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COMPOSITION OF MATTER FOR WAVING HAIR

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5 Claims. (Cl. 167—87.1)

This invention relates to the treatment of hair, and is particularly applicable to hair upon the human head in giving lasting or "permanent" waves, and the like.

Hair is a complex organic substance consisting largely of keratin, itself a complex material. This material either contains or may be readily hydrolyzed into a substance known as cystine or cystenic acid, probably to the extent of 20%. The hair also apparently contains rather loosely bound sulphur to the amount of about 5%.

In order to impart a lasting or permanent wave to the hair, it is necessary not merely to arrange the hair in some curved form into which it is desired to permanently set it, but to modify the chemical composition so that the natural resiliency of the hair is either destroyed or suspended, in whole or in part, and the hair allowed to assume a permanent set in the form in which it is held.

This has, heretofore, generally been accomplished by the use of alkaline solutions applied to the hair, which is then subjected to heat, the commoner solutions consisting of ammonium hydroxide, while such alkalies as sodium carbonate, borax, and tri-sodium phosphate are used. When hair treated with any of the above alkalies is heated, a wave or curl is imparted to it, but the texture of the hair itself becomes impaired, it becoming, to a considerable extent, deadened and dried out, and losing much of its natural resiliency and sheen.

Apparently the alkalies previously used extracted a considerable quantity of the cystenic acid from the hair and thus caused the change in its appearance and texture.

If the hair be subjected to any strongly alkaline material, the hair is dissolved either in whole or in part. If an alkaline material could be handled with just sufficient dilution to prevent destruction of the hair, it would produce a satisfactory wave. However, if such a material is diluted more than just sufficient, no wave is produced, and in practice it is found that the limits of dilution are within so fine a range as to render this treatment practically impossible.

It is an object of this invention to provide an improved method of and means for imparting a wave to the hair which will obviate the difficulties previously experienced.

Other objects will hereinafter appear.

I have found that mixtures of salts, some of which may be too strongly alkaline with others which alone are too weak in their action, can be used effectively.

One of such mixtures, a composition consisting of potassium sulphite and ammonium carbonate in approximately the proportions of 70% and 30%, respectively, has been found to operate satisfactorily.

The molecular weight of potassium sulphite is 158.26, and that of ammonium carbonate 96.09. The reaction, most simply stated, between potassium sulphite and ammonium carbonate is as follows:

Potassium sulphite	—	Ammonium carbonate	=	Potassium carbonate	—	Ammonium sulphite
158.26		96.09		138.21		116.14

The above reaction, of course, illustrates the two components as being in equilibrium.

With the proportions previously stated, namely 70% and 30%, it will be seen that potassium sulphite is in excess of that used in the reaction and that when put into water this mixture is really the equivalent of the following:

	Percent
Potassium sulphite	20.5
Potassium carbonate	43.3
Ammonium sulphite	36.2

When this mixture is dissolved in water, the following characteristics of the materials will be noted:

1. Potassium sulphite in the presence of water and heat hydrolyzes into potassium hydroxide and sulphurous acid. The potassium hydroxide is a relatively strong base, while the sulphurous acid is a relatively strong acid.

2. Potassium sulphite decomposes with heat giving potassium sulphate and potassium sulphide.

3. Potassium sulphite combines with sulphur to form potassium thiosulphate.

4. Potassium carbonate hydrolyzes in water giving potassium hydroxide and carbonic acid.

5. Ammonium sulphite decomposes with both water and heat yielding free ammonia and sulphur dioxide.

Apparently, when a solution such as above described is used, the following happens:

The presence of the relatively strong sulphurous acid decreases the effective alkalinity which would otherwise be imparted the solution by the potassium hydroxide and ammonium to a point where the solution is effectively substantially neutral. Hence the reaction of the alkali upon the cystenic acid is reduced well within safe bounds.

The free ammonia may react with the cystenic acid to produce an ammonium soap of cystenic acid.

The potassium sulphite itself combines with the

sulphur of the hair to form a thiosulphate, this reaction being quite different in its type than that of a base and acid reacting to form a salt. This reaction with the sulphur is very mild in its nature and so does not destroy the hair, but materially assists in imparting a wave to it. The resultant thiosulphate is easily soluble in water, and is readily removed. Moreover, the removal of the sulphur in this manner appears to give much better results than could be obtained by extracting an equivalent quantity of cystenic acid.

The presence of small amounts of potassium sulphide in the water softens the hair, suspending for the time its natural resiliency.

Besides this, odors of the ammonia and sulphur dioxide tend to neutralize each other.

While the exact reactions have not been definitely ascertained, it appears that they are at least similar to those above described, and it has been found by experiment that with the materials in the proportions stated, optimum results are obtained. It is believed that this indicates that with the materials described and under the conditions present during waving, there is sufficient sulphurous acid to perform two functions, (1) that of controlling the alkaline action of the potassium and ammonium, and (2) that of gently extracting the sulphur.

In practice, a mixture is made of crystalline potassium sulphite and ammonium carbonate, these materials being much more conveniently handled, packed, shipped, and stored in the dry form than as solutions. To this, it is only necessary to add water when the material is to be used. Conveniently sufficient material for one head of hair only is packed in a bottle or vial, so that the solution for each patron is fresh and sanitary.

This application is a division of my copending application Serial Number 616,359, Pat. No. 2,002,989 filed June 9, 1932, for Method of waving hair.

While I have described my invention in some particularity, many other embodiments will readily occur to those skilled in this art, and I do not, therefore, limit myself to the precise details described, but claim as my invention all embodiments, variations and modifications coming within the scope of the appended claims.

I claim:

1. A composition of matter for hair waving consisting of solid ammonium carbonate and solid potassium sulphite, the potassium sulphite being between 10% and 30% by weight in excess of the molecular equivalent of said ammonium carbonate.

2. A composition of matter for hair waving comprising substantially 70% by weight dry, solid potassium sulphite and 30% by weight dry, solid ammonium carbonate.

3. A composition of matter for hair waving comprising one part by weight crystalline ammonium carbonate and more than two parts by weight potassium sulphite.

4. A composition of matter for production of a hair waving solution including potassium sulphite and ammonium carbonate in such proportions that in solution the mixture is effectively substantially neutral.

5. A composition of matter for production of a hair waving solution including a salt of sulphurous acid, and a salt of a weaker acid in such proportions that in solution the mixture is effectively substantially neutral.

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