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(54) Title: COSMETIC POWDER COMPOSITIONS HAVING LARGE PARTICLE SIZE COLOR TRAVEL EFFECT PIGMENTS

(57) Abstract: A cosmetic composition preferably in powder form comprising pigments having a color travel effect, wherein said composition contains a sufficient amount of large particle size color travel pigments having a D50 particle size of at least 40 µm up to about 150 µm to retain the color travel effect upon application to skin.



WO 2006/005595 A2

COSMETIC POWDER COMPOSITIONS HAVING LARGE PARTICLE SIZE COLOR TRAVEL EFFECT PIGMENTS

Specification

This invention relates to cosmetic compositions preferably powder compositions having color travel effects.

With the emerging of new pigment technologies, interference pigments with unique, spectacular effects, such as color travel ("color variable"), have been developed. However, the eye-catching color travel pigments of normal particle sizes (1-80 μm) is not readily visible in cosmetic powder products or upon application on the skin when a relatively low concentration of the pigments was used. By low concentration is meant generally about 1-10 percent by weight in the powder composition. If a large quantity of the normal particle size color travel pigments is used, it is likely possible to achieve the color travel effect, but it may not be economically practical with this type of special effect pigments.

An objective of this invention, therefore, is to provide an economical cosmetic formulation having a color travel effect.

Upon further study of the specification, other objects and advantages of the invention will become apparent.

To achieve these objects, there are provided cosmetic compositions preferably in powder form, comprising color travel pigments, wherein said composition contains a sufficient amount of large particle size color travel pigments to retain the color travel effect in the formulations and upon application to skin.

By using large particle size color travel pigments, it is possible to achieve the color travel effect on the skin using powder applications and the like without using high concentrations of the pigments, unlike their normal particle size counterparts. Here, "large particle size" pigments are defined as having a median particle size (D50) of 40 μm or higher, preferably 60 μm or higher. The normal particle size pigments usually have median particle sizes (D50) less than 40 μm but larger than 5 μm .

The maximum D50 of the large particle size pigments is preferably 150 μm , more preferably about 85 μm with the preferred particle size D50 being 75-95 μm . The particle size of such glitter pigment can reach up to about 500 μm .

One example of the normal particle size pigment is silica based color travel pigments. When 10% of this type of pigment (its particle size range is 10-50 μm , D50 is 16-25 μm) is added to powder formulations, a subtle color travel effect can be seen from the powder cake, but it disappears once the powder is applied onto the skin. On the other hand, if a color travel pigment with large particle size (D50 > 60 μm) is employed, not only the color travel effect can be observed clearly on the powder cake, but it is also retained upon application on the skin. Without being bound by an explanation of the unexpected advantage of using large particle size color travel pigments in powder formulations and their application on skin, at least two factors are believed to be important:

The presence of light scattering agents:

In a typical powder formulation, talc, kaolin, starch, and magnesium stearate are usually used at high concentration (more than 60% by weight combined, in many cases). Absorption pigments are also commonly used to impart colors (e.g. organic dyes and likes, iron oxides, etc.). The particle sizes of the fillers and absorption pigments are generally less than 25 μm . Their functions are filling, anti-caking or imparting colors. However, they also partially act as light scattering agents due to their high edge to area ratio. In some cases, they may also inevitably decorate the surface of the color travel pigments and consequently reduce the light reflection from the surface of the color travel pigments. The scattering effect (or morphological perturbation) from other ingredients in powder formulations usually reduces or eliminates the color travel effect. However, it has less impact on large particle size pigments and therefore, the luster intensity of large particle size color travel pigment decreases less significantly than that of smaller particle size color travel pigment. The incorporation of at about

0.01-100 % preferably less than 35 %, more preferably about 1-20% by weight of the large color travel pigment particles is generally sufficient to obtain the desired

color travel effect, but the specific value may vary dependent on the ingredients of the powder composition. The upper limit of the concentration of the large particles will be dictated by aesthetic and cost factors.

Skin property and pigment orientation:

Many skin topology studies have shown that human skin is not completely smooth. It has invisible peaks and valleys, i.e. skin roughness. Some skin roughness data were reported according to different testing methods. They range from a few micrometers to tens of micrometers depending on the testing methods, skin conditions and many other factors. Nonetheless, the skin roughness can be significant enough to interfere with the pigment performance on the skin.

When a powder product is applied onto the skin, the reflectivity of color travel pigment can be further reduced by the skin roughness due to the disorientation of pigment particles and light scattering from the skin. As indicated above, the effect of light scattering from the skin on the large particle size pigments is less pronounced than on the small particle pigments. Hence, our eyes perceive a higher brilliance from the large particle size pigments. Furthermore, large particle size color travel pigments can generally align themselves in parallel better than the smaller ones, owing to their flow characteristics or higher aspect ratio. This again renders a less disturbed light reflection and consequently higher luster intensity and more visible color from the large particle size color travel pigments.

Possible compositions of the color travel pigments:

One type of color travel pigments described in the present invention are substrate-based pearlescent pigments. Suitable base substrates for the inventive pigments according to the invention are flake-form substrates. Preferred substrates are phyllosilicates. Particularly suitable are natural and/or synthetic mica, aluminum oxides, glass flakes, borosilicate flakes, SiO₂ flakes, talc, kaolin, sericite, flake-form iron oxides or TiO₂ flakes, graphite flakes, BiOCl or other comparable materials.

The size of the base substrates is important per se and can be matched to the particular application. In general, the flake-form substrates have a thickness of

between 0.01 and 5 μm , in particular between 0.1 and 4.5 μm . The size in the other two directions is usually between 1 and 550 μm , preferably between 2 and 300 μm , and in particular between 10 and 150 μm (at least 75% within range). The aspect ratio (ratio of surface dimension to thickness of an object) is preferably about 1-500, especially 40-350.

Pigments having color travel effects are defined as exhibiting angle-dependent color change between a number of intense interference colors.

The color travel pigments according to the invention have high and/or low refractive-index layer(s) on top of the surface. The high-refractive-index layer(s) have a refractive index of $n > 1.8$, preferably of $n \geq 2.0$. The high refractive-index layers preferably comprise TiO_2 , ZrO_2 , SnO_2 , ZnO , BiOCl , Fe_2O_3 , Fe_3O_4 , Cr_2O_3 , CeO_3 , molybdenum oxides, CoO , Co_3O_4 , VO_2 , V_2O_3 , NiO , V_2O_5 , CuO , Cu_2O , Ag_2O , CeO_2 , MnO_2 , Mn_2O_3 , Mn_2O_5 , titanium oxynitrides, pseudobrookite, ilmenite, as well as titanium nitride, MoS_2 , WS_2 or mixtures or combinations thereof. The TiO_2 here can be in the rutile or anatase modification, preferably in the rutile modification.

Suitable low-refractive-index materials ($n \leq 1.8$) are preferably metal oxides or the corresponding oxide hydrates, such as, for example, SiO_2 , Al_2O_3 , $\text{AlO}(\text{OH})$, B_2O_3 , MgF_2 , MgSiO_3 or a mixture of the said metal oxides.

The layer thickness of the high refractive-index layer is 20 - 500 nm, preferably 50 - 300 nm. The layer thickness of the low refractive-index layer is 20 - 500 nm, preferably 50 - 300 nm. Preferred color travel pigments have three, four or five layers.

Especially preferred color travel pigments show the following layer structure: substrate + high refractive-index layer + low refractive index layer + high refractive index layer.

Particularly interesting color travel pigments have the following layer sequences:

substrate + TiO_2 + SiO_2 + TiO_2

substrate + Fe_2O_3 + SiO_2 + TiO_2

substrate + TiO_2 + SiO_2 + Fe_2O_3

substrate + $\text{Fe}_2\text{O}_3/\text{TiO}_2$ + SiO_2 + TiO_2

substrate + $\text{Fe}_2\text{O}_3/\text{TiO}_2$ + SiO_2 + $\text{Fe}_2\text{O}_3/\text{TiO}_2$

substrate + TiO_2 + SiO_2 + $\text{Fe}_2\text{O}_3/\text{TiO}_2$

substrate + Fe_3O_4 + SiO_2 + TiO_2

substrate + TiO_2 + SiO_2 + Fe_3O_4

substrate + TiO_2 + Al_2O_3 + TiO_2

substrate + Fe_2O_3 + Al_2O_3 + TiO_2

substrate + TiO_2 + Al_2O_3 + Fe_2O_3

substrate + $\text{Fe}_2\text{O}_3/\text{TiO}_2$ + Al_2O_3 + TiO_2

substrate + $\text{Fe}_2\text{O}_3/\text{TiO}_2$ + Al_2O_3 + $\text{Fe}_2\text{O}_3/\text{TiO}_2$

substrate + TiO_2 + Al_2O_3 + $\text{Fe}_2\text{O}_3/\text{TiO}_2$

substrate + Fe_3O_4 + Al_2O_3 + TiO_2

substrate + TiO_2 + Al_2O_3 + Fe_3O_4

Additionally on the outer (metal oxide) layer absorption pigments or water insoluble dye(s)/lake(s) (such as ferric ferrocyanide, carmine, organic dyes/lakes such as FD&C dyes/lakes or D&C dyes/lakes, etc.) can be applied.

In the case that the substrate is a glass flake or borosilicate flake the substrate can be coated with a SiO_2 layer first and in the second step with the layer sequence: high refractive layer + low refractive layer + high refractive layer. Preferred pigments based on glass flakes or borosilicate flakes have the following layer structure:

glass flakes + SiO_2 + TiO_2 + SiO_2 + TiO_2

borosilicate flakes + SiO_2 + TiO_2 + SiO_2 + TiO_2

The pigments according to the invention can be prepared relatively easily by the precipitation of high- and low-refractive-index metal oxide layers having precisely defined thickness and a smooth surface on the finely divided, flake-form substrates.

The metal-oxide layers are preferably applied by wet-chemical methods.

Methods of this type are described, for example, in DE 14 67 468, DE 19 59 988, DE 20 09 566, DE 22 14 545, DE 22 15 191, DE 22 44 298, DE 23 13 331, DE 25 22 572, DE 31 37 808, DE 31 37 809, DE 31 51 343, DE 31 51 354, DE 31 51 355, DE 32 11 602, DE 32 35 017, EP 1375601 A1 or in other patent documents and other publications known to the person skilled in the art.

In the wet coating method, the substrate particles are suspended in water, and one or more hydrolyzable metal salts are added at a pH which is suitable for hydrolysis and which is selected so that the metal oxides or metal oxide hydrates are precipitated directly onto the flakes without secondary precipitations occurring. The pH is usually kept constant by simultaneous metered addition of a base or acid. The pigments are subsequently separated off, washed and dried and, if desired, calcined, where the calcination temperature can be optimized with respect to the coating present in each case. In general, the calcination temperatures are between 250 and 1000°C, preferably between 350 and 900°C. If desired, the pigments can be separated off after application of individual coatings, dried and, if desired, calcined and then re-suspended for the deposition of the further layers.

The coating may furthermore also take place in a fluidized-bed reactor by gas-phase coating, it being possible, for example, to use correspondingly the methods proposed in EP 0 045 851 and EP 0 0106 235 for the preparation of color travel pigments.

The production of Ti suboxide or Fe_3O_4 layers can be carried out, for example, by reduction of the TiO_2 layer using ammonia, hydrogen and also hydrocarbons and hydrocarbon/ammonia mixtures, as described, for example, in EP-A-0 332 071, DE 199 51 696 A1 and DE 199 51 697 A1. The reduction is preferably carried out in a forming-gas atmosphere (92% of N_2 /8% of H_2 or 96% of N_2 /4% of H_2). The reduction is generally carried out at temperatures of 250-1000°C, preferably 350-900°C and in particular 500-850°C.

The hue of the pigments can be varied within broad limits through a different choice of the coating amounts or the layers resulting therefrom. Fine tuning for a certain hue can be achieved beyond the pure choice of amount by approaching the desired color under visual or measurement technology control.

Furthermore, organic or combined organic/inorganic post-coatings are possible, for example with silanes, as described, for example, in EP 0090259, EP 0 634 459, WO 99/57204, WO 96/32446, WO 99/57204, U.S. 5,759,255, U.S. 5,571,851, WO 01/92425 or in J.J. Ponjeé, Philips Technical Review, Vol. 44, No. 3, 81 ff. and P.H. Harding J.C. Berg, J. Adhesion Sci. Technol. Vol. 11 No. 4, pp. 471-493.

The pigments of the present invention can also advantageously be used in blends with organic dyes, organic pigments or other pigments, such as, for example, transparent and opaque white, colored and black pigments, and with flake-form iron oxides, organic pigments, holographic pigments, LCPs (liquid crystal polymers) and conventional transparent, colored and black luster pigments based on metal oxide-coated mica and SiO₂ flakes, etc. The color travel pigments can be mixed in any ratio with commercially available pigments and fillers.

As for the nature of the color travel pigments, all types which exhibit a color travel effect can be used in the present invention. More examples of such pigments include but are not limited to those described in EP 1375601 A1, as well as to those described in the patents and literature cited therein, e.g. U.S. 4,434,010, JP H7-759, U.S. 3,438,796, U.S. 5,135,812, DE 44 05 494, DE 44 37 753, DE 195 16 181 and DE 195 15 988, DE 196 18 565, DE 197 46 067 and in the literature, for example in EURO COSMETICS, 1999, No. 8, p. 284.

The compositions of this invention are preferably in the form of a cosmetic powder for application to skin. Examples of such cosmetic powders include but are not limited to: eye shadow, blusher, powder makeup, lip powder, face powder, body powder, bronzing powder.

Aside from powders, it is contemplated that the powders can be incorporated in various systems so as to form formulations such as for example foundation (liquid and stick), face makeup such as cream-to-powder, eye highlighter, eye pencil, bronzing stick, etc.

Also, the large particle size color travel pigments of this invention will exhibit a sparkling effect and appear to be more lustrous than the normal particle size color travel pigments when dispersed in a wax base or fluid system or the like, such as, for example, in lip gloss, lipstick, nail polish, eyeliner, mascara, hair gel, shower gel, body lotion, skin cream, shampoo, etc.

To reiterate, important aspects of this invention, include but are not limited to color travel pigments having a large particle size ($D_{50} > 60 \mu\text{m}$), and coated with two layers or more, especially with alternating layers of high and low refractive index, for example, with TiO₂-SiO₂-TiO₂. The preferred coatings are with metal oxides,

preferably TiO_2 and SiO_2 and/or Fe_2O_3 , with the TiO_2 being rutile or anatase, preferably rutile. The large particle size color travel pigments of the invention can be modified with a coating of absorption pigments or water insoluble organic dye/lakes on top, for example without exclusion ferric ferrocyanide, Prussian Blue, Indigo, Carmine, FD&C dyes and lakes, and D&C dyes and lakes. A protective layer can also be provided on the modified or unmodified color travel pigment. The substrate of the color travel pigments include, but are not limited to: mica, SiO_2 flakes, Al_2O_3 flakes, glass flakes, borosilicate flakes, graphite flakes, and BiOCl .

The desired particle sizes of the pigments are obtained by conventional methods, e.g. sieving or sedimentation.

It goes without saying that, for the various applications, the color travel pigments can also advantageously be used in the form of a mixture with organic dyes, organic pigments or other pigments, such as, for example, transparent and opaque white, coloured and black pigments, and with flake-form iron oxides, organic pigments, holographic pigments, LCPs (liquid crystal polymers) and conventional transparent, coloured and black lustre pigments based on metal oxide-coated mica and SiO_2 flakes, etc. The color travel pigments can be mixed in any ratio with commercially available pigments and fillers.

In the various applications, the pigment according to the invention can also be combined with further colorants of any type, for example organic and/or inorganic absorption pigments and dyes, multilayered interference pigments, such as, for example, Timiron[®] (Merck KGaA, Rona), Sicopearl[®] (BASF AG), ChromaFlair[®] (Flex Products Inc.), BiOCl pigments, pearl essence or coated or uncoated metal pigments, for example from Eckart. There are no limits to the mixing ratios and concentration.

The pigments according to the invention are compatible with a multiplicity of colour systems, preferably from the areas of plastics, paints, powder coatings, coatings and printing inks and especially preferred in cosmetic formulations.

The color travel pigments and pigment mixtures have particular applications in decorative and personal care cosmetic preparations, especially in powder form. The use concentration ranges from 0.01% by weight in shampoo to 100% by weight in the

case of loose powders. In the case of a mixture of the color travel pigments with spherical fillers, for example SiO_2 , the concentration in the formulation can be 0.01-70% by weight. The cosmetic products, such as, for example, nail varnishes, compact powders, shampoos, loose powders and gels, are distinguished by particularly interesting color effects and an intense color shift. The color flop effect in nail varnish can be significantly increased compared with conventional nail varnishes with the aid of the pigments according to the invention.

The formulations containing the color travel pigments according to the invention can belong to the lipophilic, hydrophilic or hydrophobic type. In the case of heterogeneous formulations having discrete aqueous and non-aqueous phases, the color travel pigments according to the invention may in each case be present in only one of the two phases or alternatively distributed over both phases.

Without further elaboration, it is believed that one skilled in the art can, using the preceding description, utilize the present invention to its fullest extent. The following preferred specific embodiments are, therefore, to be construed as merely illustrative, and not limitative of the remainder of the disclosure in any way whatsoever.

In the foregoing and in the following examples, all temperatures are set forth uncorrected in degrees Celsius and, all parts and percentages are by weight, unless otherwise indicated.

As a disclaimer, it is to be noted that one or more examples may have not been actually conducted.

Example 1: Color travel pigment

100 g of mica (particle size 10-150 μm , $D_{50} = 75\text{-}95 \mu\text{m}$) is suspended in deionized water and the suspension is heated to 75°C with stirring. When this temperature has been reached, a solution consisting of 3 g of $\text{SnCl}_4 \times 5 \text{H}_2\text{O}$ and 10 ml of hydrochloric acid (37%) in 90 g of water is slowly metered into the mica suspension with vigorous stirring. 220 ml of TiCl_4 solution (400 g of TiCl_4/l) are metered in at a pH of 2.0. The pH is subsequently raised to 7.0, and 830 ml of sodium water-glass solution (13% by weight of SiO_2) is slowly metered in at this pH, during which the pH is kept constant

at 7.5 using 10% HCl. A solution of 11.5 g of $\text{SnCl}_4 \times 5 \text{H}_2\text{O}$ and 10 ml of hydrochloric acid (32%) in 350 ml of deionised water is subsequently metered in at pH 1.8. Finally, 220 ml of TiCl_4 solution (400 g of TiCl_4/l) are metered in at pH 2.0. During the addition of the $\text{SnCl}_4 \times 5 \text{H}_2\text{O}$ solutions and TiCl_4 solutions, the pH is in each case kept constant using NaOH solution (32%).

For work-up, the coated mica pigment is filtered off, washed and dried at 110°C for 16 hours. Finally, the pigment is calcined at 800°C for 0.5 hour.

The pigment thus obtained when viewed straight on exhibits an intense blue-green interference color which changes through violet into red when the pigment is tilted.

Use Examples 1-4

LOOSE EYE SHADOW POWDER WITH COLOR TRAVEL PIGMENTS

INCI NAME	TRADE NAME/MANUFACTURER	% by weight
Phase A		
Talc	Supra H/Luzenac	q.s. to 100.00
Kaolin	Kaolin, Colloidal, USP/Whittaker, Clark & Daniels	4.0
Magnesium Stearate	Magnesium Stearate Vegetable F.G./Whittaker, Clark & Daniels	2.00
Bismuth Oxychloride	Biron [®] LF-2000/Rona	5.00
Phase B		
Iron Oxides, Mica	Colorona [®] Aborigine Amber/Rona	7.00
Silica, CI77891 (Titanium dioxide), Mica, Tin oxide	Color Travel Pigment according to Example 1	
Phase C		
Octyldodecanol	Eutanol G/Cognis	5.00
Total		100.00

Procedure: Combine Phase A. Add Phase B with gentle agitation. Spray Phase C onto batch while agitating bulk. Pass entire batch through a jump gap.

Several examples are prepared, substituting the specific color travel pigment into the above formula:

<u>Example</u>	<u>Wt%</u>	<u>*Description</u>	<u>D50</u>
1	25%	Color Travel Pigment	~86
2	25%	Xirona [®] Magic Mauve	16-22
3	10%	Color Travel Pigment	~86
4	10%	Xirona [®] Magic Mauve	16-22

INCI Name:

Xirona[®] Magic Mauve: silica, titanium dioxide, tin oxide

Examples 5-8**EYE SHADOW WITH COLOR TRAVEL PIGMENTS**

INCI NAME	TRADE NAME/MANUFACTURER	%
Phase A		
Talc	Supra H/Luzenac	q.s. to 100.00
Aluminium Starch Octenyl Succinate	Dry Flo PC/National Starch & Chemical	7.30
Magnesium Stearate	Magnesium Stearate Vegetable F.G./Whittaker, Clark & Daniels	2.45
Bismuth Oxychloride	Biron [®] LF-2000/Rona	7.00
Phase B		
Iron Oxides, Mica	Colorona [®] Aborigine Amber/Rona	7.00
	Color Travel Pigment according to Example 1	
Phase C		
Isopropyl Palmitate, Isopropyl Myristate, Isopropyl Sterate	Lexol 3975/Inolex	10.50
Cetyl Palmitate	Cutina CP/Henkel	0.70
Petrolatum	Snow White Petrolatum/Penreco	0.70
Propylparaben	Propylparaben/Spectrum Chemical	0.10
Total		100.00

Procedure:

Combine ingredients in Phase A. Pulverize with a hammer mill, passing twice through a 0.27" herring bone screen. Add Phase B with gentle agitation. Combine

Phase C; heat to 70°C. Solution should be clear and uniform. Spray Phase C onto batch while agitating bulk. Pass entire batch through a jump gap.

Several examples are prepared, substituting the specific color travel pigment into the above formula:

<u>Example</u>	<u>Wt%</u>	<u>*Description</u>	<u>D50</u>
5	25%	Color Travel Pigment	~86
6	25%	Xirona [®] Magic Mauve	16-22
7	10%	Large particle size color travel (Red/Gold)	~86
8	10%	Color Travel Pigment	16-22

INCI Name:

Xirona[®] Magic Mauve: silica, titanium dioxide, tin oxide

The above examples showed that when 10% of normal particle size color travel pigment (Xirona[®] Magic Mauve: D50 = 16-22) is used, the color travel effect is merely visible in the powder samples and not visible upon application onto skin. However, the color travel effect can be seen clearly in the powder samples containing the large particle size color travel pigment according to Example 1 and when the powders are applied onto skin.

Example 9**4-IN-1 POWDER MAKEUP
(FOR EYES, CHEEKS, LIPS AND NAILS)**

INCI NAME	TRADE NAME/MANUFACTURER	%
Phase A		
Mica, Titanium Dioxide; Iron Oxides, Silica	Color Travel Pigment according to Example 1	35.00
Bismuth Oxychloride	Biron [®] LF-2000/Rona	5.00
Talc	Supra H/Luzenac	38.00
Kaolin	Kaolin, Colloidal, USP/Whittaker, Clark & Daniels	5.00
Magnesium Stearate	Magnesium Stearate Vegetable F.G./ Whittaker, Clark & Daniels	2.50
Calcium Silicate	Hubersorb 600/Huber	0.50
Phase B		
Mineral Oil (and) Lanolin Alcohol	Amerchol L-101/Amerchol	11.90
Lanolin Alcohol	Super Hartolan/Croda	1.00
Petrolatum	Snow White Petrolatum/Penreco	1.00
Propylparaben	Propylparaben/Spectrum Chemical	0.10
Total		100.00

Procedure: Mix the ingredients of Phase A homogeneously. Combine ingredients in Phase B and heat to 80° C with mixing. Add the melted Phase B to Phase A with stirring. The powder is pressed at 40-50 bar (~600 – 700 lb./sq. in.).

Application: Apply to eyelids and cheeks and blend gently with fingertips. Outline lips with contour pencil and fill in with color. For nails, apply powder to nails with fingertips and fix with clear nail lacquer. Excess powder on cuticles can easily be washed off.

In the following non-limiting examples 10-18, the invention can be realized by adding or substituting a sufficient amount of any of the exemplified large particle size color travel pigments having a D50 particle size of at least 40 µm, preferably at least 60 µm, to each product. For example, the eye highlighter of example 14 can be made by adding 25% by weight of large particle size color travel (Red/Gold) having a D50

of about 86. The remaining components of example 14 will then amount to 75% by weight of the Eye Highlighter.

Example 10

FOUNDATION

INCI NAME	TRADE NAME/MANUFACTURER	%
Phase A		
Water	Water, Demineralized	50.32
Hydroxylated Lecithin	Alcolec Z-3/American Lecithin Co.	0.10
Phase B		
Mica	Mica M/Rona	5.00
Titanium Dioxide, Mica, Zinc Oxide	Microna [□] Matte White/Rona	4.00
Mica, Iron Oxides	Microna [®] Matte Yellow/Rona	2.00
Mica, Iron Oxides	Microna [®] Matte Orange/Rona	0.20
Iron Oxides, Mica	Microna [®] Matte Red/Rona	0.20
Iron Oxides, Mica	Microna [®] Matte Black/Rona	0.20
Phase C		
Propylene Glycol	Propylene Glycol/Lyondell	4.00
Magnesium Aluminum Silicate	Veegum/RT Vanderbilt	1.00
Phase D		
Propylene Glycol	Propylene Glycol/Lyondell	4.00
Cellulose Gum	CMC 7H3SF/Aqualon	0.15
Phase E		
Deionized Water	Deionized Water	5.00
Triethanolamine 99%	Triethanolamine 99%/Dow	1.00
Phase F		
Sucrose Cocoate	Crodesta SL40/Croda	1.50
Methyl Paraben	Methylparaben/Spectrum Chemical	0.20
Disodium EDTA	Hamp-ene Na2/Hampshire	0.05
Phase G		
Propylene Glycol Dicaprylate Dicaprate	Myritol PC/Cognis	11.00
Isostearyl Stearoyl Stearate	Hetester ISS/Heterene	2.00
Sorbitan Monolaurate	Arlacel 20/Uniquema	2.50
Cetyl Alcohol	Crodacol C-70/Croda	1.25
Stearic Acid	Emersol 120/Cognis	1.50
Oleic Acid	Emersol 210/Cognis	0.50
BHA	Tenox BHA/Eastman	0.05

Propyl Paraben	Propylparaben/Spectrum Chemical	0.10
Phase H		
DMDM Hydantoin 55%	Glydant/Lonza	0.18
Water	Water, Demineralized	2.00
Total		100.00

Procedure:

Water Phase: Combine the ingredients of Phase A. Mix until homogenous. Add Phase B with stirring, mixing until no undispersed pigment remains. Combine and add Phase C. Continue mixing and heat to 90°C for 15 minutes. Cool to 75°C. Combine and add Phase D and Phase E, maintaining agitation until no undispersed particles remain. Add Phase F.

Oil Phase: Combine the ingredients of phase G separately from the water phase. Heat to 75-80°C with propeller agitation until homogenous.

Emulsification: Add the oil phase to the water phase at 75-80°C, with propeller agitation. Maintain temperature and homogenize for 15 minutes. Cool to 45°C with moderate agitation. Combine and add Phase H. Cool to 30°C.

Example 11**SPF 4.5 LOOSE BODY POWDER**

INCI Name	Trade Name (Supplier)	% w/w
Phase A		
Talc	Supra H/Luzenac America	40.50
Mica	Mica M/Rona	27.50
Mica, Silica	Micronasphere [®] M/Rona	10.00
Kaolin	Kaolin, Colloidal, USP/ Whittaker, Clark & Daniels	4.00
Magnesium Stearate	Magnesium Stearate Vegetable F. G./ Whittaker, Clark & Daniels	5.00
Titanium Dioxide, Alumina, Simethicone	Eusolex [®] T-2000/Rona	5.00
Mica, Iron Oxides	Microna [®] Matte Orange/Rona	4.34
Iron Oxides, Mica	Microna [®] Matte Red/Rona	0.84

Mica, Iron Oxides	Microna [®] Matte Yellow/Rona	0.84
Mica, Iron Oxides	Microna [®] Matte Black/Rona	0.98
Titanium Dioxide, Mica, Zinc Oxide	Microna [®] Matte White/Rona	1.00
Total		100.00

Procedure:

The powder ingredients are mixed homogeneously and then sieved through a 63 µm screen.

Note:

In vivo SPF 4.5 (5 subjects), Colipa Task Force Method

Example 12**LIP POWDER**

INCI Name	Trade Name /Manufacturer	%
Phase A		
Mica, Iron Oxides	Colorona [®] Bordeaux/Rona	30.00
Bismuth Oxychloride	Biron [®] LF-2000 or Biron [®] MTU/Rona	10.00
Talc	Supra Talc/Luzenac	40.00
Magnesium Stearate	Magnesium Stearate Vegetable Food Grade/ Whittaker, Clark & Daniels	5.00
Phase B		5.00
Isopropyl Stearate	Tegosoft S/Goldschmidt	11.20
Dimethicone, Dimethiconol	1403 Fluid/Dow Corning	3.75
Fragrance	Fragrance	q.s.
Propylparaben	Propylparaben/Sutton	0.05
Total		100.00

Procedure: Mix the ingredients of Phase A homogeneously. Heat and mix the ingredients in Phase B. Add Phase B to Phase A with mixing. The powder is pressed between 40 – 50 bar.

Example 13**EYE PENCIL**

INCI Name	Trade Name /Manufacturer	%
Phase A		
Italian Talc	Supra H/Luzenac	11.30
C18-36 Ethylene Glycol Ester	Syncrowax ERL-C/Croda	8.10
Glyceryl Tribehenate	Syncrowax HR-C/Croda	1.90
Ethyl Hexyl Palmitate	Pelemol OP/Phoenix Chemical	38.40
Caprylic/Capric Triglyceride	Myritol 318/Cognis	4.00
Stearic Acid	Emersol 120/Cognis	3.00
Polyglyceryl 3-Diisostearate	Emerest 2452/Cognis	0.50
Methylparaben	Methylparaben/Spectrum Chemical	0.20
Propylparaben	Propylparaben/Spectrum Chemical	0.10
Phase B		
Bismuth Oxychloride	Biron [®] MTU/Rona	15.00
Iron Oxides, Mica	Microna [®] Matte Red/Rona	16.00
Iron Oxides, Mica	Microna [®] Matte Black/Rona	1.50
Total		100.00

Procedure: Combine all ingredients in Phase A and heat to 80 - 85°C with stirring until homogenous. Add Phase B. Agitate with a high-speed mixer until no agglomerates remain. Pour at 70°C.

Example 14**EYE HIGHLIGHTER**

INCI Name	Trade Name /Manufacturer	%
Phase A		
Talc	Supra H/Luzenac	48.25
Starch	Novation 1600/National Starch & Chemical	7.30
Magnesium Stearate	Magnesium Stearate Vegetable F.G./WC&D	2.45
Bismuth Oxychloride	Biron [®] LF-2000/Rona	5.70
Phase B		
Mica, Titanium Dioxide	Timiron [®] MP-99/Rona	17.00
Mica, Titanium Dioxide, Carmine	Colorona [®] Magenta/Rona	4.90
Mica, Titanium Dioxide, Iron Oxides	Colorona [®] Red Gold/Rona	2.40
Phase C		
Isopropyl Stearate	Tegosoft S/Goldschmidt	10.50
Cetyl Palmitate	Cutina CP/Cosgnis	0.70
Petrolatum	Snow White Petrolatum/Penreco	0.70
Propylparaben	Propylparaben/Spectrum Chemical	0.10
Total		100.00

Procedure: Combine Phase A. Pulverize with a hammer mill, passing twice through a 0.027" herring bone screen. Add Phase B with gentle agitation. Combine Phase C. Heat to 70°C. Spray onto batch while agitating bulk. Pass entire batch through a jump gap.

Example 15**BRONZING POWDER**

INCI NAME	TRADE NAME/MANUFACTURER	%
Phase A		
Talc	Supra H/Luzenac	q.s. to 100.00
Lithium Stearate	Lithium Stearate #306/Witco	3.50
Kaolin	Kaolin 2457/ Whittaker, Clark & Daniels	5.00
Calcium Silicate	Microcel E/Celite	0.30
Methylparaben	Methylparaben/Spectrum Chemical	0.20
Propylparaben	Propylparaben/Spectrum Chemical	0.10
Bismuth Oxychloride	Biron [®] MTU/Rona	5.00
Phase B		
Mica (and) Iron Oxides	Colorona [®] Bronze/Rona	50.00
Phase C		
Isopropyl Palmitate	Lexol IPP/Inolex	7.30
Cetyl Palmitate	Cutina CP/Cognis	2.00
Petrolatum	White Petrolatum/Witco	2.00
Polyglyceryl-3 Diisostearate	Emerest 2452/Cognis	0.50
Phase D		
Fragrance	Grapefruit Fragrance 26125V/Shaw Mudge	0.10
Total		100.00

Procedure: Combine Phase A. Pulverize with a hammer mill, passing twice through a 0.027" herring bone screen. Add Phase B with gentle agitation. Combine Phase C. Heat to 70°C, stirring until clear. Reduce temperature to 55-60°C. Add Phase D (if desired). Spray onto batch while agitating bulk. Pass entire batch through a jump gap.

Example 16**FACE POWDER**

INCI NAME	TRADE NAME/MANUFACTURER	%
Talc	Supra H/Luzenac America	87.10
Aluminum Starch Octenylsuccinate	Dry Flo Pure/National Starch	11.00
Mica (and) Iron Oxides	Microna [®] Matte Yellow/Rona	1.00
Mica (and) Iron Oxides	Microna [®] Matte Orange/Rona	0.20
Iron Oxides (and) Mica	Microna [®] Matte Red/Rona	0.20
Iron Oxides (and) Mica	Microna [®] Matte Black/Rona	0.20
Methylparaben	Methylparaben/Spectrum Chemical	0.10
Propylparaben	Propylparaben/Spectrum Chemical	0.10
Imidazolidinyl Urea	Germall 115/Sutton	0.10
Total		100.00

Procedure: Add ingredients to powder blender. Mix until uniform.

Micropulverize. Package.

Example 17**CREAM TO POWDER MAKEUP**

INCI NAME	TRADE NAME/MANUFACTURER	%
Phase A		
Silica (and) Titanium Dioxide (and) Iron Oxides	Ronasphere [®] LDP/Rona	10.00
Mica (and) Titanium Dioxide	Extender W/Rona	12.00
Mica (and) Iron Oxides	Microna [®] Matte Yellow/Rona	4.40
Iron Oxides (and) Mica	Microna [®] Matte Red/Rona	0.80
Iron Oxides (and) Mica	Microna [®] Matte Black/Rona	0.40
Mica (and) Iron Oxides	Microna [®] Matte Orange/Rona	0.40
Talc	Supra H/Luzenac America	6.40
Silica	Ronasphere [®] /Rona	2.10
Aluminum Starch Octenyl Succinate	Dry Flo PC/National Starch & Chemical	14.40
Phase B		
Octyl Palmitate	Pelemol OP/Phoenix	29.50
Mineral Oil (and) Lanolin Alcohol	Amerchol L-101/Amerchol	2.50
Copernica Cerifa (Carnauba) Wax	Carnauba Wax/Ross	1.30
Ceresin	Ceresin Wax #375/Ross	2.00
Hydrogenated Castor Oil	Cutina HR/Henkel	3.50
Phenyl Trimethicone	Dow Corning 556/Dow Corning	9.50
Sorbitan Sesquioleate	Arlacel 83/Uniquema	0.50
Propylparaben	Propylparaben/Spectrum Chemical	0.20
PEG-8 (and) Tocopherol (and) Ascorbyl Palmitate (and) Ascorbic Acid (and) Citric Acid	Oxynex [®] K/Rona	0.10
Total		100.00

Procedure:

Heat the ingredients of Phase B to 85°C with mixing. Blend Phase A and add to Phase B. Continue mixing until the melt is homogeneous. Cool down to 80°C and pour into molds.

Example 18**BLUSHER**

INCI NAME	TRADE NAME/MANUFACTURER	%
Phase A		
Octyl Palmitate	Pelemol OP/Phoenix Chemical	29.00
Ozokerite	Ozokerite Wax 77W/Ross	4.00
Hydrogenated Castor Oil	Cutina HR/Cognis	4.00
Copernica Cerifa (Carnauba) Wax	Carnauba Wax/Ross	1.00
Phenyl Trimethicone	Dow Corning 556 Fluid/Dow Corning	8.50
Mineral Oil (and) Lanolin Alcohol	Amerchol L-101/Amerchol	2.50
Sorbitan Sesquioleate	Arlacel 83/Uniquema	0.50
Propylparaben	Propylparaben/Spectrum Chemical	0.20
Allantoin	Allantoin/Rona	0.20
PEG-8 (and) Tocopherol (and) Ascorbyl Palmitate (and) Ascorbic Acid (and) Citric Acid	Oxyplex [®] K/Rona	0.10
Phase B		
Talc	Supra H/Luzenac America	18.60
Aluminum Starch Octenyl Succinate	Dry Flo PC/National Starch & Chemical	14.90
Bismuth Oxychloride	Biron [®] MTU/Rona	12.50
Phase C		
Mica (and) Iron Oxides	Colorona [®] Bordeaux/Rona	3.00
Mica (and) Titanium Dioxide (and) Carmine	Colorona [®] Carmine Red/Rona	1.00
Total		100.00

Procedure: Combine all ingredients in Phase A. Heat to 80-85°C and mix until homogenous. Add Phase B and Phase C with mixing. Pour at 70°C.

These cosmetic compositions can be applied to skin in the conventional manner.

The preceding examples can be repeated with similar success by substituting the generically or specifically described ingredients and/or operating conditions of this invention for those used in the preceding examples.

The entire disclosures of all applications, patents and publications, cited herein are incorporated by reference herein.

From the foregoing description, one skilled in the art can easily ascertain the essential characteristics of this invention and, without departing from the spirit and scope thereof, can make various changes and modifications of the invention to adapt it to various usages and conditions.

Claims

1. A cosmetic composition containing pigments having a color travel effect, wherein said composition contains 0.01-100 % by weight, of large particle size color travel pigments having a D50 particle size of at least 40 μm up to about 150 μm to retain the color travel effect upon application to skin.
2. A cosmetic composition according to claim 1, wherein the color travel pigments have a D50 particle size of at least 60 μm .
3. A cosmetic composition according to claim 1 or 2, containing less than 35 % by weight of the large particle size color travel pigments.
4. A cosmetic composition according to any of claims 1 to 3, containing 1-20% by weight of the large particle size color travel pigments.
5. A cosmetic composition according to any of claims 1 to 4, wherein the large particle size color travel pigments are coated with alternating layers of high and low refractive index coatings.
6. A cosmetic composition according to claim 5, wherein the layers are metal oxides.
7. A cosmetic composition according to claim 6, wherein the metal oxides are TiO_2 and SiO_2 or Fe_2O_3 or mixtures thereof.
8. A cosmetic composition according to any of claims 1 to 7, wherein the large particle size color travel pigments contain more than 2 layers of metal oxides.
9. A cosmetic composition according to claim 8, wherein said metal oxide layers are TiO_2 - SiO_2 - TiO_2 .

10. A cosmetic composition according to any of claims 7 to 9, wherein the TiO_2 is rutile.

11. A cosmetic composition according to any of claims 1 to 10, wherein said color travel pigments contain a substrate selected from the group consisting of natural/synthetic mica, SiO_2 flakes, Al_2O_3 flakes, glass flakes, borosilicate flakes, graphite flakes and BiOCl , flake-form of TiO_2 , flake-form of Fe_2O_3 .

12. A cosmetic composition according to any of claims 1 to 11, wherein the pigments having a color travel effect further comprising as a top layer an absorption pigment or a water insoluble dye(s)/lakes(s).

13. A cosmetic powder composition according to claim 12, comprising as a top layer a ferric ferrocyanide, Prussian Blue, carmine red, indigo, or carmine, FD&C dyes/lakes, D&C dyes/lakes.

14. A color travel pigment having a D50 particle size of at least 40 μm up to about 150 μm .

15. A color travel pigment according to claim 14, having a D50 particle size of at least 60 μm .

16. A color travel pigment according to claim 15, having a D50 range of 75-95 μm .

17. A color travel pigment according to any of claims 14 to 16, wherein said pigment comprises as a top layer an absorption pigment, a water insoluble dye(s) or a water insoluble lake(s).

18. A cosmetic composition comprising pigments having a color travel effect, wherein said composition contains a sufficient amount of large particle size

color travel pigments having a D50 particle size of at least 40 μm up to about 150 μm to retain the color travel effect upon application to skin.

19. A cosmetic composition according to claim 20, in the form of an eye pencil or eye highlighter, a cream to powder, a liquid or stick foundation or bronzer, lip gloss, lipstick, nail polish, eyeliner, mascara, hair gel, shower gel, body lotion, skin cream or shampoo.