural and industrial compositions, contain active or functional materials which require solubilization in the form of a solution, emulsion or dispersion, in aqueous or non-aqueous form. For example, a sunscreen formulation containing aromatic compounds such as avobenzene (Escalol® 517) and/or benzophenone-3 (Escalol® 567) as active UVA/UVB absorbing ingredients, requires a solubilization agent to keep them in an emulsion, i.e., to prevent crystallization. Several such solubilizers are known, e.g., ethyl benzoate or a C₁₂-C₁₅ alkyl benzoate; however, the former compound is a strong irritant, and the latter is only a mediocre solvent for avobenzene and benzophenone-3.

Sunscreen compositions generally contain an active ingredient to absorb UV-B irradiation of wavelengths from 280 to 320 nm, which can cause erythema burning of the skin. Such compositions also may contain actives that absorb UV-A irradiation of wavelengths from 320 to 400 nm. These agents protect sensitive skin from harmful effects. These active sunscreen compounds (and the active amounts thereof) generally are selected to provide a desired sun protection factor (SPF). This SPF rating is expressed mathematically by the ratio of the irradiation time required to attain the

erythema-forming threshold with the UV screening agent present to the time required to attain the same threshold in the absence of the UV screening agent.

An active sunscreen agent which absorbs irradiation in the UV-B range generally contributes much of the SPF rating to a sunscreen composition. Thus, high SPF values ordinarily are obtained by incorporating a large amount of a UV-B absorbing sunscreen compound therein, e.g., octylmethoxy cinnamate and benzophenone-3. However, addition of such compounds in such large quantities can cause skin irritancy as well as increase the cost of the formulation.

Antiperspirant compositions are well known in the art. See, e.g., U.S. Pats. 4,985,238; 5,302,381; 5,376,362; 5,417,963; 5,482,702; and 5,486,355. The active antiperspirant ingredient in such compositions usually is an inorganic compound, e.g., an aluminum, zirconium, or zinc salt such as an aluminum zirconium tetrachlorohydrate complex with glycine.

Many solid antiperspirant compositions have been described in the chemical and cosmetic literature. These compositions generally tend to fall into one of two classes: emulsion sticks and suspensoid sticks. Emulsion sticks contain a solution of the antiperspirant active incorporated into the stick via an emulsion. Although emulsion sticks may be desirable in certain respects, they tend to be unstable, have poor aesthetics (e.g., are overly hard, greasy or sticky), and leave a visible residue on the skin after use. Suspensoid sticks contain the powdered antiperspirant active suspended in the stick without the use of water or an emulsion. While suspensoids tend to be stable, they may be brittle and hard and, more importantly, they tend to leave an unsightly white chalky residue on the skin after application. This residue is not only aesthetically displeasing to the user, but can also discolor clothing. It has now been discovered that when a specific diaryl organic compound is incorporated into water-free suspensoid antiperspirant stick compositions, they exhibit excellent antiperspirant efficacy and aesthetics, while leaving reduced visible residue on the skin of the user.

Personal care products are used to give polymeric substrates such as hair and skin a desired property such as body, hold or color. However, it is also desirable for such products to impart shine or gloss (luster) to hair or skin. For example, a fixative hair composition should be capable of adding luster to treated hair; and a color cosmetic such as lipstick should impart shine to the lips of the user.

Leather, imitation leather and other plastics often find high shine a desirable appearance.

Previous syntheses of diaryl organic esters, e.g., 2-phenylethyl benzoate, have employed toxic solvents or explosive or expensive reagents. For example, 2-phenylethanol and benzoic acid have been condensed in acetonitrile solvent with the aid of a stoichiometric *N,N,N',N'*-tetramethylchloroformamidinium chloride reagent, prepared in situ from *N,N,N',N'*-tetramethylurea, oxalyl chloride and pyridine (Fujisawa et al., *Chem. Lett.* 1982, 1891-1894). (Oxalyl chloride is a toxic liquid and produces carbon monoxide, a toxic gas; pyridine has a sickening odor and adverse health effects.) Similarly, 2-phenylethanol and benzoic acid have been condensed in tetrahydrofuran solvent with the aid of a stoichiometric 3-methylbenzothiazole-2-selone/diethyl azodicarboxylate/*N,N*-dimethylaniline reagent (Mitsunobu et al., *Chem. Lett.* 1984, 855-858) or a stoichiometric triphenylphosphine/*S*-benzyl-*S*-phenyl-*N-p*-tosylsulfilimine reagent (Aida et al., *Chem. Lett.* 1975, 29-32). (The selenium and phosphorous by-products create a toxic waste problem, and tetrahydrofuran is not acceptable in personal care applications.) They have also been condensed in toluene with catalytic (ca. 7.3 mol %) toluenesulfonic acid, prepared in situ from toluene and sulfuric acid (Zardecki et al., *Polish Patent*, PL 55230, issued 1968/05/15). (Our strong acid procedure features a low concentration, 0.47 mol %, of methanesulfonic acid, which has a low molecular weight and produces a smaller waste stream.)

2-Phenylethyl benzoate has also been prepared from 2-phenylethanol and benzoic anhydride with alkali or alkali earth metal perchlorates as catalysts (Chakraborti et al., *Tetrahedron* 2003, 7661-7668), in dichloromethane solvent with vanadium salts as catalysts (Chen, *U.S. Patent*

6,541,659, issued 2003/04/01) or with bismuth tris(trifluoromethanesulfonate) catalyst (Orita et al., *Angew. Chem. Int. Ed.* 2000, 2877-2879). (Perchlorates are an explosion hazard, and dichloromethane is not acceptable in personal care applications.) It has also been prepared from 2-phenylethanol and benzoic anhydride in *N,N*-dimethylformamide solvent with equimolar 1,1,3,3-tetramethylguanidine (Kim et al., *Bull. Korean Chem. Soc.* 1984, 205-206). (*N,N*-Dimethylformamide is not acceptable in personal care applications.)

Finally, 2-phenylethyl benzoate has been prepared from 2-phenylethanol and benzoyl chloride in acetonitrile solvent with ZnCl_2 reagent (Kim et al., *Synth. Commun.* 1986, 659-666) or neat with pyridine base (Tommila, *Ann. Acad. Sci. Fenn., Ser. A*, 1942, vol. 59, 2-34). (Zn has waste disposal problems, and acetonitrile and pyridine are toxic.)

Accordingly, it is an object of this invention to provide a composition including an active or functional organic compound, which is solubilized by a safe and effective organic compound as solvent, cosolvent or additive.

Another object is to provide a personal care, e.g., a sunscreen, cosmetic, pharmaceutical, agricultural or industrial composition containing a solid active or functional organic compound which is solubilized therein.

A further object herein is to solubilize at least 10%, preferably 20%, most preferably 30% (w/w) or more of the active with the solubilizer of the invention.

A specific object of the invention is to provide a sunscreen composition containing active UVA and/or UVB compounds, which are solubilized by an effective organic solvent.

It is an object of this invention to provide a sunscreen composition which includes an additive ingredient which boosts the SPF rating of the composition.

Another object herein is to provide sunscreen compositions which require less UV-B compound to achieve a desired SPF rating for the composition.

A further object of this invention to provide an antiperspirant composition which leaves a reduced visible residue on the skin of the user.

Another object of the invention is to provide an antiperspirant composition containing an additive preferably having a refractive index which substantially matches the refractive index of the white, chalky residue formed after use thereby significantly reducing the appearance of the visible white, chalky residue on the skin of the user.

Yet another object of this invention to provide a method and composition for imparting high shine, gloss or luster to a polymeric substrate, such as hair or skin, leather, imitation leather or other plastics.

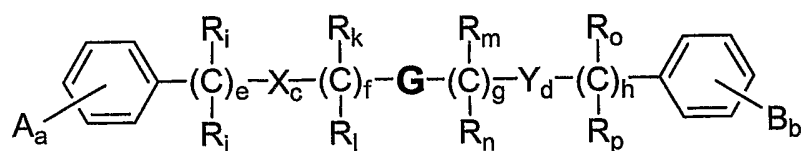
Still another object of the invention is to provide a process for synthesis of the solubilizer compound that economically affords a product with low color and low odor and that has a low environmental impact and no dangerous (e.g., toxic or explosive) reagents or by-products.

These and other objects and features of the invention will be made apparent from the following description.

SUMMARY OF THE INVENTION

What is described herein is a composition of an active or functional organic compound which is solubilized in a diaryl organic compound containing a polar or polarizable functional group.

A general formula for the solubilizer compounds of the invention is shown below:



where

G = polar or polarizable functional group (e.g., ester, amide, carbonate, carbamate, urea, carbonyl, oxa, oxo, alkylidene, silyl, sulfonyl, sulfoxyl, phosphonyl, phosphinyl, etc., or thio derivatives thereof).

$X_c, Y_d = \mathbf{G}$ or heteroatom and any attached groups (e.g., O, S, or NR_q , etc.).

$A_a, B_b = \text{H, F, alkyl or fluoralkyl groups, CN, CO}_2\text{R}_r$, or heterogroups
(e.g., OH, OR_s , O_2CR_t , NR_uR_v , NO_2 , F, Cl, $\text{SiR}_w\text{R}_x\text{R}_y$, SO_3R_z , etc.).

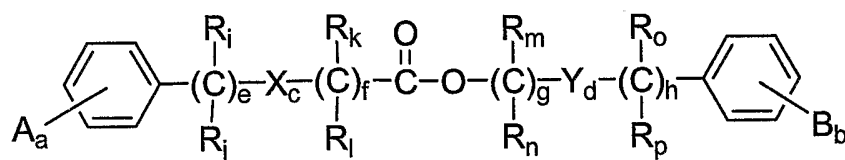
$\text{R}_i\text{--R}_z = \text{H, F, alkyl or fluoralkyl groups (e.g., methyl, ethyl, } n\text{-propyl, } i\text{-propyl, } n\text{-butyl, } s\text{-butyl, } i\text{-butyl, } t\text{-butyl, etc., or their fluoro analogs) or alkoxy groups OR' (R' = R}_i\text{--R}_z\text{)}.$

$a, b = 1\text{--}5$

$c, d = 0\text{--}2$

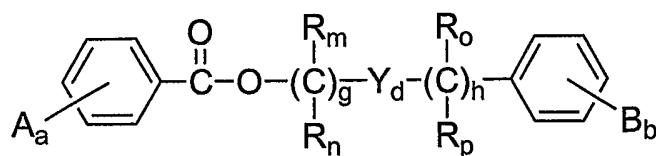
$e\text{--}z = 0\text{--}4.$

A preferred class of compounds is diaryl esters, i.e., an aryl carboxylic acid ester of an aryl alcohol:



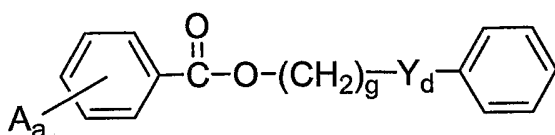
where A, B, X, Y, and R are defined as above.

Suitable compounds include aryl benzoates, having the formula:



where A, B, Y, and R are defined as above.

Preferred compounds have the formula:



where A and Y are as defined above, and $g = 1-3$.

In preferred forms of the invention, the ester is a 2-phenylethyl, benzyl or substituted benzyl benzoate, the active or functional organic compound is a solid organic compound, e.g., a personal care, cosmetic, sunscreen (UV filter), pharmaceutical, agricultural or industrial compound; most preferably an active sunscreen ingredient, e.g., a sunscreen composition containing UVA and/or UVB chemical compounds, e.g., avobenzene and/or benzophenone-3. Typically, the sunscreen composition exhibits increased SPF, UVA/UVB absorbance ratio and critical wavelength.

Also described herein is an antiperspirant composition including

- (a) an active antiperspirant ingredient, solubilized in
- (b) a diaryl organic compound containing a polar or polarizable functional group, which leaves a reduced visible white chalky residue on the skin of the user.

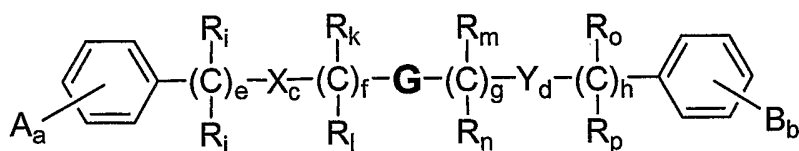
Representative diaryl organic compounds include phenylethyl esters such as 2-phenylethyl benzoate, 2-phenethyl toluate or di-2-phenylethyl phthalate, 1-phenylethyl benzoate, or benzyl benzoate, preferably 2-phenylethyl benzoate.

The active is solubilized in an amount of at least 10%, preferably 20%, most preferably 30% w/w or more with the solubilizer of the invention.

Another feature of the invention is the provision of processes for producing the ester derivatives, as detailed below.

DETAILED DESCRIPTION OF THE INVENTION

The most general formula for the compounds of the invention is the following:



where

G = polar or polarizable functional group (e.g., ester, amide, carbonate, carbamate, urea, carbonyl, oxa, oxo, alkylidene, silyl, sulfonyl, sulfoxyl, phosphonyl, phosphinyl, thio, etc., or derivatives thereof).

X_c, Y_d = **G** or a heteroatom and any attached groups (e.g., O, S, or NR_q , etc.).

A_a, B_b = H, F, alkyl or fluoroalkyl groups, such alkyl and fluoroalkyl groups preferably containing 1-8 and more preferably 1-4 carbon atoms, CN , CO_2R_r , or heterogroups

(e.g., OH, OR_s , O_2CR_t , NR_uR_v , NO_2 , F, Cl, $SiR_wR_xR_y$, SO_3R_z , etc.).

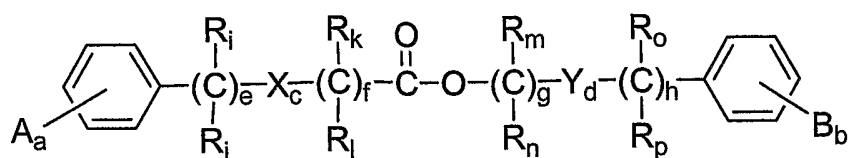
R_i-R_z = H, F, alkyl or fluoroalkyl groups such alkyl and fluoroalkyl groups preferably containing 1-8 and more preferably 1-4 carbon atoms (e.g., methyl, ethyl, *n*-propyl, *i*-propyl, *n*-butyl, *s*-butyl, *i*-butyl, *t*-butyl, etc., or their fluoro analogs) or alkoxy groups OR' ($R' = R_i-R_z$).

a, b are independently 1-5

c, d are independently 0-2

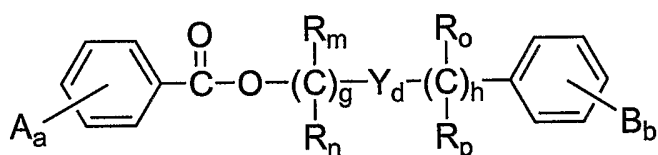
e through z are independently 0-4.

A preferred class of compounds is diaryl esters, i.e., an aryl carboxylic acid ester of an aryl alcohol:



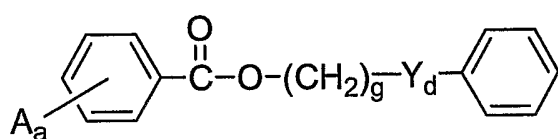
where A, B, X, Y, and R are defined as above.

Suitable compounds include aryl benzoates, having the formula:



where A, B, Y, and R are defined as above.

Preferred compounds have the formula:



where A and Y are as defined above, and g = 1-3.

Representative compounds of the invention have the named formulas shown in Chart 1:

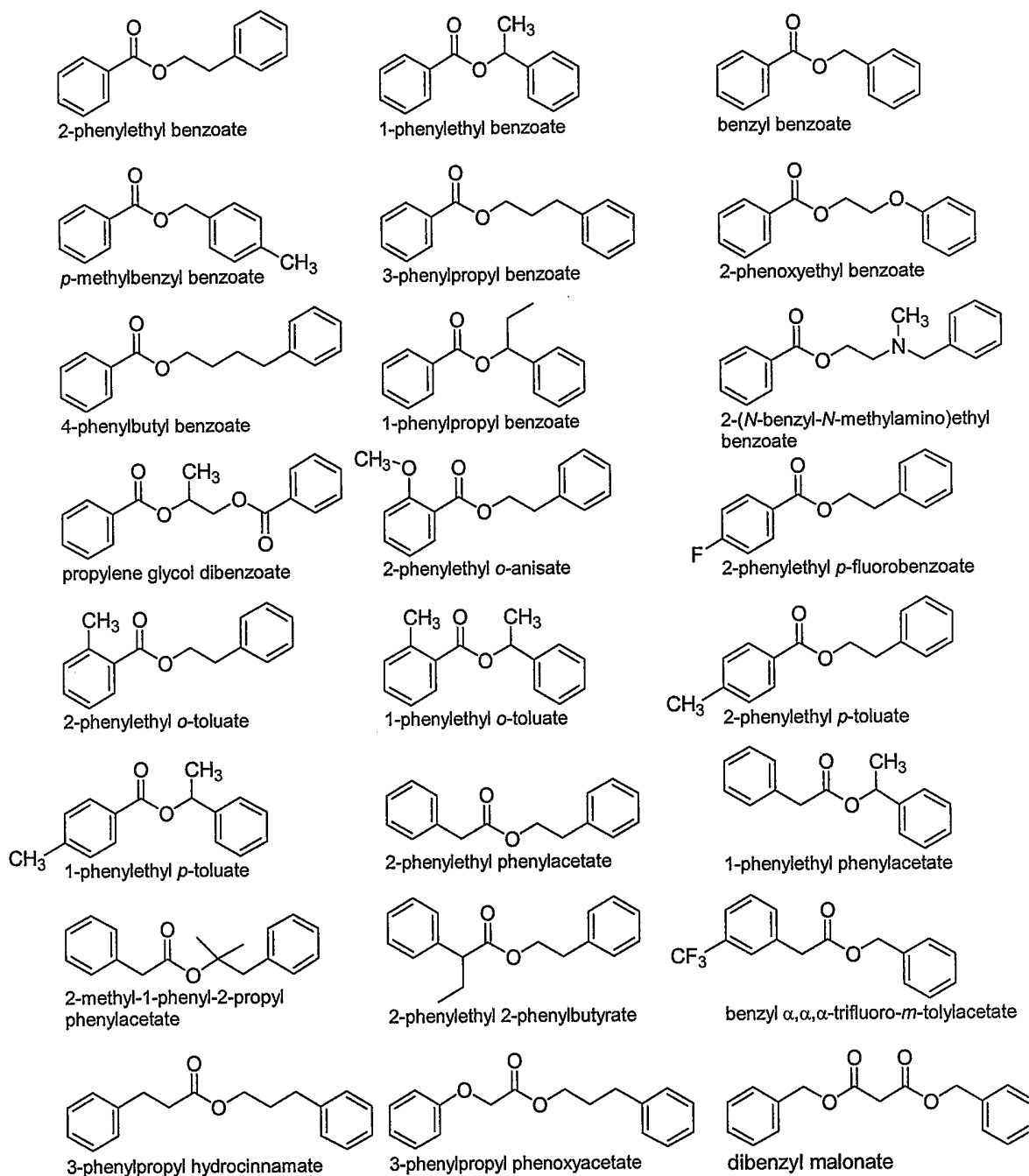


Chart 1. Representative compounds of the invention.

Process for Making the Solubilizer of the Invention

The process for making a typical solubilizer of the invention will be illustrated by the examples below. Accordingly, 2-phenylethyl benzoate solubilizer was prepared by reacting 2-phenylethanol (phenethyl alcohol) and benzoic acid in the presence of a catalyst, e.g., a Lewis acid catalyst such as tin oxalate (FASCAT 2001[®]) at temperatures above ca. 180°C, preferably at ca. 190-220°C, or a Brønsted ('strong') acid catalyst such as methanesulfonic acid, preferably at ca. 150-170°C. Additives such as triisodecylphosphite (TDP) and hypophosphorous acid (HPA) can improve the color of the product. Purification involves distillation of excess 2-phenylethanol or extraction of excess benzoic acid with aqueous sodium carbonate and treatment with activated carbon. Alternately, most of the products can be purified by distillation under high vacuum.

Acid chlorides, anhydrides and esters are also useful starting materials. Representative compounds of the invention are summarized in Chart 1, and their preparations are described in the Examples below.

Invention Compositions

Formulations such as sunscreen compositions containing active UVA and UVB compounds, e.g., avobenzene, benzophenone-3, and 4-methylbenzylidene camphor were effectively solubilized in 2-phenylethyl benzoate or the other compounds of the invention. Enhancement of the UVA component of their absorption spectrum relative to the UVB portion, boosting of the SPF, and increased critical wavelength were typically observed.

Other UV filter actives that may be employed in the present inventive compositions (and solubilized in 2-phenylethyl benzoate, 2-phenethyl *p*-toluate, benzyl benzoate, etc.) include *p*-Aminobenzoic acid (PABA), Camphor benzalkonium methosulfate, Homosalate, Phenylbenzimidazole sulfonic acid, Terephthalidene dicamphor sulfonic acid, Benzylidene camphor sulfonic acid, Octocrylene, Polyacrylamidomethyl benzylidene camphor, Ethylhexyl methoxycinnamate, PEG-25 PABA, Isoamyl *p*-methoxycinnamate, Ethylhexyl triazone, Drometrizole trisiloxane, Diethylhexyl butamido triazone,

3-Benzylidene camphor, Ethylhexyl salicylate, Ethylhexyl dimethyl PABA, Benzophenone-4, Benzophenone-5, Methylene bis-benzotriazolyl tetramethylbutylphenol, Disodium phenyl dibenzimidazole tetrasulfonate, Bis-ethylhexyloxyphenol methoxyphenol triazine, and Polysilicone-15. Such compositions may include one or more of the aforementioned UV filter actives, including avobenzene, benzophenone-3, and 4-methylbenzylidene camphor (MBC).

Other actives such as personal care, cosmetic, pharmaceutical, agricultural and industrial compounds are effectively solubilized by the compounds of the invention, including such actives as antibacterial and herbicidal, e.g., algacidal, compounds, particularly to keep the active in emulsion form without crystallizing or precipitating out of the emulsion, and without requiring the use of large amounts of solvent. Examples of such pharmaceutical compositions include one or more of Furosemide, Lovastatin, Clarithromycin, Diclofenac, Famotidine, Carbamazepine, Dipridamole, Chlorthiazide, Spironolactone, Dilantin, Imipranine, Melfloquine, Cyclosporine, Glyburide, and Nimodipine. Compositions of the present invention may also include combinations of actives or functional organic compounds, such as, for example, a pharmaceutical (one or more thereof) and a UV filter active (one or more thereof, as well).

The sunscreens which may be formulated according to the present invention typically comprise chemical absorbers, but may also comprise physical blockers. Exemplary sunscreens which may be formulated into the compositions of the present invention are chemical absorbers such as *p*-aminobenzoic acid derivatives, anthranilates, benzophenones, camphor derivatives, cinnamic derivatives, dibenzoyl methanes, β,β -diphenylacrylate derivatives, salicylic derivatives, triazine derivatives, benzimidazole compounds, bis-benzoazolyl derivatives, methylene bis-(hydroxyphenyl-benzotriazole) compounds, the sunscreen polymers and silicones, or mixtures thereof. These are variously described in U.S. Patents Nos. 2,463,264, 4,367,390, 5,166,355 and 5,237,071 and in EP-0,863,145, EP-0,517,104,

EP-0,570,838, EP-0,796,851, EP-0,775,698, EP-0,878,469, EP-0-933,376, EP-0,893,119, EP-0,669,323, GB-2,303,549, DE-1,972,184 and WO-93/04665, also expressly incorporated by reference. Also exemplary of the sunscreens which may be formulated into the compositions of this invention are physical blockers such as cerium oxides, chromium oxides, cobalt oxides, iron oxides, red petrolatum, silicone-treated titanium dioxide, titanium dioxide, zinc oxide, and zirconium oxide, or mixtures thereof.

A wide variety of sunscreens is described in U.S. Patent No. 5,087,445, issued to Haffey et al. on February 11, 1992; U.S. Patent No. 5,073,372, issued to Turner et al. on December 17, 1991; and Chapter VIII of Cosmetics, Science and Technology by Segarin et al., pages 189 et seq. (1957), all of which are incorporated herein by reference in their entirety.

Preferred among those sunscreens which may be formulated into the compositions of the instant invention are those selected from among: aminobenzoic acid, amyldimethyl PABA, cinoxate, diethanolamine *p*-methoxycinnamate, digalloyl trioleate, dioxybenzone, 2-ethoxyethyl *p*-methoxycinnamate, ethyl 4-bis(hydroxypropyl)aminobenzoate, 2-ethylhexyl 2-cyano-3,3-diphenylacrylate, ethylhexyl *p*-methoxycinnamate, 2-ethylhexyl salicylate, glyceryl aminobenzoate, homomenthyl salicylate, homosalate, 3-imidazol-4-ylacrylic acid and ethyl ester, methyl anthranilate, octyldimethyl PABA, 2-phenylbenzimidazole-5-sulfonic acid and salts, red petrolatum, sulisobenzene, titanium dioxide, triethanolamine salicylate, *N,N,N*-trimethyl-4-(2-oxoborn-3-ylidene methyl)anillinium methyl sulfate, and mixtures thereof.

Similarly preferred sunscreens active in the UV-A and/or UV-B range include:

- p*-aminobenzoic acid,
- polyoxyethylene *p*-aminobenzoate,
- 2-ethylhexyl *p*-dimethylaminobenzoate,
- ethyl *N*-oxypropylene *p*-aminobenzoate,
- glycerol *p*-aminobenzoate,
- 4-isopropylbenzyl salicylate,

2-ethylhexyl 4-methoxycinnamate,
methyl diisopropylcinnamate,
isoamyl 4-methoxycinnamate,
diethanolamine 4-methoxycinnamate,
3-(4'-trimethylammonium)-benzyliden-bornan-2-one methylsulfate,
2-hydroxy-4-methoxybenzophenone,
2-hydroxy-4-methoxybenzophenone-5-sulfonate,
2,4-dihydroxybenzophenone,
2,2',4,4'-tetrahydroxybenzophenone,
2,2'-dihydroxy-4,4'-dimethoxybenzophenone,
2-hydroxy-4-*n*-octyloxybenzophenone,
2-hydroxy-4-methoxy-4'-methoxybenzophenone,
 α -(2-oxoborn-3-ylidene)-tolyl-4-sulfonic acid and soluble salts,
3-(4'-sulfo)benzyliden-bornan-2-one and soluble salts,
3-(4'methylbenzylidene)-d,l-camphor,
3-benzylidene-d,l-camphor,
benzene 1,4-butanediol-di(3-methylidene-10-camphosulfonic) acid and
salts thereof,
terephthalylidene-3,3'-dicamphor-10,10'-disulfonic acid
2,4,6-tris[*p*-(2'-ethylhexyl-1'-oxycarbonyl)-anilino]-1,3,5-triazine,
2-[(*p*-(*tert*-butylamido)anilino]-4,6-bis-[(*p*-(2'-ethylhexyl-1'-oxy-
carbonyl)aniline]-1,2,5-triazine,
2,4-bis[[4-(2-ethylhexyloxy)]-2-hydroxy]-phenyl]-6-(4-methoxyphenyl)-
1,3,5-triazine ("TINOSORB S", marketed by Ciba),
the polymer of *N*-(2 and 4)-[(2-oxoborn-3-yliden)methyl]benzyl]-
acrylamide,
1,4 butanediol-bisbenzimidazolyl-phenylen-3,3',5,5'-tetrasulfonic acid
and salts thereof,
the benzalmalonate-substituted polyorganosiloxanes,
the benzotriazole-substituted polyorganosiloxanes (e.g., Drometrizole
Trisiloxane),

dispersed 2,2'-methylene-bis-[6-(2*H*-benzotriazol-2-yl)-4-(1,1,3,3-tetramethylbutyl)phenol] such as that marketed under the trademark MIXXIM BB/100 by Fairmount Chemical, or micronized in dispersed form thereof such as that marketed under the trademark "TINOSORB M" by Ciba-Geigy, and solubilized 2,2'-methylene-bis-[6-(2*H*-benzotriazol-2-yl)-4-(methyl)phenol] such as that marketed under the trademark "MIXXIM BB/200" by Fairmount Chemical.

Typically preferred among the subject sunscreens are one or more of the following: octyl salicylate, octocrylene, and oxybenzone. Combinations of one or more of these sunscreens are similarly preferred.

The dibenzoyl methane derivatives other than avobenzone are also preferred sunscreens according to the present invention. These are described, for example, in FR-2,326,405, FR-2,440,933 and EP-0,114,607, hereby expressly incorporated by reference.

More preferred dibenzoyl methane sunscreens include (whether singly or in any combination):

- 2-methyldibenzoylmethane
- 4-methyldibenzoylmethane
- 4-isopropyldibenzoylmethane
- 4-*tert*-butyldibenzoylmethane
- 2,4-dimethyldibenzoylmethane
- 2,5-dimethyldibenzoylmethane
- 4,4'-diisopropyldibenzoylmethane
- 4,4'-dimethoxydibenzoylmethane
- 2-methyl-5-isopropyl-4'-methoxydibenzoylmethane
- 2-methyl-5-*tert*-butyl-4'-methoxydibenzoylmethane
- 2,4-dimethyl-4'-methoxydibenzoylmethane
- 2,6-dimethyl-4-*tert*-butyl-4'-methoxydibenzoylmethane

At least one of the subject UV-A and/or UV-B sunscreens is advantageously formulated into the compositions of the invention in amounts ranging from about 0.1% to about 10%, and preferably from about 1% to

about 6%, by weight thereof. Of course, depending upon the nature of the particular formulation, higher or lower amounts may be suitable.

The compositions of the present invention can be formulated into a wide variety of product types, including creams, dispersions, emulsions (e.g., oil-in-water, water-in-oil, water-in-oil-in-water, and oil-in-water-in-silicone), gels, ointments, lotions, milks, mousses, sprays, tonics, and the like.

The topical cosmetic compositions of the present invention typically comprise a carrier (vehicle or diluent) or mixture of carriers. The carrier should be cosmetically and/or pharmaceutically acceptable, which reflects that the carrier is suitable for topical application onto the skin, has good aesthetic properties, is compatible with the copolymer of the present invention, and any other components, and will not cause any untoward safety or toxicity concerns. The carriers and additional components used to formulate such products vary with the product type and may be routinely chosen by one skilled in the art. The following is a description of some of these carriers and additional components.

The compositions of the present invention can comprise a carrier, or a mixture of carriers, suitable for topical application onto the human skin. The carriers typically constitute from about 0.5% to about 99.5% by weight, preferably from about 5.0% to about 99.5% by weight, more preferably from about 10.0% to about 98.0% by weight, of the composition. As used herein, the phrase "suitable for topical application onto human skin" reflects that the carrier does not damage or negatively affect the aesthetics of, or cause irritation to, human skin.

Carriers suitable for use with the present invention include, for example, those used in the formulation of a wide variety of product types, including creams, dispersions, emulsions, gels, lotions, milks, mousses, sprays, and tonics.

The carriers used herein can include a wide range of components conventionally used in cosmetic/dermatological compositions. The carriers can contain a solvent to dissolve or disperse the polymer. The carriers can also contain a wide variety of additional materials including, but not limited to,

esters (such as isopropyl myristate), halogenated hydrocarbons (such as freons), hydrocarbons (such as decene, hexane, and isobutene), linalool, and volatile silicon derivatives (especially siloxanes such as phenyl pentamethyl disiloxane, methoxypropyl heptamethyl cyclotetrasiloxane, chloropropyl pentamethyl disiloxane, hydroxypropyl pentamethyl disiloxane, octamethyl cyclotetrasiloxane, decamethyl cyclopentasiloxane, cyclomethicone, dimethicone), and mixtures thereof.

Mousses and aerosol sprays can also include any of the conventional propellants to deliver the material as a foam, in the case of a mousse, or as a fine, uniform spray, in the case of an aerosol spray. Examples of suitable propellants include materials such as hydrofluorinated compounds, dichlorodifluoromethane, difluoroethane, dimethylether, isobutene, n-butane, propane, or trichlorofluoromethane. A tonic or spray product having a low viscosity may also include an emulsifying agent. Examples of suitable emulsifying agents are anionic surfactants, cationic surfactants, nonionic surfactants, and mixtures thereof. Fluorosurfactants are especially preferred, particularly if the product is a preferred spray composition and most especially if it is a spray composition having a relatively low level of volatile organic solvents, such as alcohols, and relatively high levels of water (i.e., in excess of about 10 wt. %). If such an emulsifying agent is included, it is preferably present at a level of from about 0.01% to about 7.5% by weight of the composition. The level of propellant can be adjusted as desired, but is generally from about 3% to about 30% by weight of mousse compositions and from about 15% to about 50% by weight of the aerosol spray compositions.

Suitable spray compositions are well known in the art and include conventional, non-aerosol pump sprays, i.e., "atomizers", aerosol containers or cans having propellant, as described above, and also pump aerosol containers utilizing compressed air as the propellant. Pump aerosol containers are disclosed, for example, in U.S. Patent No. 4,077,441 and U.S. Patent No. 4,850,517.

A wide variety of additional components can be employed in the topical cosmetic/dermatological compositions herein. The compositions of the present invention can comprise a safe and effective amount of a pharmaceutical additive or adjuvant. The phrase "safe and effective" connotes an amount of an active agent high enough to significantly or positively modify the condition to be treated, but low enough to avoid serious side effects (at a reasonable benefit/risk ratio) within the scope of sound medical judgment. A safe and effective amount of the pharmaceutical active agent will vary with the specific active species, the ability of the composition to be applied, the particular condition being treated, the age and physical condition of the patient being treated, the severity of the condition, the duration of the treatment, the nature of concurrent therapy, and like factors.

The subject cosmetic/dermatological compositions can contain various emulsifiers when formulated as emulsions. These emulsifiers are useful for emulsifying the various carrier components of the compositions herein. Suitable emulsifiers can include any of a wide variety of nonionic, cationic, anionic, and zwitterionic emulsifiers disclosed in the prior patents and other references. See McCutcheon's, Detergents and Emulsifiers, North American Edition (1986), published by Allured Publishing Corporation; U.S. Patent No. 5,011,681, U.S. Patent No. 4,421,769 and U.S. Patent No. 3,755,560.

Suitable emulsifier types include acyl lactates, alkyl phosphates, carboxylic acid copolymers, esters and ethers of glucose, esters of glycerin, esters of propylene glycol, esters of sorbitan anhydrides, esters of sorbitol, ethoxylated ethers, ethoxylated alcohols, fatty acid amides, fatty acid esters of polyethylene glycol, fatty esters of polypropylene glycol, polyoxyethylene fatty ether phosphates, soaps and mixtures thereof.

Preferred emulsifiers can include, but are not limited to, cetareth-20, ceteth-10, cetyl phosphate, diethanolamine cetyl phosphate, glyceryl stearate, PEG-100 stearate, polyethylene glycol 20 sorbitan monolaurate, polyethylene glycol 5 soya sterol, polysorbate 60, polysorbate 80, potassium cetyl phosphate, PPG-2 methyl glucose ether distearate, steareth-20, and mixtures thereof.

Typically preferred among these emulsifiers which are useful in the compositions of the present inventions is PPG-2 isoceteth-20 acetate (described in U.S. Patent No. 4,559,226).

The subject cosmetic/dermatological compositions can also contain various emollients. Examples of suitable emollients include, but are not limited to, highly branched hydrocarbons, non-polar carboxylic acid and alcohol esters, volatile and non-volatile silicone oils, and mixtures thereof. See, U.S. Patent No. 4,919,934.

Typically preferred among these emollients which are useful in the compositions of the present inventions are one or more of the following: octyldodecyl neopentanoate and propylene glycol isoceteth-3 acetate.

A variety of additional components can be incorporated into the subject cosmetic/dermatological compositions. Non-limiting examples of these additional components include cationic polymers and thickeners, chelators, gums and thickeners, low pH thickening agents, and polymers for enhancing film-forming.

In summary, sunscreen compositions containing active UV-A and UV-B compounds, e.g., avobenzene (UV-A) and benzophenone-3 (UV-B) are used in this invention. Other UV filter actives that may be employed in the present inventive compositions include *p*-aminobenzoic acid (PABA), camphor benzalkonium methosulfate, homosalate, phenylbenzimidazole sulfonic acid, terephthalidene dicamphor sulfonic acid, benzylidene camphor sulfonic acid, octocrylene, polyacrylamidomethyl benzylidene camphor, ethylhexyl methoxycinnamate, PEG-25 PABA, isoamyl *p*-methoxycinnamate, ethylhexyl triazone, drometrizole trisiloxane, diethylhexyl butamido triazone, 4-methylbenzylidene camphor, 3-benzylidene camphor, ethylhexyl salicyate, ethylhexyl dimethyl PABA, benzophenone-4, benzophenone-5, methylene bis-benztriazolyl tetramethylbutylphenol, disodium phenyl dibenzimidazole tetrasulfonate, bis-ethylhexyloxyphenol methoxyphenol triazine, and polysilicone-15.

In accordance with the invention, it has been discovered herein that an antiperspirant composition which includes a specific diaryl organic compound as additive can mask the whitening effect of the unsightly white, chalky residue formed after use of the composition. Accordingly, the user experiences a reduced visible or non-whitening residue on the skin which is aesthetically pleasing to the consumer.

Preferred diaryl organic compounds used as additive in the antiperspirant compositions of the invention include an aryl carboxylic ester of phenylethyl alcohol, e.g., 2-phenylethyl benzoate, 2-phenylethyl toluate or di-2-phenylethyl phthalate. These compounds have a relatively high refractive index of about 1.5 which substantially matches the refractive index of the white, chalky residue. This refractive index matching manifests itself in a light effect on the residue so that effectively the user does not see any white residue.

While the invention will be described herein with particular emphasis on antiperspirant stick compositions, it will be understood that lotions, creams, roll-on solutions and aerosols may be used as well.

Typically, antiperspirant stick compositions include (a) an antiperspirant active ingredient, (b) a volatile silicone oil; (c) a water-insoluble emollient; (d) a low melting wax; (e) a coupling agent; and (f) a surface active agent.

The antiperspirant composition of the invention may take the form of an antiperspirant stick, lotion, cream, roll-on, solution or aerosol.

Suitable active antiperspirant ingredients include inorganic salt or organic compound, preferably an aluminum, zirconium or zinc salt, or mixtures thereof.

Most preferably, the antiperspirant ingredient is a coordination complex of aluminum zirconium tetrachlorohydrate and glycine.

As a feature of the invention, the refractive index of the diaryl organic compound in the composition herein substantially matches the refractive index of the white, chalky residue formed after use of the antiperspirant, thereby reducing the visible white, chalky residue which may form on the skin of the user.

Suitably, the diaryl organic compound additive is employed in the antiperspirant composition of the invention in an amount of about 1 to 10% by wt. of the composition, preferably about 2 to 7 wt. %.

Also described herein is a method of imparting high shine to a polymeric substrate such as hair or skin, leather or plastic, which comprises applying thereto a specific diaryl organic compound. The invention particularly includes compositions for imparting the desired high shine, gloss or luster to hair or skin.

Suitable diaryl organic compounds include phenylethyl, benzyl or substituted benzyl esters, which are aryl carboxylic esters of 2-phenylethyl alcohol, 1-phenylethyl alcohol, benzyl alcohol or substituted benzyl alcohol. Representative esters include 2-phenylethyl benzoate, 2-phenylethyl toluate, di-2-phenylethyl phthalate, 1-phenylethyl benzoate, benzyl benzoate and substituted benzyl benzoates. A preferred phenylethyl ester is 2-phenylethyl benzoate (X-Tend™ 226, ISP). Most preferably, the refractive index of the ester is about 1.5.

In this invention, the spectral reflections of light on hair or skin, or natural or synthetic leather or plastics are substantially enhanced by the presence of the phenylethyl ester thereon.

Typical personal care formulations are color cosmetics, a lipstick, or a hair care product.

In accordance with this invention it has been discovered that specific diaryl organic compounds can impart shine, gloss and luster to polymeric substrates such as hair or skin, or leather or imitation leather and other plastics, by application of the compound to the substrate, preferably in a hair fixative composition or a lipstick. It is believed that these properties are achieved because of the relatively high refractive index of the compounds. For example, the refractive index of X-Tend™ 226 is about 1.5.

Suitably, the diaryl organic compound is present in a composition in an amount sufficient to impart the desired shine to the substrate, e.g., hair or skin, generally in an amount of about 0.1-25% by weight of the composition, preferably 1-10%.

The invention will now be illustrated more particularly by the examples which follow:

EXAMPLE 1

Preparation of 2-Phenylethyl Benzoate (Lewis Acid Catalyst)

A 2-L, 4-neck, round-bottom flask, fitted with a thermometer, mechanical stirrer, nitrogen inlet tube and Liebig condenser/receiving flask, was charged with 671.7 g (5.50 mol, 1.00 equiv) of benzoic acid, 739.1 g (6.05 mol, 1.10 equiv) of 2-phenylethanol, and 2.5 g (0.2% w/w) of Fascat 2001[®]. The system was heated gently with slow stirring (<50 rpm) until all the benzoic acid was in solution. The air was removed with three cycles of evacuation/nitrogen fill using a mechanical vacuum pump (50-100 torr). The rate of stirring was increased to ca. 200 rpm, the nitrogen sparge was set at 0.2 scfh, and the reaction mixture was heated to 180°C. After a 1-h hold, 38.3 g of distillate had been collected. The alcohol (9.1 g) was separated and returned to the reaction mixture. The temperature was increased to 190°C and held for 1 h; an additional 45.2 g of distillate was collected. The alcohol (16.0 g) was separated and returned. The temperature was increased to 200°C and held for 1 h; an additional 33.5 g of distillate was collected. The alcohol (8.2 g) was separated and returned. Finally, the temperature was increased to 210°C, and the nitrogen sparge was increased to 0.5 scfh. After a 1-h hold, 21.2 g of distillate had been collected; 8.0 g of alcohol was separated, but not returned. The reaction mixture was cooled to room temperature and sampled for analysis. The acid number was 4.04 mg KOH/g (98.3% conversion), and the APHA color was 29. The excess 2-phenylethanol (4.4% by GLC) was removed by vacuum distillation at 175-180°C (20 torr, 0.5 scfh nitrogen sweep) for 2 h. The APHA color was 40. Activated carbon (37.1 g, 3% w/w) was added, and the mixture was heated at 75-80°C under vacuum (50-70 torr) for 1 h. The mixture was cooled to room temperature and filtered through Celite[®] to afford 1074 g (86%) of

2-phenylethyl benzoate (99.6% pure by GLC): residual alcohol, <0.05% (GLC); APHA color, 12; acid number, 0.98 mg KOH/g; saponification number, 244 mg KOH/g.

EXAMPLE 2

Preparation of 2-Phenylethyl Benzoate (Brønsted Acid Catalyst)

A 2-L, 4-neck, round-bottom flask, fitted with a thermometer, mechanical stirrer, nitrogen inlet tube and Liebig condenser/receiving flask, was charged with 671.7 g (5.50 mol, 1.00 equiv) of benzoic acid, 806.3 g (6.60 mol, 1.20 equiv) of 2-phenylethanol, 2.5 g (0.2% w/w, 0.47 mol %) of methanesulfonic acid (MSA) and 1.25 g (0.1% w/w) of triisodecylphosphite (TDP). The system was heated gently with slow stirring (<50 rpm) until all the benzoic acid was in solution. The air was removed with three cycles of evacuation/nitrogen fill using a mechanical vacuum pump (50-100 torr). The rate of stirring was increased to ca. 200 rpm, the nitrogen sparge was set at 0.2 scfh, and the reaction mixture was heated to 150°C. After a 1-h hold, the temperature was increased to 160°C, and the nitrogen sparge was increased to 0.5 scfh. After a 1-h hold, the temperature was increased to 170°C and held for 2 h. The reaction mixture was cooled to room temperature and sampled for analysis. The acid number was 5.4 mg KOH/g (98.1% conversion of benzoic acid, corrected for MSA), the APHA color was 49, and the excess 2-phenylethanol was 8.6% by GC. The reaction mixture was heated to 50°C, and 125 g of 10% w/w aqueous sodium carbonate was added. The batch was held at 50°C and stirred for 15 min. The stirring was stopped and the batch was allowed to settle for 30 min. The aqueous (bottom) layer was removed from the flask with a pipette, and 37.3 g (0.3% w/w) of activated carbon was added. The excess 2-phenylethanol was removed by vacuum distillation at 180-185°C (20 torr) for 1 h with a nitrogen sweep of 0.5 scfh. The reaction mixture was cooled to room temperature and filtered through Celite® to afford 1030 g (83%) of 2-phenylethyl benzoate

(98.7% pure by GLC): residual alcohol, 0.66% (GLC); APHA color, 89; acid number, 0.11 mg KOH/g; saponification number, 241 mg KOH/g.

EXAMPLE 3

Preparation of 2-Phenylethyl Benzoate from Benzoyl Chloride

A 2-L, 4-neck, round-bottom flask, fitted with a thermometer, mechanical stirrer, nitrogen inlet tube and Liebig condenser/receiving flask, was charged with 244.3 g (2.00 mol, 1.00 equiv) of 2-phenylethanol, 232.7 g (2.30 mol, 1.15 equiv) of triethylamine, and 376 g of toluene. The rate of stirring set at ca. 200 rpm, the nitrogen sparge was set at 0.1 scfh, and 286.8 g (2.04 mol, 1.02 equiv) of benzoyl chloride was added over a period of 1.5 h, while maintaining the temperature at 10-15°C. The ice bath was removed after an additional 0.5 h at ca. 10°C and the reaction mixture was allowed to warm to room temperature (23°C). After 18 h at room temperature, the conversion was 99%, and 500 g of water was added. After stirring for 30 min at 50°C, the phases were allowed to separate for 15 min, and the aqueous layer (bottom, pH 9) was removed with a pipette. The organic layer was washed with an additional 500 g of water, and the toluene was stripped at 100-105°C (100 torr). The residue was distilled at 170-172°C (5 torr) to afford 410 g (91%) of 2-phenylethyl benzoate (99.2% pure by GLC): residual alcohol, 0.08% (GLC); APHA color, 66; acid number, 0.57 mg KOH/g; saponification number, 247 mg KOH/g; refractive index, 1.5576; specific gravity, 1.096.

The process can be run without toluene or similar solvent; however, the reaction mixture tends to become thick and difficult to stir, owing to the precipitation of amine hydrochloride. The solvent also aids phase separation during the aqueous washes.

EXAMPLE 4

Preparation of 2-Phenylethyl Benzoate from Benzoic Anhydride

A 1-L, 4-neck, round-bottom flask, fitted with a thermometer, mechanical stirrer, nitrogen inlet tube and Liebig condenser/receiving flask, was charged with 294.1 g (1.30 mol, 1.00 equiv) of benzoic anhydride, 349.4 g (2.86 mol, 2.20 equiv) of 2-phenylethanol, and 1.18 g of Fascat 2001[®]. The system was heated gently with slow stirring (<50 rpm) until all of the benzoic anhydride dissolved. The air was removed with three cycles of evacuation/nitrogen fill using a mechanical vacuum pump (50-100 torr). The rate of stirring was increased to ca. 200 rpm, the nitrogen sparge was set at 0.1 scfh, and the reaction mixture was heated to 210°C. After a 1-h hold at 210°C, the amount of distillate was 24.4 g, from which 9.5 g of alcohol was separated and returned to the reaction mixture. The temperature was increased to 220°C for 1 h, during which time an additional 10.8 g of distillate was collected. The alcohol (3.7 g) was separated and returned to the reaction mixture. The temperature was increased to 230°C, and after a 1-h hold, an additional 1.8 g of distillate had been collected; the alcohol (0.5 g) was not returned. The acid number was 2.15 mg KOH/g. The excess alcohol was stripped and the product was treated with activated carbon as usual to give 470 g (80%) of 2-phenylethyl benzoate (99.4% pure by GLC). The residual alcohol was 0.08% by GLC and the APHA color was 426. The product was distilled as in Example 3 to obtain 430 g (73%) of 2-phenylethyl benzoate (99.7% pure by GLC): residual alcohol, 0.03% (GLC); APHA color, 10; acid number, 0.21 mg KOH/g; saponification number, 244 mg KOH/g; refractive index, 1.5575; specific gravity, 1.095.

EXAMPLE 5

Preparation of 2-Phenylethyl Benzoate (Ester Exchange)

A 1-L, 4-neck, round-bottom flask, fitted with a thermometer, mechanical stirrer, nitrogen inlet tube and reflux condenser, was charged with 492.6 g (3.00 mol, 1.50 equiv) of propyl benzoate, 244.3 g (2.00 mol, 1.00 equiv) of 2-phenylethanol, 2.3 g of Fascat 2001[®] (tin oxalate) and 2.3 g of Fascat[®] 4201 (dibutyltin oxide). The rate of stirring was set at ca. 200 rpm, the nitrogen sparge was set at 0.2 scfh, and the reaction mixture was heated at 150-160°C for 1 h, whereupon reflux commenced. The reflux condenser was replaced with a Liebig condenser/receiving flask, and distillate was removed for 30 min at 160°C with a nitrogen flow of 0.3 scfh. The temperature was increased to 170°C, the nitrogen flow was increased to 0.4 scfh, and distillation (90-95°C vapor temperature) was continued for 30 min. The temperature was increased by 10°C and the nitrogen sparge by 0.1 scfh every 30 min until the temperature was 230°C (30 min.), and a total of 119 g of distillate had been collected (theor. 120 g). The excess propyl benzoate was stripped, and the product was distilled as in Example 3 to obtain 390 g (86%) of 2-phenylethyl benzoate (99.6% pure by GLC): residual 2-phenylethanol, <0.01% (GLC); residual propyl benzoate, 0.1% (GLC); APHA color, 24; acid number, 0.20 mg KOH/g; saponification number, 245 mg KOH/g; refractive index, 1.5574; specific gravity, 1.095.

EXAMPLE 6

Preparation of 1-Phenylethyl Benzoate

The product (98.9% pure by GLC) was prepared from 1-phenylethanol and benzoyl chloride by the method of Example 3: acid number, 1.44 mg KOH/g; saponification number, 248 mg KOH/g; refractive index, 1.5555; specific gravity, 1.092.

EXAMPLE 7Preparation of Benzyl Benzoate

The product (99.3% pure by GLC) was prepared from benzyl alcohol and benzoic acid by the method of Example 1: acid number, 0.37 mg KOH/g; saponification number, 261 mg KOH/g; refractive index, 1.5661; specific gravity, 1.117.

EXAMPLE 8Preparation of *p*-Methylbenzyl Benzoate

The product (99.0% pure by GLC) was prepared from *p*-methylbenzyl alcohol and benzoic acid by the method of Example 1: acid number, 0.10 mg KOH/g; saponification number, 239 mg KOH/g; refractive index, 1.5597; specific gravity, 1.003.

EXAMPLE 9Preparation of 3-Phenylpropyl Benzoate

The product (99.7% pure by GLC) was prepared from 3-phenylpropanol and benzoic acid by the method of Example 1: acid number, 0.19 mg KOH/g; saponification number, 232 mg KOH/g; refractive index, 1.5515; specific gravity, 1.078.

EXAMPLE 10Preparation of 2-Phenoxyethyl Benzoate

The product (99.4% pure by GLC) was prepared from 2-phenoxyethanol and benzoic acid by the method of Example 1: acid number, 0.25 mg KOH/g; saponification number, 229 mg KOH/g; refractive index, 1.5608; specific gravity, 1.157.

EXAMPLE 11

Preparation of 4-Phenylbutyl Benzoate

The product (99.7% pure by GLC) was prepared from 4-phenylbutanol and benzoic acid by the method of Example 1: acid number, 0.05 mg KOH/g; saponification number, 220 mg KOH/g; refractive index, 1.5467; specific gravity, 1.063.

EXAMPLE 12

Preparation of 1-Phenylpropyl Benzoate

The product (98.4% pure by GLC) was prepared from 1-phenylpropanol and benzoyl chloride by the method of Example 3: acid number, 0.96 mg KOH/g; saponification number, 233 mg KOH/g; refractive index, 1.5494; specific gravity, 1.074.

EXAMPLE 13

Preparation of 2-(N-benzyl-N-methylamino)ethyl Benzoate

The product (98.1% pure by GLC) was prepared from 2-(N-benzyl-N-methylamino)ethanol and propyl benzoate by the method of Example 5: acid number, 0.65 mg KOH/g; saponification number, 208 mg KOH/g; refractive index, 1.5483; specific gravity, 1.074.

EXAMPLE 14

Preparation of Propylene Glycol Dibenzoate

The product (98.9% pure by GLC) was prepared from 1,2-propanediol (propylene glycol) and benzoic acid by the method of Example 1: acid number, 3.31 mg KOH/g; saponification number, 388 mg KOH/g; refractive index, 1.5433; specific gravity, 1.148.

EXAMPLE 15

Preparation of 2-Phenylethyl o-Anisate

The product (97.0% pure by GLC) was prepared from 2-phenylethanol and anisic acid by the method of Example 1: acid number, 2.96 mg KOH/g; saponification number, 218 mg KOH/g; refractive index, 1.5646; specific gravity, 1.139.

EXAMPLE 16

Preparation of 2-Phenylethyl p-Fluorobenzoate

The product (99.2% pure by GLC) was prepared from 2-phenylethanol and p-fluorobenzoic acid by the method of Example 1: acid number, 0.27 mg KOH/g; saponification number, 227 mg KOH/g; refractive index, 1.5425; specific gravity, 1.158.

EXAMPLE 17

Preparation of 2-Phenylethyl o-Toluate

The product (97.2% pure by GLC) was prepared from 2-phenylethanol and o-toluic acid by the method of Example 1: acid number, 0.01 mg KOH/g; saponification number, 225 mg KOH/g; refractive index, 1.5556; specific gravity, 1.082.

EXAMPLE 18

Preparation of 1-Phenylethyl o-Toluate

The product (98.0% pure by GLC) was prepared from 1-phenylethanol and o-toluic acid by the method of Example 3: acid number, 0.12 mg KOH/g; saponification number, 231 mg KOH/g; refractive index, 1.5543; specific gravity, 1.079.

EXAMPLE 19Preparation of 2-Phenylethyl *p*-Toluate

The product (96.1% pure by GLC) was prepared from 2-phenylethanol and *p*-toluic acid by the method of Example 1: acid number, 0.15 mg KOH/g; saponification number, 228 mg KOH/g; refractive index, 1.5547; specific gravity, 1.074.

EXAMPLE 20Preparation of 1-Phenylethyl *p*-Toluate

The product (98.5% pure by GLC) was prepared from 1-phenylethanol and *p*-toluic acid by the method of Example 3: acid number, 1.50 mg KOH/g; saponification number, 234 mg KOH/g; refractive index, 1.5539; specific gravity, 1.069.

EXAMPLE 21Preparation of 2-Phenylethyl Phenylacetate

The product (98.6% pure by GLC) was prepared from 2-phenylethanol and phenylacetic acid by the method of Example 1: acid number, 0.16 mg KOH/g; saponification number, 231 mg KOH/g; refractive index, 1.5472; specific gravity, 1.081.

EXAMPLE 22Preparation of 1-Phenylethyl Phenylacetate

The product (98.6% pure by GLC) was prepared from 1-phenylethanol and phenylacetyl chloride by the method of Example 3: acid number, 1.39 mg KOH/g; saponification number, 228 mg KOH/g; refractive index, 1.5434; specific gravity, 1.073.

EXAMPLE 23

Preparation of 2-Methyl-1-phenyl-2-propyl Phenylacetate

The product (95.3% pure by GLC, 2:1 mixture of isomers) was prepared from 2-methyl-1-phenyl-2-propanol and phenylacetic acid by the method of Example 3: acid number, 9.22 mg KOH/g; saponification number, 173 mg KOH/g; refractive index, 1.5438; specific gravity, 1.053.

EXAMPLE 24

Preparation of 2-Phenylethyl 2-Phenylbutyrate

The product (99.7% pure by GLC) was prepared from 2-phenylethanol and 2-phenylbutyric acid by the method of Example 1: acid number, 0.26 mg KOH/g; saponification number, 207 mg KOH/g; refractive index, 1.5351; specific gravity, 1.047.

EXAMPLE 25

Preparation of Benzyl α,α,α -Trifluoro-*m*-tolylacetate

The product (99.4% pure by GLC) was prepared from benzyl alcohol and α,α,α -trifluoro-*m*-toluic acid by the method of Example 1: acid number, 0.07 mg KOH/g; saponification number, 189 mg KOH/g; refractive index, 1.5054; specific gravity, 1.233.

EXAMPLE 26

Preparation of 3-Phenylpropyl Hydrocinnamate

The product (99.6% pure by GLC) was prepared from 3-phenylpropanol and hydrocinnamic acid by the method of Example 1: acid number, 0.12 mg KOH/g; saponification number, 206 mg KOH/g; refractive index, 1.5379; specific gravity, 1.052.

EXAMPLE 27

Preparation of 3-Phenylpropyl Phenoxyacetate

The product (99.5% pure by GLC) was prepared from 3-phenylpropanol and phenoxyacetic acid by the method of Example 1: acid number, 0.05 mg KOH/g; saponification number, 206 mg KOH/g; refractive index, 1.5454; specific gravity, 1.111.

EXAMPLE 28

Preparation of Dibenzyl Malonate

The product (97.9% pure by GLC) was prepared from benzyl alcohol and dimethyl malonate by the method of Example 5: acid number, 0.43 mg KOH/g; saponification number, 387 mg KOH/g; refractive index, 1.5415; specific gravity, 1.161.

EXAMPLE 29

Solubility of Solid Organic Sunscreens in Various Solvents

Predetermined solutions (w/w) were prepared at 40-50°C using a given solvent-sunscreen combination. The solutions were allowed to stand for 1 week at 25°C in a constant temperature chamber. A small seed crystal was initially added at 25°C to hasten equilibration. Solubility was measured by GLC using standard solutions to calibrate the instrument. As shown below in Table 1, the solubilizer of the invention is effective in solubilizing at least 10%, preferably 20%, most preferably 30% or more (w/w) of at least one of the sunscreens.

Table 1. Solubility data for sunscreen compounds.

Solvent	Sunscreen		
	Avobenzene	Oxybenzone	MBC
2-phenylethyl benzoate	26	36	39
1-phenylethyl benzoate	26	35	40
benzyl benzoate	28	38	40
<i>p</i> -methylbenzyl benzoate	30	36	39
3-phenylpropyl benzoate	31	35	38
2-phenoxyethyl benzoate	A	35	a
4-phenylbutyl benzoate	27	32	37
1-phenylpropyl benzoate	23	32	39
2-(<i>N</i> -benzyl- <i>N</i> -methylamino)ethyl benzoate	25	31	35
propylene glycol dibenzoate	21	32	33
2-phenylethyl <i>o</i> -anisate	26	33	32
2-phenylethyl <i>p</i> -fluorobenzoate	23	33	37
2-phenylethyl <i>o</i> -toluate	24	33	40
1-phenylethyl <i>o</i> -toluate	25	32	39
2-phenylethyl <i>p</i> -toluate	26	33	39
1-phenylethyl <i>p</i> -toluate	34	34	39
2-phenylethyl phenylacetate	17	35	33
1-phenylethyl phenylacetate	17	34	35
2-methyl-1-phenyl-2-propyl phenylacetate	23	34	37
2-phenylethyl 2-phenylbutyrate	20	30	34
benzyl α,α,α -trifluoro- <i>m</i> -tolylacetate	15	28	34
3-phenylpropyl hydrocinnamate	20	33	33
3-phenylpropyl phenoxyacetate	17	33	31
dibenzyl malonate	14	31	25
C ₁₂₋₁₅ alkyl benzoate (Finsolv TN [®] control)	16	16	29

^aEntire mixture solidified.

Examples 30 and 31 describe typical sunscreen formulations with and without X-Tend™ 226 (2-phenylethyl benzoate) present therein. The results show that the presence of X-Tend™ 226 increases the SPF factor of the formulation.

EXAMPLE 30**Anhydrous Oil Sunscreen Composition with X-Tend™ 226**

Phase	Ingredient	% w/w
A	Ceraphyl 368 (Ethylhexyl Palmitate)	5.00
	Escalol 567 (Oxybenzone)	3.00
	Escalol 517 (Avobenzone)	3.00
	Ceraphyl 41 (C ₁₂₋₁₅ Alkyl Lactate)	20.00
	X-Tend 226	20.00
	Escalol 597 (Octocrylene)	1.50
	Escalol 587 (Octisalate)	5.00
	Ceraphyl 55 (Tridecyl Neopentanoate)	5.00
	Escalol 557 (Octinoxate)	7.50
	Ganex V-216 (PVP-Hexadecene Copolymer)	3.00
	Vitamin E Acetate (Tocopheryl Acetate)	0.10
B	Si Tec DM 1 Plus (Dimethicone)	5.00
	Si Tec PTM 200 (Phenyl Trimethicone)	3.00
	Si Tec CM 040 (Cyclopentasiloxane)	17.70
C	Liquapar Optima (Phenoxyethanol and Methylparaben and Isopropylparaben and Isobutylparaben and Butylparaben)	1.00
	Suncare Fragrance RR 82895	0.20
		100.00

Procedure: The phase A ingredients were combined and mixed with moderate stirring at 70°C until homogeneous. The batch was cooled to 50°C, and the phase B ingredients were added, mixing after each addition until clear. At 40°C, the phase C ingredients were added, and the batch was mixed until clear.

SPF = 22.8, which is significantly higher than the value for the control.

Anhydrous Oil Sunscreen Composition (Control)

Phase	Ingredient	% w/w
A	Ceraphyl 368 (Ethylhexyl Palmitate)	5.00
	Escalol 567 (Oxybenzone)	3.00
	Ceraphyl 55 (Tridecyl Neopentanoate)	25.00
	Escalol 517 (Avobenzone)	3.00
	Ceraphyl 41 (C ₁₂₋₁₅ Alkyl Lactate)	20.00
	Escalol 587 (Octisalate)	5.00
	Escalol 597 (Octocrylene)	1.50
	Escalol 557 (Octinoxate)	7.50
	Ganex V-216 (PVP-Hexadecene Copolymer)	3.00
	Vitamin E Acetate (Tocopheryl Acetate)	0.10
B	Si Tec DM 1 Plus (Dimethicone)	5.00
	Si Tec PTM 200 (Phenyl Trimethicone)	3.00
	Si Tec CM 040 (Cyclopentasiloxane)	17.70
C	Liquapar Optima (Phenoxyethanol and Methylparaben and Isopropylparaben and Isobutylparaben and Butylparaben)	1.00
	Suncare Fragrance RR 82895 Ungerer	0.20
		100.00

Procedure: The phase A ingredients were combined and mixed with moderate stirring at 70°C until homogeneous. The batch was cooled to 50°C, and the phase B ingredients were added, mixing after each addition until clear. At 40°C, the phase C ingredients were added, and the batch was mixed until clear.

SPF = 12.0 was measured.

EXAMPLE 31**O/W Emulsion Sunscreen Composition**

Phase	Ingredients	% w/w
A	DI water	50.95
	Stabilize QM	0.50
	Butylene glycol	3.00
	Disodium EDTA	0.15
B	Cerasynt 840	2.00
	Cerasynt 945	2.50
	Ceraphyl 368	5.00
	Escalol 557	7.50
	Escalol 567	3.00
	Escalol 517	3.00
	X-Tend™ 226	20.00
C	NaOH 10%	1.40
D	Liquapar PE	1.00

Procedure:

Sprinkle Stabilize in water with mixing. Heat the phase A at 80°C. Maintain 85°C for 45 minutes with mixing. After 45 minutes add the remaining ingredients in phase A. Separate combine phase B ingredients heat at 80°C, mix until melted. Add phase B into phase A under propeller with good mixing. Mix until uniform. Start cooling down the batch. At 70°C add phase C (NOH 10% solution). At 40°C add phase D ingredient and mix well. SPF = 25.7.

O/W Emulsion Sunscreen Composition (Control)

Phase	Ingredients	% w/w
A	DI water	50.95
	Stabilize QM	0.50
	Butylene glycol	3.00
	Disodium EDTA	0.15
B	Cerasynt 840	2.00
	Cerasynt 945	2.50
	Ceraphyl 368	5.00
	Escalol 557	7.50
	Escalol 567	3.00
	Escalol 517	3.00
	Ceraphyl 41	20.00
C	NaOH 10%	1.40
D	Liquapar PE	1.00

Procedure:

Sprinkle Stabilize in water with mixing. Heat the phase A at 80°C. Maintain 85°C for 45 minutes with mixing. After 45 minutes add the remaining ingredients in phase A. Separate, combine phase B ingredients, heat at 80°C, mix until melted. Add phase B into phase A under propeller with good mixing. Mix until uniform. Start cooling down the batch. At 70°C add phase C (NaOH 10% solution). At 40°C add phase D ingredient and mix well. SPF = 22.6.

EXAMPLE 32Enhancement of UVA Absorption

A 10-mg portion of sunscreen was dissolved in 1 L of solvent, and the UV spectrum of the solution was measured using a Cary 1E UV-Visible spectrophotometer. The results in Table 2 demonstrate that greater UVA protection is afforded for the active sunscreen using 2-phenylethyl benzoate instead of C₁₂₋₁₅ benzoate in the composition.

Table 2. UVA Absorption Data

Solvent	λ_{max} , nm	
	E-517	E-567
Ethanol	358	325
C ₁₂₋₁₅ benzoate (Finsolv [®] TN)	358	328
2-phenylethyl benzoate (X-Tend [™] 226)	362	329

EXAMPLE 33

Broad Spectrum UVA/UVB Sunscreen Formulations

These 'anti-aging' formulations (Table 3) were examined for critical wavelength, a measure of UVA protection, using an Optometrics SPF 290 analyzer after five freeze-thaw cycles and then after 1 month of storage at 45°C. The higher the critical wavelength, the greater the UVA protection. As can be seen for both the freeze-thaw and 1-month storage conditions (Table 4), the formulation containing X-Tend[™] 226 (2-phenylethyl benzoate) was superior to the other formulations containing Finsolv[®] TN, Eldew[®] SL-205, Finsolv[®] TPP, and Elefac[®] I-305.

Table 3. Anti-aging cream formulations.

Ingredient	Formulation				
	1	2	3	4	5
	% w/w	% w/w	% w/w	% w/w	% w/w
Phase A					
Deionized water	57.35	57.35	57.35	57.35	57.35
Stabileze [®] QM	0.50	0.50	0.50	0.50	0.50
Butylene glycol	3.00	3.00	3.00	3.00	3.00
Disodium EDTA	0.10	0.10	0.10	0.10	0.10
Phase B					
Cerasynt [®] 840	1.50	1.50	1.50	1.50	1.50
Cerasynt [®] 945	2.00	2.00	2.00	2.00	2.00
Escalol [®] 557	7.50	7.50	7.50	7.50	7.50
Escalol [®] 517	3.00	3.00	3.00	3.00	3.00
Escalol [®] 587	5.00	5.00	5.00	5.00	5.00
Escalol [®] 567	2.00	2.00	2.00	2.00	2.00
X-Tend[™] 226	10.00	0.00	0.00	0.00	0.00
Finsolv[®] TN	0.00	10.00	0.00	0.00	0.00
Eldew[®] SL-205	0.00	0.00	10.00	0.00	0.00
Finsolv[®] TPP	0.00	0.00	0.00	10.00	0.00
Elefac[®] I-305	0.00	0.00	0.00	0.00	10.00
Phase C					
Sodium hydroxide, 10% w/w	1.30	1.30	1.30	1.30	1.30
Deionized water	5.00	5.00	5.00	5.00	5.00
Phase D					
Liquapar [®] Optima	1.25	1.25	1.25	1.25	1.25
Liquapar [®] Oil	0.40	0.40	0.40	0.40	0.40
Phase E					
Glycacil [®] -L	0.100	0.100	0.100	0.100	0.100
	100.00	100.00	100.00	100.00	100.00

Typical Preparation: For Phase A, a beaker was charged with water, butylene glycol and disodium EDTA. Mixing was begun, and Stabileze[®] QM was slowly sifted into it. The batch was heated to 80°C with mixing and held for 45 min. In a separate beaker, the ingredients for Phase B were combined, mixed and heated to 75°C. Phase C was slowly added to Phase A, and the batch was mixed until clear, and then Phase B was added. The batch was cooled to 45°C with mixing, and Phase D was added. After mixing thoroughly, Phase E was added and the batch was again mixed thoroughly. After qs for water loss, it was packaged.

Table 4. Critical wavelength data.

Formulation	Critical wavelength (nm)	
	freeze-thaw	Storage
1 (X-Tend™ 226)	376.1	375.1
2 (Finsolv® TN)	374.7	373.3
3 (Eldew® SL-205)	374.3	374.1
4 (Finsolv® TPP)	373.9	373.8
5 (Elefac® I-305)	373.7	372.5

EXAMPLE 34**Solubility of Triclosan**

5-Chloro-2-(2,4-dichlorophenoxy)phenol (Triclosan) has bacteriostatic properties and is used as a disinfectant and preservative in cosmetic and detergent preparations. It is soluble up to 69% w/w in 2-phenylethyl benzoate, as determined by GLC.

An 80% w/w solution prepared from 8.002 g of Triclosan and 2.009 g of 2-phenylethyl benzoate precipitated a significant amount of solid at 25°C. A 23.3-mg sample of the supernatant was dissolved in 1.00 mL of chloroform and 1.00 µL was injected via automatic injector into a GLC instrument. The areas of the 2-phenylethyl benzoate and Triclosan peaks were 9381 and 12953, respectively. The mixture was heated at 70°C until it was homogeneous, and an 18.2-mg sample was dissolved and injected in the same manner. The 2-phenylethyl benzoate peak had an area of 4456 units, which represented 3.6 µg, and the Triclosan peak had an area of 11240 units, which represented 14.6 µg. (Note that the amount injected was 3.6 µg + 14.6 µg = 18.2 µg.) Therefore, under our GLC conditions the response factors were 1240 units/µg and 770 units/µg, respectively. Then, the respective amounts of each component in the supernatant were $9381/1240 = 7.6$ µg and $12953/770 = 16.8$ µg, which corresponds to 69% w/w Triclosan.

EXAMPLE 35

Example 35 below shows a typical antiperspirant stick composition with aluminum zirconium tetrachlorohydrate GLY using 2-phenylethyl benzoate as anti-whitening agent therein.

The antiperspirant sticks of the invention were prepared by first combining the ingredients listed in Phase A while mixing and heating to 75-80°C. Cooling was begun and Phase B was added in the order listed while mixing well between additions. Then Phase C was added and mixing continued. The resultant composition was poured into suitable stick containers at 50-53°C and solidified.

Antiperspirant Stick with 2-Phenylethyl Benzoate and Zirconium Salt

<u>Ingredients</u>	<u>% w/w</u>
<u>Phase A</u>	
SI-TEC™ CM 040	42.00
Paraffin	6.50
Stearyl Alcohol	15.00
X-Tend™ 226	5.00
<u>Phase B</u>	
Zirconium Salt	25.00
Talc	5.75
<u>Phase C</u>	
CK-1 Fragrance	<u>0.75</u>
Total	100.00%

EXAMPLE 36Antiperspirant Stick with 2-Phenylethyl Benzoate
and Aluminum Chlorohydrate

<u>Ingredients</u>	<u>% w/w</u>
<u>Phase A</u>	
SI-TEC™ CM 040	42.00
Paraffins	6.50
Stearyl Alcohol	15.00
X-Tend™ 226	5.00
<u>Phase B</u>	
Aluminum Chlorohydrate	25.00
Talc	5.75
<u>Phase C</u>	
CK-1 Fragrance	<u>0.75</u>
Total	100.00%

ControlAntiperspirant Stick without 2-Phenylethyl Benzoate with Zirconium Salt

<u>Ingredients</u>	<u>% w/w</u>
<u>Phase A</u>	
SI-TEC™ CM 040	47.00
Paraffins	6.50
Stearyl Alcohol	15.00
<u>Phase B</u>	
Zirconium Salt	25.00
Talc	5.75
<u>Phase C</u>	
CK-1 Fragrance	<u>0.75</u>
Total	100.00%

ControlAntiperspirant Stick without 2-Phenylethyl Benzoate
with Aluminum Chlorohydrate Salt

<u>Ingredients</u>	<u>% w/w</u>
<u>Phase A</u>	
SI-TEC™ CM 040	47.00
Paraffins	6.50
Stearyl Alcohol	15.00
<u>Phase B</u>	
Aluminum Chlorohydrate	25.00
Talc	5.75
<u>Phase C</u>	
CK-1 Fragrance	<u>0.75</u>
Total	100.00%

The efficacy of the antiperspirant stick composition of the invention as an anti-whitening product was determined by visually assessing the residue produced after swiping onto a black card. The results show that the antiperspirant stick of the present invention (Examples 35-36) substantially reduced the observable white residue as compared to the control sticks, without the invention ingredient.

EXAMPLE 37

The formulation below is a high shine lipstick showcasing the ability of 2-phenylethyl benzoate to impart shine by nature of its high refractive index. This formulation was made by first preparing a color grind using a roller mill on melted Ganex® WP-660 to which color mix is added before milling. The Phase A ingredients were mixed and heated to 90-95°C until uniform, and cooled to 82-85°C. Then, Phase B was added with mixing until homogeneous. Next, Phase C color grind was added and mixed for 30 minutes. Finally, the Phase D ingredients were added and mixed until

uniform. The contents were poured into a lipstick mold at 82-85°C and solidified. When applied onto lips, a brilliant shine and glossy appearance radiated from the lips of the user.

Brilliant Shine Moisturizing Lipstick

<u>Ingredients</u>	<u>% w/w</u>
<u>Phase A</u>	
Ozokerite (White Ozokerite Wax 170)	10.50
Polyethylene (Permalene Polymer)	5.00
Octyldodecyl Stearate (CERAPHYL [®] ODS)	13.00
Diisopropyl Adipate (CERAPHYL [®] 230)	2.00
Octyldodecyl Stearoyl Stearate (CERAPHYL [®] 847)	12.00
2-Phenylethyl Benzoate (X-Tend [™] 226)	4.00
C ₁₂₋₁₅ Alkyl Lactate (CERAPHYL [®] 41)	11.00
Myristyl Lactate (CERAPHYL [®] 50)	1.00
Hydrogenated Polyisobutene (Panalane L-14E)	6.10
VP/Eicosene Copolymer (GANEX [®] V-220)	5.00
VP/Hexadecene Copolymer (GANEX [®] V-216)	5.00
Disodium Lauriminodipropionate Tocopheryl Phosphates (VITAL [™] ET)	0.20
Retinyl Palmitate (Vitamin A Palmitate)	0.10
<u>Phase B</u>	
Isopropylparaben (and) Isobutylparaben (and) Butylparaben (LIQUAPAR [®] OIL)	0.40

Phase C

Isocetyl Stearoyl Stearate (CERAPHYL® 791)	3.28
Tricontanyl PVP (GANEX® WP-660)	0.07
Red 7 Lake (C6507 D&C Red #7 CA Lk)	2.35
Iron Oxides (C33-5198 Black Iron Oxide)	0.75
Blue 1 Lake (FD&C Blue #1 Aluminum Lake)	0.25

Phase D

Mica (Mica UF)	8.00
Bismuth Oxychloride (Pearl Glo UVR)	3.00
Mica (and) Iron Oxides (Cloisonne Gold)	4.00
Mica (and) Iron Oxides (Cloisonne Super Rouge)	3.00
	100.00%

Control

The lipstick formulation of Example 37 was prepared, however, without including 2-phenylethyl benzoate therein. When it was applied to the lips of the user, a rather dull appearance resulted.

The use of the phenylethyl esters in hair care compositions to enhance shine is illustrated by the following examples.

EXAMPLE 38

The formulation was made by charging water to a suitable mixing vessel with sweep blade agitation. Styleze® W-20 and Liquid Germall® Plus were added with mixing, which was continued until homogeneous. Then, 2-phenylethyl benzoate was added and mixed until uniform. Finally, Rapi-Thix® A-60 was added and the batch was mixed until uniform (about 15 minutes).

The hair care composition of Example 38 was applied to both wet and dry hair. A high shine appearance on the hair resulted in both cases.

High Shine Hair Care Composition

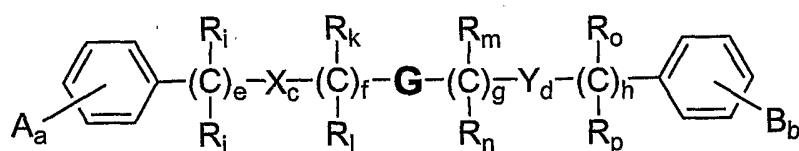
<u>Ingredient</u>	<u>Wt. %</u>
Water	91.55
Polyquaternium-55 (Styleze [®] W-20) (ISP)	1.25
Propylene Glycol (and) Diazolidinyl Urea (and) Iodopropynyl Butylcarbamate (Liquid Germall [®] Plus (ISP)	0.50
2-Phenylethyl Benzoate (X-Tend [™] 226) (ISP)	5.00
Sodium Polyacrylate (and) Hydrogenated Polydecene (and) Trideceth-6 (Rapi-Thix [®] A-60) (ISP)	1.70
	100.00%

Control

The formulation of Example 38 without 2-phenylethyl benzoate also was applied to hair. A dull appearance resulted.

WHAT IS CLAIMED IS:

1. A composition of an active or functional organic compound solubilized in a diaryl organic compound containing a polar or polarizable functional group.
2. A composition according to claim 1 wherein said polar group is an ester.
3. A composition according to claim 1 wherein said diaryl organic compound has the formula:



where

G = polar or polarizable functional group selected from ester, amide, carbonate, carbamate, urea, carbonyl, oxa, oxo, alkylidene, silyl, sulfonyl, sulfoxyl, phosphoryl, phosphinyl, and thio;

$X_c, Y_d = G, O, S,$ or NR_q ;

$A_a, B_b = H, F,$ alkyl, fluoralkyl, CN, $CO_2R_r,$ OH, $OR_s,$ $O_2CR_t,$ $NR_uR_v,$ $NO_2,$ F, Cl, $SiR_wR_xR_y$ or SO_3R_z ;

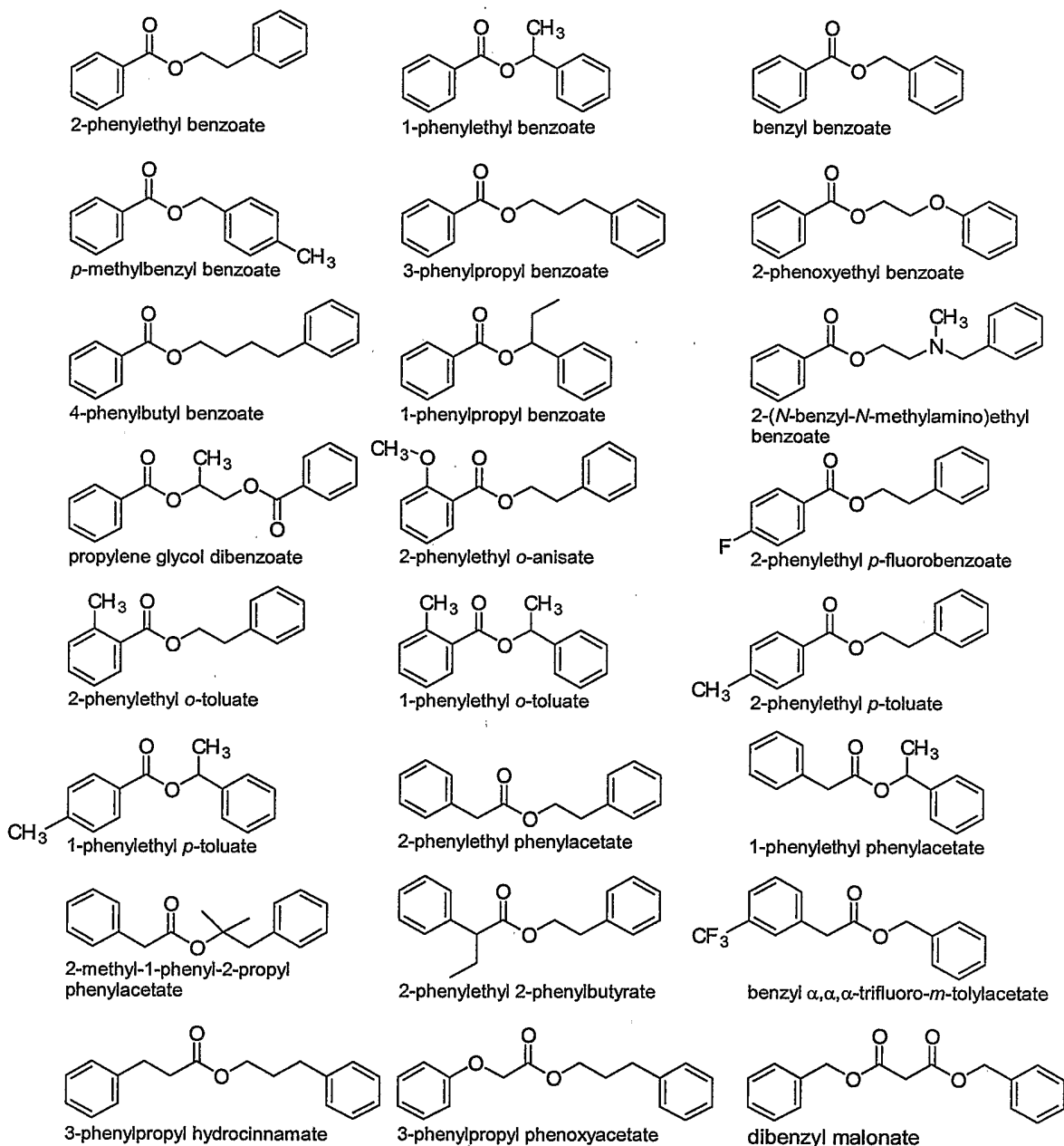
$R_i-R_z = H, F,$ alkyl, fluoralkyl or alkoxy;

a, b are independently 1-5

c, d are independently 0-2

e through z are independently 0-4.

4. A composition according to claim 1 in which said diaryl organic compound is selected from the group consisting of:



5. A composition according to claim 1 wherein said active or functional compound is a personal care, cosmetic, pharmaceutical, agricultural or industrial compound.

6. A composition according to claim 1 containing UVA and/or UVB chemical compounds, wherein said composition shows increased SPF and/or UVA/UVB absorbance ratio and/or critical wavelength.

7. A composition according to claim 1 in which said active or functional organic compound is selected from the group consisting of Avobenzene, Benzophenone-3, 4-Methylbenzylidene camphor, *p*-Aminobenzoic acid (PABA), Camphor benzalkonium methosulfate, Homosalate, Phenylbenzimidazole sulfonic acid, Terephthalidene dicamphor sulfonic acid, Benzylidene camphor sulfonic acid, Octocrylene, Polyacrylamidomethyl benzylidene camphor, Ethylhexyl methoxycinnamate, PEG-25 PABA, Isoamyl *p*-methoxycinnamate, Ethylhexyl triazone, Drometrizole trisiloxane, Diethylhexyl butamido triazone, 3-Benzylidene camphor, Ethylhexyl salicylate, Ethylhexyl dimethyl PABA, Benzophenone-4, Benzophenone-5, Methylene bis-benztriazolyl tetramethylbutylphenol, Disodium phenyl dibenzimidazole tetrasulfonate, Bis-ethylhexyloxyphenol methoxyphenol triazine, Polysilicone-15, Furosemide, Lovastatin, Clarithromycin, Diclofenac, Famotidine, Carbamazepine, Dipyridamole, Chlorthiazide, Spironolactone, Dilantin, Imipranine, Melfloquine, Cyclosporine, Glyburide, Nimodipine, and mixtures thereof.

8. A composition according to claim 1 comprising at least two active or functional organic compounds selected from the group consisting of UV- filter, cosmetic, and pharmaceutical compounds.

9. The composition of claim 1 wherein said active is an active antiperspirant ingredient.

10. A composition according to claim 1 wherein said active is an active antiperspirant ingredient selected from the group consisting of an inorganic salt and an organic compound.

11. A composition according to claim 1 wherein said active is an active antiperspirant ingredient selected from the group consisting of an aluminum, zirconium or zinc salt, a coordination complex of aluminum zirconium tetrachlorohydrate and glycine and mixtures thereof.

12. A composition for imparting high shine, gloss or luster to a polymeric substrate comprising a diaryl organic compound containing a polar or polarizable functional group therein.

13. The composition of claim 12 wherein said substrate is hair, skin, leather, imitation leather or a plastic.

14. The composition of claim 12 which is a personal care composition, a lipstick, or a hair care product.