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**SKIN PROTECTING COMPOSITION CONTAINING  
A WATER-SOLUBLE PARTIALLY DEGRADED  
PROTEIN**

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9 Claims

**ABSTRACT OF THE DISCLOSURE**

Lotion and detergent composition containing a water-soluble surface active agent and a water-soluble partially degraded protein having a gel strength of about 0 Bloom grams incorporated in an inert solvent such as water; an oil phase may also be present. The composition protects skin from irritation.

This invention relates to lotion and detergent compositions characterized by mild effect upon skin and to a process of prophylactically protecting skin from detergent irritation.

Surface active agents or detergents have been employed in order to obtain efficient cleaning of dishes and utensils, as well as in lotions and in cosmetic creams. During use, various parts of the anatomy, and particularly the skin of the hands, often come into direct contact with the cleansing agents. Skin irritation may result, and the surface active agents may remove nitrogenous materials from the skin. Lotions have been particularly employed to protect skin which has been exposed to detergent compositions. However, the protection afforded has not been entirely effective.

It is an object of this invention to provide detergent and lotion compositions which are mild in their effect upon skin. Other objects will become apparent upon inspection of the following description.

In accordance with certain of its aspects, this invention relates to a detergent composition comprising an inert solvent and incorporated therein a water-soluble surface active agent and a water-soluble, partially degraded protein having a gel strength of about zero Bloom grams.

The surface active agent which may be employed may be any commonly used compound having surface active or detergent properties. Most preferred are those water-soluble surface active compounds having anionic or nonionic properties. Anionic surface active agents include those surface active or detergent compounds which contain an organic hydrophobic group and an anionic solubilizing group. Typical examples of anionic solubilizing groups are sulfonate, sulfate, carboxylate, and phosphate. Examples of suitable anionic detergents which fall within the scope of the invention include the soaps, such as the water-soluble salts of higher fatty acids or rosin acids, such as may be derived from fats, oils and waxes of animal, vegetable or marine origin, e.g., the sodium soaps of tallow, grease, coconut oil, tall oil and mixtures thereof; and the sulfated and sulfonated synthetic detergents, particularly those having about 8 to 26, and preferably about 12 to 22, carbon atoms to the molecule.

As examples of suitable synthetic anionic detergents there may be cited the higher alkyl mononuclear aromatic sulfonates such as the higher alkyl benzene sulfonates containing from 10 to 16 carbon atoms in the alkyl group in a straight or branched chain, e.g., the sodium salts of decyl, undecyl, dodecyl (lauryl), tridecyl, tetradecyl, pentadecyl, or hexadecyl benzene sulfonate and the higher

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alkyl toluene, xylene and phenol sulfonates; alkyl naphthalene sulfonate, ammonium diamyl naphthalene sulfonate, and sodium dinonyl naphthalene sulfonate; sulfated aliphatic alcohols such as sodium lauryl and hexadecyl sulfates, triethanolamine lauryl sulfate, and sodium oleyl sulfate; sulfated alcohol ethers, such as lauryl, tridecyl, or tetradecyl sulfates including 2-4 ethylene oxide moieties; sulfated and sulfonated fatty oils, acids or esters, such as the sodium salts of sulfonated castor oil and sulfated red oil; sulfated hydroxyamides such as sulfated hydroxy-ethyl lauramide; sodium salt of lauryl sulfoacetate; sodium salt of dioctyl sulfosuccinate; and the sodium salt of oleyl methyl tauride.

Also included with in the ambit of the invention are the sulfuric acid esters of polyhydric alcohols incompletely esterified with higher fatty acids, e.g., coconut oil monoglyceride monosulfate, tallow diglyceride monosulfate; and the hydroxy sulfonated higher fatty acid esters such as the higher fatty acid esters of low molecular weight alkylol sulfonic acids, e.g., oleic acid ester of isethionic acid.

Nonionic surface active agents are those surface active or detergent compounds which contain an organic hydrophobic group and a hydrophilic group which is a reaction product of a solubilizing group such as carboxylate, hydroxyl, amido or amino with ethylene oxide or with the polyhydration product thereof, polyethylene glycol.

As examples of nonionic surface active agents there may be noted the condensation products of alkyl phenols with ethylene oxide, e.g., the reaction product of isooctyl phenol with about 6 to 30 ethylene oxide units; condensation products of alkyl thiophenols with 10 to 15 ethylene oxide units; condensation products of higher fatty alcohols such as tridecyl alcohol with ethylene oxide; ethylene oxide addends of monoesters of hexahydric alcohols and inner ethers thereof such as sorbitan monolaurate, sorbitol mono-oleate and mannitan monopalmitate and the condensation products of polypropylene glycol with ethylene oxide.

Cationic surface active agents may also be employed. Such agents are those surface active detergent compounds which contain an organic hydrophobic group and a cationic solubilizing group. Typical cationic solubilizing groups are amine and quaternary groups.

As examples of suitable synthetic cationic detergents there may be noted the diamines such as those of the type  $RNH_2CH_2CH_2NH_2$  wherein R is an alkyl group of about 12 to 22 carbon atoms, such as N-aminoethyl stearyl amine and N-aminoethyl myristyl amine; amide-linked amines such as those of the type  $R'CONHC_2H_4NH_2$  wherein R' is an alkyl group of about 12 to 18 carbon atoms, such as N-amino ethyl-stearyl amide and N-amino ethyl myristyl amide; quaternary ammonium compounds wherein typically one of the groups linked to the nitrogen atom is an alkyl group of about 12 to 18 carbon atoms and three of the groups linked to the nitrogen atom are alkyl groups which contain 1 to 3 carbon atoms, including such 1 to 3 carbon alkyl groups bearing inert substituents, such as phenyl groups, and there is present an anion such as halogen, acetate, methosulfate, etc. Typical quaternary ammonium detergents are ethyl-dimethyl-stearyl ammonium chloride, benzyl-dimethyl-stearyl ammonium chloride, benzyl-dimethyl-stearyl ammonium chloride, trimethyl stearyl ammonium chloride, trimethylcetyl ammonium bromide, dimethyl-ethyl dilauryl ammonium chloride, dimethyl-propyl-myristyl ammonium chloride, and the corresponding methosulfates and acetates.

The surface active compounds which are used in the most preferred aspects of this invention are those having

anionic properties. The most highly preferred water soluble anionic detergent compounds are the ammonium and substituted ammonium (such as mono-, di- and triethanolamine), alkali metal (such as sodium and potassium) and alkaline earth metal (such as calcium and magnesium) salts of the higher alkyl benzene sulfonates, the higher alkyl sulfates, and the higher fatty acid monoglyceride sulfates. The particular salt will be suitably selected depending upon the particular formulation and the proportions therein.

The water-soluble partially degraded protein employed in accordance with this invention may be a partially enzymatically hydrolyzed protein or a heat derived product of protein. This material is employed as an agent to overcome the irritant effect upon the skin of the surface active compound. When the partially degraded protein is applied together with or subsequent to contact with the surface active compounds, the prophylactic effect is found to be present. The partially degraded protein is characterized as having a gel strength of about zero Bloom grams.

The partially degraded protein having a gel strength of about zero Bloom grams may be the water soluble enzymatic hydrolysis product of a protein. Such hydrolysis products include proteoses, peptones, and polypeptides, typically having a molecular weight of at least about 600, typically 600-12,000, and including moieties of a plurality of amino acids. These hydrolysis products may be formed by partial enzymatic hydrolysis, such as by the action of trypsin, erepsin or pancreatic enzymes on protein material at about 35° C.-50° C. for about 12-48 hours. The partially degraded protein may also be a heat-derived decomposition product of protein. Proteins partially degraded by heat and having the required Bloom strength for use in the invention may be prepared by heating proteinaceous material such as bones, feet, or skin of pork or beef which has been reduced to small pieces and immersed in water, by autoclaving at about 2.8-3.5 kg./cm.<sup>2</sup> of saturated steam (i.e. about 141.5-147.6° C.) for about two hours. Three phases including fat, the desired aqueous phase, and a residue may thus be obtained. The aqueous phase which may contain about 8-10% solids may be concentrated in vacuo to about 50-60% solids at 60-71° to obtain a "solubilized collagen," a heat degraded protein, which may be employed in this invention.

Typical proteins which may be partially degraded for use in accordance with this invention include casein, gelatin, collagen, albumin, zein, gliadin, keratin, fibroin, globulin, glutenin, etc.

Typical partially enzymatically hydrolyzed proteins include Bacto-Proteose (sold by Difco Laboratories, Detroit, Mich.), proteose-peptone, casein-peptone, gelatin-peptone, Bacto-Peptone (sold by Difco Laboratories), vegetable peptones, such as soybean peptone, Proto-Peptone (which may be enzymatically derived from solubilized collagen using pancreatic enzymes), tryptone, albumin-peptone, etc. The preferred partial enzymatic hydrolysis products are the peptones, particularly Proto-Peptone, the peptone enzymatically derived from solubilized collagen using ground frozen pancreatic enzymes having a pH of 8, digestion being at about 49° C. for about 12-48 hours, which solubilized collagen is derived by heating bones, feet, or skin of pork or beef. The preferred proteins which may be partially degraded by heat are solubilized beef collagen and solubilized pork collagen, which may be prepared by autoclaving, phase separation and concentration as described above. Solubilized collagen is characterized by a gel strength of zero Bloom grams.

Partially degraded protein of this invention, such as Bacto-Peptone, typically has a low dissociation constant, say, about 10<sup>-10</sup> when calculated in a cation exchange reaction in solution with aniline chloride.

It is noted that partially degraded protein as employed

in this invention may contain a small amount of relatively completely degraded polypeptides, such as dipeptides and tripeptides and even some amino acids. These more completely degraded products taken individually do not substantially contribute to the prevention of skin irritation and chapping. However, the partially degraded protein, taken as a whole, does possess the desired properties. If desired, the relatively completely degraded polypeptides and the amino acids may be separated from the remainder of the partially degraded protein by dialysis. In this procedure the partially degraded protein is placed in a cellophane bag closed at both ends which is lowered into a tank into which deionized water continuously enters and from which it continuously exits. Products such as the tripeptides, dipeptides, and amino acids pass out of the cellophane by dialysis to mix with the deionized water and leave the partially degraded protein. When employed, the dialysis procedure has the additional advantage of removing the unpleasant odor caused by the presence of the more completely hydrolyzed material.

In accordance with certain aspects of the invention the surface active agent and the partially degraded protein having a gel strength of about zero Bloom grams are dissolved in the inert solvent in which they are incorporated. The inert solvent is selected from the group consisting of water, inert solvent miscible therewith, and mixtures thereof.

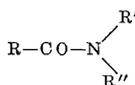
When the sole solvent employed is water, water-miscible material or mixture thereof, the composition of this invention may be used as a detergent composition for washing dishes. As used herein, water-miscible solvents include water-soluble solvents.

In addition to water, any suitable water-miscible solvent may be employed as the liquid medium for the surface active compound and the partially degraded protein. The solvent should be chemically inert. Solvent, other than water, should be at least somewhat water miscible and preferably water soluble in view of the fact that the present composition may be designed, at least in part, for use in aqueous solutions. It should be easily flowable in order to impart to the composition the desired fluidity. It should also preferably possess reasonably good stability to heat, light, chilling, etc. It has been found that a low molecular weight hydroxyl containing solvent is the most preferred type of solvent. More particularly, a liquid solvent medium may be selected from the group consisting of water, low molecular weight alcohols and preferably mixtures thereof. The alcohols should preferably be the saturated aliphatic type; they may be monohydric or polyhydric in character, and may contain inert solubilizing groups such as ether linkages. Suitable examples of such solvents include ethyl alcohol, propyl alcohol, isopropyl alcohol, n-butyl alcohol, benzyl alcohol, etc. Additional suitable solvents of the polyhydric alcohol type are ethylene glycol, propylene glycol, glycerol (glycerine), etc. Alcohols possessing either linkages are the monomethyl-ether of ethylene glycol, the monoethylether of ethylene glycol, diethylene glycol, dioxane, etc. It is preferred to use water, the aliphatic monohydric alcohols, and the dihydric alcohols of about 2 to 4 carbon atoms, and the lower alkylethers of the dihydric alcohols, and mixtures thereof.

In accordance with certain preferred aspects of this invention the liquid detergent composition may also contain an additive to enhance foaming. This foam-enhancing agent is particularly effective when the detergent compound is an anionic detergent. Such foam-enhancing agents include triorganoamine oxides and alkylolamides of 10-14 carbon atom carboxylic acids. The organic groups in the amine oxides include aliphatic, aromatic heterocyclic, alicyclic and combinations thereof. The groups may be substituted, such as a hydroxyalkyl group. Specific amine oxides include dimethylododecyl amine oxide, bis (2-hydroxyethyl) dodecyl amine oxide and N-dodecyl morpholine oxide. The alkylolamides include

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the mono- and the dialkylolamides. Typical mono and dialkylolamides have the general formula



wherein R—CO represents a fatty acyl radical of 10–14 carbon atoms, R' is a hydroxyalkyl group, preferably containing 2–5 carbon atoms, and R'' is selected from the group consisting of hydrogen and a hydroxyalkyl group, preferably containing 2–5 carbon atoms. Specific higher fatty acid alkyloamide foam enhancing agents which may be employed in the practice of this invention are the diethanolamide of coconut oil fatty acids, lauric monoethanolamide, myristic mono-3-propanolamide, capric diethanolamide and admixtures of various higher fatty acid alkyloamides which may be denominated, for instance, lauric myristic monoethanolamide and lauric myristic diethanolamide.

The liquid detergent compositions of this invention may also contain various additional components. Typical examples of such components are thickeners, such as alkyl cellulose, say methyl cellulose; hydrotropic materials, such as sodium toluene sulfonate or sodium xylene sulfonate; preservatives, such as methyl p-hydroxy benzoate, ethyl p-hydroxy benzoate or propyl p-hydroxy benzoate; resinous opacifiers, such as polystyrene; and perfumes. It has been observed that compositions in accordance with this invention prevent irritation and chapping to a surprising degree and also hasten the cure of skin which is irritated and chapped. Thus, liquid detergent compositions which contain no agent for protecting skin from irritation and chapping, or which contain agents such as protein salts, say, calcium caseinate, or amino-acids, say, alanine, or polypeptides having appreciable gel strength or other additives such as urea, are characterized by skin irritation and chapping in a much shorter time, which skin remains irritated and chapped for a much longer time, than skin contacted with compositions in accordance with this invention. In fact, sulfur-containing amino acids, such as cysteine, could actually increase irritation and chapping to a greater degree than if no additive were present.

When water, water-miscible solvent or mixture thereof is the solvent present, the liquid detergent compositions of this embodiment of the invention may contain varying amounts of the individual components. Preferably the solvent is present in amount of 100 parts by weight. The surface active component is preferably present in amount 30–100 parts by weight, typically 80–100 parts, say 100 parts. The partially degraded protein is preferably present in amount of 2–20 parts by weight, typically 5–15 parts, say, 10 parts. Typically, at the time of this dilution, parts of the human anatomy, such as the skin, are also contacted with the detergent compositions.

The above described compositions are characterized as liquid concentrate detergent compositions. These concentrates may be admixed with additional solvent, typically water.

Thus, in accordance with certain of its aspects, this invention relates to a process comprising contacting skin with a detergent and lotion composition comprising an inert solvent and incorporated therein a water-soluble surface active agent and a water-soluble, partially degraded protein having a gel strength of about zero Bloom grams, thereby prophylactically protecting said skin from irritation and chapping.

The contact of the liquid detergent compositions of this invention with skin typically occurs in water solution, such as in a sink containing dirty dishes. The total components of the detergent composition may be present in very small amounts, such as one "capful" in a kitchen sink full of water, typically 1 part per 600 parts solvent, typically principally water.

In accordance with certain further aspects of this invention, additional materials may be present, which additional materials are characterized by water immiscibility.

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When such water-immiscible materials are employed, the composition of this invention may be particularly useful as a skin lotion, typically as a hand lotion. The presence of the water-immiscible materials produces an emulsion, which is an oil-in-water emulsion when the solvent in which the surface active agent and the partially degraded protein are dissolved in water.

The water-immiscible materials may be any materials typically employed in the oil phase of and lotions or cold creams. Thus, high boiling petroleum fractions, such as paraffin wax, petrolatum or ozocerite may be blended with liquid mineral oils. Alternatively, mineral oil, lanolin, fatty oil esters, such as glyceryl monostearate, and fatty acids, such as stearic acid or oleic acid, may be ingredients of the oil phase.

Lotions, including oil-in-water emulsions, effectively protect skin against chapping and irritation. This effect is particularly notable when the lotion is applied to the skin subsequent to its becoming irritated as by contact with a liquid detergent composition comprising an inert solvent and a surface active agent, typically a liquid dishwashing detergent, which need not itself include partially degraded protein having a gel strength of zero Bloom grams.

When lotions containing an oil-in-water emulsion are employed, the components of the lotions may be present in varying amounts. Preferably the aqueous phase contains 100 parts by weight of water. The surface active compound is preferably present in amount of 0.8–1.5 parts by weight, say 1 part. Small amounts of other additives, typically a total of about 0.2 part, may be present. Such additives include alkyl hydroxybenzoates and coloring material.

Preferably the oil phase is 5–15 parts by weight, based on 83.7 parts of the aqueous phase, and contains 1–3 parts by weight of mineral oil, say, 2 parts. Lanolin is preferably present in amount of 0.5–2 parts by weight, say 1 part. Fatty acid is preferably present in amount of 1–3 parts by weight, say 1.5 parts. An ester of a polyhydroxy compound such as glyceryl monostearate is preferably present in amount of 2.5–7 parts, say 4 parts.

The oil-in-water emulsion is formed by heating each of the water phase and the oil phase to 70–80° C., say 74° C., adding the oil phase to the water phase and mixing. The temperature of the emulsion is then lowered. The temperature may be maintained at 35–50° C., say 40° C. as additional ingredients including the partially degraded protein are incorporated in the water phase of the emulsion. Thus 2–5 parts by weight, say 3 parts, of glycerin and 0.1–5 parts of partially degraded protein may be added to 2–5 parts by weight, say 3 parts, of water and incorporated in the water phase. Similarly, a solution of 0.1–0.4 part by weight, say 0.3 part of perfume may be added to 0.5–1.2 parts, say 1 part of solvent at least somewhat miscible with water and incorporated in the water phase. During incorporation of these ingredients in the water phase the temperature is lowered to 20–30° C., say 27° C. The typical oil-in-water emulsion includes about 85–95 parts by weight aqueous phase and about 5–15 parts by weight oil phase.

The invention is further illustrated by the following specific examples. All parts are by weight, unless otherwise indicated.

#### EXAMPLES 1–7

##### Example 1

Components:	Parts
Sodium linear C <sub>12</sub> –C <sub>14</sub> benzene sulfonate	12.0
Linear C <sub>12</sub> –C <sub>14</sub> alcohol sulfate-ammonium salt including 3 ethylene oxide moieties	7.0
Lauric myristic monoethanolamide	3.0
Sodium xylene sulfonate	3.5
Ethyl alcohol	3.0
Polystyrene opacifier	0.35
Perfume	0.15
Water	71.0

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## Example 2

The composition of Example 1 including 5.0 parts of Proto-Peptide having a gel strength of zero Bloom grams in place of 5.0 parts of water.

## Example 3

Components:	Parts
Lauryl sulfate-sodium salt including 3 ethylene oxide moieties -----	32.0
Lauric myristic monoethanolamide -----	3.0
Sodium xylene sulfonate -----	3.5
Ethyl alcohol -----	3.0
Polystyrene opacifier -----	0.35
Perfume -----	0.15
Water -----	58.0

## Example 4

The composition of Example 3 including 5.0 parts of Proto-Peptide having a gel strength of zero Bloom grams in place of 5.0 parts of water.

## Example 5

100 parts of water.

## Example 6

Commercially available dishwashing detergent—Brand X.

## Example 7

Commercially available dishwashing detergent—Brand Y. Samples of each of these compositions were diluted to 600 times in water at 45° C. A number of subjects having hand-skin irritation exhibiting a mildness index between 1.5 to 3 soaked their hands for one-half hour per day for successive days in particular diluted samples of the compositions of Examples 1–7.

The average number of days for the hand-skin of the subjects to be cured of irritation is indicated in Table I.

TABLE I

Example No.:	Average number of days to be cured of irritation
1 (control) -----	15.9
2 -----	5.9
3 (control) -----	12
4 -----	8.6
5 (control) -----	19.6
6 (control) -----	14.9
7 (control) -----	14.6

In the above examples, as well as in the following examples, the mildness index has the following significance.

Mildness No.:	Degree of mildness
0 -----	No visual change.
1 -----	Dryness and scales.
2 -----	Scales and erythema.
3 -----	Scales, erythema and fissuring.

It is apparent from Table I that the highly diluted detergent compositions of Examples 2 and 4 including Proto-Peptide successfully cured skin irritation in a short period of time, whereas skin soaked in the detergent compositions of Examples 1, 3, 6 or 7, or in the water of Example 5 took a substantially longer period of time to be cured.

## EXAMPLES 8–10

Twenty parts of sodium lauryl sulfate were added to 980 parts of water. Ten 100-part samples of this solution were set aside for testing as described below (Example 8).

Ten parts of sodium lauryl sulfate admixed with fifty parts of Bacto-Peptide, available from Difco Laboratories, and having a gel strength of zero Bloom grams, were added to 440 parts of water. Five 100-part samples

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of this solution were set aside for testing as described below (Example 9).

Ten parts of sodium lauryl sulfate admixed with twenty-five parts of partially enzymatically hydrolyzed gelatin having a gel strength of zero Bloom grams were added to 465 parts of water. Five 100-part samples of this solution were set aside for testing as described below (Example 10).

A group of ten Caucasian males having clear and un-irritated hands soaked one hand in one of each of the twenty samples of Example 8, maintained at 45° C., for one hour each day over a maximum period of six days.

Five of this group soaked their other hand in each of the samples of Example 9, maintained at 45° C., over the same period of time, and the other five of this group similarly soaked their other hand in each of the samples of Example 10, maintained at 45° C.

The average number of days for the mildness index of the hands soaked in the manner described above to reach at least 2 was about four days in Example 8, while the hands soaked in accordance with Examples 9 and 10 showed no visible change after four days.

It is apparent from these examples that the compositions including surface active agent and water-soluble partially degraded protein having a gel strength of about zero Bloom grams (Examples 9 and 10) successfully permitted skin to retain its mildness, whereas skin contacted with surface active compositions containing no additive (Example 8) became severely irritated by the detergent compositions. The irritated hands were characterized by large red blotches and excessive itching.

## EXAMPLE 11

The following detergent composition was prepared and found to effectively permit retention of mildness on otherwise sensitive skin.

Components:	Parts
Triethanolamine lauryl sulfate -----	9.50
Lauric myristic diethanolamide -----	2.50
Ethanol -----	2.75
Methyl cellulose -----	0.45
Bacto-Peptide having a gel strength of zero Bloom grams -----	5.00
Water -----	79.80

## EXAMPLES 12–13

Five equal-weight samples of the following control detergent composition were prepared (Example 12).

Components:	Parts
Sodium linear C <sub>12</sub> –C <sub>14</sub> alkyl benzene sulfonate ..	12.0
Linear C <sub>12</sub> –C <sub>14</sub> sulfate-ammonium salt including 3 ethylene oxide moieties -----	7.0
Lauric myristic monoethanolamide -----	3.0
Sodium xylene sulfonate -----	3.5
Ethyl alcohol -----	3.0
Polystyrene opacifier -----	0.35
Perfume -----	0.15
Water -----	71.0

Five additional samples were prepared of the composition of Example 12 modified by the inclusion of 5.0 parts of Bacto-Peptide having a gel strength of zero Bloom grams in place of 5.0 parts of water. These samples are hereinafter referred to as Example 13.

The samples of each of Examples 12 and 13 were diluted to twenty-five times their weight in water. Five male Caucasians having hands which had been irritated to a mildness index of at least 2 by contact with a solution of 2 parts of sodium lauryl sulfate in 98 parts of water, at 45° C., for one-half hour per day for four days, then each soaked one hand in each of the samples of Example 12, maintained at 45° C., for one-half hour per day, and the other hand in each of the samples of Example 13, maintained at 45° C., for the same amount of time, during

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successive days. The hands soaked in the samples of Example 12 (control) were cured only slowly and still exhibited slight erythema after ten days. The hands soaked in the samples of Example 13 were healed in five days.

It is apparent from observation of these tests that the highly diluted detergent composition of Example 13, including Bacto-Peptide, successfully cured skin irritation, whereas the hands soaked in the samples of Example 12, which did not contain a partially degraded protein, remained irritated for a longer period.

## EXAMPLES 14-18

A water phase solution useful in the preparation of oil-in-water emulsion lotion was prepared containing:

Components:	Parts
Sodium lauryl sulfate	1
Methyl p-hydroxybenzoate	0.18
Propyl p-hydroxybenzoate	0.02
Colorant	0.00025
Deionized water	82.5

This solution was divided into thirty equal parts. Six of these parts were set aside (Example 14); the other twenty-four were heated to 74° C. The following oil phase was prepared, divided into equal parts, heated to 74° C. and added to the twenty-four water solutions.

Components:	Parts
White mineral oil (Saybolt)	2
Glyceryl monosterate	4
Linolin absorption base available under the trademark Amerchol H-9	1
Stearic acid	1.5

The twenty-four thus formed emulsion lotions were cooled to 40° C. Six equal parts of each of the following solutions were added in succession to each of the emulsions.

Example 15  
Solution A

Components:	Parts
Glycerine	3
Deionized water	3

## Solution B

Components:	Parts
Perfume	0.3
Benzyl alcohol	1

Example 16  
Solution A

Components:	Parts
Urea	2
Glycerine	3
Deionized water	3

## Solution B

Components:	Parts
Perfume	0.3
Benzyl alcohol	1

Example 17  
Solution A

Components:	Parts
Proto-Peptide <sup>1</sup>	2
Glycerine	3
Deionized water	3

## Solution B

Components:	Parts
Perfume	0.3
Benzyl alcohol	1

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## Example 18

## Solution A

Components:	Parts
Bacto-Peptide <sup>1</sup>	2
Glycerine	3
Deionized water	3

## Solution B

Components:	Parts
Perfume	0.3
Benzyl alcohol	1

<sup>1</sup> Proto-Peptide (Example 17) and Bacto-Peptide (Example 18) having a gel strength of zero Bloom grams.

The five emulsion lotions were then cooled to 27° C. Thirty randomly selected individuals were divided equally into five groups. All individuals soaked their hands in a solution of two parts of sodium lauryl sulfate in ninety-eight parts of water at 45° C. for one-half hour, once a day, prior to contact with the preparations described above. The first group then contacted each of their hands with the water solution of Example 14 for one-half hour per day at 45° C. for successive days. The second, third, fourth, and fifth group then applied 1 ml. of each of lotions of Examples 15, 16, 17, and 18, respectively to their hands each day for successive days. The table below shows the average number of days passed for the subjects' hands in each group to reach a mildness index of 2.

TABLE II

Example No.:	Average No. days to reach mildness index of 2
14 (control)	7.8
15 (control)	9.8
16 (control)	11.2
17	20.3
18	15.2

It is apparent from observation of the table above that the lotion composition of Examples 17 and 18 which contain partially degraded protein within the scope of this invention successfully inhibited skin irritation for longer periods of time than the solution of Example 14 or the lotions of Examples 15 or 16.

## EXAMPLE 19

Seven equal parts of the lotion corresponding to Example 18 above were prepared, but one part of solubilized pork collagen having a gel strength of zero Bloom grams was substituted for the two parts of Proto-Peptide.

Seven randomly selected individuals soaked their hands in a solution of two parts of sodium lauryl sulfate in ninety-eight parts of water at 45° C. for one-half hour a day for successive days. After each soaking, each individual then applied to his hands the lotion of this example. After twenty-eight successive days, the hands of three individuals still had a mildness index lower than 2. The hands of three more of the individuals exhibited a mildness index of 2 after twenty-four days, and the hands of one individual exhibited a mildness index of 2 after seventeen days.

It is apparent from the above data that the solubilized collagen is highly superior in the prevention and inhibition of irritation of skin exposed to surface active agents.

Although this invention has been described with reference to specific examples, it will be apparent to one skilled in the art that various modifications may be made thereto which fall within its scope.

What is claimed is:

1. A skin protecting lotion composition consisting essentially of about 85-95 parts by weight of an aqueous phase consisting essentially of about 100 parts by weight of water, 0.8-1.5 parts by weight of a water-soluble surface active agent selected from the group consisting of (1) anionic detergent, (2) nonionic surface active

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agent reaction product of isooctyl phenol with about 6 to 30 ethylene oxide units and (3) cationic surface active agent selected from the group consisting of



wherein R is an alkyl group of about 12 to 22 carbon atoms, R'CONHC<sub>2</sub>H<sub>4</sub>NH<sub>2</sub> wherein R' is an alkyl group of about 12 to 18 carbon atoms and quaternary ammonium compounds wherein one group linked to the nitrogen atom is an alkyl group of about 12 to 18 carbon atoms and three groups are alkyl groups containing 1 to 3 carbon atoms, 0.1-5 parts by weight of a water-soluble partially degraded protein including proteoses, peptones and polypeptides and have a molecular weight of about 600-12,000, a dissociation constant of about 10<sup>-10</sup> when calculated in a cationic exchange reaction in solution with aniline chloride and a gel strength of about 0 Bloom grams, and about 5-15 parts by weight of an oil phase consisting essentially of a material selected from the group consisting of mineral oil, lanolin, glyceryl monostearate, stearic acid, oleic acid and mixtures thereof.

2. A skin protecting lotion composition as set forth in claim 1 wherein said water-soluble surface active agent is an anionic detergent.

3. A skin protecting lotion composition as set forth in claim 2 wherein said anionic detergent is sodium lauryl sulfate.

4. A skin protecting lotion composition as set forth in claim 1 wherein said water-soluble, partially degraded protein is an enzymatic hydrolysis product.

5. A skin protecting lotion composition as set forth in claim 4 wherein said enzymatic hydrolysis product is a peptone.

6. A skin protecting lotion composition as set forth in claim 4 wherein said enzymatic hydrolysis product is Proto-Peptide.

7. A skin protection lotion composition as set forth in claim 1 wherein said water-soluble partially degraded protein is a heat degraded protein.

8. A skin protecting lotion composition as set forth in claim 7 wherein said heat degraded protein is solubilized collagen.

9. A skin protecting lotion and detergent composition consisting essentially of about 100 parts by weight of inert solvent selected from the group consisting of water, low molecular weight saturated aliphatic alcohol solvent selected from the group consisting of monohydric and dihydric alcohols containing 2 to 4 carbon atoms and mixtures thereof and incorporated in said inert solvent about 30-100 parts by weight of a water-soluble surface

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active agent selected from the group consisting of (1) anionic detergent, (2) nonionic surface active agent reaction product of isooctyl phenol with about 6 to 30 ethylene oxide units and (3) cationic surface active agent selected from the group consisting of RNHC<sub>2</sub>H<sub>4</sub>NH<sub>2</sub> wherein R is an alkyl group of about 12 to 22 carbon atoms, R'CONHC<sub>2</sub>H<sub>4</sub>NH<sub>2</sub> wherein R' is an alkyl group of about 12 to 18 carbon atoms and quaternary ammonium compounds wherein one group linked to the nitrogen atom is an alkyl group of about 12 to 18 carbon atoms and three groups are alkyl groups containing 1 to 3 carbon atoms and about 2-20 parts by weight of a water-soluble partially degraded protein including proteoses, peptones and polypeptides and having a molecular weight of about 600-12,000, a dissociation constant of about 10<sup>-10</sup> when calculated in a cation exchange reaction in solution with aniline chloride and a gel strength of about 0 Bloom grams, wherein said inert solvent is the sole solvent present.

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