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Journal of Pharma and Ayurved Research
Volume 1 Issue 2
eISSN: 2582-8428

Comprehensive Investigation about the Hair Color Techniques

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ABSTRACT

Hair coloring not only belongs to the modern world today, but has long been popular among people and most women. Although purple, blue, pink, oak, hazelnut, and other colors were not common in ancient times, the ancient Greeks used henna and handmade soaps to change and lighten their hair color. The Romans also had different tastes. They darkened their hair with the green skin of walnuts and some other plants. However, today, varieties of chemical dyes with a wide range of colors are on the market and have replaced natural dyes. Some people use these colors to cover their white hair and others to make their hair more beautiful. In this paper, I want to provide a complete investigation about hair color and its technology.

Keywords: *Hair color, Coloring, Chemical dyes.*

INTRODUCTION

Hair is actually one of the components of the skin, the main component of which is a protein called "creatine". There are two other proteins in the hair called omelanin and phaeomlanin that are responsible for the natural color of the hair. Umelanin pigment is responsible for dark blacks and browns and phaeomlanin pigment is responsible for red to yellow colors. In fact, the different proportions of these pigments in each person, cause the appearance of natural and unique hair color in him.

Lack of these pigments causes hair to turn white.To better understands hair color, it is better to know their types first. Chemical hair dyes are available in temporary, semi-permanent and permanent types. Temporary dyes are applied as a layer on the outer layer of the hair and do not penetrate into the hair shaft, and as their name suggests, after a while, they are removed by washing the hair with shampoo two or three times. These dyes do not irritate the scalp and cause allergies. In fact, they are not allergenic and are less dangerous than other hair colors. Semi-permanent hair dyes penetrate into the hair shaft through natural pores, but after a few washes, they usually leave the same pores and the hair returns to its natural color.But permanent hair dyes that contain substances such as ammonia and hydrogen peroxide, or oxidants, cause permanent and irreversible changes in the wax, and by penetrating the structure of the hair, they destroy it and do not disappear by washing.

However, most hair dyes on the market today are of this type.Permanent hair dyes have special compounds, each of which is responsible for a task.

Paraphenylenediamine, ammonia, water, cream and oxidant are the main components of this hair dye. Ammonia, which is an alkaline substance, is responsible for breaking down the outer layer of the hair (or cuticle) so that the dye penetrates into the hair shaft, and in fact acts as a catalyst in the hair's reaction with the dye. The hair dye then enters the hair shaft, destroys the hair's natural pigments and replaces the new dye.

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Paraphenylenediamine, commonly referred to as PPD on hair dye packaging, is a cyclic compound that is easily oxidized due to its chemical structure. Therefore, in the presence of oxidants (hydrogen peroxide), it creates intermediates that combine with pigments and, due to their bulkiness, are trapped inside the hair and do not come out easily. That is why these colors are permanent.Oxidant is the chemical name of hydrogen peroxide, which is responsible for removing natural color and accelerating hair color. Occasionally in people who are allergic to these colors, allergic skin reactions on the face, ears, neck, and upper forehead appear as redness, scaling, blisters, and even redness of the eyes, while most people experience these reactions due to color. They do not know hair.In fact, they say that if they are allergic to hair color, their scalp should also suffer from these side effects.

While the presence of hair creates less damage to the scalp by creating a spray, the skin around it is more exposed to the hair dye and is more at risk. Another common but common misconception about hair color is that some people think that once they use hair dye they can judge whether or not they are sensitive to it.While allergic reactions may not show up when you first use hair dye because the immune system has not yet reacted to the new antigen, which is the hair dye chemical, over time, the immune system reacts to that antigen. Produces antibodies, and the next time you use them, unpleasant side effects of allergies appear.

Permanent and more durable hair color, due to having more and stronger chemicals, both provides the background for skin allergies and changes the structure of the hair. Ammonia and oxidants, which are the main ingredients of these dyes, although they stabilize the color, but break the chemical bonds of sulfide in the hair structure and cause brittleness, dryness and destruction of the hair shaft and sometimes even hair loss. It is interesting to know that very dark colors, red and warm, have more chemicals and are more harmful.On the other hand, researchers believe that those who use a lot of permanent hair dye have a higher prevalence of various cancers, especially a type of leukemia called non-Hodgkin's lymphoma. Therefore, reduce the number of times you can paint. Sometimes people, when they see the roots of their newly bleached hair, think that this is due to hair coloring, and the hair color increases the white hair.Although the chemicals in permanent hair dye change and destroy the hair pigments, this pigment degradation occurs only in the hair shaft and the hair that goes after coloring is not affected by the color of the hair, because the pigment of the hair dries out from inside the skin.

LITERATURE REVIEW

Chemical hair dye is the first specialized line of make-up and beauty in the world, and the unconditional mastery of the hairdresser to the color combinations and neutralizers, as well as the knowledge of the hair structure in this field is the first word. According to many experts in the field, the world of hair dyes and chemicals such as dechlorination and a variety of permanent hair conditioners is so complex and risky that even after years of experience there will still be new things to learn.

A French hairdresser first introduced a standard range of hair dyes in 1910. While the previous colors mixed the hair color in the spots and the colors produced varied, the colors of this French hairdresser produced a predictable color. Sold in a range of 18 colors from black to light blonde, these colors became very popular in both Europe and the United

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States.However, amino dyes cause allergic reactions in a significant proportion of consumers. Researchers in the United States are credited with standardizing the method of dye use and creating precise specifications for the purity and strength of raw materials by creating a modified, non-toxic amine-based hair dye. Further advances in hair dye chemistry were made by Clairol makers.

Clarol produced the first one-step hair dye in 1950. This led to the loss of the primary shampoo and the initial clarification of the protocol created for hair death. With the intensive marketing of this easy-to-use product, the percentage of women in the United States who dye their hair has risen from about 8% to about 50% by 1973.

Raw Materials used in the Production of Hair Dye

Most commercial hair color formulas are complex and contain dozens of ingredients, and the formulas vary considerably from manufacturer to manufacturer.

In general, hair dye contains dyes, conditioners, antioxidants, alkalis, soaps, ammonia, wetting agents, perfumes, and other chemicals that are used sparingly and give the hair a special quality (such as softening the texture).

Dye chemicals are usually amino compounds and are listed in hair dye ingredients as 4-amino-2-hydroxy-toluene and meta-aminophenol. Metal oxides such as titanium dioxide and iron oxide are also often used as pigments.Other chemicals used in hair color act as modifiers that stabilize the color pigments or otherwise change the shade. Modifiers may exhibit color tones such as green or purple that complement the color pigment. A common modifier used is resorcinol, although there are other uses. Antioxidants protect the paint from oxidation by air.

Sodium sulfite is commonly used as an antioxidant. Alkalis are added to change the pH of the color formula, because dyes work best in a highly alkaline compound. Ammonium hydroxide is a common alkaline builder. Beyond these basic chemicals, many different chemicals are used to transfer specific quality to the manufacturer's formula.

These ingredients may be shampoos, fragrances, chemical compounds that make the formula creamy, frothy or thick, or that contribute to the overall function of the formula.Hair dyes are usually packaged with a supplement that is in a separate bottle. Supplements are often based on hydrogen peroxide, and small amounts of other chemicals are added to the supplement.The process of preparing hair dye includes the following steps:

1) Investigation of ingredients
2) Weight
3) Processes before mixing

In some hair color formulas, the dye chemicals are pre-mixed in warm water. The dye chemicals are poured into a tank and the water, previously heated to 158 degrees Fahrenheit (70 degrees Celsius), is pumped into it. Other materials or solvents may be added to the premix. The premix is stirred for approximately 20 minutes.

Choosing the Most Suitable Chemical Hair Dye

Whether a person's hair color is natural or colored, it is a very important and vital point to recognize the main color of the background and its shade. Then, according to the background color of the hair and the choice of the chemical hair color of the applicant, we combine the colors and start coloring.

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The colors in nature and the different shades and tonnages they have are innumerable, but if we want to include all the colors in nature in a complete category, we can say that all known human colors are summarized in the colors of the rainbow. Purple, indigo, blue, green, yellow, orange and red. Now, if we consider the colors blue and indigo, which are very similar, as one color, we can say that 6 colors remain, and three of these six colors are the main colors and the other three colors are the secondary colors. The main colors include blue, yellow and red, from which sub-colors are obtained. For example, green is obtained from the combination of blue and yellow, and orange is obtained from the combination of red and yellow, and finally purple is obtained from the combination of red and blue. In fact, the basic colors of all colors are the existence of all colors.

From the combination of the two main colors, a sub-color can be created that the obtained color is placed in front of a main color in the color circle, and these two colors cancel each other out. For example, from the combination of yellow and blue, green can be created. This green is located in front of red in the color wheel, and these two colors neutralize each other. If we place the colors of the rainbow in such a way that they form the circumference of a circle, a circle of colors is formed in which the opposite colors cancel each other out.

In order to use this formula in chemical hair dye combinations, it should be noted that to neutralize any of these colors in hair dye, a neutralizing dye with a stronger depth and percentage should be used. For example, the higher the percentage of redness in a hair color, the deeper and stronger the neutralizing green color, which is used as a contrasting force to modulate redness, should be. Easy Medicine recommends memorizing this fixed formula to eliminate excess tonnage and shades in a hair color.

Hair cuticles normally have scales or scales that surround the entire length of a hair. Inside the hair there are natural pigments in a person's hair that have primary colors such as yellow, blue or red and their natural combinations. Is available. Human skin and hair have weak acidic properties and a variety of chemical hair dyes that have alkaline pressure after combining with oxidant can thicken the hair and cause irritation and opening of the hair follicles and easily enters the hair structure and Inject the desired color into a person's hair and combine it with natural hair pigments. In this way, hair color changes the color of the hair structure. To create the best condition for more beautiful hair after hair color, we recommend that you blow-dry your hair professionally. Also, in the weeks after coloring your hair, use a variety of vitamin hair masks to hydrate your hair.

Colors are defined in terms of darkness and light in 10 bases, base number 1 has the darkest state in all colors and base number 10 has the lightest colors. That is, they start from black to colorless. By following a fixed formula, you can lighten hair colors that are naturally dark in one go.

Hair that has a natural black color with base one and the applicant's chosen color with base 4 should be considered the hair color used 3 degrees lighter than the selected color, ie using a color with base seven. Similarly, if the base of the natural hair color was black number two and the color chosen by the applicant was five, we would consider the color used to be two degrees lighter, that is, a color with base seven. And so we go. Finally, the color of hair that has a base of 4 to 9 is the same as the base color of choice and the color used.

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Introducing the Family of Colors

1) N series or natural colors: The colors of this series can be combined with all colors and can also be combined and coordinated with variation colors. These colors are among the strongest in terms of opacity.
2) W series or chocolate colors - Mocha: This series of colors can be combined with all warm colors as well as red variations, the W series is reddish brown, which is called chocolate.
3) R-F series or red colors: colors such as cyclamen, ruby red, medium wine and… are from this series.
4) G series or golden colors: bases 3 and 4 of this series are suitable for any skin and face color, and base 5 and above are better to be used on dechlorinated hair.
5) M series or olive colors: The colors of this series are very resistant and durable against sunlight and shampoo, for hair that has white strands, this series is very suitable and effective.
6) Series A or gray colors: In this series of colors, there is more blue and it is used to eliminate orange and red colors.
7) C series or smoky colors: In this series, the amount of purple pigments is high and for better results in obtaining the most beautiful smoky, it is better to dechlorinate the hair beforehand.
8) V or purple-wine series: This series of colors usually has a limited range of wine and purple colors that it is necessary to use certain color combinations or special brands to be seen better.

Chemicals in Hair Dye and Psoriasis of the Scalp

The chemicals in hair dye cause severe allergies and itching in some psoriasis patients and may even cause lesions and exacerbate psoriasis on the scalp. In some cases, due to excessive use of hair dye, the scalp becomes severely psoriasis and may even secrete an infection. Such people should not use any kind of hair dye. Dechlorination and meshing of hair also causes brittleness and hair loss, and the constant use of these chemicals can cause serious damage to the hair follicles and permanent hair loss.Hair dyes usually have different chemical compositions.

One of these compounds that can aggravate psoriasis of the scalp is a substance called "paraphenylenediamine" which is used in dark hair dye. It is not bad to know that the skin of 6.3% of people who use hair dye is sensitive to this substance, so if you dye your hair at home or you are a hairdresser, you should wear gloves when coloring your hair. And completely cover the skin of the neck and back of the ear before painting so that you do not suffer from allergies caused by it. Swelling of the corners and forehead is also a side effect of chemical dyes.

Dyeing hair is not recommended at all because the dyes used for hair contain different chemicals. Of course, although today, with the advancement of science and technology, all dye factories try to minimize the side effects of these products and reduce their problems, but still our recommendation is not to use chemicals to dye hair, especially in people with skin problems. Suffer from psoriasis and eczema.

Sensitivity may be just redness or redness with itching or even more severe swelling around the eyes, scalp, neck and scalp. It should be noted that sensitivity to a particular color or brand may indicate sensitivity to all colors. Sometimes a person is allergic to oxidants and even multi-colored brands. In these cases, you should use other semi-permanent colors, provided that the skin is tested before coloring the hair.

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Because dry and dull hair is one of the side effects of coloring them. People who dye their hair should use special shampoos for colored hair that contain conditioner. Of course, the use of conditioner is also appropriate because the hair dye causes damage to the outer layers of the hair or the cuticle, and the use of a conditioner partially eliminates the damage caused by it and makes the hair soft and supple. People with dry or long hair can also use shampoos with emollients.

To maintain the health and freshness of hair, we do not recommend coloring it at all, but how good hair coloring is from time to time depends on the type of hair color and material and the speed of growth. In general, the greater the distance, the better. Excessive use of hair dye is not recommended and people who are interested in using chemical dyes should not use it more than three times a year.Usually some pigments, such as dechlorination, also contain oxidants. It is good to know that both hair color and oxidants can cause damage to the hair due to the chemical compounds and interactions they have on the hair shaft. High concentrations of oxidants have far more destructive effects on our hair. When people use oxidants due to contact with chemicals, their skin and hair may become irritated and their psoriasis may worsen. If the concentration of substances placed on the head is too high, these substances will cause scalp burns. Because they combine rapidly with skin and hair proteins and can cause burns on the skin. If a person suffers from scalp burns due to the use of dyes and dechlorination, they should immediately see a dermatologist to have a doctor treat the chemical burn.

CONCLUSION

Hair color formulation varies depending on the type of color and its application. Today, with the expansion of the production of various hair dyes in different colors and shelf life, various chemicals are used in their formulations. In general, there are two main reasons for using hair dye. The first reason is to cover white hair and help rejuvenate, and the second reason is to create variety and beauty. Hair color is divided into three types based on the degree of durability: temporary, semi-permanent and permanent. The function of each is based on the mechanism that it applies to the hair. In this paper, we provide complete investigation about hair colors and the characteristics of each of the categories of such dyes.

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