



PREPARATION OF HERBAL SHAMPOO (HS) BY GREEN METHOD AND THEIR CHARACTERIZATION

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Abstract:Presently the entire world is endeavoring to return towards the natural herbal materials through it has a no some other side effects towards ailments. We are utilizing manufactured items for our hair, losing their magnificence, quality, strength, volume and shine. Every single manufactured item like cleanser contains a destructive substance which is in charge of damage of hair. HS is the only product which used for hair washing and also used for hair remedy on hair problem. In recent study herbal HS (HS) has remarkable properties toward hairs. Greener preparation of HS made has two sections, In first section contain, herbal extract prepared by mixtue of amla, reetha, shikakai, nagarmotha, bhringaraj, brahmi, aloevera, lemon juice and some Ingredients. Herb extract (10%) take an amla, reetha, shikakai, nagatmotha, bhringaraj, brahmi all in dried form in a beaker in aqueous medium, warm up to till the beginning of boil by microwave method, sieve and put for cooling, obtained herb extract. For their transparency add some lemon squeeze in it, followed by mixing up to colourless. In second section beaker contains SLES, glycerin and CAPB everyone followed by stirring gradually, Herb extract with lemon juice in it stir gradually due to avoid foaming. Preservative methyl paraben and sodium benzoate, for pearling impact with EGMS to it. Pour an Aloevera in it, with small concentration of cocamono in it, mockup with water in it for small proportion, increasing a thickness with cocodi, obtained product HS. The formed HS is thick semi white transparent in colour, with great foam producing ability and fluidity. The pH of HS is between 6-7 at 250C RT, formed HS is acidic in nature which is good quality. Percentage of solid contents of HS is 0.05g after dry. The cleansing action of the formed HS is 15.1. Dirt dispersion of formed HS is light. In 1% of HS it gives 46ml froth. All these are these characters demonstrates that the herbal HS is high quality for usable in daily life.

Keywords:Herb Extract, Greener preparation, Cocodi, Cocamono, Herbal HS (HS), Microwave method.

Introduction:

HS is a widely daily unstable product all over the world. It has been used from many years. Today's market filled with a chemical HS [1]. Chemical HS prepared with several chemicals which can cure hair problem but also responsible for damage of hair. Some international research said that the chemicals of HS are also responsible for cancer [2].HS is defined as a preparation of a surfactant (surface active material) in suitable form liquid solid or power which when used under the conditions specified will remove surface grease, dirt an skin debris from the hair shaft and scalp without affecting adversely the hair, scalp or health of the user. HS has so many types are powder, liquid, lotion, cream, jelly, aerosol, specialized HS (Conditioning, Anti-dandruff, Baby, Two Layers). But the future of HS is going to be herbal Shampoo [3]. It contains all the natural ingredients with herb extract.

It helps hairs to improvise their quality of moisture, shine, growth, thickening, strength of hair roots. The most advantagable thing of herbalHS is that it has no any side effects.HerbalHS contains Amla,Reetha, Shikakai, Brahmi, Bhringaraj, Nagarmotha, Aloevera, etc. all the nature things[4-6]. Future market will be for herbal Shmpoo.

Function of ingredients

1. Amla:-It nourishes hair and help for growth. It allowing the nature texture and nature oils of the hair retained for a healthy shine and appearance. It controls hair loss. It contain fatty acids that moisture the hair. Fatty acids penetrate through the scalp to remove dryness and dandruff. It contain antioxidant properties which strengthening the roots of the hairs. It acts as a conditioner that gives hair a nature shine and bounce [7-9].

2. Reetha :- It is a cleansing agent, keeps scalp gentle and removes any microorganism responsible for infection. It nourishes hair, keep healthy and smooth also. It shines the hair and brings back its nature texture. It is also helpful for dandruff.
3. Shikakai :-It retain nature oil of hair, It keeps hair lustrous and healthy. It condition and strength the hair. It reduce hair loss and adds volume to the hair'. It is a powerful antidandruff. It products scalp from infection.
4. Nagarmotha :-It stimulates hair roots. It works on subaceous gland to promote new hair growth.
5. Bhringaraj :-It retain the original black colour of hair. It rejuvenating the scalp.
6. Brahmi :-It nourishes hair. It relieves the tension, stress and relaxes the nerves. It also help for better circulation in scalp.
7. Aloe vera :-It helps for thickening hair. It also helps to nourish hair.
8. Lemon juice :-It maintains the pH of HS. It gives a fragrance to HS.

Function of chemicals

- 1) Glycerine :-It helps to look the moisture in hair
- 2) Cocamidopropylbetane (CAPB):- It thickness the HS. It is used as a surfactant and a foam booster. It is emuleifying agent
- 3) Sodium lauryl ether sulphate (SLES) :-It is used as a surfactant.
- 4) Sodium benzoate :-Both are used as a preservative to preserve HS.
- 5) Ethylene glycol monosterate (EGMS) :-It is used for a pearlised effect.
- 6) Cocamono:-It is used as a surfactant. It increases the viscosity.

Experiment:

Materials:

Ingredients:Amla, reetha, shikakai, nagarmotha, bhringaraj, brahmi, aloe vera, lemon juice

Chemicals:

Glycerin, cocamidopropylbetane(CPBA), sodium lauryl ether sulphate (SLES), methyl paraben sodium (MP), sodium benzoate, ethylene glycol monosterate (EGMS), cocamono (cocamidemonoethanalamine), cocamonoamide.

Instruments: Microwave (800W), Viscometer (borosil), P^H meter, Stalagnometer, Compound electron microscope (CEM).

Green Method for Synthesis of HS

Part - 1:- Preparation of Herbal Extract:

Take a herb Amla, Reetha, Shikakai, Nagarmutha, Bhringaraj, Brahmi, Aloe vera and soak it in distilled water. Placed in microwave irradiation of 800W it for a 5 minutes or till when it starts boil sieve it and take a 10ml from extract should give a small of lemon strongly. For their transparency add some lemon squeeze in it, followed by mixing up to colourless. (Near about juice of 2 lemons)

Part -2 :- Preparation of Herbal HS:

In beaker contains SLES (30%), glycerin (18%) and CAPB (6%) everyone followed by stirring gradually, Herb extract with lemon juice in it stir gradually due to avoid foaming. Preservative methyl paraben(0.5%) and sodium benzoate (1.5%), for pearlising impact with EGMS (4%) to it. Pour an Aloe vera(12%) in it, with small concentration of cocamono(4%) in it, mockup with water in it for small proportion, increasing a thickness with cocodi, obtained product Herbal Shampoo.

Figure: Flow chart for preparation of herbal HS (HS)

Result and discussion:

Physical appearance/visual inspection:

The formulations prepared were evaluated in terms of their clarity, thick, semi white transparent in colour, great foam producing ability and fluidity.

Determination of pH:

The pH = 6.5 of 10% herbal HS solution in distilled water was determined at room temperature 25°C.

Determine percent of solids contents:

A clean dry evaporating dish was weighed and added 1grams of HS to the evaporating dish. The dish and HS was weighed. The exact weight of the HS was calculated only and put the evaporating dish with HS was placed on the hot plate until the liquid portion was evaporated. The 0.01g weight of the HS only (solids) after drying was calculated.

Wetting time:

The canvas was cut into 1-inch diameter discs having an average weight of 0.44g. The disc was floated on the surface of HS solution 1%w/v and the stopwatch started. The time required for the disc to begin to sink was measured accurately and noted as 3 sec wetting time.

Rheological evaluations:

The viscosity of the HS was determined by using Brookfield Viscometer set at different spindle speeds from 0.3 to 10 rpm. The viscosity of the HS was measured by using spindle T95. The temperature and sample container's size was kept constant during the study.

Dirt dispersion:

Two drops of HS 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 shaken ten times. The amount of ink in the foam was estimated as Light.

Cleaning action:

5 grams of wool yarn were placed in grease, after that it was placed in 200 ml. of water containing 1 gram of HS in a flask. Temperature of water was maintained at 35°C. 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 [10-11].

$$DP = 100 \left(1 - \frac{T}{C} \right)$$

In which, DP is the percentage of detergency power, 1g is the weight of sebum in the control sample and the cleansing action HS is found to be 15 %.

Surface tension measurement:

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

$$R_2 = \frac{(W_3 - W_1)n_1}{(W_2 - W_1)n_2} \times R_1$$

Where,

W_1 is weight of empty beaker.

W_2 is weight of beaker with distilled water.

W_3 is Weight of beaker with HS solution.

N_1 is no. of drops of distilled water.

n_2 is no. of drops of HS solution.

R_1 is surface tension of distilled water at room temperature.

R_2 is surface tension of HS solution.

Detergency ability:

The Thompson method was used to evaluate the detergency ability of the samples. Briefly, a crumple of hair were washed with a 5% sodium lauryl sulfate (SLS) solution, then dried and divided into 3g weight groups. The samples were suspended in a n-hexane solution containing 10% artificial sebum and the mixture was shaken for 15 minutes at room temperature. Then samples were removed, the solvent was evaporated at room temperature and their sebum content determined. In the next step, each sample was divided into two equal parts, one washed with 0.1 ml of the 10% test HS and the other considered as the negative control. After drying, the residual sebum on samples was extracted with 20 ml n-hexane and re-weighed. Finally, the percentage of detergency power was calculated using the following equation:

$$DP = 100 \left(1 - \frac{T}{C} \right)$$

Foaming ability and foam stability:

Cylinder shake method was used for determining foaming ability. 50 ml of the 1% HS 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. In 1 % of HS gives 50 ml foam [12].

Compound Electron microscopy:

Surface morphology of the hairs was examined by compound electron microscopy (CEM Ltd. BioIndia Tech, India). The hair samples were mounted directly on the CEM hair sample slide, using double side stitching tape and hair on treatment with herbal HS (HS). The photomicrographs of suitable 45X magnification were obtained

for surface characterization. The following two samples were characterized by CEM:

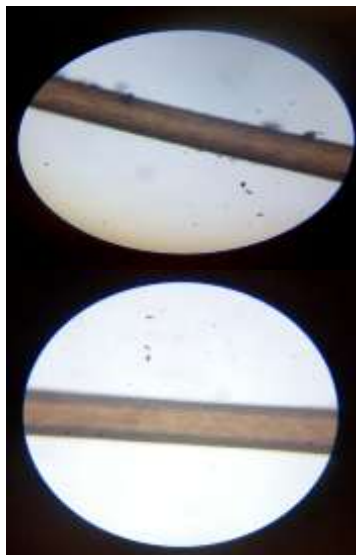


Figure: CEM images a) Sample-1: Hair
b) Sample-2: Hairs with HS

Stability studies:

The thermal stability of formulations was studied by placing in glass tubes and they were placed in a humidity chamber at 50°C and 80% relative humidity. Their appearance and physical stability were inspected for a period of 3 months at interval of one month.

SN	Characterizations	Result
1	Physical appearance/visual inspection	White transparent
2	Determination of pH	6.4
3	Determine percent of solids contents	0.1 g/L
4	Wetting time	3 second
5	Rheological evaluations	0.95
6	Dirt dispersion	The estimated amount of ink in the foam is light
7	Cleaning action	15 %
8	Surface tension measurement:	28.4 ± 2
9	Detergency ability	Good
10	Foaming ability and foam stability	50 ml
11	Compound Electron microscopy	45X identified
12	Stability studies	5 % changes.

Table No. 1: Characterization of Herbal HS

Ingredients for HS	Herb extract	SLES	Glycerine	Aloevera	CAPB	MP	Sodium benzoate	EGMS	Cocamono	Cocodi	Distilled water
Concentration (%)	10	30	18	12	6	0.5	1.5	4	4	3	11

Table No. 2 Composition for 100 ml of Herbal HS (HS)

Conclusion:

Present study is to successful preparing herbal HS containing herbal extract which is traditionally used for hair cleansing in India. All the ingredients used for the preparation of herbal HS are safer than marketed commercial HSs and the characterization showed ideal results. In afterword research is required to improve its high quality checking especially on animals and their conditioning performance.

Acknowledgement:

The author RajdipUtane is gratefully acknowledges the funding support rendered by DST, New Delhi for the INSPIRE fellowship [IF140439]. Appreciably recognize to Dr. AratiMoglewar principal SantgadgeMaharajMahavidyalayaHingna Nagpur for their valuable support. We thanks to Dr. R.G. Atram, Director Institute of Science, Nagpur.

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