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Dyeing Samples of Camel's Hair Using Henna, Nickel, Copper, and Iron

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Abstract: ***This study aimed to observe the colors on white camel's hair available in Afif province in Saudi Arabia, when mixing henna with both nickel, copper, and iron, with the purpose the use of dyed camel's hair in local textile, to achieve the goal of the study, Henna was mixed with both nickel sulphate, copper sulphate, and iron chloride byatios r (1:1, 3:1, 5:1, 7:1) and (1:1, 1:3, 1:5, 1:7) straight at room temperature. The results of the study were to obtain different grades of dark brown, reddish brown, when dyeing camel's hair with nickel. Moreover,the results show different shades of copper green and greenish brown when dyeing camel's hair with copper. When dyeing camel's hair with iron, different degrees of brown and greenish brown color resulted. The resulting color compared to the white camel's hair of each of the (henna, nickel sulfate, copper sulphate, and iron chloride) without mixing, the reddish-orange color, yellowish green color, oily green color, and light brown color respectively.***

Keywords: Camel's hair, henna, Afif Province, transition elements, kingdom of Saudi Arabia

1. Introduction

Nowadays, the textile industry is one of the most important industries that serve the human being in various fields, so it has received considerable attention and many studies are continuing, making textiles a stand-alone science [(3)]

Animal textile hairs (e.g., Camel, hare, sheep wool, and hors hair) are part of the local economy of some areas. They are use in the production of textiles such as coats, carpets, hair houses, and furniture and textile fillings [(2),(8)].

The dyes were not as new as they were known since ancient times from their natural sources, since 3000 BC the ancient Egyptians extracted the Indigo (Indigo) dye, which is found in the form of a compound in the indigo plant [(4)].

However, the dye and laboratory preparation of dyes was only know in the mid-19th century [(4)].

The use of natural dyes is becoming increasingly important because of their non-hazardous nature for humans and this shows the environmental awareness of humans [(9)].

Natural dyes are available in plants, insects, minerals and fungi[(10)].

2. Literature Review

2.1The dyes

The dye is a color material that can add color to another subject with several conditions, namely that it has a certain susceptibility to the body that conducts the object, with a dense color, with constant qualities against the influence of chemical and natural factors such as the persistence of light and washing [(9)]. One of the most important conditions that a chemical must have in order to be a dye is to contain two groups, one with a color and the other called the Auxiliary group, not every chemical compound can be called a dye unless it contains these groups, as well as containing successive double bonds[(17)] .

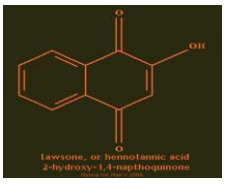
Hair dye is a normal practice that makes dark and light. The change in the Middle East can affect a group of methods using dyes, dye, plant tincture, metallic-based lead or sensitive organic chemical dyes[(6)].

Henna is one of the natural dyes used by humans,and the scientific name of the henna plant is Lawson, [(12), (6)],and its chemical molecule of type 2-Hadroxi 1.4 Naphthokinone. The substance (Lawsone) in henna is the substance responsible for the medical biological effect and for its dye and color, it's orange-colored crystals that melt in water and give a pH of less than 4, and contain a number of elements such as (Na, K, Cd, Mn, Cr, Fe, Cu, Ni, Zn Pb)[(15)].

It also contains resine and other tannins of a special type known as «Tannas Henna» Henna tannin also contains mannitol[(18)]andPhenolic compounds, flavonoids, carbohydrates, proteins, alkaloids and fatty acids[(7)].

Henna plant blossoms contain aromatic pilot oil that has a strong and intelligent odor [(11)].

Some studies have also shown that the aqueous extract of the material (Lawsone) contained in the henna leaf contains phenolic compounds and has an antioxidant efficacy and effectiveness of capturing the free radical and the ability to bind iron and copper and the number of metallic elements[(5)].



2.2 Animal textile Capillaries

Textile hairs are the basic units for the formation of yarns and textiles, and the tissue hairs differ in their basic

properties such as softness, elasticity and mechanical properties(13),but they usually share some of the properties, such as:

1) Ease of bending so that it takes the outer shape of the human body easily.
2) Allows the free movement of the body and its organs.
3) It has high resistance to consumption as it provides warmth to the body (19).

2.3 Camel's Hair

The camel is consider a soft textileCapillaries used in the United States to produce high quality coats, as well as in China and transported [16].

Camels are obtain from two types of camel: one-hump camel (Arabic or Hajjan), two-hump (bacterial) camels, and the northwest of China and Mongolia [1].

The camel, taken from the one-hump, is considered to be a dark, short-colored texture used in the manufacture of blankets, carpets, tents and trolley belts compared to the two humped, which is characterized by softness and length and is used in the manufacture of high-quality garments and coats[14].

3. Material and Methods

The samples weighted by a sensitive balance,then blended and preserved in bottles for a week at a temperature of 25 °c, after that the camel hair washed with water several times and then with soap, then it filmed,shown in the tables below.

Table 3.1: Experience samples when the weight of nickel sulfate is stable and henna weight change

No	Weight of camel hair/gram	Weight of Niso4/ gram	Weight of Henna /gram	Water volume/cm3
1	0.5	1	1	50
2	0.5	1	3	50
3	0.5	1	5	50
4	0.5	1	7	50

Table 3.2: Experiment samples, when the weight of henna is stable and nickel sulfate weight change

NO	Weight of camel hair/gram	Weight of Niso4/ gram	Weight of Henna /gram	Water volume/cm 3
1	0.5	1	1	50
2	0.5	3	1	50
3	0.5	5	1	50
4	0.5	7	1	50

Table 3.3: Experiment samples, when the weight of copper sulphate is stable and henna weight change

No	Weight of camel hair/gram	Weight of Cuso4/ gram	Weight of Henna /gram	Water volume/cm 3
1	0.5	1	1	50
2	0.5	1	3	50
3	0.5	1	5	50
4	0.5	1	7	50

Table 3.4: Experiment samples, when the weight of henna is stable and copper sulphate weight change

No	Weight of camel hair/gram	Weight of Cuso4/ gram	Weight of Henna /gram	Water volume/cm 3
1	0.5	1	1	50
2	0.5	3	1	50
3	0.5	5	1	50
4	0.5	7	1	50

Table (3.5): Experiment samples, when the weight of iron chloride is stable and henna weight change

No	Weight of camel hair/gram	Weight of FeCl3/gram	Weight of Henna/gram	Water volume/cm 3
1	0.5	1	1	50
2	0.5	1	3	50
3	0.5	1	5	50
4	0.5	1	7	50

Table 3.6: Experiment samples, when the weight of henna is stable and iron chlorideweight is change

No	Weight of camel hair/gram	Weight of FeCl3/gram	Weight of Henna/gram	Water volume/cm 3
1	0.5	1	1	50
2	0.5	3	1	50
3	0.5	5	1	50
4	0.5	7	1	50

4. Results and Discussion

Figure 4.1: Coloring using henna and nickel when the concentration of henna is stable and nickel concentration changes

Figure 4.2: Coloring using henna and nickel when nickel concentration is stable and henna concentration changes.

From the Figures (4.1), (4.2), we note that when dyeing the white camel's hair with henna produces reddish-orange color, and when is dyed with nickel in the nickel sulfate salt Niso4 produces a degree of yellowish green tones, As the two figures shows, the higher the nickel concentration in the nickel sulfate salt Niso4 when the henna is stable, the darker the brown color increases.

When the nickel concentration is stable in the nickel sulfate with increased concentration of henna, the concentration of reddish-brown color increased.

Figure 4.3: Coloring using henna and copper when the concentration of henna is stable and copper concentration changes.

Figure 4.4: Coloring by using henna and copper, when the copper concentration is stable and the henna concentration changes.

Figures (4.3) (4.4),we infer that when the white camel's hair is dye by the copper element in the salt of copper sulphate was get the oily green color, When the white camel's hair dye is different from the copper sulfate salt CuSO4 with the firming of the henna concentration each time, we get the grades of green.

When copper concentrate is installed in the salt of copper sulphate CuSO4 on the white camel's hair with a change in the percentage of henna concentration we get grades of greenish brown color.

Figure 4.5: Coloring using henna and iron when stable concentration of iron and change the concentration of henna

Figure 4.6: Coloring using henna and iron when the concentration of henna and iron concentration change.

From Figures (4.5), (4.6), we clearly observe that iron in the iron chloride salt $FeCl_3$ gives with white camel's hair light brown color.

Note that the color of the white camel's hair when dyeing using different concentrations of iron chloride salt and fixation of the henna concentration, the tones of light brown are increased intensity by increasing the concentration of iron to greenish brown.

When iron chloride salt an installed with a change in the concentration of henna, we observe the color of white camel's hair in brown, where the color increases with the concentration of henna.

5. Conclusion

For different grades of dark brown and reddish brown color by mixing the henna with nickel sulfate in different concentrations, and to obtain different grades of copper green and greenish brown mix the henna with copper sulfate in different concentrations. As well as for the grades of brown and green brown color, mixing henna in varying concentrations with iron chloride.

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