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ASTRINGENT PREPARATIONS

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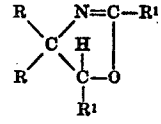
The present invention relates to improvements in cosmetic astringent preparations, and, more particularly, to the use of certain oxazoline derivatives therein.

Cosmetic preparations capable of retarding or inhibiting perspiration have been known for some time. The active ingredients previously utilized in such compositions comprise a relatively large class of compounds, among which may be mentioned, for example, tartaric acid, benzoic acid, salts of chromic acid, boric acid, salicylic acid, zinc chloride, alum, ferric chloride, aluminum chloride, aluminum acetate, aluminum nitrate, aluminum sulfate, and the like. Owing to various defects of the above-mentioned astringents, such as, for example, poor perspiration-inhibiting properties of benzoic acid, tartaric acid and boric acid, the toxicity of chromic acid, the irritating effects of zinc salts, and the mordanting effect of ferric chloride upon fabrics worn on the body in the immediate area of the application of such astringents, the above materials have not met with unqualified success as active ingredients in cosmetic preparations of the aforesaid type.

Of the known cosmetic astringents inhibiting compositions used for cosmetic purposes, aluminum chloride and aluminum sulfate have apparently been two of the most generally employed materials, although various other aluminum salts, as well as other compounds, have likewise been used to an appreciable extent. While such compositions are effective in stopping or inhibiting perspiration, they are somewhat unsatisfactory and hazardous in that the use thereof frequently produces acute skin irritation and rots clothing fabrics which come in contact with the treated areas. The action of such preparations apparently depends upon the presence of both metallic aluminum, or aluminum hydroxide and a mineral acid ion. Considering aluminum sulfate, for example, the aluminum, or aluminum hydroxide apparently combines with and coagulates with skin protein when in the presence of the sulfate radical, and as a result of this action, a residue of sulfuric acid remains, which irritates the skin and rots the clothing.

In an attempt to overcome the above-mentioned disadvantages, astringent preparations have been produced which contain certain basic reacting materials. Such materials apparently tend to substantially decrease the disadvantageous characteristics of astringent preparations having as their active ingredients an acidic material, or a substance which liberates an acidic component on contact with moisture. Among the various compounds utilized for this purpose, are the nitriles. Such compounds, although they may function to inhibit the undesirable action of free acid in these cosmetic preparations, are not without certain draw-backs. For example, it is known that nitriles cause acute irritation of the skin, and are toxic.

As a result of the present invention, it is now possible to prepare cosmetic astringent compositions which possess none of the foregoing defects. In accordance with my invention, I am able to produce improved perspiration-inhibiting preparations by adding to an astringent composition containing a metal salt astringent or coagulant ingredient, from between about 5 and about 30 per cent of the reaction product of lactic acid and an oxazoline having the formula:



in which R represents hydrogen, hydroxymethyl or an alkyl group, and R^1 is either hydrogen or alkyl.

Oxazolines included by the above generic formula and which may be utilized in my invention, are 2-ethyl-4-hydroxymethyl-4-methyloxazoline, 2-isopropyl-4-hydroxymethyl-4-methyloxazoline, 2-heptyl-4-hydroxymethyl-4-ethyloxazoline, 2-tridecyl-4-hydroxymethyl-4-methyloxazoline, 2-octyl-4-hydroxymethyl-4-ethoxyazoline, 2-hendecyl-4-hydroxymethyl-4-methyloxazoline, 2-hendecyl-4-hydroxymethyl-4-ethyloxazoline, 2-heptyl-4-(hydroxymethyl)oxazoline, 2-heptyl-4,4-bis(hydroxymethyl)oxazoline, 2-octyloxazoline, 2-hendecyl-4,4-bis(hydroxymethyl)-oxazoline, 2-hendecyloxazoline, 2-hendecyl-4,4-dimethyloxazoline and the like.

Although the lactic acid reaction products of the foregoing oxazolines may be produced in accordance with any of several suitable procedures, I prefer to prepare such materials in accordance with the method outlined in my copending appli-

cation U. S. Serial No. 442,135, filed May 7, 1942. By the process there described, approximately equimolecular quantities of the oxazoline are reacted with lactic acid in the presence of water. The acid is preferably added to the mixture of water and oxazoline with thorough agitation, and the stirring continued after all of the acid has been added, until a clear solution is obtained. Occasionally, slight opaque solutions are produced. However, in such instances the addition of a suitable solvent, such as ethyl alcohol, will generally result in the procurement of a clear solution. The reaction may be carried out over a relatively wide temperature range. However, I have found it more practical for my purposes to effect such operation between temperatures of from about 25°–75° C. Also, the quantity of water utilized may vary, and in certain cases may be omitted, depending upon the particular reactants employed, as well as the desired physical characteristics of the reaction products produced.

The aforesaid reaction products are compatible with the common astringent materials, such as aluminum chloride, aluminum sulfate, aluminum phosphate, etc., and may be utilized in cosmetic astringent compositions prepared in the form of lotions or creams, whichever may be desired. Other metal salt astringents suitable for use in the formulation of such compositions, are the water-soluble strong acid salts of zinc, iron, cerium, bismuth and the like.

The astringent compositions of my invention are prepared by first mixing separately the water-soluble and oleaginous ingredients, and thereafter bringing together these two components and heating them, in the presence of agitation, to a temperature of between 70° and 80° C. The mixture is then stirred vigorously until cool in order to insure the formation of an astringent composition having a smooth, creamy texture. Failure to stir the aforesaid composition adequately, subsequent to the heating period, frequently results in the procurement of a grainy product. In addition to the astringent material, the water-soluble ingredients utilized consist of glycerine or propylene glycol, and the lactic acid-oxazoline reaction prdouct. The oleaginous portion, which ordinarily constitutes from about 20 to 30 per cent by weight of the astringent preparation, usually consists of a mixture of stearic or palmitic acids with spermaceti, beeswax, cetyl alcohol, or paraffin.

The mechanism by which the undesirable acid effects of the metal salt astringent are counteracted by the lactic acid-oxazoline reaction products, is not known. However, tests on fabric treated with cosmetic astringent preparations of the type contemplated by the present invention, show conclusively that said preparations exert substantially no deteriorating action whatever thereon. Neither do they exhibit an irritant action on the skin when allowed to remain in contact therewith for extended periods. In addition to the above-mentioned advantages, it should also be pointed out that these reaction products of lactic acid and oxazolines of the above-mentioned class, serve as an emulsifying agent and thereby materially assist in the preparation of lotions and creams having the desired consistency and texture. Thus, it may be seen that the present invention provides a means of attaining two objects with a single compound which, prior to this discovery, required the utilization of at least two separate materials.

My invention is more specifically illustrated by the following examples in which all parts are by weight:

Example I

Aluminum sulfate	15
Glycerine	8
Water	24
Reaction product of lactic acid, and 2-hendecyl-4-hydroxymethyl-4-methyloxazoline	28
Stearic acid	20
Spermaceti	5

Example II

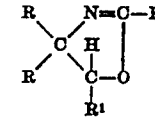
Aluminum chloride	15
Glycerine	2
Propylene glycol	6
Water	50
Lactic acid reaction product of 2-octyl-4-hydroxymethyl-4-ethyloxazoline	7
Stearic acid	15
Cetyl alcohol	5

In both examples the oleaginous and water-soluble portions were first separately mixed and then heated together, with agitation, to 75° C. After this temperature was reached, heating was discontinued and the mixture stirred until cool.

It will be apparent, to those skilled in the art, that the present invention is subject to numerous modifications. In general, it may be said that the present invention is intended to cover, by the terminology employed in the appended claims, all features of patentable novelty inherent therein.

Having now described my invention, I make the following claims:

1. A cosmetic astringent composition comprising a water-soluble strong acid salt of a polyvalent metal and the reaction product of lactic acid and an oxazoline having the following structural formula:



in which R represents a radical selected from the class consisting of hydrogen, hydroxymethyl and alkyl, and R^1 is a member of the class consisting of hydrogen and alkyl.

2. A cosmetic astringent composition comprising, as its active astringent ingredient, aluminum sulfate together with the lactic acid reaction product of 2-hendecyl-4-hydroxymethyl-4-methyloxazoline, wherein said reaction product serves to inhibit the undesirable action of the aforesaid aluminum sulfate on the skin and fabric.

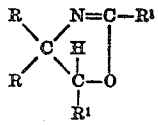
3. A cosmetic astringent composition comprising, as its active astringent ingredient, aluminum chloride together with the lactic acid reaction product of 2-octyl-4-hydroxymethyl-4-ethyloxazoline, wherein said reaction product serves to inhibit the undesirable action of the aforesaid aluminum chloride on the skin and fabric.

4. An emulsified cosmetic astringent composition comprising, as its active astringent ingredient, aluminum sulfate together with the lactic acid reaction product of 2-hendecyl-4-hydroxymethyl-4-methyloxazoline.

5. An emulsified cosmetic astringent composition comprising, as its active astringent ingredient, aluminum chloride together with the lactic acid reaction product of 2-octyl-4-hydroxymethyl-4-ethyloxazoline.

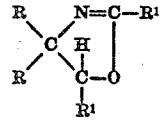
6. An emulsified cosmetic astringent composi-

tion comprising, as its active astringent ingredient, a water-soluble strong acid salt of a polyvalent metal together with from about 5 to about 30 per cent by weight of the lactic acid reaction product of an oxazoline having the structural formula:



in which R represents a radical selected from the class consisting of hydrogen, hydroxymethyl and alkyl, and R^1 is a member of the class consisting of hydrogen and alkyl.

7. A cosmetic astringent composition containing water-soluble and oleaginous ingredients and comprising, as its active astringent ingredient, a water-soluble strong acid salt of a polyvalent metal, together with a lactic acid reaction product of an oxazoline having the structural formula:



in which R represents a radical selected from the class consisting of hydrogen, hydroxymethyl and alkyl, and R^1 is a member of the class consisting of hydrogen and alkyl, wherein said reaction product serves both to inhibit the undesirable action of the aforesaid astringent ingredient on the skin and fabric, and to emulsify the water-soluble and oleaginous ingredients of said astringent composition.

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