

UNITED STATES PATENT OFFICE

2,173,203

COSMETIC PREPARATION

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No Drawing. Original application February 27, 1930, Serial No. 431,964. Divided and this application February 27, 1937, Serial No. 128,273

5 Claims. (Cl. 167—91)

My invention relates in general to water-oil emulsions and process of producing the same. It has its greatest advantage as developed at the present time, in the manufacture of margarine, but it is not limited to such use.

In the art of making water in oil emulsions and oil in water emulsions, it is customary to bring the ingredients into intimate contact with each other by shaking, agitating, beating, homogenizing, grinding, working in a colloid mill or using some other means for the purpose of subdividing the disperse phase in intimate contact with the continuous phase, and, generally speaking, in the presence of a suitable emulsifying agent.

Some of the better known emulsions of this kind are, for example, mayonnaise, which is an emulsion of oil in water with egg yolk as the emulsifying agent; oleomargarine, which is essentially an emulsion of oils and fats and water with finely subdivided clotted casein as the emulsifying agent; vanishing cream, which is stearic acid emulsified with potassium or sodium soap in water; cold creams which essentially are emulsions of oleaginous materials with soap and water; certain types of furniture polishes, which likewise are emulsions of various kinds of oils, among them mineral oil and turpentine and water or aqueous liquid such as vinegar with a suitable emulsifying agent, bread doughs and cake batters, etc.

Throughout this specification, I employ the term "oleomargarine" in the sense in which it is defined in the statutes of the United States, namely: to designate both vegetable and animal margarine and mixtures thereof.

These and similar emulsions are generally made with vegetable, animal or mineral oils and fats, which are, for all practical purposes, immiscible with water and aqueous liquids.

The stabilities of these emulsions vary, but on aging, sooner or later, all of them reach a point where an appreciable separation of one or the other phase or both phases commences to become noticeable. The ease with which this deterioration sets in, is dependent upon a number of factors—the relative proportion of emulsifying agent; character of the emulsifying agent; the thoroughness of initial emulsification; storage conditions, etc.

One of the principal objects of my invention is to stabilize emulsions of this general character.

Another object is the production of improved emulsions of the mayonnaise and margarine types.

I have found that emulsions of the general character described above as well as other emulsions comprising oleaginous and fatty materials and water or aqueous liquids may be appreciably improved by the introduction of a proportion of certain types of materials, which I designate as

hydrophillic lipins and which are described in greater detail hereinafter. In certain cases, if desired, the oleaginous substance may be entirely replaced by hydrophillic lipins.

One of the principal differences between my hydrophillic lipins and the oleaginous substances used heretofore in water and oil emulsions is that my substances have a more or less marked affinity for water and aqueous liquids, whereas the oleaginous substances used heretofore, such as corn oil, cotton seed oil, various marine oils, linseed oil, tung oil, oleo oil, beef stearine, turpentine, liquid paraffin, etc., are distinctly immiscible with water, are not readily wetted by water to any appreciable extent and do not show the affinity for water, which characterizes, in part, my hydrophillic lipins.

Generally speaking, the hydrophillic properties of my lipins manifest themselves by capacity, in varying degrees, to imbibe water, to be wetted by water and to foam or froth with water. It is common knowledge to those skilled in the art that the fats and oils used heretofore are, generally speaking, notably deficient in this capacity.

In general, my hydrophillic lipins are characterized by the presence of a group of moderately high molecular weight, say, from about six carbons up, and of predominantly oleaginous or hydrocarbon characteristics, which imparts the strictly oleaginous character to a portion of the hydrophillic lipin molecule and another group, or association of groups, of relatively smaller molecular weight with at least one unesterified hydroxyl group attached to carbon and with distinctly hydrophillic characteristics; that is, a group which imparts to the molecule as a whole a certain degree of affinity for water and aqueous media not possessed by the oleaginous materials such as linseed oil, lard, petrolatum, soy bean oil, etc., heretofore used in oil and water emulsions.

Some of my hydrophillic lipins which are of particular value are the following:

1,6-dilauryl diglycerol,
Mono Melissyl ester of diethylene glycol,
Monoleyl diglycerol,
Mono-abietic acid ester of triglycerol,
Mono stearyl glycerol,
Mono cetyl ether of glycerol,
Mono oleyl glycerol,
Di ethylene glycol mono-stearate.

An example of the way in which my invention may be carried out in the manufacture of margarine is as follows:

Mono stearyl glycerol	-----pounds--	85
Cocanut oil (76° F.)	-----do-----	800
Cotton seed oil (winterized)	-----do-----	125
Cultured milk	-----gallons--	50 to 55

The hydrophilic lipins and the fats are melted and churned with the cultured milk, crystallized, tempered, worked and salted in the usual manner.

The margarine thus prepared has a much more desirable texture than when made without my hydrophilic lipin; for example, by using hydrogenated cotton seed oil (140° F.) in place of my lipin. This margarine also is much more resistant to the leaking out of aqueous material during storage and aging. Furthermore, when cut, worked or spread on bread, it presents a dryer appearance than is the case with margarine as made heretofore with ordinary oleaginous ingredients.

One way of utilizing my invention in connection with the production of mayonnaise is as follows:

Sixty pounds of a good grade of edible corn oil are mixed with eighteen pounds of mono oleyl glycerol. This total of 78 pounds is then emulsified with 8 pounds of egg yolk, 7½ pints of 5% vinegar, 1½ pints of water, 1¼ pounds of salt, 1 pound of sugar and ½ pound of mustard in the usual manner. The mayonnaise emulsion thus prepared has greater stability than when made with ordinary oil as practiced heretofore.

An example of the way in which my invention may be carried out in the manufacture of vanishing cream is as follows:

	Grams
Rosewater	1400
Glycerine	300
Stearic acid	120
Potassium hydroxide	12
Monostearyl ester of diethylene glycol	60

The ingredients, exclusive of the lipin, are warmed, (to saponify), and agitated together in the usual order and manner by means of a suitable stirring apparatus or a colloid mill. Finally, while still warm, this mixture is treated with the hydrophilic lipin with stirring. A suitable amount of coloring and scent material may be added. Other ingredients may also be added such as zinc oxide or other medicaments may be incorporated. Starch may also be incorporated to give the product whitening qualities.

The mono stearyl diethylene glycol used in connection with the above product will give the finished product a good texture, greater resistance to syneresis and excellent spreading value on the skin.

Hydrophilic lipins can also be used in the preparation of cold creams. Where lanolin is used, the lanolin may be entirely or partially substituted with hydrophilic lipins. In formulae where beeswax is used, this product may also be substituted in part or in whole with lipin.

In cosmetic cold cream formulae, which contain a proportion of white vaseline or oils or fats, a part of the fatty ingredient may be substituted with the hydrophilic lipin to give desirable results. Thus, for example, in the following formula:

Stearic acid	grams	1000
Lard	do	200
Ammonia water (sp. g. 0.880)	cubic centimeters	100
Distilled water	do	7700
Scent		

the lard may be advantageously replaced by 200 grams of monostearyl diglycerol. When this change is made, the saponification of the stearic

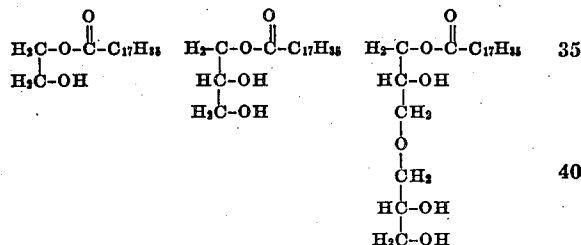
acid with the ammonia is preferably carried out first, after which the lipin is introduced; in other respects, the usual procedure for making a face cream of this type may be followed.

The hydrophilic lipins described herein are especially useful in cosmetic creams or emulsions of the above types, as well as in other creams or emulsions which are to be applied to the skin, in view of the fact that they are not only miscible with water, but have the properties of penetrating through the natural greasy layer on the skin and facilitating the softening of the hair when applied to the skin.

It will seem that one outstanding characteristic of the constitutional structure of my hydrophilic lipins is that the fatty character of the otherwise oleaginous molecule is partly offset and attenuated by the presence of hydrophilic hydroxyl groups attached to carbon. The extent of this effect, however, is not so great as to render the lipin freely miscible with certain aqueous media as is the case for example with the ordinary "sulphonated" oils of commerce.

I have found that the degree of the attenuation of the oleaginous characteristics is by no means the same in different hydrophilic lipins, but that it varies, among other things, first: with the number and character of the hydroxyl groups present, and second; with the mass and character of the oleaginous group or groups. The illustrations given below will serve to make these two points clear:

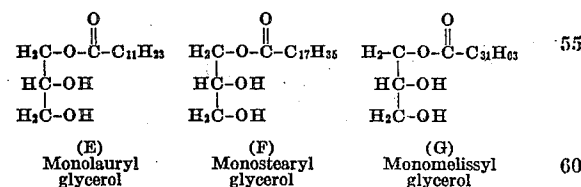
Of the following three substances:



(A) Monostearyl ethyleneglycol (B) Monostearyl glycerol (C) Monostearyl diglycerol

A is the least hydrophilic and C the most pronouncedly hydrophilic. It will be observed that while the fatty residue is constant throughout, the number of hydrophilic groups increases going from A to C.

Secondly, in the following three hydrophilic lipins:



E is relatively more hydrophilic than F and F in turn is more hydrophilic than G: the hydrophilic group is the same throughout but the oleaginous character is asserted least in E by the relatively small lauryl group.

It will thus be understood by those skilled in the art, that my invention embraces a broad class of materials of varying degrees of fatty and hydrophilic characteristics. The particular purpose for which a hydrophilic lipin is to be used will, in general, in a large measure, govern the decision as to which lipin should be employed.

It is by no means to be understood that my hydrophilic lipins are limited to the particular

substances specifically named in this specification by way of example. Many organic water soluble polyhydroxy substances such as glycerol, polyglycerols, glycols, polyglycols, such as diethylene-glycol, sugars, mannitol, sorbitol and other polyhydroxy alcohols and various other water soluble polyhydroxy substances may be used in which one or more than one hydroxyl is converted to an ether or ester group. These ether and ester groups are preferably high or moderately high molecular weight, say, from C_6 up.

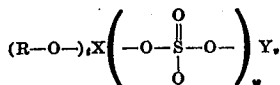
In general, the hydrophilic character of a given substance may be considerably increased by esterifying one or more of its hydroxyl groups with sulphuric acid. The product so produced may be used for the purposes of my invention and is contemplated thereby, particularly when it is produced in the form of a solid as described in my application Serial No. 383,143 filed August 2, 1929.

The preferred hydroxy hydrophilic lipins which may be sulphated have the general composition



in which H, C and O represent hydrogen, carbon and oxygen, respectively; R denotes an organic radical, for example an acyl or alkyl group or its derivatives; and w , x , y and z are at least one but preferably small whole numbers.

The sulphuric acid reaction products of polyhydroxy derivatives preferably are substances of the general formula



wherein R is an alkyl or acyl radical, X is the residue of a water-soluble polyhydroxy substance having at least two esterifiable hydroxy groups, Y is a cation, t , w and v are relatively small whole numbers.

Throughout this specification, I have used the prefix "poly" to denote more than one.

There are carboxylic esters with unesterified hydroxyl groups which however, are not sufficiently hydrophilic to offer any marked advantages over the fats and oils used heretofore. Examples of such esters are distearyl glycerol, dipalmityl glycerol, monopalmityl-monostearyl glycerol.

I have disclosed the details of my invention in considerable detail so that those skilled in the art may be able to practice the same. I wish to point out, that in the use of the hydrophilic lipins of the character set forth, with a given emulsion, a selection should be made in accordance with the emulsion product manufactured. The most pronouncedly hydrophilic lipin is not necessarily always of most value. As an example, monostearyl glycerol is not the most hydrophilic of the substances herein described, but I have found it of very great value in the making of mayonnaise. Among its advantages is that it is easily made, and can be furnished in sufficiently large quantities at a satisfactory price. Moreover, it imparts very desirable properties to the mayonnaise.

This application is a division of my copending

application Serial No. 431,964 filed February 27, 1930, which has matured into Patent No. 2,109,842.

It is obvious for the reasons stated, that the invention is not limited in any respects, except within the scope of the appended claims.

I claim:

1. A cosmetic preparation of the vanishing cream type comprising a plastic emulsion of stearic acid, water and a water soluble salt of a sulphuric acid ester of glycerine in which one of the hydroxyl groups has been esterified with a fatty acid having at least 6 carbon atoms.

2. A cosmetic preparation comprising a plastic emulsion of oleaginous material and aqueous material and having included therein a water soluble salt of a sulphuric acid ester of a polyhydroxy aliphatic compound having one of the hydroxyl groups thereof esterified with a long chain aliphatic carboxylic acid, said salt having good wetting and lubricating properties and being miscible with water and having the properties of penetrating through the natural greasy layer on the skin and facilitating the softening of the hair when applied to the skin.

3. A cosmetic preparation of the vanishing cream type comprising a plastic emulsion of oleaginous material and aqueous material and having included therein a chemical compound having oleophilic and hydrophilic groups in the molecule, the oleophilic group of said compound comprising a hydrocarbon group containing at least 6 carbon atoms, said chemical compound having good wetting and lubricating properties and being miscible with water and having the properties of penetrating through the natural greasy layer of the skin and facilitating the softening of the hair when applied to the skin, a major proportion of said oleaginous material being stearic acid.

4. A cosmetic preparation of the vanishing cream type comprising a plastic emulsion of oleaginous material and aqueous material and having included therein a chemical compound having oleophilic and hydrophilic groups in the molecule and a water soluble soap of a fatty acid, the oleophilic group of said compound comprising a hydrocarbon group containing at least 6 carbon atoms, said chemical compound having good wetting and lubricating properties and being miscible with water and having the properties of penetrating through the natural greasy layer of the skin and facilitating the softening of the hair when applied to the skin.

5. A cosmetic preparation of the vanishing cream type comprising a plastic emulsion of oleaginous material and aqueous material and having included therein a proportion of a chemical compound having oleophilic and hydrophilic groups in the molecule, the oleophilic group comprising a hydrocarbon group containing at least 6 carbon atoms, said chemical compound having good wetting and lubricating properties and being miscible with water and having the properties of penetrating through the natural greasy layer on the skin and facilitating the softening of the hair when applied to the skin.

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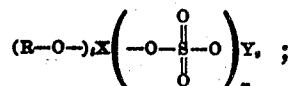
Certificate of Correction

Patent No. 2,173,203.

September 19, 1939.

BENJAMIN R. HARRIS

It is hereby certified that errors appear in the printed specification of the above numbered patent requiring correction as follows: Page 3, first column, line 25, after "H" strike out the period and insert instead a comma; lines 33 to 36, inclusive, strike out the formula and insert instead the following—



and that the said Letters Patent should be read with this correction therein that the same may conform to the record of the case in the Patent Office.

Signed and sealed this 24th day of October, A. D. 1939.

[SEAL]

HENRY VAN ARSDALE,
Acting Commissioner of Patents.