SMOOTHING WRINKLED SKIN

Filed: Dec. 20, 1971
Appl. No.: 209,897

U.S. Cl. 424/63, 424/69, 424/78
Int. Cl. A61K 7/00, A61K 7/02, A61K 23/00
Field of Search 424/28, 63, 69; 260/79.3 R

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ABSTRACT

Wrinkled human skin is smoothed by applying to the wrinkled area a layer of an aqueous solution of about 1% to 15% by weight sodium polystyrene sulfonate of number-average molecular weight between about 300,000 and 1,000,000, and permitting the layer to dry. Particular compositions include a surfactant to assist application of a uniform layer and cosmetically acceptable ingredients imparting to the layer the appearance of make-up.

7 Claims, No Drawings
SMOOTHING WRINKLED SKIN

This invention relates to methods for smoothing wrinkled human skin and to certain compositions useful in the practice of such method.

Methods for wrinkle smoothing have been proposed heretofore utilizing various preparations, of which a principal type utilized albumin, commonly blood serum albumin derived from cattle. These have not been entirely satisfactory for various reasons including lack of action which is sufficiently effective or which lasts sufficiently long, excessive cost, deterioration, and odor.

Accordingly, the object of this invention is to provide a wrinkle smoothing method and compositions for use therein relatively free of such deficiencies.

I have discovered that aqueous solutions of sodium polystyrene sulfonate of concentrations and molecular weight as hereinafter specified, when spread on wrinkled human skin and allowed to dry, have unique and highly advantageous wrinkle smoothing properties. On drying there is formed a strongly adherent film, which is durable, long-lasting, transparent (in the absence of certain additives) and relatively non-allergenic and which is highly effective in causing the wrinkles essentially to disappear. The film tightens while drying, apparently re-molding the skin to a flat, smooth state by drawing out depressions and compressing elevations. In addition to effectiveness in use, such solutions are stable, not unpleasantly odorous and non-toxic. I have also found that such solutions can contain various additives without impairing the desirable qualities thereof, some of which are desirable as enhancing the wrinkle smoothing action, others for aesthetic or other reasons.

One important such additive is anionic or non-ionic surfactant which improves the spreadability of the preparation as a smooth, even film over the skin and thus enhancing the uniformity and adherence of the dried film. Other such additives include drying hasteners such as alcohol and various cosmetic colors and materials which enable the preparations to function also as make-up. However, the dried films are so strong and adherent that oleophilic make-up can be readily applied over them without detrimental effects.

The concentrations by weight of sodium polystyrene sulfonate in the preparation should be between about 1 and 15 percent, about 5 percent being preferable. At concentrations significantly below 1 percent the desired effects are not sufficiently obtained, while above about 15 percent the solutions are quite viscous and the dried film is so tight as to be uncomfortable. About 5 percent is adequate, such preparations being non-viscous and readily spread on the skin, particularly if a surfactant is included. The molecular weight average of the sodium polystyrene sulfonate used is also a material factor, this being a variable within wide limits. The number-average molecular weights should be between about 300,000 and about 1,000,000 with about 500,000 preferred.

Sodium polystyrene sulfonate may be produced by sulfonating polystyrene and neutralizing the resultant polystyrene with sodium hydroxide or, alternatively, by sulfonating styrene monomer, polymerizing, then neutralizing the resultant product.

If desired, surfactant in an amount from about 0.05 to about 1 percent, by weight of the composition can be added to the cosmetic composition of the present invention; preferably, about 0.5 percent. Such surfactants can be either anionic or nonionic. Suitable anionic surfactants include, for example, soaps of fatty acids containing from 12 to 18 carbon atoms (e.g., lauric, myristic, palmitic, stearic or oleic acid, and the like); sulfates of fatty alcohols containing from 12 to 16 carbon atoms (e.g., sodium lauryl sulfate, and the like); sarcosine derived surfactants containing from 12 to 18 carbon atoms (e.g., sodium lauroyl sarcosinate, and the like); taurine derived surfactants containing from 12 to 18 carbon atoms (e.g., sodium N-coconut-acid-N-methyl taurate, and the like); and peptide-fatty acid condensate surfactants wherein the fatty acid moiety contains from 12 to 27 carbon atoms (e.g., potassium salt of peptide coco fatty acid condensate, triethanolamine salt, and the like). Suitable nonionic surfactants include, for example, surfactant condensates of ethylene oxide with hydrophobic bases formed by condensing propylene oxide with propylene glycol (e.g., Pluronic Series of surfactants) and alkyl phenoxypolyethoxylates wherein the alkyl portion contains from 8 to 12 carbon atoms, there being from 2 to 12 moles of ethylene oxide to the phenoxo group (e.g., octyl phenoxypolyethoxyl, iso-octyl phenoxypolyethox ethanol, decyl phenoxypolyethoxyl ethanol, etc. several surfactants of which are marketed under the name Triton).

A fast drying material such as cosmetically acceptable alcohol (e.g. ethanol, isopropanol) may be included to hasten the drying of the film on the skin. However, the amount should usually be limited to about 25 percent or less, preferably 5 percent or less by weight of the composition. In general, any of the cosmetically acceptable pigments or dyes can be added in amounts up to 10 percent (preferably up to 5 percent) by weight of the composition; they include F D & C colors, iron oxide pigments, titanium dioxide, bismuth oxychloride, titanium coated micas and the like. Other cosmetic materials may be included for make-up and wrinkle smoothing preparations, such as algin, magnesium aluminum silicate and the like.

The following are specific examples of preferred compositions:

1. Wrinkle Smoothing Only.

<table>
<thead>
<tr>
<th>Ingredient</th>
<th>Weight %</th>
</tr>
</thead>
<tbody>
<tr>
<td>(a) Sodium polystyrene sulfonate, number average mol. wt. 500,000</td>
<td>4.75</td>
</tr>
<tr>
<td>(b) Denatured ethanol</td>
<td>5.00</td>
</tr>
<tr>
<td>(c) Sodium lauryl sulfate (Maprofin 563, Onyx Chemical Co.)</td>
<td>0.20</td>
</tr>
<tr>
<td>(d) Distilled water</td>
<td>g.s. to 100%</td>
</tr>
</tbody>
</table>

2. Wrinkle Smoothing And Make-Up. Example 1 was made to function also as make-up by adding thereto F D & C colors (0.0178 percent of Red No. 2, 0.0072 of Red No. 5 0.00035 of Blue No. 1).

3. Wrinkle smoothing And Make-Up.

<table>
<thead>
<tr>
<th>Ingredient</th>
<th>Weight %</th>
</tr>
</thead>
<tbody>
<tr>
<td>(a) Same as 1 (a)</td>
<td>4.00</td>
</tr>
<tr>
<td>(b) Algin (Kelman Algin, Kelco Co. N.Y.)</td>
<td>1.00</td>
</tr>
<tr>
<td>(c) Same as 1 (c)</td>
<td>0.10</td>
</tr>
<tr>
<td>(d) Magnesium aluminum silicate (Veegum)</td>
<td>0.50</td>
</tr>
<tr>
<td>(e) R. T. Vanderbilt Co.)</td>
<td></td>
</tr>
<tr>
<td>(f) Iron oxide cosmetic pigments (3170)</td>
<td></td>
</tr>
</tbody>
</table>
In making composition 1, the other ingredients were added to the water and stirred until the sodium polystyrene sulfonate was completely dissolved. Composition 2 was made by dispersing the colors in a prepared solution according to Example 1. In making preparation 3 ingredient (d) was dispersed in the water by mixing, ingredients (a) and (c) were added and mixed until (a) was dissolved, ingredients (e) and (f) were added with mixing until well dispersed and ingredient (b) was added, again with thorough mixing. The preparation was allowed to stand overnight and was then milled.

Compositions according to the examples were applied as a layer to wrinkled skin areas of several persons, a preferred applicator being a soft brush. After drying while kept quiescent a tenacious and strong film developed over the treated areas which essentially eliminated the wrinkles. Despite normal activities of the subjects, the films remained effective for as long as 8 hours. The films from the composition of Example 1 were transparent, those from the Example 2 and 3 preparations had the appearance of usual make-up. Liquid cosmetics of an oleophilic nature were applied over dried films from the compositions of Example 1 using a brush without noticeable adverse effect on the films.

Preparations according to Examples 1 and 2 but without the alcohol exhibited the same effects but were slower drying. Preparations without the surfactant were more difficult to spread evenly and produced acceptable but less satisfactory films, with or without the alcohol. Compositions tested with lower concentrations of sodium polystyrene sulfonate exhibited less effective wrinkle smoothing film-forming characteristics, with a minimum useful effect being exhibited at about 1 percent. Addition of substantially more than 5 percent of sodium polystyrene sulfonate made such compositions more difficult to spread evenly and did not improve the result obtained. At about 15 percent thereof, the dried films were very tight and at higher concentrations the discomfort was excessive.

Both flexibility and tightness of the dried film can be improved by adding to the solution minor amounts, from 0.5 to 10% (preferably about 10 percent) by weight based on the weight of the sodium polystyrene sulfonate, of selected water-soluble polymers of relatively low molecular weight. For example, Ganex V—804 or Ganex V—904 (General Aniline & Film Corp., polyvinyl pyrrolidone based polymers, manufacturer's number-average molecular weight 19,000 and 16,000, respectively), were found to have such effects when added in amounts of about 0.5 percent by weight to solutions of about 5 percent by weight sodium polystyrene sulfonate.

I claim:

1. A method of smoothing wrinkled human skin for as long as eight hours which includes the steps of forming over the wrinkled skin areas a layer of an aqueous solution of from about 1 to about 5 percent of sodium polystyrene sulfonate having a number-average molecular weight between about 300,000 and about 1,000,000 and permitting the layer to dry.

2. The method of claim 1 wherein said number-average molecular weight is about 500,000.

3. The method of claim 1 wherein said solution contains an anionic or non-ionic surfactant different from said sodium polystyrene sulfonate.

4. The method of claim 1 wherein said solution contains ethanol or propanol.

5. The method of claim 1 which includes the further step of forming over the dried layer a layer of make-up composition.

6. The method of claim 1 wherein said solution contains a mixture of cosmetically acceptable ingredients which impart to the dried layer the appearance of make-up.

7. The method of claim 1 wherein said solution is applied by brushing.