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(71) Applicant *(for all designated States except US)*: **LG HOUSEHOLD & HEALTH CARE LTD.** [KR/KR]; LG Twin Tower 20, Yoido-dong, Youngdungpo-ku, Seoul 150-721 (KR).

(72) Inventors; and

(75) Inventors/Applicants *(for US only)*: **LEE, Cheon-Koo** [KR/KR]; 204-1602 Expo apt., Jeonmin-dong, Yuseong-gu, Daejeon-city 305-761 (KR). **KIM, Kyong-Seob** [KR/KR]; 102-203 Sejong apt., Jeonmin-dong, Yuseong-gu, Daejeon-city 305-728 (KR). **SON, Hong-Ha** [KR/KR]; 1-402 LG Employee's apt., 386-4 Doryong-dong, Yuseong-gu, Daejeon-city 305-340 (KR). **SEO, Dong-Sung** [KR/KR]; 12-203 KIT Professor's apt., 236-2 Gajeong-dong, Yuseong-gu, Daejeon-city 305-350 (KR).

(74) Agent: **YOU ME PATENT & LAW FIRM**; Seolim Bldg., 649-10, Yoksam-dong, Kangnam-ku, Seoul 135-080 (KR).

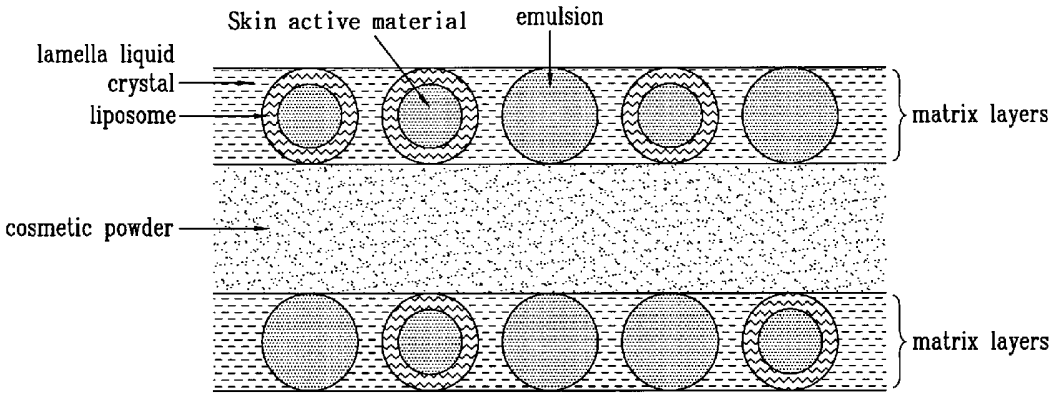
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(54) **Title:** COSMETIC POWDER, ITS PREPARING METHOD AND MAKE-UP COSMETIC COMPOSITION COMPRISING THE SAME



(57) **Abstract:** The present invention relates to cosmetic powder, a method of preparing the same, and a make-up cosmetic composition comprising the same in the present invention. More specifically, the cosmetic powder of the present invention comprises powder and matrix layers coated on its surface wherein the matrix layers comprise nano-sized liposome and emulsion (NLE) and lamella liquid crystal. Therefore, the present invention provides cosmetic powder coated with NLE and lamella liquid crystal not only endowing the same skin treatment effects with make-up cosmetics as with skincare products due to the even emission of active components belonging to NLE, but also contributing to obtaining a make-up cosmetic composition with the high skin compatibility, low sensitivity and, excellent skin softness and moisture effects due to the bound water combined in lamella liquid crystal. In addition, the present invention provides a make-up cosmetic composition having an excellent applicability and adherence to skin due to the matrix layer coated on the surface of the powder.

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COSMETIC POWDER, ITS PREPARING METHOD AND MAKE-UP COSMETIC COMPOSITION COMPRISING THE SAME

BACKGROUND OF THE INVENTION

(a) Field of the Invention

The present invention relates to a cosmetic powder, a method of preparing the same, and a make-up cosmetic composition comprising the same, and more specifically, to a cosmetic powder with skincare treatment effects by evenly emitting active components included in Nano-sized Liposome and Emulsion (hereafter, referred to NLE) and lamella liquid crystals, a method of preparing it, and a make-up cosmetic composition comprising the same.

(b) Description of the Related Art

All products using liposome or emulsions, from foods to medicines as well as cosmetics, have their use in water as a medium in common because they advantageously exist in the water medium, which naturally understood in the related field.

However, unlike skincare products, most make-up cosmetics do not use water as a medium. Accordingly, liposomes have seldom been used in powder-based cosmetic products such as eye shadows, blusher, cake-type foundations, compact foundations, and powder foundations; lip make-up products mainly using waxes and oils such as lipstick and lip gloss; control

base and emulsion type foundation products including water but also used for solid-type cosmetics; and eye make-up products such as mascara, eyebrow pencils, and so on. Therefore, make-up cosmetics cannot have the same skin treatment functions as do skincare products such as stabilization of active component, and skin permeation or transdermal absorption reinforcement accomplished by positively using the active components of liposomes.

Conventional make-up products, for example eye shadow, blusher, liquid foundation, compact foundation, powder foundation, cake-type foundation, and so on, have employed a surface treatment method for improving the defects of powder properties and allowing their own properties. The following are representative surface treatment methods: zinc stearate treatment, silicon treatment, fluorine-based oil treatment, amino acid treatment, wax treatment, oil component treatment, and lecithin treatment, and so on.

The conventional surface treatments for make-up cosmetics have mainly focused on the improvement of their own powder properties such as sweat and water resistance, durability, adherence to skin, agreeability of use, and so on. Accordingly, it has been regarded as impossible to endow make-up cosmetics with skin treatments such as those that skincare products have in this method.

However, there have been ceaseless efforts to compound liposomes

into make-up cosmetics. Korean patent publication No. 90-8308 discloses how to form make-up compounds of cosmetics with powdered liposomes after the evaporation of moisture therein. Here, the liposomes were directly compounded as a part of the make-up cosmetic composition. However, this method was not ultimately advantageous for make-up cosmetics that were mostly composed of solid materials, as the liposomes were impeded from directly contacting the skin.

SUMMARY OF THE INVENTION

In order to solve the aforementioned problems, an aspect of the present invention is to provide a cosmetic powder which includes powders and matrix layers coated thereon, and the matrix layers include nano-sized liposome and emulsion (NLE) and lamella liquid crystal.

Another aspect of the present invention is to provide a method of preparing the aforementioned cosmetic powder.

Another aspect of the present invention is to provide a make-up cosmetic composition including the aforementioned cosmetic powder.

In order to accomplish these aspects, the present invention provides cosmetic powder including powder and matrix layers coated thereon, the matrix layer comprising nano-sized liposome and emulsion (NLE) and lamella liquid crystal.

The present invention also provides a method of preparing the cosmetic powder including the following steps: preparing a dispersed

solution by adding a water-dispersed solution of self-assembly ampholytic material and a skin-active material into higher alcohol or fatty acid , and polyhydric alcohol dissolved with heat; preparing a coating solution by applying shear force to the dispersed solution while heating it; coating matrix layers to be absorbed on the surface of powder by carefully adding a metal salt solution after dispersing powder in the coating solution, or by slowly adding the coating solution after adding a metal salt solution into the water phase dispersed with powder; and obtaining cosmetic powder coated with matrix layers by washing, filtering, and drying the coated powder prepared in the previous step after setting it aside for a time until the coated powder sinks down into sediment and removing the supernatant solution therefrom.

The present invention also provides a make-up cosmetic composition including the cosmetic powder prepared in the aforementioned method.

BRIEF DESCRIPTION OF THE DRAWINGS

A more complete appreciation of the invention, and many of the attendant advantages thereof, will be readily apparent as the same becomes better understood by reference to the following detailed description when considered in conjunction with the accompanying drawings.

Fig. 1 is a schematic cross sectional view of the cosmetic powder of

the present invention.

Fig. 2 is a picture of the cosmetic powder prepared according to Example 1, which is magnified 100,000 times with a scanning electron microscope (SEM).

Fig. 3 is a picture of the cosmetic powder prepared according to Example 2, which is magnified 100,000 times with an SEM.

Fig. 4 is a picture of the cosmetic powder prepared according to Example 3, which is magnified 100,000 times with an SEM.

Fig. 5 is a graph illustrating the absorbance of vitamin E acetate within the wavelength of 200nm to 900nm measured with a DRIFT UV-VIS spectrometer.

Fig. 6 is a DRIFT UV-VIS spectroscopic graph of the cosmetic powder prepared according to Example 4 and of the talc before coating in its Comparative Example.

DETAILED DESCRITPION OF THE PREFERRED EMBODIMENTS

The cosmetic powder of the present invention includes powders and matrix layers coated on the surface of the powder, and the matrix layer includes NLE and lamella liquid crystal including a skin-active material, a self-assembly ampholytic material, a higher alcohol or fatty acid, and polyhydric alcohol.

The matrix layer does not only include the NLE formed with the aforementioned self-assembly ampholytic material, higher alcohol or fatty

acid, and polyhydric alcohol, but also includes a liquid crystal formed with the self-assembly ampholytic material, higher alcohol or fatty acid, and polyhydric alcohol having no relation with the formation of the NLE. This liquid crystal shapes a lamella that appears transparent or bluish. As shown in Fig. 1, liquid crystal is coated with NLE on the surface of the cosmetic powder.

The weight ratio of the matrix layers and powder is preferably in the range of 0.5:99.5 to 30:70, and more preferably in the range of 1:99 to 15:85. A weight ratio of under 0.5:99.5 could bring about insufficient skincare effects, while a weight ratio of over 30:70 not only cause bad agreeability in use but is also uneconomical because skincare effects may not be significantly improved in proportion to the increased amount of both materials.

Preferable examples of the cosmetic powder employed for coating in the present invention include at least one material selected from the group consisting of talc, mica, sericite, phlogopite, barium sulfate, kaolin, platy alumina, boron nitride, titaniuim dioxide coated on mica , fluorine apatite, hydroxyapatite, magnesium carbonate, calcium carbonate, titanium dioxide, iron oxide red, iron oxide yellow, iron oxide black, and silica.

The skin-active material supported inside NLE or contained between the layers and the structures of the lamella liquid crystal is advantageously at least one material selected from the group consisting of collagen,

hyaluronic acid, sodium hyaluronate, arbutin, oil soluble extract of *Glycyrrhiza uralensis*, extract of *Mori Cortex Radicis* , vitamin A and a derivative thereof, vitamin B and a derivative thereof, vitamin C and a derivative thereof, vitamin E and a derivative thereof, nicotinamide and a derivative thereof, serina-4(14),7(11)-diene-8-on(AT-1), 5,15-diacetyl-3-benzoyllathyrol, tripeptide, resveratrol, jasmonate, methyljasmonate, oligopeptide and a derivative thereof, and polyphenol and a derivative thereof. This active material is preferably included in an amount of 0.001 to 10 parts by weight, and more preferably 0.05 to 5 parts by weight with respect to 100 parts by weight of the cosmetic powder. The amount of the active material can be regulated within the above weight ratio range depending on the properties of included materials and the degree of desired effects. However, an amount of the active material of under 0.001 parts by weight does not result in sufficient skincare effects, while an amount of over 10 parts by weight can result in poor economy because the skincare effects do not increase in proportion to the increased amount of the active material.

The self-assembly ampholytic material being capable of comprising NLE and lamella liquid crystal is preferably at least one material selected from the group consisting of an amino acid-based surfactant, a lecithin-based surfactant, phospholipids, ceramide, and cholesterol.

As to the amino acid-based surfactant, an acylated amino acid-based surfactant is most comprehensively used at present. More specifically,

advantageous is at least one material selected from the group consisting of N-acyl lysine salt wherein an alkyl group with 12 to 24 carbons is combined with lysine, and one of hydrogen, sodium, and potassium is substituted in the end of the carbonyl group, N-acyl glutamate wherein an alkyl group with 12 to 24 carbons is combined with glutamic acid, and one of hydrogen, sodium, and potassium is substituted in the end of the carbonyl group; and N-acyl alaninate wherein an alkyl group with 12 to 24 carbons is combined with alanine, and one of hydrogen, sodium, and potassium is substituted in the end of the carbonyl group.

As to the lecithin-based surfactant, advantageous is at least one material selected from the group consisting of hydrogenated yolk lecithin, hydrogenated soy bean lecithin, and synthetic lecithin.

As to the phospholipids, advantageous is at least one material selected from the group consisting of glycerophospholipids, sphingolipids, sphingoglycolipids, sphingophospholipids, phosphatidylcholine, phosphatidylinositol, and phosphatidylmyelin.

As to the ceramide, advantageous is at least one material selected from the group consisting of acyl ceramide, hydroxy ceramide, and synthetic ceramide.

As to the cholesterol, advantageous is at least one material selected from the group consisting of cholesterol, cholesterol ester, and ethyleneoxide-added cholesterol with the added ethyleneoxide mole number

of 10 to 30.

These self-assembly ampholytic materialampholytic material can be used alone or as a mixture with other materials to facilitate the formation of NLE.

The amount of the self-assembly ampholytic materialampholytic material is advantageously in the range of 0.05 to 10 parts by weight with respect to 100 parts by weight of cosmetic powder. The amount of the self-assembly ampholytic material can be regulated within the above range depending on the HLB (Hydrophilic Lipophilic Balance) value and the packing parameter on the interface, advantageously accomplishing the intended purpose. An amount of under 0.05 parts by weight may not achieve sufficient skincare effects while an amount of over 10 parts by weight is not economical because skincare effects may hardly increase in proportion to the increased amount of self-assembly ampholytic material.

The higher alcohol or fatty acid cannot form NLE alone, but co-works with self-assembly ampholytic material, assisting the formation of NLE by improving the packing density and the packing property of the membrane materials of NLE. The higher alcohol or fatty acid working as a kind of an assistant for NLE formation is advantageously at least one material selected from the group consisting of myristyl alcohol, lauroyl alcohol, cetyl alcohol, stearyl alcohol, isostearyl alcohol, arachidyl alcohol, behenyl alcohol, batyl alcohol, lauric acid, myristic acid, palmitic acid, stearic acid, isostearic acid,

arachidic acid, and behenic acid. The amount of the higher alcohol or fatty acid is advantageously in the range of 0.05 to 5 parts by weight with respect to 100 parts by weight of cosmetic powder. An amount of under 0.05 parts by weight cannot achieve sufficient skincare effects, while an amount of over 5 parts by weight can hardly increase skincare effects in proportion of the increased amount.

The polyhydric alcohol facilitates NLE formation by actively dissolving and swelling higher alcohol or fatty acid and self-assembly ampholytic material. It is advantageously at least one material selected from the group consisting of ethylene glycol, propylene glycol, dipropylene glycol, 1,2-butylene glycol, 1,3-butylene glycol, 2,3-butylene glycol, trimethylene glycol, pentamethylene glycol, 2-butene-1,4-diol, hexylene glycol, octylene glycol and glycerin. The amount of polyhydric alcohol with respect to the cosmetic powder is advantageously in the range of 0.1 to 10 parts by weight with respect to 100 parts by weight of cosmetic powder. An amount of under 0.1 parts by weight may not bring about sufficient skincare effects, while an amount of over 10 parts by weight is not economically advantageous because skincare effects hardly increase in proportion to its increased amount.

The present invention also provides a method of preparing the cosmetic powder including the following steps: preparing a dispersed solution by adding a water-dispersed solution of self-assembly ampholytic

material and a skin-active material into higher alcohol or fatty acid, and polyhydric alcohol melted with heat; preparing a coating solution by applying shear force to the dispersed solution while heating it; coating matrix layers to be absorbed on the surface of powder by carefully adding a metal salt solution after dispersing powder in the coating solution, or by slowly adding the coating solution after adding a metal salt solution into the water phase dispersed with powder; and obtaining cosmetic powder coated with matrix layers by washing, filtering, and drying the coated powder prepared in the previous step after setting it aside for a time until the coated powder sinks down into sediment and removing the supernatant solution therefrom.

A method of preparing cosmetic powder in the present invention is now described in more detail. Cosmetic powder of the present invention is prepared through the following steps. First, a dispersed solution is prepared by adding a water-dispersed solution of self-assembly ampholytic material and skin-active material to a higher alcohol or fatty acid, and polyhydric alcohol dissolved with heat. The polyhydric alcohol facilitates NLE formation and actively dissolves the higher alcohol or fatty acid.

The aforementioned self-assembly ampholytic material, skin-active material, higher alcohol or fatty acid, and polyhydric alcohol used here is the same as described above.

A coating solution is prepared by applying shear force to the dispersed solution while heating it.

Here, the heating temperature is advantageously in the range of 60 to 90℃, considering the melting point of the self-assembly ampholytic material and higher alcohol or fatty acid. If the temperature is under 60℃, a solid material like fatty acid is difficult to dissolve, causing insufficient formation of the liposome and emulsion and the like. On the contrary, when the temperature is over 90℃, a material with low safety against heat could be denaturalized, and it is also uneconomical.

As to a dispersing device, advantageously used is a homogenizer or a sonicator producing shear force at dispersion. The amount of time for the dispersion is advantageously in the range of 1 to 30 minutes, and more advantageously 1 to 10 minutes.

In addition, the dispersing solution can be additionally passed through a microfludizer one to three times more after applying shear force.

After powder is dispersed in the aforementioned coating solution, the matrix layers is absorbed and coated on the surface of powder by carefully adding a metal salt solution after dispersing powder in the coating solution, or by slowly adding the coating solution after adding a metal salt solution into the water phase dispersed with powder. The metal salt solution includes counter ions regulating the zeta potential of the electric surface charge of NLE and lamella liquid crystal.

The surface charge of self-assembly ampholytic material plays an important role in coating matrix layers including NLE and lamella liquid

crystal on the surface of cosmetic powder. In general, the stability of colloid in the dispersed system depends on its potential energy represented by the sum of repulsion and attraction. That is, the colloid is either maintained stably or is coagulated down to sediment, depending on the balance between repulsion and attraction among particles.

Based on this theoretical background, the present inventor found that NLE and lamella liquid crystal can be actively coated on the surface of cosmetic powder by regulating the interactions among colloid particles in the disperse system of NLE, lamella liquid crystal, and cosmetic powder. In other words, the interactions among colloid particles are also formed among powder-powder, NLE-NLE, lamella liquid crystal-lamella liquid crystal, powder-NLE, powder- lamella liquid crystal, and NLE- lamella liquid crystal. The interaction required for coating is attraction rather than repulsion among particles.

Considering that it is advantageous for small colloids to move toward larger ones in the coating process and that the diameter of powder particle is relatively larger and heavier than that of NLE and lamella liquid crystal, the interaction among powder particles can be ignored. In addition, the interaction among the same colloids such as NLE-NLE and lamella liquid crystal-lamella liquid crystal can also be ignored. The coagulations formed with these particles should be more spontaneously oriented and absorbed in the cosmetic powder, finally being coated, because the size of these

coagulations is still relatively smaller than that of powder particles even though much the attraction among colloids is fortified and the other interaction, repulsion, is diminished. Therefore, the present invention focused more attention to the interaction between powder-NLE and powder-lamella liquid crystal and could successfully accomplish coating of the powder with NLE and lamella liquid crystal by decreasing the repulsion and increasing the attraction between them.

Matrix layers including NLE and lamella liquid crystal on the surface of powder can advantageously be coated by carefully adding and titrating an polyvalent metal salt aqueous solution and by precisely manipulating the zeta potential in the dispersed system. The polyvalent metal salt aqueous solution is appropriate because some materials of self-assembly ampholytic material are replaced with sodium (Na) and potassium (K). The addition of a metal salt aqueous solution can also help powder coated on the surface by decreasing the solubility of self-assembly ampholytic material replaced with a monovalent alkali metal. Here, the polyvalent metal salt is advantageously at least one selected from the group consisting of magnesium chloride ($MgCl_2$), magnesium sulfate ($MgSO_4$), zinc chloride ($ZnCl_2$), zinc sulfate ($ZnSO_4$), calcium chloride ($CaCl_2$), calcium sulfate ($CaSO_4$), aluminum chloride ($AlCl_3$), and aluminum sulfate ($Al_2(SO_4)_3$). The amount of the metal salt is advantageously in the range of 0.01 to 2 g, and more advantageously in the range of 0.05 to 1 g with respect to 100 g of powder. An amount of

under 0.01 g may not sufficiently neutralize the surface charge of self-assembly ampholytic material, while an amount of over 2 g can make the coagulation among particles difficult due to the relatively too strong electric repulsion, eventually impeding the coating.

The careful addition of a metal salt aqueous solution and manipulation of zeta potential leads the dispersed system of powder-NLE-lamella liquid crystal to be oriented toward the surface of cosmetic powder and absorbed in it, reducing the repulsion among NLE's and also among lamella liquid crystals, and increasing the attraction between NLE and powder and between lamella liquid crystal and powder. Here, NLE and lamella liquid crystal are absorbed and coated in a pattern on the surface of powders. Then, the powders coated with NLE and lamella liquid crystal are flocculated and slowly sink down, and later, an interfacial separation happens between water and cosmetic powers coated with matrix layers including NLE and lamella liquid crystal.

Powder coated with matrix layers including NLE and lamella liquid crystal in the present invention is obtained by setting aside the aforementioned solution including the coated powder for a time after the interfacial separation is complete, by washing and filtering the sediments after removing the supernatant solution from them, and by drying them at low or high pressure, depending on the properties of included materials.

The present invention also provides the cosmetic powder prepared

in the aforementioned method.

The cosmetic powder of the present invention makes it possible to compound NLE and lamella liquid crystal into make-up cosmetic compositions as skincare products which basically exist in liquid phrase.

The cosmetic powder coated with matrix layers including NLE and lamella liquid crystal is advantageously compounded in an amount of 0.1 to 30 parts by weight, and more advantageously 0.5 to 20 parts by weight with respect to 100 parts by weight of a total make-up cosmetic composition. An amount of under 0.1 parts by weight cannot achieve the intended effects due to its insufficient amount. On the contrary, a ratio of over 30 parts by weight is not economical, because it could be excessive regarding every type and state of make-up cosmetics.

However, the cosmetic powder coated with NLE and lamella liquid crystal can be applied to various types of make-up cosmetics manufactured by using dried powder or pulverulent body as a main component. Especially, it can be appropriately applied to powder-based products commonly using cosmetic powder, various types of foundations, lip make-up like lipstick, and eye make-up like mascara, and more specifically, to cake-type foundation, powder foundation, compact foundation, liquid foundation, control base, skin-cover, eye-shadow, Cheek color, lipstick, mascara, and eyebrow pencil.

Cosmetic powder coated with NLE and lamella liquid crystal can not only endow the same skin treatment effects with make-up cosmetics as with

skincare products due to the even emission of active components which is included in NLE, but can also contribute to obtaining a make-up cosmetic composition with high skin compatibility and low sensitivity of NLE and, excellent skin softness and moisture effects due to the bound water combined in lamella liquid crystal.

The make-up cosmetic composition of the present invention can be prepared by precisely manipulating the physicochemical properties of NLE to be oriented toward and absorbed in cosmetic powder and by variously treating them to be coated on the surface of cosmetic powder, forming matrix layers including NLE and lamella liquid crystal which render NLE excluding water to exist stably in a water phase. Therefore, the make-up cosmetic composition of the present invention includes a component known as most difficult to be applied to make-up cosmetics.

The following examples and experimental examples illustrate the present invention in further detail. However, it is understood that the present invention is not limited by these examples and experimental examples.

EXAMPLES

Example 1

Lecithin at 2 parts by weight and arbutin at 0.2 parts by weight with respect to cosmetic powder at 100 parts by weight were dissolved in 100 ㎖ of distilled water, heated to the temperature of 65℃, and dispersed for 3 minutes with sonicator. On the other hand, stearyl alcohol at 0.3 parts by

weight was mixed and dissolved in 1,3-butylene glycol at 2 parts by weight with heat of up to 70℃, and the resulting solution was dispersed in the water phase of the lecithin and arbutin solution with heat of up to 75℃.

Talc at 95.5 parts by weight was put into 900 ㎖ of distilled water, and sufficiently dispersed and agitated together. Then, 10 ㎖ of a 5% magnesium chloride ($MgCl_2$) solution was added to this talc mixture and agitated together at a ambient temperature.

Next, the coating solution comprising NLE and lamella liquid crystal which include lecithin, arbutin, stearyl alcohol, and 1,3-butylene glycol, which had been kept at the temperature of 70℃, was gradually added into this talc and slowly agitated together for 10 minutes so that NLE and lamella liquid crystal could be sufficiently absorbed on the surface of the talc. Then, the whole mixture solution was set aside for a time until the sediment sank to the bottom. After removing the supernatant solution from it, the sediment was washed twice with distilled water to remove metal salt ions remaining in the water phase, then dehydrated and dried in vacuum, finally obtaining a resulting cosmetic powder.

Example 2

Cosmetic powder was prepared by the same method as in Example 1 except that sericite instead of talc, monosodium stearoyl glutamic acid instead of lecithin, and collagen instead of arbutin were used.

Example 3

Cosmetic powder was prepared by the same method as in Example 1 except that mica instead of talc, retinylpalmitate instead of arbutin and propylene glycol instead of 1,3-butylene glycol, were used.

Example 4

Cosmetic powder was prepared by the same method as in Example 1 except for the use of vitamin E acetate instead of arbutin.

Example 5

Cosmetic powder was prepared by the same method as in Example 1 except that titanium dioxide (TiO_2) instead of talc and vitamin E acetate instead of arbutin were used.

Example 6

Cosmetic powder was prepared by the same method as in Example 1 except that mica instead of talc and vitamin E acetate instead of arbutin were used.

Example 7

Cosmetic powder was prepared by the same method as in Example 1 except that iron oxide red instead of talc and vitamin E acetate instead of arbutin were used.

Example 8

Cosmetic powder was prepared by the same method as in Example 1 except that iron oxide yellow instead of talc and vitamin E acetate instead of arbutin were used.

Example 9

Cosmetic powder was prepared by the same method as in Example 1 except that iron oxide black instead of talc and vitamin E acetate instead of arbutin were used.

Example 10

Cosmetic powder was prepared by the same method as in Example 1 except that silica instead of talc and vitamin E acetate instead of arbutin were used.

Example 11

Phosphatidylcholine at 1.5 parts by weight and nicotinamide at 0.3 parts by weight to cosmetic powder at 100 parts by weight were dissolved in 100 ㎖ of distilled water, heated to 65℃, and dispersed for 3 minutes with sonicator. Cetylalcohol at 0.2 parts by weight to cosmetic powder at 100 parts by weight were mixed in 2,3-butylene glycol at 1.5 parts by weight and dissolved therein with heat of up to 70℃. Then, the dissolved solution was dispersed in the water phase of the aforementioned phosphatidylcholine and nicotinamide solution, while heating it to the temperature of 75℃.

Silica at 96.5 parts by weight to cosmetic powder at 100 parts by weight were put into 900 ㎖ of distilled water, and sufficiently dispersed and agitated together. Then, 10 ㎖ of 5% $ZnCl_2$ aqueous solution was added thereto, and agitated together at a ambient temperature.

The coating solution comprising NLE and lamella liquid crystal which

include phosphatidyl choline, nicotinamide, cetyl alcohol, and 2,3-butylene glycol, which had been kept at the temperature of 70℃, was gradually added to the silica and slowly agitated together so that NLE and lamella liquid crystal could be sufficiently absorbed on the surface of the silica for 10 minutes. Next, the whole mixture solution was set aside for a time until the sediment sank. After removing supernatant solution therefrom, the sediment was washed twice with distilled water to remove metal salt ions remaining in the water phase, then dehydrated and dried in vacuum, finally obtaining resulting cosmetic powder.

Example 12

Glycerophospholipid at 2.0 parts by weight and 5,15-deacetyl-3-benzoyllathyrol at 0.05 parts by weight to cosmetic powder at 100 parts by weight were dissolved in 100 ㎖ of distilled water, heated to 65℃, and dispersed for 3 minutes with a homogenizer. Stearic acid at 0.5 parts by weight to cosmetic powder at 100 parts by weight were mixed in glycerin at 2.0 parts by weight and dissolved therein with heat of up to 70℃. Then, the dissolved solution was dispersed in the water phase of the above glycerophospholipid and 5,15-deacetyl-3-benzoyllathyrol solution, heating up to 75℃, and passed through a microfludizer three times.

Barium sulfate at 95.45 parts by weight to cosmetic powder at 100 parts by weight were put into 900 ㎖ of distilled water, and sufficiently dispersed and agitated together. Then, 10 ㎖ of a 5% $CaSO_4$ solution was

added to the aforementioned Barium sulfate mixture and agitated together at a ambient temperature.

Next, the coating solution comprising NLE and lamella liquid crystal which include glycerophospholipid, 5,15-deacetyl-3-benzoyllathyrol, stearic acid, and glycerin, which had been kept at the temperature of 70℃, was gradually added into barium sulfate, and slowly agitated together for 10 minutes so that NLE and lamella liquid crystal could be sufficiently absorbed on the surface of the barium sulfate ($BaSO_4$). Then, the whole mixture solution was set aside for a time until the sediment sank. After removing the supernatant solution therefrom, the sediment waswashed twice with distilled water to remove metal salt ions remaining in the water phase, then dehydrated and dried in vacuum, finally obtaining the resulting cosmetic powder.

Example 13

Polyoxyethylenecholesterylether at 3.0 parts by weight and tripeptide at 1.0 part by weight to cosmetic powder at 100 parts by weight were dissolved in 100 ㎖ of distilled water, heated to 65℃, and dispersed for 3 minutes with a homogenizer. Behenyl alcohol at 0.1 part by weight to cosmetic powder at 100 parts by weight was mixed in hexylene glycol at 1.5 parts by weight and dissolved therein with heat of up to 70℃. Then, this dissolved solution was dispersed in the water phase of the aforementioned polyoxyethylenecholesterylether and tripeptide solution, while heating up to

75℃.

Kaolin at 94.4 parts by weight to cosmetic powder at 100 parts by weight were put into 900 ㎖ of distilled water, and sufficiently dispersed and agitated together. Then, 10 ㎖ of a 5% $Al_2(SO_4)_3$ solution was added to the aforementioned kaolin mixture and agitated together at a ambient temperature.

Next, the coating solution comprising NLE which included polyoxyethylenecholesterylether, tripeptide, behenyl alcohol, and hexylene glycol and lamella liquid crystal, which had been kept at the temperature of 70℃, was gradually added into kaolin mixture, and slowly agitated together for 10 minute so that NLE and lamella liquid crystal could be sufficiently absorbed on the surface of the kaolin. Then, the whole mixture solution was set aside for a time until the sediment sank. After removing the supernatant solution therefrom, the sediment was washed twice with distilled water to remove metal salt ions remaining in the water phase, then dehydrated and dried in vacuum, finally obtaining the cosmetic powder.

Experimental Example 1

The cosmetic powders prepared according to Examples 1, 2, and 3 were observed at 100,000 times magnifications under a Scanning Electron Microscope (SEM, Jeol, Japan). The pictures taken with the SEM are illustrated in Figs. 2, 3, and 4.

As shown in Figs. 2 to 4, the cosmetic powder turned out clearly

coated on its surface with about 10~30 nm of NLE particles as well as lamella liquid crystals consecutively linked between NLE particles.

Experimental Example 2

The difference between cosmetic powder coated on the surface with NLE containing vitamin E acetate and lamella liquid crystal (Example 4) and talc before coating (Control) was measured by a DRIFT UV-VIS spectrometer (JASCO, Japan), within the wavelength range of 200nm~900nm.

Fig. 5 is a graph illustrating the absorbance of vitamin E acetate measured by a DRIFT UV-VIS spectrometer (JASCO, Japan), within the wavelength range of 200nm~900nm. Fig. 6 is the DRIFT UV-VIS spectrograph of cosmetic powder (Example 4) and talc before coating (Control).

The absorption peak of vitamin E acetate itself was found in the wavelength range of 210 nm to 285 nm (marked with a sign ▼), shown in Fig. 5. However, the spectroscopic spectrum of talc before coating (Control) was found at the bottom of Fig. 6. On the contrary, cosmetic powder coated on the surface with NLE containing vitamin E acetate and lamella liquid crystal (Example 4) was clearly found at the top of Fig. 6, proving the existence of vitamin E acetate (marked with a sign ▼) in the wavelength range of 210 nm to 285 nm.

Preparation Example 1 and Comparative Example 1

1. Preparation of cake-type foundation

Each cake-type foundation was prepared by compounding cosmetic powder prepared according to the Example 4 with general talc in the aforementioned method in the following weight ratios (unit: parts by weight) given in Table 1.

Table 1

Raw material	Preparation Example 1	Comparative Example 1
kaolin treated with dimethicone	to 100	to 100
talc treated with dimethicone	-	15.0
cosmetic powder according to Example 4	15.0	-
sericite	10.0	10.0
titanium dioxide treated with dimethicone	5.0	5.0
iron oxide red treated with dimethicone	0.6	0.6
iron oxide yellow treated with dimethicone	2.8	2.8
iron oxide black treated with dimethicone	0.3	0.3
Triethylhexanoin	3.0	3.0
Dimethyl polysiloxane	3.0	3.0
Sorbitan sesquioleate	1.0	1.0
Preservative	appropriate quantity	appropriate quantity

fragrance	appropriate quantity	appropriate quantity

2. Evaluation of make-up effects

20 women of age 20 to 40 were impaneled to test and compare the make-up effects of each cake-type foundation prepared according to Preparation Example 1 and Comparative Example 1.

The panel members were asked to apply each cake-type foundation on both of their cheeks after basic care with skincare products, and to then evaluate and compare skin compatibility, moisture, softness, agreeability of use, natural lightening, adherence to skin, and durability. The measurement scale used in this test was as follows: 5: very good, 4: good, 3: average, 2: bad, 1: very bad. Then, the mean of the 20 panel members was calculated and is given in Table 2.

Table 2

Evaluation	Preparation Example 1	Comparative Example 1
skin compatibility	4.3	3.2
moisture/softness	4.6	2.7
agreeability of use	4.3	3.7
natural lightening	4.1	3.5
adherence to skin	4.4	3.8
durability	4.2	3.6

As shown in Table 2, the cake-type foundation of Preparation Example 1 of the present invention proved to have better properties than those of Comparative Example 1 in every evaluation category.

Preparation Example 2 and Comparative Example 2

1. Preparation of liquid foundation

Each liquid foundation was prepared by combining cosmetic powder prepared according to Examples 5 to 9 with the following components given in Table 3 in the following weight ratios (unit: parts by weight), also given in the same table, in the aforementioned method.

Table 3

Raw material	Preparation Example 2	Comparative Example 2
distilled water	To 100	To 100
Cyclomethicone	30.5	30.5
Dimethicone copolyol	4.0	4.0
Distearyldimonium chloride	0.2	0.2
dipropylene glycol	4.0	4.0
glycerin	3.0	3.0
betaine	2.0	2.0
magnesium sulfate ($MgSO_4$)	0.7	0.7
titanium dioxide (TiO_2)	-	8.0

cosmetic powder according to Example 5	8.0	-
mica	-	3.5
cosmetic powder according to Example 6	3.5	-
Nylon powder	2.5	2.5
iron oxide red	-	0.18
iron oxide yellow	-	0.90
iron oxide black	-	0.07
cosmetic powder according to Example 7	0.18	-
cosmetic powder according to Example 8	0.90	-
cosmetic powder according to Example 9	0.07	-
Preservative	appropriate quantity	appropriate quantity
fragrance	appropriate quantity	appropriate quantity

2. Evaluation of make-up effects

20 women of age 20 to 40 were impaneled to test and compare the make-up effects of each liquid foundation prepared according to Preparation Example 2 and Comparative Example 2.

The panel members were asked to apply each liquid foundation on both of their cheeks after basic care of their skin with skincare products, and then to evaluate and compare its skin compatibility, moisture, softness, agreeability of use, natural lightening, adherence to skin, and durability. The measurement scale used in this test was as follows: 5: very good, 4: good, 3: average, 2: bad, 1: very bad. Then, the mean of the 20 panel members was calculated and is given in Table 4.

Table 4

Evaluation	Preparation Example 2	Comparative Example 2
adherence to skin	4.1	3.8
moisture/softness	4.3	3.7
agreeability of use	4.2	3.9
durability	4.2	3.7

As shown in Table 4, the liquid foundation of Preparation Example 2 in the present invention proved to have better properties than that of Comparative Example 2 in every evaluation category.

Preparation Example 3 and Comparative Example 3

1. Preparation of a lipstick

Each lipstick was prepared by combining cosmetic powder prepared according to Examples 5 to 8 with the components given in the following Table 5 in the weight ratio (unit: parts by weight) also given in the same

table in the aforementioned method.

Table 5

Raw material	Preparation Example 3	Comparative Example 4
polyglyceryl-2-triisostearate	To 100	To 100
Ceresine	7.0	7.0
Cetyl palmitate	5.0	5.0
ethylene/ propylene copolymer	3.0	3.0
Triethylhexanoin	16.0	16.0
diisostearyl malate	17.0	17.0
squalane	10.0	10.0
olive oil	5.0	5.0
red color No.202	0.8	0.8
iron oxide yellow	-	1.2
iron oxide red	-	0.5
titanium dioxide (TiO_2)	-	0.5
cosmetic powder according to Example 8	1.2	-
cosmetic powder according to Example 7	0.5	-
cosmetic powder according to Example 5	0.5	-

mica	-	15.0
cosmetic powder according to Example 6	15.0	-
Preservative	appropriate quantity	appropriate quantity
fragrance	appropriate quantity	appropriate quantity

2. Evaluation of make-up effects

20 women of age of 20 to 40 were impaneled to test and compare the make-up effects of each lipstick prepared according to Preparation Example 3 and Comparative Example 3.

The panel members were asked to separately apply each lipstick to the left and right side of their lips after basic care of their skin with Skincare products, and then to evaluate and compare its adherence to skin, moisture/softness, and agreeability of use. The measurement scale used in this test was as follows: 5: very good, 4: good, 3: average, 2: bad, 1: very bad. Then, the mean of the 20 panel members was calculated and is given in the following Table 6.

Table 6

Evaluation	Preparation Example 3	Comparative Example 3
adherence to skin	4.2	3.9

moisture/softness	4.3	3.8
agreeability of use	4.3	3.9

As shown in Table 6, the lipstick of Preparation Example 3 in the present invention proved to have better properties than that of Comparative Example 3 in every evaluation category.

Preparation Example 4 and Comparative Example 4

1. Preparation of mascara

Each mascara was prepared by combining cosmetic powder prepared according to Examples 9 to 10 with the following components given in Table 7 in the following weight ratio (unit: parts by weight) also given in the same table in the aforementioned method.

Table 7

Raw Material	Preparation Example 4	Comparative Example 4
distilled water	To 100	To 100
hydroxyethylcellulose	1.0	1.0
triethanolamine	2.0	2.0
polyvinyl alcohol	3.0	3.0
iron oxide black	-	7.0
cosmetic powder according to Example 9	7.0	-

silica	-	5.0
cosmetic powder according to Example 10	5.0	-
beeswax	9.0	9.0
carnauba wax	6.5	6.5
stearic acid	4.0	4.0
Glyceryl monostearate	2.0	2.0
triethylhexanoin	3.0	3.0
polysorbate 20	1.0	1.0
simethicone	1.0	1.0
Preservative	appropriate quantity	appropriate quantity
acrylate copolymer emulsion	18.0	18.0

2. Evaluation of make-up effects

20 women of age 20 to 40 were impaneled to test and compare the make-up effects of both of the mascaras prepared according to Preparation Example 4 and Comparative Example 4.

The panel members were asked to separately apply mascara to the eyelashes of each of their eyes, and then to evaluate and compare its volume, applicability, and durability. The measurement scale used in this test was as follows: 5: very good, 4: good, 3: average, 2: bad, 1: very bad.

Then, the mean of the 20 panel members was calculated and is given in the following Table 8.

Table 8

Evaluation	Preparation Example 4	Comparative Example 4
volume	4.2	3.6
applicability	4.0	3.5
durability	4.2	3.6

As shown in Table 8, the mascara of Preparation Example 4 in the present invention proved to have better properties than that of Comparative Example 4 in every evaluation category.

The cosmetic powder of the present invention is characterized that lamella liquid crystal in helping stabilize NLEs in water phase like water, can be coated on the surface of the powder with NLE. Therefore, the present invention can provide a cosmetic powder coated with NLE and lamella liquid crystal not only endowing the same skin treatment effects with make-up cosmetics as with skincare products due to the even emission of active components belonging to NLE, but also contributing to obtaining a make-up cosmetic composition high skin compatibility and low sensitivity of NLE and lamella liquid crystal, and with excellent skin softness and moisture effects due to the bound water combined in lamella liquid crystal. In addition, the

present invention can provide a make-up cosmetic composition having an excellent applicability and adherence to skin due to the matrix layer coated on the surface of the powder.

While the present invention has been described in detail with reference to the preferred embodiments, those skilled in the art will appreciate that various modifications and substitutions can be made thereto without departing from the spirit and scope of the present invention as set forth in the appended claims.

WHAT IS CLAIMED IS:

1. A cosmetic powder comprising:

powder, and

matrix layers coated on the surface of the powder,

wherein the matrix layers comprise nano-sized liposome and emulsion (NLE) and lamella liquid crystal.

2. The cosmetic powder of claim 1, wherein the nano-sized liposome and emulsion (NLE), and lamella liquid crystal comprise a skin-active material, self-assembly ampholytic material, higher alcohol or fatty acid, and polyhydric alcohol.

3. The cosmetic powder of claim 1, wherein a weight ratio of the matrix layers and the powder is in the range of 0.5:99.5 to 30:70.

4. The cosmetic powder of claim 1, wherein the powder is at least one material selected from the group consisting of talc, mica, sericite, phlogopite, barium sulfate, kaolin, platy alumina, boron nitride, titanium dioxide coated on mica, fluorine apatite, hydroxyapatite, magnesium carbonate, calcium carbonate, titanium dioxide, iron oxide red, iron oxide yellow, iron oxide black, and silica.

5. The cosmetic powder of claim 2, wherein the skin active material is at least one material selected the group consisting of collagen; hyaluronic acid; sodium hyaluronate; arbutin; oil soluble extract of glycyrrhiza uralensis; extract of Mori Cortex Radicis; vitamin A and a derivative thereof; vitamin B and a derivative thereof; vitamin C and a derivative thereof; vitamin E and a derivative thereof; nicotinamide and a derivative thereof; serina-4(14),7(11)-diene-8-on(AT-1); 5,15-diacetyl-3-benzoyllathyrol; tripeptide; resveratrol; jasmonate; methyljasmonate; oligopeptide and a derivative thereof; and polyphenol and a derivative thereof.

6. The cosmetic powder of claim 2, wherein an amount of the skin active material is in the range of 0.001 to 10 parts by weight with respect to 100 parts by weight of cosmetic powder.

7. The cosmetic powder of claim 2, wherein the self-assembly ampholytic material is at least one material selected from the group consisting of an amino acid-based surfactant, a lecithin-based surfactant, phospholipids, ceramide, and cholesterol.

8. The cosmetic powder of claim 7, wherein the amino acid-based surfactant is at least one material selected from the group consisting of N-acyl lysine salt wherein an alkyl group with 12 to 24 carbons is combined

with lysine and one of hydrogen, sodium, and potassium is substituted in the end of a carbonyl group; N-acyl glutamate wherein an alkyl group with 12 to 24 carbons is combined with glutamic acid and one of hydrogen, sodium, and potassium is substituted in the end of a carbonyl group; and N-acyl alaninate wherein an alkyl group with 12 to 24 carbons is combined with alanine and one of hydrogen, sodium, and potassium is substituted in the end of a carbonyl group.

9. The cosmetic powder of claim 7, wherein the lecithin-based surfactant is at least one material selected from the group consisting of hydrogenated yolk lecithin, hydrogenated soy bean lecithin, and synthetic lecithin.

10. The cosmetic powder of claim 7, wherein the phospholipids is at least one material selected from the group consisting of glycerophospholipids, sphingolipids, sphingoglycolipid, sphingophospholipids, phosphatidylcholine, phosphatidylinositol, and phosphatidylmyelin.

11. The cosmetic powder of claim 7, wherein the ceramide is at least one material selected from the group consisting of acyl ceramide, hydroxy ceramide, and synthetic ceramide.

12. The cosmetic powder of claim 7, wherein the cholesterol is at least one material selected from the group consisting of cholesterol, cholesterol ester, and ethyleneoxide-added cholesterol with the added ethyleneoxide mole number of 10 to 30.

13. The cosmetic powder of claim 2, wherein an amount of the self-assembly ampholytic material is advantageously in the range of 0.05 to 10 parts by weight with respect to 100 parts by weight of cosmetic powder.

14. The cosmetic powder of claim 2, wherein the higher alcohol or fatty acid is at least one material selected from the group consisting of myristyl alcohol, lauroyl alcohol, cetyl alcohol, stearyl alcohol, isostearyl alcohol, arachidyl alcohol, behenyl alcohol, batyl alcohol, lauric acid, myristic acid, palmitic acid, stearic acid, isostearic acid, arachidic acid, and behenic acid.

15. The cosmetic powder of claim 2, wherein an amount of the higher alcohol or fatty acid is in the range of 0.05 to 5 parts by weight with respect to 100 parts by weight of cosmetic powder.

16. The cosmetic powder of claim 2, wherein the polyhydric alcohol is at least one material selected from the group consisting of ethylene glycol,

propyleneglycol, dipropyleneglycol, 1,2-butyleneglycol, 1,3-butyleneglycol, 2,3-butyleneglycol, trimethyleneglycol, pentamethyleneglycol, 2-butene-1,4-diol, hexyleneglycol, octyleneglycol, and glycerin.

17. The cosmetic powder of claim 2, wherein an amount of polyhydric alcohol with respect to the cosmetic powder is in the range of 0.1 to 10 parts by weight with respect to100 parts by weight of cosmetic powder.

18. A method of preparing a cosmetic powder comprising:

a) preparing a dispersed solution by adding a water-dispersed solution of self-assembly ampholytic material and a skin-active material into higher alcohol or fatty acid, and polyhydric alcohol melted with heat;

b) preparing a coating solution by applying shear force to the dispersed solution in the step a) while heating it

c) coating matrix layers to be absorbed on the surface of powder by carefully adding a metal salt solution after dispersing powder in the coating solution or by slowly adding the coating solution after adding a metal salt solution into the water phase dispersed with powder; and

d) obtaining cosmetic powder coated with matrix layers by washing, filtering, and drying the coated powder prepared in the previous step after setting it aside for a time until the coated powder sinks down into sediment and removing the supernatant solution therefrom.

19. The method of preparing a cosmetic powder of claim 18, wherein the shearing in the step b) is performed while heating in the range of 60 to 90℃.

20. The method of preparing a cosmetic powder of claim 18, wherein the shearing in the step b) is performed using a homogenizer or a sonicator.

21. The method of preparing a cosmetic powder of claim 18, further comprising passing through a microfludizer after applying shear force.

22. The method of preparing a cosmetic powder of claim 18, wherein the metal salt is at least one selected from the group consisting of magnesium chloride ($MgCl_2$), magnesium sulfate ($MgSO_4$), zinc chloride ($ZnCl_2$), zinc sulfate ($ZnSO_4$), calcium chloride ($CaCl_2$), calcium sulfate ($CaSO_4$), aluminum chloride ($AlCl_3$), and aluminum sulfate ($Al_2(SO_4)_3$).

23. The method of preparing a cosmetic powder of claim 18, wherein an amount of the metal salt is in the range of 0.01 to 2 g with respect to 100 g of powder.

24. A make-up cosmetic composition comprising the cosmetic powder of claim 1.

25. The make-up cosmetic composition of claim 24, comprising 0.1 to 30 parts by weight of cosmetic powder with respect to100 parts by weight of a total make-up cosmetic composition.

26. The make-up cosmetic composition of claim 24, wherein the composition is formulated in a form of powder foundations, emulsion type foundations, a lip make-up, or eye make-up cosmetics.

Fig. 1

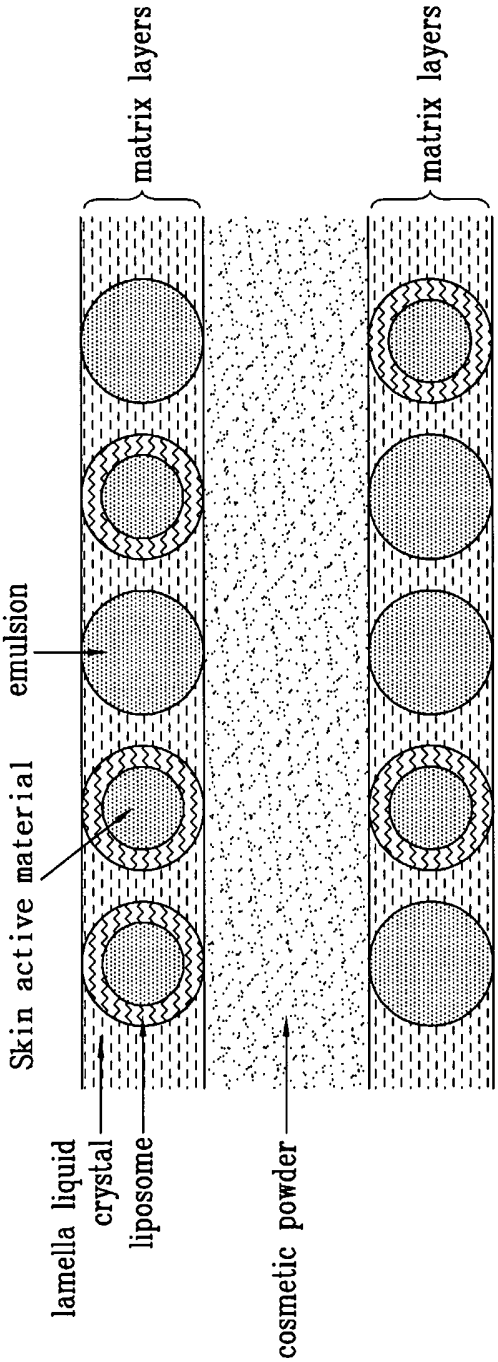

matrix layers
matrix layers
emulsion
Skin active material
lamella liquid crystal
liposome
cosmetic powder

Fig. 2

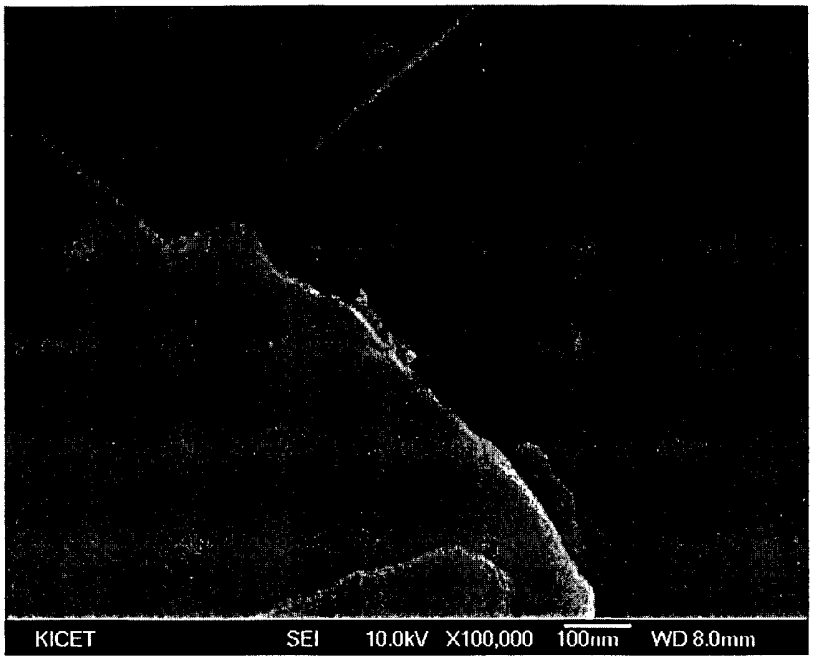


Fig. 3

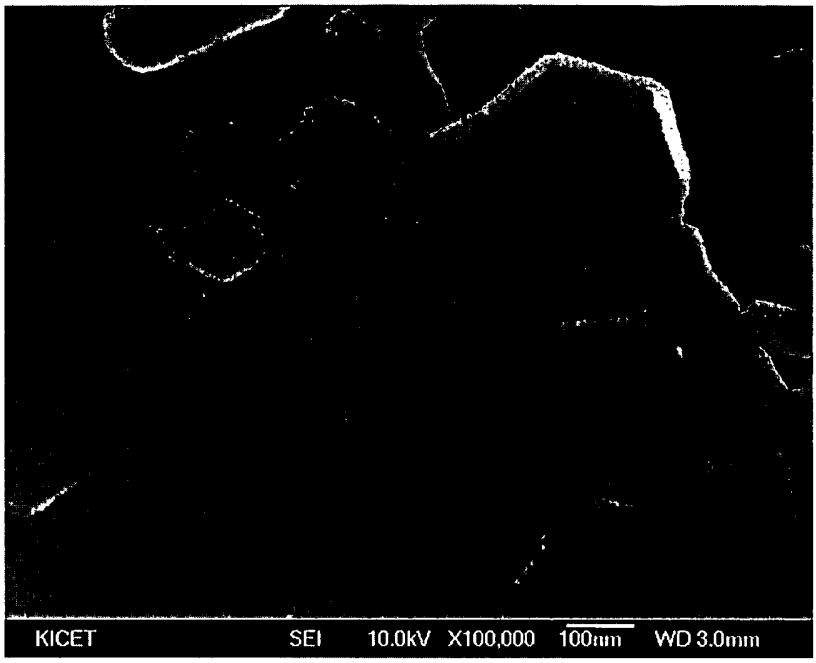


Fig. 4

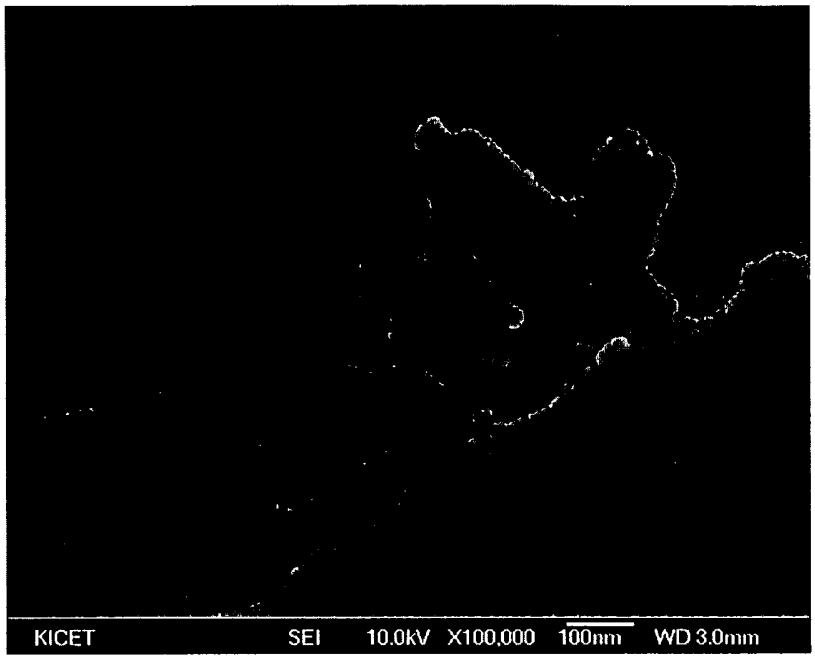


Fig. 5

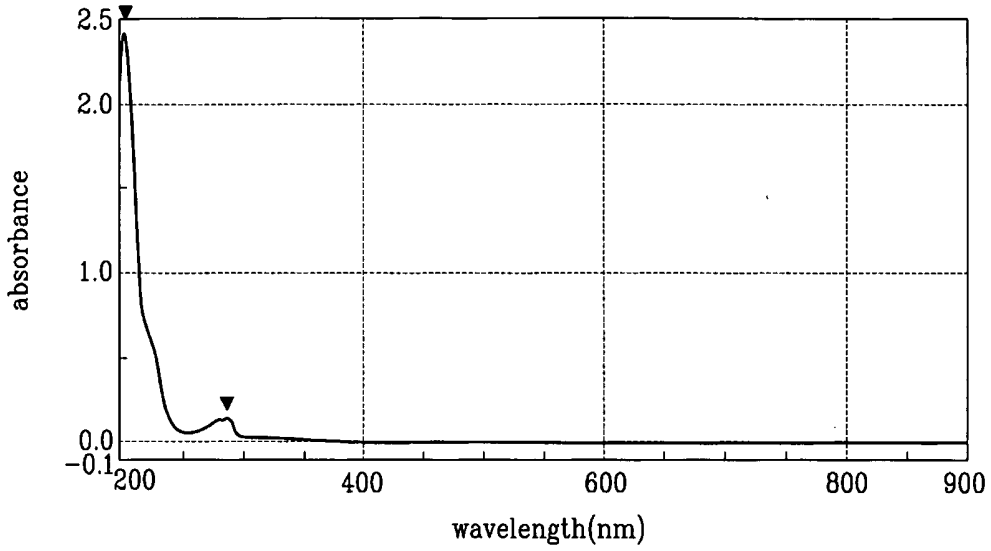
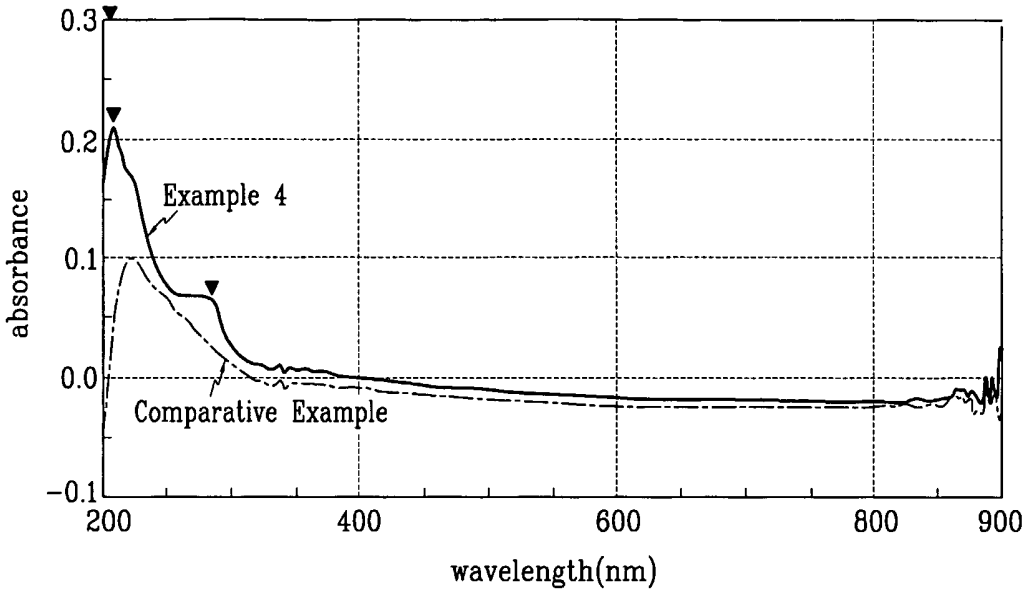


Fig. 6


0.3
0.2
0.1
0.0
-0.1
absorbance
Example 4
Comparative Example
200
400
600
800
900
wavelength(nm)

INTERNATIONAL SEARCH REPORT

International application No.
PCT/KR2004/002604

A. CLASSIFICATION OF SUBJECT MATTER

IPC7 A61K 7/02, A61P 17/16

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)
IPC7 as above

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched
Korean patents and applications for inventions since 1975

Electronic data base consulted during the intertnational search (name of data base and, where practicable, search terms used)
eKIPASS, Pubmed [powder AND (liposome OR emulsion OR lamella) AND cosmetic]

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	KR 2002-0095610 A (COREANA COSMETICS CO., LTD) 28 Dec. 2002 See the whole document.	1 - 26
A	KR 2002-0004140 A (COREANA COSMETICS CO., LTD) 16 Jan. 2002 See the whole document.	1 - 26
A	WO 02/18498 A1 (MIYOSHIKASEI, INC., SHISEIDO COMPANY, LTD) 07 Mar. 2002 See the whole document.	1 - 26
A	US 5030445 A (SUNSTAR KABUSHIKI KAISHA, TEIKOKU KAKO CO., LTD.) 09 Jul. 1991 See the whole document.	1 - 26

☐ Further documents are listed in the continuation of Box C.

☒ See patent family annex.

* Special categories of cited documents:
"A" document defining the general state of the art which is not considered to be of particular relevance
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"P" document published prior to the international filing date but later than the priority date claimed
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Date of the actual completion of the international search	Date of mailing of the international search report
01 JUNE 2005 (01.06.2005)	**03 JUNE 2005 (03.06.2005)**

Name and mailing address of the ISA/KR
Korean Intellectual Property Office
920 Dunsan-dong, Seo-gu, Daejeon 302-701,
Republic of Korea
Facsimile No. 82-42-472-7140

Authorized officer
LEE, Mi Jeong
Telephone No. 82-42-481-5601

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INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No.
PCT/KR2004/002604

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