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HAIR TREATING COMPOSITIONS AND METHODS OF MAKING SAME

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This invention relates to the art of treating human hair and relates more particularly to compositions and methods for treating human hair and to the preparation of such compositions. This invention is concerned primarily with compositions and methods for effectively changing or altering the configuration of human hair to a form which is altered or changed as compared, for example, with that normally incident to its growth. Certain of the features and advantages of this invention are peculiar to the treating of curly or kinky hair to make it more straight, although certain of the features and advantages of this invention are of more general applicability either to the straightening of curly or kinky hair or to the imparting of curls or waves to hair that is normally straight.

It is a purpose of this invention to overcome the defects and drawbacks incident to prior methods and compositions for treating human hair for the purpose of changing or altering its configuration, and is based on prolonged study and experimentation which had led to discoveries whereby I have been able to successfully overcome such defects and drawbacks.

Any such composition or method should, of course, be such as to effectively produce the desired change or alteration in the configuration of the hair, but as regards any particular composition or method which may be used its effectiveness is essentially experimental and without predictability. In addition to being effective in producing desired change or alteration in hair configuration any composition or method which is used should not be excessively irritating to the skin and should not be excessively injurious to the hair. To the extent that it is possible to minimize skin irritation and damage to the hair incident to the use of such compositions or methods, such compositions and methods are improved and rendered more desirable and acceptable to the user. Such matters as objectionable odor, prolonged processing times, and the like also are disadvantages that have been incident to many previously proposed compositions and methods. Such difficulties and drawbacks have been matters of concern in the art for many years and have been of such character that they have been regarded as necessary incidents to previously used hair treating compositions and methods if the desired alteration in hair configuration is to be obtained.

The problems incident to the straightening of hair which possesses the kinkiness that is normal to people of certain African descent are special and give rise to much greater difficulties as compared with the waving of normally straight hair. Since such kinky hair is unruly and unmanageable and difficult to arrange in attractive hair styles it is desirable to remove the kinkiness, and removal of such kinkiness or the removal of curls from other types of curly or kinky hair, in whole or at least to a substantial extent, is referred to herein as hair straightening. The difficulties incident to the straightening of kinky hair result both from the fact that the kinkiness is difficult to overcome and from the fact that such kinky hair is considerably more delicate than normally straight hair as regards the effect of chemicals thereon causing excessive embrittlement and loss of tensile strength. Kinky hair as compared with normally straight hair is usually more difficult to soften and swell so that its configuration can be changed or altered, but at the same time is more porous and is more susceptible to embrittlement and loss of tensile strength. Moreover, such kinky hair is usually black or nearly black in color and many treating chemicals have the effect of imparting to the hair an unnatural reddish color which is undesirable. For such reasons many compositions and methods which can be utilized in the waving of straight hair without excessive hair damage cannot be utilized in the straightening of kinky hair without such excessive hair damage as to render such compositions or methods highly objectionable. However, because desirable hair styling is something widely sought after, resort has been made to compositions and methods of straightening kinky hair even though they result in severe scalp irritation or severe hair damage or both. According to this invention it is possible to effectively straighten kinky hair without embrittlement, discoloration or other damage or scalp irritation and so that the effect is lasting, resistant to reversion due to moisture and results in improved quality, texture and luster and renders the hair more readily susceptible to management and styling.

Some of the earlier attempts to alter hair configuration were in the direction of using ammonia or ammonium salts, but such treating agents proved to be relatively ineffective as well as objectionable to work with and were discarded in favor of utilizing reducing agent chemicals. Thus, soluble sulfites and sulfides have been proposed and their action has been supplemented by the presence of ammonia. However, the sulfites have required relatively long treating times at relatively high temperatures and likewise when effective to soften the hair have resulted in undesirable bleaching effects. The sulfides are more active toward hair but have objectionable odor under conditions of use and possess other objectionable characteristics. In addition it has been proposed to employ certain mercaptans in the presence of ammonia or the like, but while many such mercaptans are active toward hair, such activity is difficult to control so as to prevent or minimize hair damage. Such mercaptans when used in the manner stated are difficult to remove from the hair and if left in the hair tend to cause embrittlement and breakage. They cannot be removed by washing or rinsing of the hair and some after treatment such as an after treatment with an oxidizing agent is required, if excessive hair embrittlement is to be avoided. While mercaptans in combination with ammonia have been used in the waving of normally straight hair subject to the above mentioned limitations respecting their use, nevertheless regardless of the mode of application or after treatment a composition of the type consisting essentially of a mercaptan and ammonia cannot successfully be employed in attempting to straighten kinky hair because of the resulting excessive embrittlement of the hair.

When hair is subjected to the action of a reducing agent it is believed from the point of view of the theoretical considerations involved that since hair contains fibrous protein, keratin, the reducing agent acts to modify the constituent cystine or disulfide linkages by accomplishing the rupture thereof, the number of linkages ruptured depending on such factors as the character and proportion of the reducing agent used, the temperature incident to its application and the pH of the medium with which reducing agent is utilized. As the result of the rupture of linkages the hair is brought to such condition that under stress, as, for example, the curling of normally straight hair or the straightening of normally kinky hair, the hair can be shaped to desired configuration or form with reorientation of the polypeptide chains; and if the

hair substance is thereafter set as by coagulation or redevelopment of linkages due to ultimate reoxidation or similar action the hair will tend to retain its altered configuration or form. It is apparent, therefore, that the hair during such treatment is subjected to actions substantially affecting the hair substance itself and that hair characteristics such as the tensile strength, pliability, softness, luster, etc. of the hair are likely to be adversely affected.

This invention comprises several novel features which in preferred practice of this invention are employed in combination, although certain of these features may be employed separately and thereby obtain at least in part the advantages and improvements resulting from so doing.

Certain features of this invention relate to the straightening of kinky hair using a chemical reducing agent in the presence of a base material comprising a combination of ingredients which has the effect of promoting the activity of the reducing agent while at the same time passivating the embrittling action of the reducing agent on the hair. The base material is also instrumental in facilitating the straightening of kinky hair and the maintenance of the hair in straightened condition while the hair is in the process of becoming softened and swollen. The base material which I have found to be effective for this purpose is a mixture of an anionic wetting agent and a water-soluble soap within the limits of concentration that will be described more in detail below and which I have found to be critical in order to obtain the aforesaid improvements. Preferably these materials in combination afford an aqueous base of creamy consistency in which the reducing chemical is dissolved. While the wetting agent promotes the penetration of the reducing agent so that its action in rupturing molecular linkages is rendered more effective, the soap acts to passivate its activity in such a way as to minimize hair damage; and it likewise serves to condition the air surface so the penetration-inducing action of the wetting agent is rendered more effective. Moreover, the wetting agent is believed to have a catalytic effect in enhancing the effectiveness of the reducing agent for keratin for while the soap component of the base material also exercises a detergent and cleansing effect on the hair surface the action of the reducing agent on the hair is much less effective in the absence of the wetting agent and in the case of the preferred type of reducing agent used according to this invention the effectiveness thereof is too slight to be consistent with practical use in the absence of the wetting agent. On the other hand, the wetting agent by itself does not have the passivating effect possessed by the soap in counteracting hair damage and in the straightening of kinky hair the presence of the soap is essential. It is also believed that when the wetting agent and soap are employed in combination there is substantial synergistic coaction between them as regards their capacity to remove naturally occurring oils so as to render the hair more susceptible to the action of the reducing agent employed. The wetting agent likewise appears to counteract the dulling effect on hair which is usually incident to the reaction of soap with hard water. However, regardless of theory, I have found that it is not possible to successfully straighten kinky hair without excessive hair damage in the absence of the soluble soap component of the base; and I have likewise found that it is not possible to successfully straighten kinky hair using the soap in the absence of the wetting agent. In addition to these advantages of the base material, it also enables the kinky hair to be better controlled during treatment. Naturally kinky hair is quite springy and if a comb is merely run through it it tends to spring back to its original kinky condition. This makes the hair difficult to control and arrange in desired straightened condition, and the base material has been found to be very effective in counteracting the springiness of kinky hair and in enabling it to be laid in controlled straightened condition.

Further features of this invention relates to the nature and proportions of the chemicals employed to effect the swelling and softening of the hair. Thus, the chemicals which are employed according to preferred practice of this invention have been found to minimize hair embrittlement and lose of tensile strength and to minimize hair discoloration. These features are of especial importance in connection with the straightening of kinky hair. Further features and advantages of the preferred treating chemicals are that they are self-oxidizing in that upon application to the hair they exercise initially their desired functions of rendering the hair workable and suspceptible to reorientation of molecular structure and then, during the further treatment of the hair and under the influence of heat, becoming oxidized so that their action on the hair becomes completely dissipated with the result that there is no possibility of any residue remaining which would tend to cause hair embrittlement and with the further result that no after treatment of any kind is necessary in order to remove the chemicals or to effect setting of the hair structure so that it will remain in its altered or changed configuration. If desired the chemicals can be left on the hair after treatment without any adverse effect and it has been found that when this has been done and the hair is subsequently shampooed from time to time as in normal hair care the general quality of the hair continues to be improved from the point of view of its pliability, softness and capacity to be combed and arranged into attractive hair styles. It is possible according to this invention to impart qualities of good hair to naturally problem hair.

Features of this invention relating to the preferred treating chemicals result from the combination of a reducing agent having a molar redox potential in an alkaline medium having a pH of about 8.2 in the range $-.5$ to -1.2 in combination with an ammoniacal buffer. The molar redox potential referred to above is that according to the well known scale expressed in volts and with reference to a value of zero for hydrogen, and ranging in terms of positively and negatively expressed values between limits of extreme according to which those having the greatest postive values are the strongest oxidizing agents while those having the greatest negative values are the strongest reducing agents. The ammonical buffer may consist solely of an ammonium salt or an ammonium salt in combination with a limited amount of ammonium hydroxide. It is desirable to have an ionizable ammonium compound in the composition for the ammonium ion in the treating composition appears to have a softening effect on the hair which promotes access of the reducing agent for accomplishing rupture of the cystine linkages. An ammoniacal buffer provides such an ionizable ammonium compound and likewise has the further advantage of obtaining desired control of the pH of the composition for greatest effectiveness. Moreover, the ammonium salt component appears to provide better stability of the composition and enhances the applicating qualities of the composition. Within this classification of preferred treating chemicals the substances which I prefer to employ are alkali metal bisulfite as the reducing agent and ammonium carbonate as the ammoniacal buffer and the advantages and improvements incident to the use of such preferred treating agents may be illustrated in connection with these preferred examples.

Preferably sodium bisulfite is used although potassium bisulfite may also be employed. The term alkali metal, as used herein and in the claims, does not include ammonium bisulfite which is objectionable because of instability and malodor. It is important to employ the alkali metal bisulfite rather than a normal sulfite. I have found that if the normal sulfite is used, it is not possible to obtain sufficient softening or swelling of the hair without attendant hair discoloration. For example, in

the dekinking of black hair use of a normal sulfite results in objectionable development of reddish discoloration. It is also important to employ the bisulfite rather than a normal sulfite, due to the fact that the hydrogen ion that is liberated when the bisulfite occurs in an aqueous medium results in combination with the ammonium carbonate in a solution wherein optimum ion concentrations are afforded for obtaining the most effective softening and swelling action on the hair. The ammonium carbonate that is used may be the ammonium carbonate of commerce which is regarded as having the formula

$$(NH_4)HCO_3.(NH_4)(NH_2)CO_2$$

and which technically is a mixture of ammonium acid carbonate and ammonium carbamate. Since this material is referred to in the art as ammonium carbonate the term ammonium carbonate will be used herein and in the claims with reference thereto although ammonium carbonate such as that represented by the formula

$$(NH_4)_2CO_3$$

may be employed and is included in the term ammonium carbonate. The ammonium carbonate becomes ionized in solution to produce ammonium ions, and it is desirable to use ammonium carbonate in combination with the alkali metal bisulfite for producing a medium of preferred hydrogen ion concentration wherein the sulfite radicals exert their reducing action in the presence of ammonium ions and whereby the swelling and softening of the hair is accomplished in a very desirable way which permits its configuration or form to be permanently and readily altered without embrittlement of the hair or discoloration of the hair. As above pointed out under the influence of heat the above-described compositions have such self-oxidizing properties as to eliminate the necessity for any after treatment.

For the straightening or kinky hair it is essential, as pointed out above, to employ a treating chemical such as the combination of alkali metal bisulfite and ammonium carbonate with the base material comprising both an anionic wetting agent and a soluble soap, for if the alkali metal bisulfite and ammonium carbonate are employed in sufficient concentration to accomplish such softening and swelling of kinky hair as to permit permanent straightening the hair becomes excessively brittle and loses its strength to an excessive degree. However, normally straight hair is much more resistant to embrittlement than kinky hair and the compositions above referred to can be utilized in the waving of normally straight hair without utilizing the soap component of the base, and when so formulated the compositions possess the attendant advantages of the self-oxidizing feature above mentioned when the preferred treating chemicals are employed upon heating the hair while the composition is applied thereto and also possess the further attendant advantage of leaving the hair in a very desirable condition from the point of view of texture, softness and capacity to be arranged into desired stylings. However, it is also the case that the composition adapted for straightening kinky hair which contains both an anionic wetting agent and a water-soluble soap, if employed in imparting a permanent wave to normally straight hair, has been found by me to be very effective in providing a permanent wave while at the same time leaving the hair in a most desirable condition and in such case the passivating action of the soap is of advantage in attaining optimum properties for preserving the original strength and color of the hair.

In preferred formulation for straightening kinky hair the base material not only contains the anionic wetting agent and water-soluble soap, but also contains a minor amount of an emollient material such as oleic acid, which not only contributes to passivating and counteracting the embrittling tendency of the reducing agent but also contributes substantially to the softness and luster of the hair after the treatment has been completed. The presence of such an emollient is likewise believed to have a synergistic effect in combination with the wetting agent and the soap in obtaining effective initial removal of oils and greases from the hair.

In connection with the employment of the compositions above described it is normally neither necessary nor desirable to employ other substances in the treating composition. However, other substances may be present which do not impair the effectiveness of the composition for the purposes stated or result in excessive injury to hair. However, preferred compositions for use according to this invention are substantially free of any reducing agent for keratin other than the alkali metal bisulfite or are such that the reducing agent component of the composition has a molar redox potential in the aforesaid range of —.5 to —1.2. Thus, for example, I have found that the condition of hair after treatment is better than if, for example, some other reducing agent such as a mercaptan were also to be present in the composition.

The foregoing constitutes preferred practice of this invention which is especially suitable for professional treatment of hair for the straightening of kinky hair or the waving of normally straight hair in an operation involving the employment of heat after the treating composition has been applied to the hair. While it is possible to employ heat in the treatment of hair in connection with non-professional or home treatment it is preferable for such non-professional or home treatment that the composition be such that it is effective at normal room temperatures. For such purposes the activity of the composition at room temperatures can be promoted by the inclusion therein of a more powerfully acting reducing agent such as a mercaptan. A number of mercaptans which are suitable for this purpose are disclosed in Patent No. 2,577,710 and the mercaptan which I preferably employ is thioglycolic acid or ammonium thioglycolate. When used in combination with the other ingredients of the composition of my invention I have found that the amount of mercaptan need be quite small. Thus, in the case of thioglycolic acid the amount thereof that is combined with the other ingredients of my composition in order to be effective at room temperatures may be as little as substantially less than 1% by weight of the composition as a whole. The employment of a mercaptan in small amount is preferable for when a mercaptan is used it not only is difficult to remove from the hair but also has a greater embrittling tendency than the other ingredients of my composition. Such mercaptains likewise do not possess the self-oxidizing attribute of the other ingredients of my composition and when a mercaptan is employed even in small amount it is necessary to follow the hair treatment quite promptly with some suitable after treatment by which the reducing action of any residual mercaptan retained in the hair is neutralized. Otherwise any mercaptan retained in the hair will gradually cause excessive embrittlement and loss of tensile strength. After treatments of an oxidizing character such as treatment with a dilute solution of sodium or potassium bromate or of sodium perborate are suitable for the purpose. Moreover, when a mercaptan is employed it is also necessary to employ in conjunction therewith a substantial amount of aqua ammonia or the like for otherwise the mercaptan does not have the desired effectiveness. When any such composition is used for straightening kinky hair it is essential, as mentioned above, to employ the base material containing both a wetting agent and a water-soluble soap and it is also preferable to employ the emollient. Moreover, for non-professional straightening of kinky hair it is preferable to employ a thickening agent in the composition that is applied to the hair.

Having hereinabove described the principal purposes, features and advantages of my invention I will hereinafter explain the nature of my invention in connection with typical formulations and methods coming within the scope thereof.

The preferred composition for use in the straightening of kinky hair according to this invention, which is also excellent for waving normally straight hair, contains the following ingredients in substantially the following proportions as expressed in percentages by weight:

	Percent
Ammonium carbonate	2 to 8
Sodium bisulfite	1.5 to 5
Sodium lauryl sulfate	2.5 to 6
Titre 42 tallow soap	2 to 10
Oleic acid	.5 to 5
Water q.v. to 100%.	

A typical preferred composition within the foregoing ranges is as follows:

	Percent
Ammonium carbonate	4.5
Sodium bisulfite	2.2
Sodium lauryl sulfate	4.2
Titre 42 tallow soap	5.6
Oleic acid	1.0
Water	82.5

The preparation of the foregoing typical preferred composition will now be described; and certain of the features of this invention relates to its preparation. The first step in the preparation of the composition is the production of the base material containing the wetting agent and the soluble soap. To this end the titre 42 tallow soap is first commingled with water and the mixture of water and soap is heated to about 85° C. to 90° C. The amount of water that is employed should be sufficient to dissolve the soap at this temperature and in practice about 4 parts by weight of water to about 1 part by weight of the soap has been found to be satisfactory for preparing a smooth solution without the occurrence of lumps. Referring to the foregoing example, when the soap has been dissolved in the amount of water and the sodium lauryl sulfate is then incorporated, the combined weight of the soap and the sodium lauryl sulfate constitutes substantially 30% by weight of the solution. However, a greater proportion of water could be employed consistent with the over all water content permitted in the completed composition. Thus, as illustrated by the proportional ranges hereinabove given, the combined weight of the soap and anionic wetting agent in relation to the water content of the completed composition may be as low as about 5% by weight but for the higher solids contents is about 20% by weight. It is preferable that the amount of water be held down so as to be in the lower portion of the above-mentioned range and it is desirable that the amount of water be not greater than about 8 parts by weight of water to 1 part of the soap for the better curing is thereby afforded and the storage during curing is facilitated. The heated mixture of soap and water is subjected to mechanical agitation as by stirring to accelerate the dissolution of the soap and the formation of a smooth solution. After the dissolution of the soap has been completed the resulting solution is cooled to about 45° C. Sodium lauryl sulfate which has been prepared in the form of a water solution containing, for example, about 30% by weight of the sodium lauryl sulfate is heated to about 40° C. and is then mixed with the soap solution which is at the aforesaid temperature of about 45° C. and these materials are thoroughly mixed together as by stirring. The resulting mixture is permitted to cool to room temperature and preferably is permitted to stand for about 10 days or longer to accomplish curing which results in increased smoothness and better consistency. When an emollient is used such as oleic acid it can be incorporated in this base material. Since oleic acid is of liquid consistency at room temperature all that is required is to incorporate it with mechanical agitation until it is thoroughly dispersed. However, if desired the emollient could be made into an aqueous emulsion prior to incorporating it with the base. Preferably only part of the water that is comprised in the completed composition is utilized in initially dissolving the soap and the balance of the water is added after the curing step except for such water as may be additionally included in the composition as the result of incorporating therewith a solution of the other ingredients of the compositions.

As aforesaid, the base material is an important feature of this invention because of its beneficial effects on hair whereby it protects and conditions the hair when used with a reducing agent for keratin; and these properties and characteristics likewise are of general utility in hair cleansing and treating preparations whether a reducing agent for keratin is or is not present. Moreover, the base is further improved for cleansing and conditioning preparations by the presence of substances such as oleic acid or methylcellulose gel, and preferably both. When the additional constituents of the foregoing formulation are incorporated in the preparation this is done by dissolving the ammonium carbonate in enough water to accomplish the dissolution thereof. This is ordinarily done at room temperature, and after the ammonium carbonate has become dissolved the sodium bisulfite is added to the solution by adding the sodium bisulfite relatively slowly in solid finely divided form while stirring the solution. During this operation there is a certain amount of interaction between the sodium bisulfite and the ammonium carbonate which results in evolution of some carbon dioxide. After the solution has become complete the previously prepared base material is mixed therewith and the resulting composition is ready for use. It can be used immediately or can be placed in containers for subsequent use, for the composition is stable and can be stored for long periods.

The preparation of the base material can be varied somewhat from the preferred method for doing so that has been exemplified above. It is desirable in order to effect proper dissolution of the soap to heat the mixture of the soap and water to a temperature of at least about 80° F. but while it is preferable to so heat the mixture of soap and water prior to the incorporation of the wetting agent, the wetting agent can be commingled with the soap and water before the mixture of soap and water is heated to effect dissolution of the soap, provided only that the wetting agent which is employed is not excessively decomposed or otherwise adversely affected by the temperatures employed during the dissolution of the soap. The heating of the wetting agent prior to its being commingled with the soap or the soap solution is merely to facilitate its incorporation. Thus, in the case of sodium lauryl sulfate a 30% water solution thereof is relatively solid at ordinary room temperature but becomes of the consistency of a syrupy liquid when heated to about 40° C. to 45° C. If the wetting agent employed, or an aqueous solution thereof, is sufficiently fluid at ordinary temperatures there is no necessity for heating it prior to incorporation with the soap or soap solution. However, after the soap solution has been prepared it is ordinarily desirable to mix the wetting agent with the soap solution when the soap solution is mildly heated to a temperature at which it possesses greater fluidity than it does at room temperature. Some curing of the base material, at least about 24 hours, is highly desirable in order that the composition may be of the proper consistency. It is also important to complete the preparation of the base material before the hair softening chemicals, namely, the sodium bisulfite and the ammonium carbonate, are added thereto. When the composition is thus prepared it is stable notwithstanding the presence of the hair softening chemicals which, because of their nature as electrolytes, have a tendency to break an emulsion or dispersion. However, the presence of the electrolyte ingredients is compatible with the base material as formulated according to this invention in the sense that the creamy nature of the finished composition is stable. Moreover, the activity of the wetting agent component of the base is believed to be sub-

stantially increased by the presence of the ammonium carbonate in the composition.

The composition which is formulated and has been prepared as above described is of cream-like consistency. In the straightening of kinky hair it is applied to the hair, which, preferably, has had a preliminary shampoo. While the composition is thoroughly worked into the hair, the hair is combed to partially elongate it and the creamy consistency of the composition as well as its action on the hair greatly assists in getting the hair to lie in such condition. Usually it requires only about 5 or 10 minutes to apply the composition and comb out the hair. After this operation has been completed the hair is mildly preheated and partially dried as by blowing it with a blast of warm air at about 38° C. The removal of the excess moisture requires about 5 to 10 minutes and is desirable so as to minimize the possibility of steam burns. The hair which has thus been treated and partially dried is then pressed as with a hot comb at a temperature of about 75° C. to about 130° C. with resultant straightening of the hair. After such application of heat has been completed the hair is then exposed to cool air for about three minutes. The hair can then be styled as desired and no further treatment is necessary although, if desired, the hair can be rinsed and thereafter styled in either moist or dry condition. While the hair softening chemicals in the composition serve to soften the hair at considerably lower temperatures such as 21° C. to 24° C., the oxidation of the sodium bisulfite in the composition proceeds much more slowly at such temperatures and when oxidation of the reducing agent is effected solely by reaction with the hair substance and contact with the air the time required for its accomplishment would be undesirably long. The use of heat has the effect of greatly accelerating the oxidation of the sodium bisulfite as the result of its reaction with the hair substance and contact with the air with the result that under the influence of heat the composition is self-oxidizing in a relatively short time so that no after treatment with an oxidizing agent or the like is required and this is a very desirable feature of this invention. However, it would be possible to utilize a lower temperature over a longer period of time.

Treatment of kinky hair as above described has been repeatedly demonstrated to afford greatly superior results as compared with prior proposals for straightening hair. Thus, the hair is readily handled and it is effectively and permanently straightened. It is also important that the hair is in no way discolored, embrittled or weakened. In fact the hair retains its full natural color, and its luster, softness and capacity to be combed and styled are enhanced. Moreover, there is no scalp irritation, the scalp after treatment being normal and healthy in every respect and in some cases actually improved. Operators who repeatedly carry out the operation can do so without skin irritation even though they do not wear gloves.

In the above mentioned composition the combination of the titre 42 tallow soap and the sodium lauryl sulfate, as the result of what appear to be simultaneously occurring catalytic, synergistic and suppressive effects, possesses the above mentioned capacity of enhancing the action of the softening and swelling chemicals while at the same time preventing weakening or other damage to the hair. It likewise exerts a cleansing, dispersing and foaming action and plays an important part in enabling the hair to lay in straightened condition during the hair treatment. It also promotes the self-oxidizing properties of the composition as a whole and facilitates the setting of the hair after the initial softening of the hair and after the desired alteration in the configuration of the hair has been completed. Moreover, the combination of the soap with the wetting agent enables the composition to be formulated in the form of an emulsion having a creamy consistency. In order to have much effectiveness the soap should constitute at least about 2% by weight of the composition, while a soap content in excess of about 10% is somewhat injurious to some types hair. The amount of wetting agent that is employed will depend somewhat upon the type of wetting agent that is employed, for the amount of wetting agent required for producing a given effect varies considerably between different wetting agents. While in the case of sodium lauryl sulfate it is preferable that there be present in the composition at least about 2.5%, a lesser quantity can be used and in the case of some wetting agents the quantity employed may be as low as about .3%, although a larger percentage such as at least about .5% is normally preferable. An amount of wetting agent in excess of about 6% by weight of the composition is somewhat injurious to some types of hair. The amount by weight of the soap preferably is at least that of the wetting agent. Moreover, it is preferable that the amount by weight of the base material be at least as great as that of the hair softening and swelling chemicals, namely, the sodium bisulfite and the ammonium carbonate in the case of the formulation above illustrated.

The term "water-soluble soap" as used herein and in the claims is employed in the conventional sense as referring to the water-soluble salts of fatty acids. As is inherent in the term "soap," the fatty acid is one which contains twelve or more carbon atoms and is of the general type derived from naturally occurring oils and fats. Soaps of fatty acids having more than twenty-two carbon atoms have reduced solubility and are less desirable for this reason, and ordinary types of soap wherein the fatty acid group contains on the average about eighteen to twenty carbon atoms have been found to be very satisfactory for use in the practice of my invention. A sodium soap is ordinarily employed but a potassium soap is also suitable. Most commercial soaps contain the sodium or potassium salts of more than one fatty acid and may contain minor amounts of salts of fatty acids outside the above mentioned range of carbon atom contents. The fatty acid groups present in greatest proportion in most soaps are stearic, palmitic and oleic although others may be present in minor or major proportions such as linolenic, erucic, myristic, lauric, etc. The type of soap which I preferably employ in the practice of my invention is one which contains in substantial proportion a soap of an unsaturated fatty acid. The titre 42 tallow soap which has been mentioned above is illustrative of a soap of this type for it contains approximately 50% of soap of unsaturated fatty acid, mostly the soap of oleic acid which is unsaturated. The bulk of the saturated fatty acid soap contained in titre 42 tallow soap consists of the soaps of palmitic and stearic acids. The unsaturated fatty acid group may be of the olefinic type or of the acetylenic type. In addition to soap of oleic acid, soaps of other unsaturated fatty acids such as linoleic, linolic and erucic acids may be comprised in the preferred type of soap. The presence of a substantial amount of soap of an unsaturated fatty acid is desirable in preserving the softness of the hair and in minimizing hair embrittlement and I prefer that the soap which is used contain at least about 40% by weight of soap of unsaturated fatty acid, although still better results are obtained when the soap contains at least about 50% by weight of soap of unsaturated fatty acid.

The use of sodium lauryl sulfate as the wetting agent component of the base material has been found to be especially suitable for use according to this invention. One source of sodium lauryl sulfate is the product which is sold under the trade-name "Orvus" paste by Proctor & Gamble and which consists essentially of water and about 30% to 31% of sodium sulfate of lauryl alcohol or analogous alcohols. Sodium sulfates of the so-called coconut fatty alcohols are generally equivalent. Such a wetting agent is of the anionic type, and it is wetting agents of the anionic type which are employed according to this invention. By definition an anionic wetting agent is one which is ionizable and is one wherein the effective

surface active part is the anion. An anionic wetting agent is to be distinguished from a cationic wetting agent or a non-ionic wetting agent.

In addition to sodium lauryl sulfate any anionic wetting agent may be employed according to this invention, although wetting agents of the sulfated alcohol type are preferred. There are many well known wetting agents of the anionic type. The term wetting agent has been used herein and in the claims according to conventional usage as a term which excludes and distinguishes from soap. The materials which are classified as wetting agents generally have other properties such as emulsifying, dispersing and other detergent properties and frequently have foaming and softening properties, in addition to the surface tension modifying properties which are a predominant characteristic of wetting agents as a class. More generally such agents may be referred to as surface active agents and as distinguishing them from soaps they have been commonly referred to as surface active agents of the synthetic type. However, this class of substances which is employed according to this invention, as distinguished from the soap component thereof, has been referred to herein and in the claims as an anionic wetting agent.

As indicated above sodium lauryl sulfate is illustrative of an anionic wetting agent of the sulfated alcohol type. Sodium cetyl sulfate is another example of a wetting agent of this type. In such sulfated alcohol type wetting agents the alcohol group generally contains from 8 to 18 carbon atoms and may or may not be of the straight chain type, and they are for the most part produced from unsaturated fatty alcohols derived from fish oil acids or the acids of the more unsaturated vegetable oils, although alcohol made by the reduction of fatty acids obtained by oxidation of petroleum products may be employed, e.g., the sodium sulfate of 2-ethylhexanol. Wetting agents of the alkyl aromatic sulfonate type also have especially favorable properties. Anionic wetting agents may be employed which are of the type wherein the hydrophilic group is a carboxyl group that is joined to the hydrophobic group through an intermediate group such as an amide group, an ester linkage or a sulphoamide group. However, in most of the wetting agents the hydrophilic group is either a sulfate or a sulfonate which may be attached directly to the hydrophobic group or indirectly through a linkage such as an ester, ether, or amide linkage. Sodium salts of sulfated monoglyceride of coconut fatty acids are illustrative of sulfuric ester compounds of this type. Sodium salts of the sulfate of acyl derivatives of 4-amino butanol-2 are illustrative of sulfuric ester compounds of this type with an amide linkage. Sodium salts of a sulfated phenolic ether alcohols are good wetting agents, e.g., sodium t-octylphenoxyethoxyethyl ether sulfonate. Alkane sulfonates are also typical such as coconut fatty sulfoacetate or di-isobutyl ester of sulfosuccinate. Wetting agents of the fatty alcohol amine condensate type can also be employed. The foregoing and many other anionic wetting agents are well known in the art and for this reason further reference to the wetting agent component of the composition is not regarded as necessary. Those having the greatest stability and compatibility at the pH of the composition and under the conditions of preparation and use of the composition are the most suitable.

Neither the ammonium carbonate nor the sodium bisulfite in the foregoing composition formulation is effective to produce the desired softening and swelling of the hair structure occasioned by rupture of the cystine linkages, but in combination within the aforesaid proportional ranges they are effective to do so, the action in this regard being accelerated by heat which, as mentioned above, is desirable in that the heat also accelerates the self-oxidation of the mixture accompanied by setting of the hair after it has been initially softened and formed into an altered configuration. It is normally desirable that the amount by weight of the ammonium carbonate be at least that of the sodium bisulfite for obtaining the desired effect on the hair. Preferably the weight ratio of the ammonium carbonate to the sodium bisulfite is between 1.5 to 1 and 4 to 1. The value for this ratio is preferably approximately 2 to 1. Another reason for employing the ammonium carbonate and the sodium bisulfite within the ranges and ratio relationships above given is that as the result of ionization of the chemicals in solution, the hydrogen ion concentration is such as to provide optimum activity in softening and swelling the hair, without, however, damaging or discoloring the hair. The desired hydrogen ion concentration may be further characterized by reference to the fact that the pH of the composition as applied to the hair is desirably between about 7.5 and about 9.5. The preferred pH of the composition is about 8.2 for at about this pH superior all around effectiveness has been obtained in the practice of this invention. The attainment of such pH ranges is one of the reasons for the employment in combination of ammonium carbonate and sodium bisulfite and for the employment of sodium bisulfite rather than the normal sulfite. The foregoing respecting the content of the ammonium carbonate and the sodium bisulfite represent the concentration within which effective activity toward hair is obtainable without, however, having the action on the hair excessively severe. The foregoing as regards sodium bisulfite is also applicable to other alkali metal bisulfites, i.e., potassium bisulfite, or to mixtures thereof.

While there is some interaction between ammonium carbonate and sodium bisulfite when these materials are initially mixed in an aqueous medium including some evolution of CO_2 with the result that the identity of materials as incorporated in aqueous solution may to some extent be altered as the result of ionization and some interaction therebetween, nevertheless because the extent of mixed substances in an ionized state and the extent and nature of any interaction is essentially of a relatively complex nature, the compositions that are employed in the practice of this invention are referred to and defined both herein and in the claims in terms of the kind and proportion of the ingredient materials incorporated, and it is to be understood that such reference to and definition of said compositions are applicable to the product of commingling the respective ingredients in the aqueous medium therefor.

While the ammonium carbonate is an ionizable ammonium compound that inherently possesses substantial buffering action, its function as an ammoniacal buffer can be enhanced by the inclusion in the composition of ammonium hydroxide, e.g., in the form of a solution of conventional concentration such as 26 to 28% solution. However, the amount of ammonium hydroxide that is employed is preferably relatively small such as about 1% by weight of a 28% solution, and preferably not more than about 2% by weight of a 28% ammonium hydroxide solution is incorporated so as not to adversely affect the hydrogen ion concentration at which the most desirable action on the hair is obtained, namely, within the limits of the pH hereinabove mentioned. Moreover, an excessive quantity of ammonium hydroxide imparts an unpleasantly strong ammonia odor to the composition.

In addition to ammonium carbonate other ammonium salts of weak organic acids such as ammonium acetate or ammonium oxalate may be employed either alone or in combination with ammonium hydroxide to provide an ammoniacal buffer. In such case the proportions employed are essentially similar to those given hereinabove, namely, the ammonium salt component of the ammoniacal buffer is of the range from about 2% to about 8% by weight of the composition as a whole, amounts in excess of about 10% by weight normally being excessive. The foregoing preferred ratio relationships of ammonium carbonate to alkali-metal bisulfite are also applicable more generally to the ammonium salt content of the ammoniacal buffer in relation to the alkali-metal bisulfite or other reducing agent for keratin. When the am-

moniacal buffer also comprises ammonium hydroxide in the relatively small amounts hereinabove indicated as preferable the amount of NH_4OH on an anhydrous basis in the composition as a whole is quite small, namely, about .5% by weight or less, but is to be taken into consideration as regards the percentage by weight of the ammoniacal buffer as a whole contained in the composition. Such NH_4OH content is to be understood as being additional to any NH_4OH derived from hydrolysis of the ammonium salt content of the buffer, e.g., by inclusion of ammonium hydroxide solution in addition to the ammonium salt.

The limits for pH hereinabove given are those which have been found to be preferable in obtaining desired effect on the hair of the composition as a whole. However, the compositions are operable over a wider limit of pH from above 7 up to 9.8, the higher pH values being especially applicable when a mercaptan is also included in the composition for the purposes described more fully hereinafter. Such higher pH values can readily be obtained by including a greater proportion of ammonium hydroxide in the ammoniacal buffer. However, more than about 12% of a 28% ammonium hydroxide solution is usually undesirable, and, accordingly, the amount of NH_4OH on an anhydrous basis in the ammoniacal buffer does not exceed about 3% by weight of the composition as a whole and preferably does not exceed about 2% by weight of the composition as a whole.

More generally in considering the ammoniacal buffer as a whole it may consist of the ammonium salt of a weak acid or an ammonium salt in combination with ammonium hydroxide. The amount thereof may range from about 2% to about 13% by weight of the composition as a whole with the proviso that the ammonium salt content is of the range of about 2% to about 10% by weight of the composition, while the NH_4OH on the anhydrous basis does not exceed about 3%. For the preferred lower percentages of NH_4OH above mentioned such as 1% or 2% the upper limit of the aforesaid range for the percentage of the ammoniacal buffer as a whole is correspondingly reduced and like considerations apply as regards the preferred upper limit for the ammonium salt of about 8%. While the amount of the ammoniacal buffer and the relative amounts of ammonium salt and NH_4OH, if any, comprised therein can thus be expressed, it is also the case that the percentage range for the ammoniacal buffer as a whole taken in connection with a given pH value or a given range of pH inherently imposes a limitation on the amount of NH_4OH comprised in the ammoniacal buffer, particularly as regards the lower range of pH within which the preferred treating chemicals are employed according to this invention, for as a general rule as the proportion of NH_4OH is increased the pH of the composition also increases. To a certain extent the nature of the other constitutents also affect the pH of the composition as a whole. Thus, a wetting agent such as sodium lauryl sulfate has a pH slightly under 7 but upon mixing it with the soap which is alkaline, the commingled wetting agent and soap have a pH of about 8 which is close to what is desired. The hydrogen ion liberated from the sodium bisulfite has previously been commented upon and as aforesaid the preferred composition exemplified hereinabove has a pH of about 8.2.

The reducing agent which I have found to be the most satisfactory is sodium bisulfite. However, sodium metabisulfite has closely similar properties. Sodium hydrosulfite also has effective reducing agent properties and so has sodium oxalate, but because sodium oxalate has toxic properties care would have to be exercised in its use. As aforesaid the preferred reducing agent component of the composition is such that its molar redox potential at a pH of about 8.2 is in the range of from —.5 to —1.2. The amount of such reducing agent is preferably about 1.5 to 5% for when the composition is formulated within the aforesaid preferred range of pH the action on the hair becomes more aggressive when the proportion of reducing agent is increased and the composition becomes more difficult to employ without weakening the hair structure. However, for other values of pH less favorable to the reaction with the hair substantially larger proportions of the reducing agent may be employed, but in any case the quantity of reducing agent should not exceed about 10% by weight of the composition.

With regard to the oleic acid component of the foregoing composition formulation, its presence is not essential in order to effect the straightening of kinky hair in a satisfactory and effective way. However, the inclusion of the oleic acid emollient affords a definite improvement especially as regards the condition of the hair after the hair has been straightened and set in the straightened condition. The oleic acid cooperates with the soap in protecting the hair from embrittlement while permitting the effective rupturing of the cystine linkages and likewise tends to leave the hair in a better condition as regards luster and softness. Hair from which natural oils have been removed tends to be dull looking and lacking in luster. While the oleic acid appears to exercise a synergistic effect together with the wetting agent and soap in removing natural oils from the hair, nevertheless, when the oleic acid is present in the composition a certain amount of the oleic acid is retained by the hair and replaces the natural oil with the result that the hair retains its natural brilliance and luster. Oleic acid is the preferred emollient for use according to this invention both because of its special effects on the properties of the hair during and after the treatment and because of its capacity to be readily emulsified and dispersed in the composition in a condition readily taken up by the hair. However, other unsaturated acids may be employed whose carbon content is such that at normal temperatures the consistency of the acid is of an oily or unctious character, the carbon content ordinarily being 12 or more while the melting point is preferably below ordinary atmospheric temperature, about 72°, or not more than about 30° F. higher. Such unsaturated acids are referred to herein and in the claims as unsaturated organic acid emollients. Other examples are isooleic acid, hypogaeic acid (derived from peanut oil), rapic and erucic acids (both derived from rape and mustard), linoleic acid, and linolenic acid. Unsaturated acids of the acryllic acid series may also be employed such as physetoleic, lanopalmic, and lanoceric acids.

While the above mentioned composition is intended primarily for the straightening of kinky hair it is likewise an excellent one for imparting a permanent wave to normally straight hair. In such case the treating techniques above described in connection with the straightening of kinky hair are followed except that the hair after the initial swelling and softening thereof is caused to become set while held in curlers or the like adapted to produce such hair configurations as may be desired, e.g., curls, waves or the like.

The foregoing formulations are intended primarily for professional use in an operation involving the application of heat. For nonprofessional use it is distinctly preferable to provide a composition such that no heat is required. However, when heat is not employed then chemicals having a more powerful reducing action on hair should be employed so that when the composition is used it may be effective at ordinary room temperature and during a period of reasonably short duration. The most effective chemicals in this respect are the mercaptans that have been referred to hereinabove, but when a mercaptan is employed the composition loses the desirable self-oxidizing properties of the preferred composition formulations hereinabove described and some after treatment becomes necessary in order to effectively stop at the proper time such action of the mercaptan on the hair as would result in excessive embrittlement. Moreover, in order for the mercaptan to be effective the presence of a substantial amount

of aqua ammonia is desirable and this detracts from the obtainment of optimum conditions of hydrogen ion concentration as regards the efficacy of above mentioned less powerful reducing agents such as sodium bisulfite contained in the composition. It is for these as well as other reasons that I prefer in comnection with compositions used by professional applicators to employ a composition wherein the molar redox potentiol of the reducing agent component is in the aforseaid range of —.5 to —1.2 instead of employing any mercaptan, and as aforesaid I prefer that the composition be substantially free of any reducing agent for keratin other than alkali metal bisulfite.

When the composition is formulated for use at room temperature, including a mercaptan, the composition in order to be acceptable in the straightening of kinky hair without excessive injury thereto should contain the aforesaid base material containing an anionic wetting agent and a water-soluble soap in substantially the proportions that have been set forth hereinabove. Preferred composition formulation for such use comprises the following ingredients in the following relative percentages by weight:

	Percent
Ammonium carbonate	2 to 10
Sodium bisulfite	1.5 to 5
Sodium lauryl sulfate	2.5 to 6
Titre 42 tallow soap	3 to 10
Ammonium thioglycolate	1.75 to 3
Aqua ammonia	1 to 12
Oleic acid	.5 to 5

Water q.v. to 100%.

In the foregoing composition the ammonium thioglycolate is a water-containing commercial product wherein the effective mercaptan component, thioglycolic acid, constitutes about 46% by weight thereof. It follows that the thioglycolic acid percentage in the foregoing composition is about .8% to about 1.4%. The employment of a relatively small percentage of mercaptan is preferable from the standpoint of minimizing hair embrittlement, but substantially greater proportions than those above indicated can be employed if the composition is not left on the hair too long and if appropriate steps are taken to be sure that it is completely eliminated from the hair by an after treatment. However, any percentage of mercaptan in excess of about 10% tends to be injurious to the hair and when a mercaptan is employed in a composition used to straighten kinky hair it is essential in any case to use in combination therewith the protective base material hereinabove dscribed. The aqua ammonia component of the foregoing composition is a 28% solution of ammonium hydroxide.

A typical formulation within the foregoing more generally indicated composition formulation is as follows:

	Percent
Ammonium carbonate	8.0
Sodium bisulfite	2.0
Sodium lauryl sulfate	4.3
Titre 42 tallow soap	5.8
Ammonium thioglycolate	1.8
Aqua ammonia	11.4
Oleic acid	1.0
Water	65.7

The method of preparing the foregoing composition is essentially the same as that hereinabove described except that the ammonium thioglycolate and aqua ammonia are added to the solution of the ammonium carbonate and sodium bisulfite with which the previously prepared base material thereafter is admixed. The manner of its use in the straightening of kinky hair or in the waving of normally straight hair is also essentially the same as that hereinabove described except that the hair after initial swelling and softening is maintained at room temperature or thereabouts while held in the ultimate configuration desired. Moreover, there is the important difference that because of the presence in the composition of the mercaptan it is essential, in order not to permanently damage the hair, to subject the hair to an after treatment which completely eliminates any residual activity of the mercaptan toward the hair and serves to set or fix the hair in its altered configuration. For this purpose an after treatment of the hair with an oxidizing agent such as sodium or potassium bromate or such as sodium perborate is suitable as mentioned above.

While in the preceding formulae containing mercaptan certain specific ingredients have been set forth, it is to be understood that this has been done for illustrative purposes and that the foregoing more general considerations are applicable as regards the proportions and nature of the respective ingredients other than the mercaptan including the water-soluble soap, the anionic wetting agent, the ammoniacal buffer, the reducing agent for keratin, and the unsaturated acid emollient. It is also to be understood that mercaptans other than ammonium thioglycolate may be employed such as those disclosed in the aforesaid Patent No. 2,577,710, although when a mercaptan is also employed the total reducing agent component of the composition should be less than 10% and preferably around 4% to 7% by weight of the composition as a whole.

In connection with the compositions hereinabove disclosed one may, if desired, include therein a thickening agent. Employment of a thickening agent is particularly suitable when the composition is used in the straightening of kinky hair so as to facilitate the laying out of the hair in straightened condition, although its presence is not essential. One very desirable thickening agent is methyl cellulose. Methyl cellulose is preferably employed in the form of a preformed gel solution which is referred to hereinafter as methylcellulose gel. Such a gel can be prepared using, for example, 4 pounds of high viscosity methylcellulose (400 c.p.s.) together with 95 pounds 8 ounces of distilled or deionized water and 8 ounces of sodium benzoate to make up 100 pounds of the gel. The methylcellulose is preferably pretreated by subjecting it in a closed drum to a temperature of about 88° to 93° C. for about 4 hours or longer, and is added to the water in which the sodium benzoate has been dissolved while the water is at a temperature of about 70° to 80° C. Mixing is continued for about one hour, and the mixture is permitted to cool over a period of about 8 hours and then is permitted to stand for about 48 hours with occasional mixing. Any water loss as the result of evaporation during the process is compensated for and the resulting methylcellulose gel that is added preferably is of the range from about 1% to about 6% by weight of the composition as a whole. A methylcellulose gel content of about 4% has been found to be especially desirable when included in the last mentioned specific example of composition formulation.

Other known thickening agents such as sodium alginate solution may also be employed.

The above described compositions which comprise a mercaptan and which are especially adapted for treatment of hair non-professionally at room temperature are also suitable for imparting permanent waves or curls to normally straight hair under such conditions.

When a mercaptan is employed the necessity for inclusion of a substantial amount of a material such as aqua ammonia tends to raise the pH of the composition so as to be somewhat in excess of that which is preferable in the case of the preferred formulations wherein the mercaptan is omitted. Thus, when the mercaptan is present somewhat different influences come into play for the mercaptan becomes of greater effectiveness at somewhat higher values of pH, and the region of most effective pH goes as high as about 9.8. Higher pH values for the composition tend to be too severe on the hair. It is preferable, therefore, to hold down the pH so as

to be not greater than about 9. However, the activity of mercaptans is such that substantial effectiveness is retained for pH values down to about 7.

Since the presence of the mercaptan is consistent with the formulation of the treating composition over a relatively wide range of pH a material such as triethanol amine may also be included in the composition. When triethanol amine is employed there can be a lessening of the amount of aqua ammonia and a corresponding lowering of the strong ammoniacal odor that is the necessary incident of using aqua ammonia. Triethanol amine in and of itself exercises some beneficial effect in waving or straightening hair and also possesses certain emulsifying properties. More generally the presence of triethanol amine in amounts such as from 1% to 6% may be additionally included in any of the formulations hereinabove disclosed and especially in those which include a mercaptan.

The employment of my base material is generally of advantage in connection with the straightening of kinky hair regardless of the nature of the chemical substances which are employed such as other reducing agents including not only the mercaptans but also sulfides and normal alkali metal sulfites even though such other reducing agents and chemicals have the above mentioned drawbacks incident to their use, for in any case the base material has the effect of greatly lessening hair damage while permitting the hair to become softened and swollen so that it can be reset in desired different or altered configurations. An example of a composition which contains neither an ammoniacal buffer nor a reducing agent of the kind exemplified by alkali metal bisulfite but which can be employed in the straightening of kinky hair if promptly followed by an oxidizing after treatment is as follows, the percentages being by weight:

	Percent
Anionic wetting agent (such as sodium lauryl sulfate or Triton 200)	4.0
Water-soluble soap	5.6
Ammonium thioglycolate	13.0
Aqua ammonia (28% soln.)	3.4
Methylcellulose gel	3.0
Water	71.0

The above composition can be prepared in the manner above described. Thus, the base is first prepared and permitted to become cured until it is in the form of a smooth paste-like mass. Water is then added and thereafter the other ingredients are added in the order mentioned, namely, the methylcellulose gel, the ammonium thioglycolate and the aqua ammonia.

While this invention has been described and illustrated in connection with certain typical examples of the practice thereof it is to be understood that this has been done for illustrative purposes and that the practice of this invention can be varied according to the principles hereinabove set forth and within the scope of the claims hereafter made.

This application is a division of my application Serial No. 285,797, filed May 2, 1952, now Patent No. 2,865,811, for Hair Straightener containing a Keratin Reducing Agent, Anionic Wetting Agent and Water-soluble Soap and Method of Using Same.

I claim:

1. A method of preparing a composition suitable for treating human hair to modify the curl characteristics thereof which comprises the steps of preparing an aqueous solution consisting essentially of water and from about two to about ten parts by weight of water-soluble soap and from about 0.3 to about six parts by weight of anionic wetting agent, the dissolution of the soap being effected by mixing the soap with water in the proportion of at least about four parts by weight of water to about one part by weight of soap and dissolving the soap in the water at a temperature of at least about 80° C. without boiling, curing said solution for at least about twenty-four hours, the combined weight of said soap and said wetting agent being at least about 5% by weight of said solution during said curing, and after the curing step incorporating with the cured solution a reducing agent for keratin in an aqueous solution, said soap and said wetting agent constituting from about 2% to about 10% by weight and from about .3% to about 6% by weight, respectively, of the finished composition.

2. The method according to claim 1 wherein during the curing step the combined weight of said soap and said wetting agent is from about 20% to about 30% of the solution undergoing curing.

3. A method of preparing a composition for straightening kinky hair which comprises mixing a water-soluble soap with water in the proportion of at least about four parts by weight of water per part of soap, heating the mixture to at least about 80° C. without boiling to effect dissolution of the soap, incorporating an anionic wetting agent in the soap solution, curing the mixture for at least about twenty-four hours until it is of smooth consistency, said mixture containing about two to about ten parts by weight of said soap and about .3 to about six parts by weight of said anionic wetting agent, and the combined weights of said soap and said anionic wetting agent constituting from about 20% to about 30% of said mixture during said curing, dissolving ammonium carbonate in water, adding alkali metal bisulfite to the resulting ammonium carbonate solution, and mixing the resulting solution of said ammonium carbonate and alkali metal bisulfite with the cured solution containing said soap and said anionic wetting agent, said soap and said anionic wetting agent constituting from about 2% to about 10% by weight and about .3% to about 6% by weight, respectively, of the finished composition.

4. An aqueous composition for treating human hair which comprises as the base for cleansing and conditioning the hair the following ingredients in approximately the following proportions by weight:

	Percent
Water-soluble soap	2 to 10
Anionic wetting agent	.3 to 6
Oleic acid	0.5 to 5
Methylcellulose gel	1 to 6

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