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DEODORANT COMPOSITION

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My present invention relates, generally, to innovations and improvements in cosmetic deodorants of the type in which an astringent salt such as aluminum chloride, aluminum sulfate or aluminum chlorhydroxide is the basic active ingredient.

Broadly stated, the invention is based on the unexpected discovery that silver protein or proteinates are compatible with the astringent salts commonly used as the basic ingredients in cosmetic deodorants and when so used in combination therewith offer a number of important advantages. Several of these advantages arise from the fact that in my new antiperspirant and deodorant compositions the concentrations of aluminum or other astringent salts may be substantially lowered from the high concentrations in the order of 20% which are commonly used to as low as 2%.

The high concentrations of aluminum and other astringent salts presently employed are not only damaging to sensitive tissues of the skin, produce allergies, and damage the orifices of the sweat glands, but also may lead to destruction of the tissues and of clothing due to formation of excess acid. It is customary for many women to shave their armpits and the tiny lesions of the skin produced by shaving are potentially painful as well as potentially infective areas.

An important object of the invention is the provision of antiperspirants and deodorants in which the concentration of aluminum and other astringent salts is very substantially reduced without impairing, but actually substantially enhancing, the antiperspirant and deodorant properties.

Another object of the invention is the provision of antiperspirant and deodorant compositions in which the content of aluminum or other astringent metal salt is substantially reduced so that the pain experienced on the use of deodorants is eliminated or substantially reduced, particularly immediately following shaving, and tissue damage and opportunity for infection are eliminated or substantially reduced.

Another object of the invention is the provision of antiperspirant and deodorant compositions, containing astringent salts, which are bacteriostatic or exhibit bactericidal properties and therefore especially valuable when applied to the armpits immediately following shaving thereof since the probability of infection of minute lesions of the skin is thereby markedly decreased.

Still another important object of the invention is the provision of bacteriostatic antiperspirant and deodorant compositions, containing astringent salts, which are hypoallergenic and suitable for use in instances where eczema of the skin precludes the employment of ordinary antiperspirants and deodorants containing high concentrations of astringent salts.

Another object of the invention is the provision of bacteriostatic antiperspirant and deodorant compositions in which the content of astringent salts is so reduced that damage to clothing coming in contact with the compositions in solution, jelly or ointment form is eliminated or

substantially decreased and laundering of the clothing or garments is simplified.

Another object of the invention is the provision of antiperspirant and deodorant compositions containing astringent salts and silver protein or proteinate in synergistic proportions.

Another object of the invention is the provision of a deodorant and antiperspirant dusting powder containing an astringent salt and silver protein.

Certain other objects of the invention will, in part, be obvious and will, in part, appear hereinafter.

The various objects of the invention are accomplished or obtained by incorporating small amounts of silver protein in the antiperspirant and deodorant compositions having greatly reduced concentrations of astringent salts.

For a more complete understanding of the nature and scope of my invention, reference may now be had to the following detailed description thereof wherein a number of illustrative examples are set forth.

The astringent salts which may be used in the antiperspirant and deodorant compositions of the present invention include: aluminum sulfate, aluminum chloride, aluminum chlorhydroxide complex, magnesium acetate, zinc acetate, sodium zirconium lactate. These salts may be used alone or in admixture. Also, any one of the metals may be combined with any one of the acid radicals in the group. In deodorant dusting powders powdered astringent salts such as aluminum silicate (talc) or magnesium trisilicate may be used.

Silver protein is available in several known forms which are useful in this invention, including: strong protein silver (silver protein, strong N.F.—"Argyrol"), mild protein silver (silver protein, mild N.F.), Barnes colloidal silver iodide 20% containing 1% zinc in colloidal form, Barnes silver protein zinc compound, and colloidal silver and silver oxide with a derived egg albumen (Collargol). Most of these forms of silver protein are described in The Merck Index—6th edition. As in the case of the astringent salts, the silver proteins or proteinates may be used either alone or in combination.

Polyhydroxy alcohols, alone or containing as much as up to 1.2 times their weight of water serve as the carriers or vehicles for the antiperspirant and deodorant compositions. The polyhydroxy alcohols of choice are glycerine and propylene glycol.

The formulations of this invention may be in the form of solutions, ointments, sticks, vanishing cream and soap.

If desired, up to 5% by weight of urea may be used in the formulations. Perfumes of known type may be incorporated to make the formulations more elegant. Likewise, coloring agents may be used if desired. Neosilvol (silver iodide rendered colloidal with a soluble gelatin base) is itself a beautiful opalescent golden color and for that reason is preferred rather than the darker silver protein preparations where color is a factor and other coloring agents are not included.

Example 1

	Percent by weight
Neosilvol	0.2
Aluminum chlorhydroxide	2
Glycerine	97.8

Example 2

Strong protein silver	0.2
Aluminum chloride	2
Propylene glycol	97.8

Example 3

Neosilvol	gm.	0.2
Propylene glycol	cc.	88
Aluminum chloride	gm.	2.0
Water	cc.	10

Example 4

Neosilvol	gm.	0.2
Propylene glycol	cc.	80
Aluminum chlorhydroxide	gm.	2.0
Water	cc.	10
Grain alcohol	cc.	10

Example 5

Neosilvol	gm.	0.2
Propylene glycol	cc.	88
Aluminum sulfate	gm.	2.0
Water	cc.	10

Example 6

Neosilvol	gm.	.02
Propylene glycol	cc.	98
Aluminum chloride	gm.	2.0

Example 7

Neosilvol	gm.	.02
Propylene glycol	cc.	88
Aluminum chlorhydroxide	gm.	2.0
Water	cc.	10

Example 8

Neosilvol	gm.	.02
Glycerine	cc.	98
Aluminum sulfate	gm.	2.0

Example 9

Silver protein, strong N.F	gm.	0.2
Propylene glycol	cc.	88
Aluminum chloride	gm.	2.0
Water	cc.	10

Example 10

Silver protein, strong N.F	gm.	0.2
Propylene glycol	cc.	98
Aluminum chlorhydroxide	gm.	2.0

Example 11

Silver protein, strong N.F	gm.	0.2
Glycerine	cc.	88
Aluminum sulfate	gm.	2.0
Water	cc.	10

Example 12

Silver protein, strong N.F	gm.	.02
Propylene glycol	cc.	88
Aluminum chloride	gm.	2.0
Water	cc.	10

Example 13

Silver protein, strong N.F	gm.	.02
Glycerine	cc.	80
Aluminum chlorhydroxide	gm.	2.0
Water	cc.	10
Grain alcohol	cc.	10

Example 14

Silver protein, strong N.F	gm.	.02
Glycerine	cc.	98
Aluminum sulfate	gm.	2.0

Example 15

Silver protein, mild N.F	gm.	0.2
Propylene glycol	cc.	88
Aluminum chloride	gm.	2.0
Glycerine	cc.	10

Example 16

Silver protein, mild N.F	gm.	0.2
Glycerine	cc.	98
Aluminum chlorhydroxide	gm.	2.0

Example 17

Silver protein, mild N.F	gm.	0.2
Propylene glycol	cc.	88
Aluminum sulfate	gm.	2.0
Glycerine	cc.	10

Example 18

Silver protein, mild N.F	gm.	.02
Propylene glycol	cc.	88
Aluminum chloride	gm.	2.0
Water	cc.	10

Example 19

Silver protein, mild N.F	gm.	.02
Glycerine	cc.	98
Aluminum chlorhydroxide	gm.	2.0

Example 20

Silver protein, mild N.F	gm.	.02
Propylene glycol	cc.	98
Aluminum sulfate	gm.	2.0

Example 21

Neosilvol	gm.	0.2
Glycerine	cc.	88
Aluminum sulfate	gm.	2.0
Propylene glycol	cc.	10

Example 22

Silver protein, strong N.F	gm.	.02
Glycerine	cc.	88
Aluminum chloride	gm.	2.0
Propylene glycol	cc.	10

Example 23

Silver protein, strong N.F	gm.	0.2
Glycerine	cc.	50
Aluminum chlorhydroxide	gm.	2.0
Propylene glycol	cc.	48

Example 24

Silver protein, mild N.F	gm.	0.2
Glycerine	cc.	50
Aluminum sulfate	gm.	2.0
Propylene glycol	cc.	48

Example 25

Silver protein, mild N.F	gm.	.02
Glycerine	cc.	10
Aluminum chloride	gm.	2.0
Propylene glycol	cc.	88

Example 26

Silver protein, mild N.F	gm.	0.2
Glycerine	cc.	10
Aluminum chlorhydroxide	gm.	2.0
Propylene glycol	cc.	88

Example 27

Neosilvol	gm.	.05
Propylene glycol	cc.	40
Aluminum sulfate	gm.	10
Water	cc.	50

Example 28

Silver protein, strong N.F.	gm.	.05
Propylene glycol	cc.	50
Aluminum chloride	gm.	10
Water	cc.	40

Example 29

Silver protein, mild N.F.	gm.	.05
Propylene glycol	cc.	50
Aluminum chlorhydroxide	gm.	10
Glycerine	cc.	40

Example 30

Neosilvol	gm.	0.5
Glycerine	cc.	50
Aluminum sulfate	gm.	10
Propylene glycol	cc.	40

Example 31

Silver protein, strong N.F.	gm.	0.5
Glycerine	cc.	80
Aluminum chloride	gm.	10
Water	cc.	10

Example 32

Silver protein, mild N.F.	gm.	0.5
Propylene glycol	cc.	88
Aluminum chlorhydroxide	gm.	2.0
Water	cc.	10

Example 33

Neosilvol	gm.	0.2
Propylene glycol	cc.	88
Magnesium acetate	gm.	2.0
Water	cc.	10

Example 34

Silver protein, strong N.F.	gm.	.02
Glycerine	cc.	98
Zinc acetate	gm.	2.0

Example 35

Silver protein, mild N.F.	gm.	0.1
Glycerine	cc.	50
Sodium zirconium lactate	gm.	1.0
Propylene glycol	cc.	49

Example 36

Neosilvol	gm.	0.5
Glycerine	cc.	98
Magnesium acetate	gm.	0.5
Zinc acetate	gm.	0.5
Sodium zirconium lactate	gm.	0.5

Example 37

Neosilvol	gm.	0.1
Aluminum chlorhydroxide	gm.	2.0
Alcohol (grain)	cc.	22
Glycerine	cc.	8
Water	cc.	70

Example 38

Neosilvol	gm.	0.1
Aluminum chlorhydroxide	gm.	2.0
Urea	gm.	5.0
Alcohol (grain)	cc.	22
Glycerine	cc.	8
Water	cc.	70

The formulations of Examples 1–38 are all solutions in which the vehicle contains a polyhydroxy alcohol alone or with water and/or alcohol. Such solutions, or just the active ingredients, can be put into the form of creams of desired consistency by addition, or substitution, of such cream-forming substance as glyceryl monostearate, as follows:

Example 39—Cream

Neosilvol	gm.	0.2
Aluminum sulfate	gm.	1.0
Glyceryl monostearate	cc.	14
Glycerine	cc.	5
Mineral oil	cc.	2
Water	cc.	79

The following examples illustrate other physical forms or embodiments of the invention:

Example 40.—Deodorant stick

Neosilvol	gm.	0.2
Aluminum sulfate	gm.	1.0
Sodium stearate	gm.	7.5
Propylene glycol	cc.	5.0
Alcohol (grain)	cc.	87.5

Example 41.—Deodorant stick soap

Silver proteinate, mild	gm.	0.5
Aluminum sulfate	gm.	1.0
Glycerine	cc.	8
Soap [1]	gm.	90

[1] Solid laundry soap or transparent glycerine soap.

Example 42.—Powder

Neosilvol	gm.	0.2
Aluminum sulfate	gm.	0.5
Zinc stearate	gm.	5.0
Colloidal kaolin	gm.	15
Talc	gm.	80

Example 43.—Powder

Argyrol	gm.	0.2
Aluminum chloride	gm.	1.0
Zinc stearate	gm.	5.0
Talc	gm.	94.0

Example 44.—Powder

Neosilvol	gm.	0.2
Zinc acetate	gm.	1.0
Talc	gm.	98.0
Zinc stearate	gm.	1.0

Example 45.—Powder

Neosilvol	gm.	0.2
Magnesium acetate	gm.	2.0
Talc	gm.	98.0
Zinc stearate	gm.	1.0

From the foregoing examples it will be seen that as little as 1% by weight up to as much as about 10% by weight of the astringent salt or salts may be used with as little as 0.02% up to as much as 0.5% by weight of silver protein. Preferably, the astringent salt and the silver protein are employed in compatible proportions so that a precipitate of the silver does not form. However, such precipitates do not make the compositions ineffective.

The foregoing preparations or formulations show commercially suitable deodorant, antiperspirant and bacteriostatic activity. The formulations are stable. Thus, in the lower concentrations such as would ordinarily be used, the solutions are stable at 45° C. for one month. The formulations are also light stable, being able to withstand exposure for at least one month to a 150 watt spotlight at a distance of one foot. The excellent stability of the formulations was unexpected in view of the known tendency of silver protein or proteinates to be very unstable in aqueous solution, the known tendency of astringent salts to precipitate proteins, and the known light sensitivity of the silver proteinates. It is believed that the excellent stability is due to a complexing phenomenon to which reference will be made below.

The remarkable deodorant effects of as little as 0.02% silver protein in the presence of as little as 2.0% astringent salt suggests that a synergistic activity of astringent salts and silver protein or proteinates causes them effectively to reinforce one another so as to exercise their deodorant and antiperspirant activity both on the orifices of the sweat glands and on bacteria growth. The dilute silver proteinate solutions are stable in the presence of relative high concentrations of astringent salts as the foregoing examples bring out, but as the silver proteinate

concentration increases the stability decreases. It is important to note that the least stable of the common astringent salts in the presence of silver proteinates are the sulfates, although the mixture containing the precipitate still retains deodorant activity.

In addition to use as antiperspirants and deodorants, the foregoing formulations may also be used in the treatment of the unpleasant odor of athlete's foot. The synergistic activity of the astringent salts and the silver protein or proteinates reduces the odor after one application if allowed to remain in contact with the lesions during the day. In many instances the bacteriostatic action reduces the inflammatory processes so that the secondary infection is eliminated. Thus, preparations similar to Examples 1–36 above have been used successfully in eliminating the symptoms and signs of athlete's foot when applied daily for several days.

Glycerine is especially desirable in the formulations used for treatment of athlete's foot since it is an excellent peptizing agent and if allowed to remain between the toes throughout the day aids in dissolving dead tissues. The peptizing action may be enhanced by addition of 5% urea of the formulations.

The following theoretical basis for the synergistic action may be hypothesized. It is well known that astringent salts are medically valuable for their action on the skin. They, therefore, combine with the skin constituents. By the same token, astringent salts react with proteins, and therefore, form complexes with various types of silver protein or proteinates. Thus, in the foregoing formulations the astringent salts commonly used as deodorants and as astringents for the skin probably act as binders for silver proteinate on the skin. In this way the astringent salts act to maintain a film of silver on the skin derived from the low concentrations of applied silver proteinate solutions which act synergistically to decrease the development of odor-producing bacteria on the skin.

In any event, the combinations of astringent salts and the silver proteins or proteinates exhibit antiperspirant and deodorant properties far in excess of what these constituents exhibit separately.

It will be understood that the foregoing examples are intended to be interpreted as illustrative and not in a limiting sense.

What is claimed as new is:

1. A deodorant composition comprising about 1 to 10 percent by weight of an astringent salt wherein the metal ion is selected from at least one of the group consisting of aluminum, zirconium, magnesium and zinc, a substantially smaller compatible amount of silver protein, and an inert carrier vehicle for said astringent salt and silver protein.

2. A deodorant composition containing from about 1 to 10 percent by weight of an astringent salt wherein the metal ion is selected from at least one of the group consisting of aluminum, zirconium, magnesium and zinc, from about 0.02 to 0.5 percent by weight of a silver protein, and a polyhydroxy alcohol carrier containing up to as much as about 1.2 times its own weight of water.

3. A deodorant composition comprising about 1 to 10 percent by weight of an astringent salt wherein the metal ion is selected from at least one of the group consisting of aluminum, zirconium, magnesium and zinc, and the anion is selected from the group consisting of chloride, chlorhydroxide complex, acetate, lactate and sulfate, a substantially smaller compatible amount of silver protein, and an inert carrier vehicle for said astringent salt and silver protein.

4. A deodorant composition containing from about 1 to 10 percent by weight of an astringent salt wherein the metal ion is selected from at least one of the group consisting of aluminum, zirconium, magnesium and zinc, and the anion is selected from the group consisting of chloride, chlorhydroxide complex, acetate, lactate and sulfate, from about 0.02 to 0.5 percent by weight of a silver protein, and a polyhydroxy alcohol carrier selected from at least one of the group consisting of glycerine and propylene glycol containing up to as much as about 1.2 times its own weight of water.

5. A deodorant composition comprising about 1 to 10 percent by weight of an aluminum salt, a substantially smaller compatible amount of silver protein, and an inert carrier vehicle.

6. A deodorant composition comprising from about 1 to 10 percent by weight of an aluminum salt having a negative radical selected from the group consisting of chloride, chlorhydroxide complex, acetate, lactate and sulfate, from about 0.02 to 0.5 percent by weight of silver protein, and a polyhydroxy alcohol carrier selected from at least one of the group consisting of glycerine and propylene glycol containing up to as much as about 1.2 times its own weight of water.

7. A deodorant composition having substantially the following formulation:

Silver iodide rendered colloidal with a soluble gelatin base	gm.	0.2
Propylene glycol	cc.	80
Aluminum chlorhydroxide	gm.	2.0
Water	cc.	10
Grain alcohol	cc.	10

8. A deodorant composition having substantially the following formulation:

Silver protein, mild N.F.	gm.	0.1
Glycerine	cc.	50
Sodium zirconium lactate	gm.	1.0
Propylene glycol	cc.	49

9. A deodorant composition having substantially the following formulation:

Silver iodide rendered colloidal with a soluble gelatin base	gm.	0.1
Aluminum chlorhydroxide	gm.	2.0
Urea	gm.	5.0
Alcohol (grain)	cc.	22
Glycerine	cc.	8
Water	cc.	70

10. A deodorant composition having substantially the following formulation:

Silver iodide rendered colloidal with a soluble gelatin base	gm.	0.2
Aluminum sulfate	gm.	1.0
Glyceryl monostearate	cc.	14
Glycerine	cc.	5
Mineral oil	cc.	2
Water	cc.	79

11. A deodorant composition having substantially the following formulation:

Silver iodide rendered colloidal with a soluble gelatin base	gm.	0.2
Aluminum sulfate	gm.	1.0
Sodium stearate	gm.	7.5
Propylene glycol	cc.	5.0
Alcohol (grain)	cc.	87.5

12. A deodorant composition having substantially the following formulation:

Silver proteinate, mild	gm.	0.5
Aluminum sulfate	gm.	1.0
Glycerine	cc.	8
Soap	gm.	90

13. A deodorant composition having substantially the following formulation:

Silver iodide rendered colloidal with a soluble gelatin base	gm.	0.2
Aluminum sulfate	gm.	0.5
Zinc stearate	gm.	5.0
Colloidal kaolin	gm.	15
Talc	gm.	80

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