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SOLUBILIZING OF MINERAL, VEGETABLE, ANIMAL OILS FOR COSMETIC, PHARMACEUTICAL AND INDUSTRIAL PURPOSES

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The present invention relates to solubilizing of mineral, vegetable, and animal oils for cosmetic, pharmaceutical and industrial purposes in low molecular weight alcohols, such as ethyl, isopropyl and methyl alcohols.

It has been quite impossible to prepare effective cosmetic and industrial oil solutions which will carry large quantities of either an animal, vegetable or mineral oil and which at the same time will also carry other cosmetic ingredients such as a low molecular water soluble aliphatic alcohol.

It has been found that such compositions cannot be prepared commercially and the alcohol and the oil will promptly separate into distinct layers.

It is among the objects of the present invention to provide a novel process of solubilizing mineral and vegetable oils in low molecule weight alcohols for cosmetic and industrial purposes.

Another object is to provide novel solubilized vegetable and mineral oils which may contain relatively large proportions of low molecular weight water soluble aliphatic alcohols, such as methyl, ethyl or isopropyl alcohol.

Still further objects and advantages will appear in the more detailed description set forth below, it being understood, however, that this more detailed description is given by way of illustration and explanation only and not by way of limitation, since various changes therein may be made by those skilled in the art without departing from the scope and spirit of the present invention.

In accomplishing the above objects, it has been found satisfactory to solubilize mixtures of low alcohols (1 to 5 carbon atoms) and oils (14 to 100 carbon atoms) by addition of minor proportions of esters of water soluble aliphatic alcohols having from 1 to 6 carbons and fatty acids having from 10 to 24 carbons. There may also be used minor proportions of fatty alcohols having 10 to 24 carbon atoms. The combination of the ester with or without fatty alcohol is used as a solubilizing agent in a proportion less than the low alcohol and oil taken singly or combined. Isopropyl, butyl, ethyl, and amyl palmitates, myristates, and linoleates, are quite satisfactory.

In the preferred embodiment, it is desirable to provide a mixture of a major proportion of an animal, mineral or vegetable oil and a low molecular weight aliphatic alcohol in the presence of one of the following miscibility inducing combinations:

EXAMPLE A

50% isopropyl palmitate
50% isopropyl myristate

EXAMPLE B

50% butyl laurate
50% butyl myristate

EXAMPLE C

50% ethyl palmitate
50% ethyl laurate

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EXAMPLE D

60% amyl palmitate
40% amyl myristate

In general, the above solubilizing combinations may include low molecular weight aliphatic alcohols having 1 to 8 carbon atoms and desirably 1 to 5 carbon atoms, such as ethyl, propyl, isopropyl, butyl, amyl and less preferably methyl allyl, benzyl cyclo-hexyl alcohols having 1 to 6 carbon atoms esterified with high molecular weight water insoluble fatty acids, such as lauric, oleic, myristic, palmitic, stearic, linoleic, linolenic, ricinoleic, and less preferably acids such as erucic, eleostearic, behenic, arachidonic, and clupadonic having 12 to 24 carbon atoms.

Although one of these esters may be employed in the amounts up to 15% to 35% of combined equal proportions of the oil and the alcohol, it is usually desirable to use combinations of 2 to 3 esters with or without the addition of a fatty alcohol having 10 to 24 carbons, in an amount ranging from 5 to 15% of the oil-alcohol mixture.

The preferred alcohols are cetyl, palmityl, myristyl, lauryl, oleyl, linoleyl, linolenyl, stearyl, decyl, riconoleyl, behenyl, arachindyl and eucyl fatty alcohols.

The esterified fatty acids, as well as the free fatty alcohols, should contain 10 to 24 carbon atoms and more preferably 14 to 18 carbon atoms and they should constitute 100% of the solubilizing combination in proportions ranging from 100% of the ester and 0% of the fatty alcohol to 50% of the fatty alcohol and 50% of the ester.

Preferably the solubilized combination contains from 20 to 50% of the animal, vegetable or mineral oils, and 20 to 50% of the low alcohol and from 5 to 20% of the ester with or without added fatty alcohol (10 to 24 carbon atoms).

The resultant compound contains from 20 to 50% of a low molecular weight water soluble aliphatic alcohol, such as ethyl or isopropyl alcohol. Methyl alcohol may be used in industrial products, instead of ethyl or isopropyl alcohol.

As additional solubilizing or miscibility inducing combinations, it is possible to use:

40% isopropyl palmitate

EXAMPLE E

25% butyl myristate
25% oleyl alcohol
50% butyl laurate

EXAMPLE F

40% ethyl myristate
40% ethyl laurate
20% myristyl alcohol

Among the other fatty alcohol combinations which may be used are the following:

Example.....	G	H	I	J
Decyl.....	5	5	15
Lauryl.....	5	70	60
Myristyl.....	20	25	25	30
Cetyl.....	40	2	15	30
Stearyl.....	20	2	1	40

(All parts by weight.)

These alcohols may be used in amounts ranging from 0 to 50% of the ester.

Instead of myristyl, oleyl or lauryl alcohols it is possible to use other saturated or unsaturated or hydroxylated fatty alcohols having from 10 to 20 carbon atoms.

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In the preferred composition there is employed about 5 to 20% of the above solubilizing combinations.

The preferred mineral oil which is used in about 20 to 60% proportion is light or heavy petrolatum.

The preferred vegetable oil is sesame oil or cottonseed oil, or corn oil, which is used in the amount of 20 to 60%.

Sweet almond oil, apricot oil, sunflower oil, peach kernel oil, olive oil, wheat germ oil, rice bran oil, corn oil, and peanut oil may also be employed.

Animals oils which may be used are lanolin, Neats foot oil, bone oil, sperm oil, cod liver oil and the like.

To give specific examples:

Example I

	Parts by weight
Light petrolatum oil	20 to 60
Alcohol ethyl or isopropyl	40
Solubilizing combination	15

Example II

Cottonseed oil	20 to 40
Alcohol ethyl or isopropyl	40
Solubilizing combination	10

Example III

Sesame oil	40
Alcohol ethyl or isopropyl	40
Solubilizing combination	15

Example IV

	Percent
Neat's foot oil	10 to 50
Ethyl alcohol	10 to 50
Solubilizing combination	5 to 10

The products produced are stable, clear, translucent solubilized oil.

The above compositions may be used in cosmetics, polishes, abrasive and buffing suspensions, paints and waxes, dry cleaning compounds, hydraulic fluids, degreasing compounds, insecticides, weed killers and special lubricants.

To give some additional examples:

Example V

	Parts by weight
Ethyl alcohol	50
Petrolatum	20
Isopropyl palmitate	10
Oleyl alcohol	10

Example VI

Isopropyl alcohol	20
Light petrolatum	20
Virgin olive oil	20
Isopropyl myristate	10
Lauryl alcohol	10

Example VII

Oleyl alcohol	10
Mineral oil	15
Butyl laurate	10
Peanut oil	50
Isopropyl alcohol	40

The above compositions are particularly useful in cosmetics in that they will be highly stable over a wide range of temperatures for long periods of time without separation.

All the compositions are miscible with methyl, ethyl or isopropyl alcohol in any proportions.

The freezing point of the composition is depressed and better lubricating properties are obtained in machinery bearings, as well as in cutting oil used in metal working industries.

It is possible to include amounts of essential oil in the range from 2 to 20% in the above compositions.

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Example VIII

To give an example of a sun-screening compound:

	Parts by weight
Paraminobenzoic acid	15
Isopropyl palmitate	10
Oleyl alcohol	10
Light petrolatum	40
Isopropyl alcohol	25

Example IX

SILICONE HAND LOTION

Low viscosity silicone oil, 1,000 cs	15
Soy bean oil	15
Isopropyl palmitate	10
Isopropyl alcohol	40
Lauryl alcohol	10

Example X

HAIR SPRAY

Isopropyl ester of lanolin	10
Isopropyl alcohol	20
Silicone oil, viscosity 1,000 cs	10
Polyvinyl pyrrolidone	10
Isopropyl myristate	5
Freon	25

Example XI

INSECTICIDE SOLUTION

Mineral oil (light)	30
Isopropyl alcohol	30
Butyl laurate	10
Butyl myristate	10
Insecticide:	
2-4 hexandiol	5
Dimethyl phthalate	5

Example XII

ANTI-SEBORRHEIC HAIR LOTION

Estrogenic hormone	1/10
Isopropyl ester of lanolin	30
Isopropyl palmitate	10
Isopropyl myristate	10
Ethyl alcohol	40
Acetyl methionine	5

Example XIII

ANTI-PERSPIRANT

Aluminum sulfate	25
Sesame oil	20
Butyl myristate	15
Butyl laurate	15
Hexachlorophene	2
Ethyl alcohol	45

Example XIV

AFTER SHAVE LOTION

Peanut oil	15
Ethyl laurate	15
Ethyl myristate	15
Ethyl alcohol	55

Example XV

HAIR LACQUER

Silicone oil (alcohol soluble)	5
Isopropyl lanolin	15
Protein hydrolysates	5
Polyvinyl pyrrolidone	5
Isopropyl palmitate	10
Oleyl alcohol	10

Example XVI

PERMANENT WAVING SOLUTION

Thioglycolic acid	15
Ammonium thioglycollate	15
Olive oil	10
Lauryl alcohol	10
Isopropyl palmitate	10
Isopropyl alcohol	40

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Example XVII

SOLID COLOGNE		Parts by weight
Sodium stearate	-----	10
Zinc sulfocarbolate	-----	10
Sesame oil	-----	15
Ethyl laurate	-----	10
Ethyl myristate	-----	10
Ethyl alcohol	-----	45

Example XVIII

TRANSPARENT SOAP

Sodium stearate	-----	40
Peanut oil	-----	10
Glycerol	-----	10
Butyl stearate	-----	10
Butyl laurate	-----	10
Ethyl alcohol	-----	20

Example XIX

SCALP STIMULATING LOTION

Resorcinol mono-acetate	-----	5
Tincture of capsicum	-----	5
Zinc phenol sulfonate	-----	5
Cottonseed oil	-----	20
Isopropyl palmitate	-----	10
Lauryl alcohol	-----	10
Ethyl alcohol	-----	45

Where lauryl and myristyl compounds are used together whether as high molecular weight fatty alcohols or low molecular weight aliphatic alcohol esters of high molecular weight fatty acids the proportion of lauryl should be 2 to 4 times the proportion of myristyl compounds.

Generally it is preferred to have the solubilizing agent consist of 50 to 100% of the low molecular weight aliphatic alcohol (1 to 5 carbon atoms) ester of the high molecular weight fatty acid (14 to 18 carbon atoms) with the balance being fatty alcohol (12 to 24 carbon atoms) and with this solubilizing agent constituting 5 to 25% or as much as 35% of the oil-low molecular weight alcohol (1 to 3 carbon atoms) mixture.

It is apparent that many variations may be made in the formulae.

In the examples above set forth, the specific ingredients described may be widely varied.

To summarize the present invention, it provides novel water clear, non-aqueous mineral, vegetable and animal oils dissolved in low molecular weight alcohols which will be highly effective in silicone protective lotions to give effective cutaneous protection against soaps, detergents, alkalies, sensitizers, solvents, plasticizers and allergens as well as in various aerosol preparations which are used in the cosmetic field, as, for example, for hair and nail lacquers and which will be useful for the dispersion of cutting oils, drying oils, solvent oils, insect repellants, insecticides, and pigments in the paint industry.

The solubilizing agents are preferably mixtures of:

(1) Propyl or isopropyl laurates, myristates, oleates, linoleates or ricinoleates.

(2) Butyl laurates, myristates, oleates, linoleates, stearates, ricinoleates.

(3) Ethyl laurates, myristates, oleates, linoleates, ricinoleates.

(4) Amyl laurates, myristates, oleates, linoleates, ricinoleates.

It is the primary object of the present invention to provide a novel solubilized mineral, vegetable and animal oil composition in which such oils will be dispersed in low molecular weight alcohols and which may be the product used as a base for cosmetic preparations such as hair tonics, hand lotions, sun screening preparations, and after-shave lotions, as well as facial astringents,

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anti-perspirant preparations, and anti-dandruff preparations.

To the hair lotion preparations can be added the solubilizing compounds, lanolin derivatives, antiseptic rubefacients, estrogenic hormones, methyl sulfoxide, dithiocarbamates, methoxychloracetic acid, and solubilized amino acids.

To the anti-perspirant preparations can be added the solubilizing compounds aluminum, zinc, or zirconium salts, and deodorants as hexachlorophene, and silicones.

To the silicone protective preparations can be added the solubilizing compounds, alcohol, soluble silicones, lanolin derivatives, and antiseptics.

To the after-shaving lotions can be added these antiseptics, astringents, as aluminum, zinc or zirconium salts, and also antibiotics as tyrothricin, neomycin, and bacitracin.

To the acne preparations can be added sulfur, polysulfides, resorcin, vitamins A and D, antibiotics as tyrothricin, neomycin, and bacitracin.

To the fungicidal preparations can be added salicylic acids, benzoic acid, the fatty acids, as propionic and thioglycolic acids, undecylinic acids, and their salts.

To the anti-dandruff lotions can be added sulfur, resorcinol, salicylates, organic sulfides, dithiocarbamates, oxy-acetamides, and oxy-acetic acids.

To the hair lacquer preparations can be added silicones, casein, protein hydrolysates and lanolin derivatives.

To the permanent waving solutions can be added the thioglycolic derivatives, polyvinylpyrrolidone and casein or protein hydrolysates.

These added components will not effect the solubilizing effect of the above esters.

Normally mixtures of low molecular weight alcohols and high molecular weight oils of mineral, vegetable or animal origin with 5 to 15% of the above esters will not separate, and will have high pharmaceutical and therapeutic effectiveness, cosmetic consumer acceptance, industrial applicability and efficiency.

Having now particularly described and ascertained the nature of the invention, and in what manner the same is to be performed, what is claimed is:

1. A clear, non-aqueous solubilized liquid composition consisting of a low molecular weight aliphatic alcohol and an oil normally immiscible in said low molecular weight aliphatic alcohol and said oil and alcohol being made miscible and solubilized in each other by inclusion of a mixer composition including a low molecular weight aliphatic alcohol ester of a high molecular weight fatty acid, said first mentioned low molecular weight alcohol containing 1-5 carbon atoms and said oil containing 14-100 carbon atoms and said mixer composition including an ester of an aliphatic alcohol containing 1-6 carbon atoms and a fatty acid containing 10-24 carbon atoms and said ester constituting 5-35% of the amount of the mixture of the first mentioned low molecular weight alcohol and oil, and said solubilized composition consisting essentially of 20-50% of the oil, 20-50% of the low molecular weight aliphatic alcohol and 5-20% of the ester, by weight.

2. The composition of claim 1, in which the low molecular weight fatty alcohol is selected from the group consisting of methyl alcohol, ethyl alcohol and isopropyl alcohol and in which the high molecular weight fatty acid ester has from 12 to 24 carbon atoms and constitutes between 25% to 100% of the mixer composition and 5% to 30% of the solubilized composition.

3. The composition of claim 1, in which the mixer composition consists of esters of lauric acid and myristic acid and in which the mixer composition constitutes between 10% to 25% of the solubilized composition with the balance consisting of equal parts of an oil selected from the group consisting of animal, vegetable and

mineral oils and an alcohol selected from the group consisting of methyl, ethyl and isopropyl alcohol.

4. A clear, non-aqueous solubilized liquid composition consisting of a low molecular weight aliphatic alcohol and an oil normally immiscible in said low molecular weight aliphatic alcohol and said oil and alcohol being made miscible and solubilized in each other by inclusion of a mixer composition including a low molecular weight aliphatic alcohol ester of a high molecular weight fatty acid and a high molecular weight fatty aliphatic alcohol, said first mentioned low molecular weight alcohol containing 1-5 carbon atoms and said oil containing 14-100 carbon atoms and said mixer composition including an ester of an aliphatic alcohol containing 1-6 carbon atoms and a fatty acid containing 10-24 carbon atoms and said ester constituting 5-35% of the amount of the mixture of the first mentioned low molecular weight alcohol and oil, and said solubilized composition consisting essentially of 20-50% of the oil, 20-50% of the low molecular weight aliphatic alcohol and 5-20% of the ester, by weight.

5. A clear, non-aqueous solubilized liquid composition of ethyl alcohol and a light petrolatum oil in major pro-

portion and an isopropyl ester of a high molecular weight fatty acid in minor proportion, and said solubilized composition consisting essentially of 20-50% of the oil, 20-50% of the low molecular weight aliphatic alcohol and 5-20% of the ester, by weight.

6. A clear, non-aqueous solubilized composition of 20 to 60 parts by weight of light petrolatum oil, 40 parts by weight of ethyl alcohol and 25 parts by weight of a composition of 50% isopropyl palmitate and 50% isopropyl myristate.

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