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INDO AMERICAN
 JOURNAL OF
 PHARMACEUTICAL
 RESEARCH

HERBAL CONDITIONING SHAMPOO FORMULATION AND EVALUATION- A REVIEW

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ARTICLE INFO

Article history

Received 13/04/2013

Available online

30/06/2013

Keywords

Conditioner,
 conditioning shampoo,
 herbal shampoo.

ABSTRACT

Currently, people are interested in hair preparations and conditioner materials, such as shampoos. Hair tonic and conditioner formulations containing herbal extracts which can prevent hair loss and retain hair conditioning. After preparing the formulation, some physicochemical properties such as pH, foam formation, viscosity, conditioning and wettability were evaluated. The results of its rheogram showed good thixotropy property. High foam production and stability should be determined. On the basis of wettability and conditioning results, formulated shampoo can represent an attractive and suitable product. The pH of the formulated shampoo must be nearly 5 or nearly. The formulated shampoo must show better foaming productivity and thixotropic properties which shows its suitable viscosity. The wetting effect of shampoo was taken 5 min which indicates its proper quality in comparison to some other shampoos in the market. Based on the wettability and conditioning data, it can be concluded that the formulated shampoo has a good quality of introducing it to the market.

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Please cite this article in press as **Neeharika Rallapally et.al. HERBAL CONDITIONING SHAMPOO FORMULATION AND EVALUATION- A REVIEW. Indo American Journal of Pharm Research.2013:3(2).**

1. INTRODUCTION:

Shampoos are kind of formulation that are used for hair and body washing or therapeutic purposes. Shampoos are expected to be much more than mere cleansing agents. Shampoos have many properties in addition of their detergency, such as conditioning and hair shining¹. They are expected to be non-irritating to skin and mucous membranes. There are many different varieties of ingredients for making a proper shampoo. Each of these ingredients have special role in shampoo's formulation. The major ingredients used in making a shampoo are detergents (surfactants), conditioning and active ingredients for hair manageability, additives that modify the surfactant effect (viscosity control agents, foam stabilizers and viscosity modifiers), stabilize the product (preservatives and anti-oxidants) and increase its appeal (fragrances, essence, anti-UV light protector, dyes and ingredients for consistency and a pearlescent appearance). Some of these additives are arbitrary while many of them have to be added in a shampoo formulation to increase its stability and safety. Conditioning agents are examples of these additives². They have been attractive components in the recent years. Surfactants are specific conditioners but there are many other materials used as conditioners, such as paraffin and lanolin. There are also many other materials that serves as conditioners like peptides, egg derivatives and synthetic resin. These materials were added in shampoo formulation as hair conditioner and hair shining agents. Other polymers used in the formulation of shampoos that are capable of drawing crisp hair could be water soluble phosphate salts and amino ethyl ester poly acrylic acid. The resin is used in the formulation of shampoos containing surfactants. Another compound called Mirapol A15 could be seen as a conditioner in the market and it has shown desirable properties, such as anti-static electricity. Water soluble proteins, such as hydrolyzed collagen with molecular weight between 500 to 10,000 Dalton and their tetravalent derivatives cause improve in the ease of wet and dry hair combing. These compounds have protective effects for hair and make them softened and possible stimulatory effects of shampoos. This combination causes hair softening and gives hair status like silk mode. In order to smooth the hair and make them glow the oily materials called super fatty materials are used. These materials are deposit in the hair's keratin and act as slippery agents. Discussion about hair products is highly regarded nowadays. Hair tonic and conditioners are formulated as shampoos contain a large number of cosmetic product³.

1.1 HAIR DAMAGE: IT'S CAUSES, PREVENTION AND CURES:

1.1.1 Hair Damage: It's Definition,

Hair damage is essentially any condition whereby one or more of the hair structures (cuticles, cortex, medulla, etc.), are physically or chemically altered to the extent that they are unable to return to their original state.

1.1.2 Cuticle Loss and/or Erosion:

Cuticles were designed by nature to protect the delicate inner structures of the hair, retain moisture and reflect light. They are configured like partially overlapping roof shingles, and on healthy hair, they are very tightly aligned. When damaged, cuticles can become cracked and frayed. Some of the keratin material, (of which cuticles are composed), can dissolve and disintegrate, making the hair shaft thinner. In severe cases, entire portions of the cuticle layer can be removed altogether.

1.1.3 Longitudinal Rupturing:

With extreme damage, the hair shaft can experience a massive crack along its length, damaging the cortex and medulla. The rupture leaves the hair fiber open and unprotected.

Fibril Disintegration: excessive damage, the strong proteinaceous fibers of the cortex are weakened and often disintegrate. The fibres' fray and give the hair shaft a ragged, unstable alignment⁴⁻⁶.

1.2 EVIDENCES OF HAIR DAMAGE

The by-products of hair damage include the following:



1.2.1 Loss of Elasticity & Tensile Strength





Elasticity is a measure of a hairs' ability to stretch and recover, without breaking. On average, untreated excessively curly hair should be able to stretch about 50% of its length before reaching its breaking point. When hair cannot be extended to this degree without snapping, it has lost some elasticity and tensile strength⁷⁻⁸.

1.2.2 Breakage

Breakage is closely related to loss of elasticity. It occurs as weakened hair experiences mechanical manipulations. Even simple combing and brushing can cause significant breakage on a damaged head of hair.

Table 1: Herbs Used In Conditioning Shampoo

	<p>Aritha, <i>Sapindus mukorrosi</i>, also known as Soapnuts, is an excellent hair tonic, long known for its benefits for healthy hair. The natural saponins not only cleanse hair, they add body and sheen and make hair feel thicker, silky and smooth.</p>
	<p>Hibiscus, <i>Hibiscus sabdariffa</i>, or Javakusuma, is one of the most common flowering trees of India In hair care it is used to lessen gray hair and promote hair growth. The woman of India used the Hibiscus flower to adorn her hair, and used its extracts as a treatment to thicken hair. The flowers and leaves contain many properties that benefit hair and scalp.</p>
	<p>Shikakai, <i>Acacia concinna</i>, is referred to as "fruit for the hair." It has a naturally mild pH, as a natural hair conditioner, Shikakai is said to promote hair growth, strengthen hair roots and clear dandruff.</p>
	<p>(Sweet) Almond Oil, <i>Prunus dulcis</i>, cold pressed from the dried kernels of the almond tree, is moisturizing, nourishing properties and is easily absorbed. In hair care, sweet almond oil helps condition, nourish, and soften hair.</p>
	<p>Aloe Vera Butter is an extraction of healing aloe gel into coconut oil so that it can be used like a butter. Aloe Butter melts on contact with the skin and is wonderful for treating dry skin, eczema, psoriasis, rosacea, sunburn and chapping. This great product moisturizes and also includes all of the wonderful healing properties of aloe.</p>
	<p>Beeswax, <i>Cera alba</i>, is produced by the (female) worker honeybees. In hair care Beeswax adds moisture, hydration, and softness to hair and can add shine and glossiness to dull hair.</p>
	<p>Amla, <i>Phyllanthus emblica</i>, an excellent hair conditioning herb, provides nourishment that penetrates the scalp and strengthens hair at its root to promote stronger, healthier new growth and help with hair loss by normalizing blood supply</p>

	Cocoa Butter , <i>Theobroma cacao</i> , a prime pressed creamy yellow butter. In hair care cocoa butter easily absorbs into the hair and imparts sheen. It locks in moisture and helps protect the hair shaft. Plus, it smells good enough to eat!
	Olive Oil , <i>Olea europea</i> , obtained from cold pressed olives. In hair care , olive, used for centuries in hot oil treatments, helps repair split ends, control dandruff, and makes your hair shiny, silky, and lustrous.
	Wheat Germ Oil , <i>Triticum vulgare</i> , expeller pressed from the germ of the wheat kernel, is rich in vitamins and minerals. We use virgin wheat germ oil, rich in vitamin E, a natural antioxidant. In hair care , wheat germ oil improves the scalp's ability to utilize oxygen, leaving the scalp healthy and softens hair.
	Shea Nut Butter , <i>Butyrospermum parkii</i> . In hair care Shea Butter provides deep nourishment for the hair shaft, and moisturizes dry, dull hair resulting in improved luster and manageability. It is particularly beneficial for processed and heat-treated hair and is also believed to help promote new hair growth.

1.2.3 Porosity/Moisture Loss

Porosity and moisture loss are close relatives. Porosity is a measurement of the ease to which the hair accepts and releases moisture and other substances. For instance, the more porous the hair, the easier it is to "take up" coloring solutions and the easier it is to air-dry. The healthier the hair, the more difficult it is for chemical solutions to penetrate and the longer it takes to air-dry the hair. Moisture loss occurs because the hair is more ready and willing to let the natural moisture escape from the inner fibres into the atmosphere. Healthy hair is well able to maintain its moisture levels. Both porosity and moisture loss are a result of cuticle damage. Simply put, the cuticle layer is no longer tightly aligned and is no longer providing adequate coverage to the inner hairshaft⁹.

1.2.4 Dullness

On healthy hair, shine reflects upon a tightly aligned cuticle layer. Hair damage results in a dismantled cuticle surface, making it difficult, if not impossible, for hair to shine.

1.2.5 Brittleness

Hair becomes brittle when it has lost a significant degree of moisture. Cuticle and cortex damage and the porosity that results from such damage are the fundamental reasons that hair loses pliability and becomes straw-like in feel and appearance¹⁰.

1.2.6 Splitting of Ends

Split ends are essentially longitudinal ruptures at the end of the hair shaft. Once split, these ruptures tend to travel up the hair shaft. And, because they expose the inner structures, split ends are typically dry and quite brittle.

1.2.7 Excessive Tangling

Hair that has suffered cuticle injury and damage to inner structures may be very difficult to comb. The frayed fibres interact snagging, tugging and pulling with each another. Both wet and dry combing is impeded.

1.2.8 Fly-A way Fibres

Damaged hair carries a more negative electrostatic charge than does healthy hair. Negatively-charged hair strands repel one another, producing fly-away strands, and makes hair difficult to manage overall.

1.2.9 Limpness/Lack of Body

Hair that has been damaged often won't hold curls well and does not have the Fullness and volume known as "body".

1.3 CAUSES OF DAMAGE

The sources of hair damage are many, and range from very ordinary practices and procedures to very extreme ones¹¹.

1.3.1 Ultraviolet Exposures

Everyday exposure to the sun affects the hair, even though it is seldom attributed to the damage of excessively curly hair textures. Ultraviolet rays from the sun can fuse the cuticle layers together, and this fusion causes the hair to be less elastic and more prone to mechanical breakage¹².

1.3.2 Mechanical Manipulations

Mechanical damage can occur when hair is combed, brushed, blown dry or styled. In fact, virtually any physical manipulation of the hair that entails even minimal tugging and pulling can damage hair. The damage caused, however, can range from slight to extreme depending on how carefully the hair is handled¹⁴.

1.3.3 Chemical Processing

Chemical straightening, permanent waving and permanently coloring all *irretrievably* alter the bond structure of hair. Whenever the bonds are affected in this way, the hair loses a degree of its tensile strength. Also, hair becomes prone to moisture loss since chemical processes lift and penetrate the cuticle. Once the cuticle layer is penetrated in this manner, some degree of moisture loss is typical.

1.3.4 Thermal Styling

The high temperatures of modern-day blow dryers, curling irons, flat irons, crimpers, straightening combs, can easily deplete hair of moisture. When coupled with chemical relaxing, heat styling may result in extreme hair dryness.

1.3.5 Shampoo

For many, the fact that simple shampooing can damage the hair is still a difficult one to accept. Nevertheless, it's true. A shampoo with a pH level higher than 5.5 will cause a pH imbalance and "rough-up" the cuticle layer. It will also strip much, if not all, of the natural oils from the hair. This sets the stage for mechanical damage because a stripped, rough cuticle layer sets the stage for considerable combing and styling damage. Additionally, the natural intercellular cement, (which tightly binds the fibres of the cortex layer and accounts for much of hair's strength). Can be dissolved by shampoo detergents to some extent. With repeated shampoos with a high pH, strong detergent formula, the breakdown the intercellular cement progresses. Under these circumstances. The cortex may be damaged cortex and the hair is weakened¹⁵.

1.4 Hair Damage: Its Preventions

1.4.1 Ultraviolet Exposures

To prevent the sun's ultraviolet rays from fusing cuticle layers together, avoid exposing hair to intense sunlight. Hats or scarves should be worn when out in sunlight for extended periods of time. Also, when selecting conditioning and finishing products formulated for excessively curly hair, look for those that contain sunscreen ingredients. Such an ingredient is Para Amino Benzoic Acid, (PABA)¹⁶.

1.4.2 Mechanical Manipulations

Excessively curly hair is relatively fragile, so great care should always be taken when handling it. Some suggestions are: Use only detangling/conditioning-formula shampoos for cleansing excessively curly hair, Comb hair gently, especially when it is wet. To detangle, a wide-tooth plastic or rubberized comb is the only choice. Deep condition the hair after shampooing, without fail. When time is of the essence, you may use a leave-in conditioner, but only one formulated specifically for African-American hair textures. Avoid using hair-tightening barrettes and rubberized elastic bands. Minimize the use of curling irons/heated rollers, especially when hair is not really clean. Also, ask clients to sleep in a silky cap, scarf or on a satiny pillowcase to avoid damage caused by abrasion. A silky scarf is also a good idea to prevent abrasion when wearing wool coats and jackets. Ask your stylist to prescribe the hair care products you should use between salon visits¹⁷.

1.4.3 Chemical Processing

See your stylist for chemical straightening, permanent waving and permanent coloring treatments. The next time you see your stylist for a relaxer treatment, ask for Affirm® FiberGuard™ Conditioning relaxer system. It has been proven to help maintain the tensile strength and elasticity of hair during chemical processing¹⁸.

1.4.4 Thermal Styling

To prevent extensive damage to the hair and significant moisture loss, Air dry chemically-treated hair if it is possible to do so and still achieve the desired style. It is best for the hair, If you must blow-dry, do so only after excess moisture has air-dried or been blotted from the hair. Blow drying from a soaking-wet stage stretches the hair severely and can result in extensive fibril damage, including breakage, Thermal style only after hair has been treated with an intensive conditioner, preferably one rich in moisturizers¹⁹.

Apply a light coating of a good thermal styling product before heat styling. A very small amount of a silicone laminate is excellent for thermal styling; it helps the styling comb/brush glide through the hair easily, seals cuticles to reduce interfiber snagging, and produces a great shine. Use only the degree of heat necessary. Implements with thermostatic controls should *a/ways* be used. And, remember, properly relaxed hair requires minimal heat to achieve smooth, sleek styles²⁰.

1.4.5 Shampoo

Cleanse only with high-quality conditioning/detangling shampoos, formulated especially for excessively curly hair. Make sure that the pH of the shampoo is properly balanced, within the range of 5.5 and 6.5. Avoid detergent formulas that strip the hair of its natural oils. Ingredients like those in the alkyl sulfates group, such as sodium lauryl sulfate, are harsh detergents. Shun shampoos containing such harsh detergents. While shampooing, try not to tangle the hair. Massage the shampoo into a rich lather throughout the hair and scalp, using the pads of your fingertips, not your fingernails. Be sure to rinse the hair *thoroughly* to remove all traces of shampoo²¹.

HAIR DAMAGE: ITS TREATMENTS

As indicated earlier, once hair is damaged there is no real way to completely restore it. Cutting is the only means of ridding hair of damaged areas. There are ways, however, *to* make hair look, feel and handle more like healthy hair. Conditioners play a key role in this pursuit. The most widely-used categories of conditioners are as follows:

1. Leave-In Conditioners

These conditioners are applied sparingly after shampooing and left on the hair. Some provide effective UV protection. Modern-day versions are lotion-like in consistency and are quite excellent. They can moisturize dry hair, detangle, help protect against thermal and mechanical damage, impart sheen and give hair a soft texture.

2. Deep Penetrating Conditioners

Commonly known as substantive or intensive conditioners, this category of products penetrates the hairshaft to deposit moisturizing and/or proteinaceous substances. They typically are left on the hair 20-30 minutes for the deepest penetration, and work to repair damaged areas, moisturize, detangle and eliminate static charge.

3. Reconstructors

Reconstructors are heavy-duty conditioners designed specifically for severely damaged hair. They typically contain micro- and macro-proteins to fill in cracks and ruptured areas on and within the hairshaft. Reconstructors may also contain polymeric agents to tightly bind the structures of the hairshaft together for the purposes of fortification and combability.

4. Moisturizers

Moisturizing Conditioners hydrate dry brittle hair and correct moisture imbalances. Moisturizing Conditioners hydrate dry brittle hair and correct moisture reconstructions are heavy-duty conditioners designed.

5. Laminates

This category of conditioners is designed to: a) seal the cuticle layer for a glossy sheen, b) ease combing and c) ward off the style-wrecking affects of high humidity.

6. Thermal Styling/Blow Drying Lotions

Used prior to heat styling, these conditioners help protect the hair from heat damage, reduce the force required to comb or brush the hair during blow-drying, provide sheen and eliminate static charge²²⁻²⁵.

7. Finishing Conditioners

This category includes natural oils, cremes, mineral oil-based hairdressings, oil sheen sprays and laminate sprays. Such products are used to enhance sheen, manageability, and the oil-based products are sometimes used to lubricate the scalp.

8. Pre-Chemical Conditioners

Pre-chemical Conditioners are sold as integral parts of some relaxer systems. These conditioners are especially formulated to deep condition and repair the hair during chemical processing. Depending upon the brand, a Pre-Chemical Conditioner will also leave hair with an extraordinarily silky texture and luster²⁶.

9. Post-Chemical Conditioners

Post-chemical Conditioners are also sold as integral parts of some relaxer systems. They work to sustain and augment the deep conditioning treatment that the Pre-Conditioner effected. Post-chemical Conditioners also help normalize and re-balance the pH of the hair

2. MATERIALS AND METHODS:

2.1 Plant extraction

Plant extraction was performed by maceration method. First, 200 g of the plant was weighted and it was extracted using ethanol (50%) within 72 h. The extract was smoothed every 24 h and the extraction continued using a new alcoholic solvent. Collected extracts was concentrated below 50°C by rotary evaporation method and it was then solved in water and concentrated finally by freeze drier. The produced powder was then weighed and stored with a proper absorbent in the fridge²⁷.

2.2 Formulation of a conditioner shampoo

To formulate a basic shampoo; specific amount of sodium luryl sulfate, sodium sulfosuccinate, N-alkyl betaein and coconut fatty acid diethanol amid were added to an aqueous de-mineralized water solution containing propyl and butyl paraben (1%). Sodium luryl sulfate and sodium sulfosuccinate with coconut fatty acid

diethanol amid were added into demineralized water and were mixed gently to avoid making any foam. Then, propyl and buthyl paraben were added and mixed gently. Previously prepared plant extract was added to the basic shampoo formulation, after which it was mixed gently and then topped up with water where needed²⁸.

3. EVALUATION OF HERBAL CONDITIONING SHAMPOO:

3.1 Evaluation of physicochemical pH assessment test:

The pH of a basic shampoo (formulation without extract) and shampoo with extract were measured by pH meter. The measurements were performed in triplicate and mean values and standard deviation (SD) were used for analysis. The experiment was performed in 1% shampoo solution at 25°C

3.2 Foam productivity determination:

10 ml of shampoo was rotated with a certain speed in a graduated cylinder by Erveka machine for 2 min. The foam volume was measured at 0, 1, 4, 16 and 24 h

3.3Moisturizing time determination:

One gram hair ball with approximate of 20 cm³ size was placed on the surface of 60 ml of different dilutions of shampoo and the complete sinking time of the ball hair in the shampoo was measured²⁹.

3.4 Rheology experiment:

Rotational spindle Brookfield viscometer (Model DV-I Plus, LV, USA) instrument was used for rheology experiment.

3.5 Conditioning effect experiment:

In order to test the conditioning effect of the shampoo, we had to see how it is easy to comb the hairs, and to do so, we had to use a comb connected to a spring and a scaled page. The scaled page was able to display the rate of hair resistance against combing. In this method, the incoming force on ergo-meter caused by moving

of the comb between hairs after and before using of shampoo was measured. This experiment was done five times³⁰.

3.6 Study of detergency activity:

In order to make this test, the artificial sebum formula was used as follow: olive oil (15%), coconut oil (15%), stearic acid (15%), oleic acid (15%), paraffin wax (15%) and cholesterol (15%). The experiment was performed as follow: 3 g of hair was placed in 20 ml of sebum solution (10%) in hexane for 15 min and the mixture was stirred in this period. The hairs were then taken out from the mixture and hexane was evaporated and the dried hairs at room temperature were weighted. The 3 g hair was divided into two equivalent portions. One portion was used for the experiment and the other one as control. The first portion was then washed with 0.1 ml tested shampoo (10%) and was dried. To make sure the hairs are dried completely, we had to store them in oven (60°C) for 4 h. The remained sebum was then mixed with the hairs used for the experiment after shampooing and it was also mixed with the hairs for control experiment without shampooing in hexane. The hexane was then evaporated within 30 min and the extracted sebum from both portions was measured on the basis of its weight percent. The cleaning percent was calculated according the following formula
Removed sebum after using shampoo (Detergency percent) = $100 - (T+100/C)$, where T is sebum weight in hairs portion for the experiment and C is sebum weight in hairs portion in control sample³¹.

3.7 Determine percent of solids contents

A clean dry evaporating dish was weighed and added 4 grams of shampoo to the evaporating dish. The dish and shampoo was weighed. The exact weight of the shampoo was calculated only and put the evaporating dish with shampoo was placed on the hot plate until the liquid portion was evaporated. The weight of the shampoo only (solids) after drying was calculated³².

3.8 Rheological evaluations

The viscosity of the shampoos was determined by using Brookfield Viscometer (Model DV-1 Plus, LV, USA) set at different spindle speeds from 0.3 to 10 rpm³. The viscosity of the shampoos was measured by using spindle T95. The temperature and sample container's size was kept constants during the study.

3.9 Dirt dispersion

Two drops of shampoo were added in a large test tube contain 10 ml of distilled water. 1 drop of India ink was added; the test tube was stoppered and shakes it ten times. The amount of ink in the foam was estimated as None, Light, Moderate, or Heavy³³.

3.10 Cleaning action

Weight 5 grams of wool yarn were placed in grease, after that it was placed in 200 ml. of water containing 1 gram of shampoo in a flask. Temperature of water was maintained at 350C. The flask was shaken for 4 minutes at the rate of 50 times a minute.

The solution was removed and sample was taken out, dried and weighed. The amount of grease removed was calculated by using the following equation:

$$DP = 100(1 - T/C)$$

In which,

DP is the percentage of detergency power,

C is the weight of sebum in the control sample,

T is the weight of sebum in the test sample

3.11 Surface tension measurement

Measurements were carried out with a 10% shampoo dilution in distilled water at room temperature. Thoroughly clean the stalagmometer using chronic acid and purified water. Because surface tension is highly affected with grease or other lubricants.

$$R_3 = (W_3 - W_1) n_1 \times R_1 (W_2 - W_1) n_2$$

Where W_1 is weight of empty beaker.

W_2 is weight of beaker with distilled water.

W_3 is Weight of beaker with shampoo solution

n_1 is no. of drops of distilled water

n_2 is no. of drops of shampoo solution.

R_1 is surface tension of distilled water at room temperature.

R_2 is surface tension of shampoo solution

3.12 Foaming ability and foam stability

Cylinder shake method was used for determining foaming ability. 50ml of the 1% shampoo solution was put into a 250 ml graduated cylinder and covered the cylinder with hand and shaken for 10 times. The total volumes of the foam contents after 1 minute shaking were recorded. The foam volume was calculated only. Immediately after shaking the volume of foam at 1 minute intervals for 4 minutes were recorded.

3.13 Skin sensitization test

The guinea pigs were divided into 7 groups (n=3). On the previous day of the experiment, the hairs on the backside area of guinea pigs were removed. The animals of group I was served as normal, without any treatment.. Shampoos were applied onto nude skin of animals of groups. A 0.8% v/v aqueous solution of formalin was applied as a standard irritant on animal. The animals were applied with new patch/formalin solution up to 72 hours and finally the application sites were graded according to a visual scoring scale, always by the same investigator. The erythema scale was as follows: 0, none; 1, slight; 2, well defined; 3, moderate; and 4, scar formation (severe)³⁴.

3.14 Eye irritation test

Animals (albino rats) were collected from animal house. About 1% shampoo solutions was dripped into the eyes of six albino rabbits with their eyes held open with clips at the lid. The progressive damage to the rabbit's eyes was recorded at specific intervals over an average period of 4 seconds. Reactions to the irritants can include swelling of the eyelid, inflammation of the iris, ulceration, hemorrhaging (bleeding) and blindness³⁵.

3.15 Stability studies

The thermal stability of formulations was studied by placing in glass tubes and they were placed in a humidity chamber at 45°C and 75% relative humidity. Their appearance and physical stability were inspected for a period of 3 months at interval of one month.

4. CONCLUSION:

The replacement of synthetic ingredients by herbal natural extracts having the same activity to overcome side effects is the need of study. Conditioning shampoo is shampoo that tries to keep the pH of the hair at about its natural level, around 5.0 or so. When the pH of the hair gets too high, the hair becomes too alkaline, and the cuticles open, the hair becomes dry and brittle, and the shine disappears. If the pH of the hair gets too low, on the other hand, it will become hard and rough. So a big part of conditioning shampoo is aiming to keep the hair in that sweet spot between the cuticles opening too much, and the hair becoming too hard. Of course, a conditioning shampoo isn't your only line of defence against dry and brittle hair. A good conditioner will help heal any damage you may have caused with a rough shampoo, and help to replenish some of the oils that you've stripped away with your shampoo. On the other hand, conditioner can only go so far, so the less damage you can cause, preferably by using a good moisturizing shampoo, the healthier and more vibrant your hair will be in the long run. Many investigations are being carried out to completely avoid the use of synthetic products in the preparation of herbal shampoo.

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