

A REASERCH ON FORMULATION AND EVALUATION OF DRY POLY HERBAL POWDER SHAMPOO

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ABSTRACT

A Sot Poly herbal greasepaint soaps are gaining fashionability as a natural and sustainable volition to traditional liquid soaps. This study presents a dry herbal greasepaint soap formulated using a mix of natural constituents, including sauces, roots and botanical excerpts. the greasepaint cleaner was created as aneco- friendly, sulfate-free optional to ordinary fluid soaps. Phytochemical disquisition uncovered the nearness of saponins, flavonoids, and alkaloids, which contribute to its sanctification, exertion and hair development advancing parcels. In vivo considers illustrated critical advancements in hair face, sparkle, and reasonability, with dropped dandruff and crown aggravation. This dry home grown greasepaint cleaner offers a common, justifiable and feasible arrangement for hair care, conforming with the developing request foreco-friendly and heartiness- acquainted individual care particulars. The dry herbal greasepaint soap was formulated through a scrupulous selection and blending process, icing optimal birth of bioactive composites from the sauces. The product was estimated for its physical characteristics, including texture, color, and scent, as well as its efficacy in sanctification and nutritional hair. crucial performance pointers included hair wimpiness, manageability and reduction in dandruff and itchiness. The dry herbal greasepaint soap effectively cleanses hair without stripping it of its natural canvases , promoting healthy hair growth and crown health. The absence of harsh chemicals and sulfates makes it suitable for all hair types, including sensitive raniums.

KEYWORD: Natural hair care, Eco-friendly soap, Sulfate-free, Herbal shampoo, Sustainable personal care, Hair growth promotion.

INTRODUCTION

The dry herbal powder shampoo is a natural, sulfate-free hair care product formulated with a blend of herbs, including Aloe Vera, Shikakai, and Reetha. This innovative product offers a gentle, effective, and sustainable alternative to traditional liquid shampoos, catering to the growing demand for natural and eco-friendly personal care options. The powder shampoo is designed to cleanse and nourish hair, promoting healthy hair growth and scalp health while avoiding harsh chemicals and artificial fragrances. dry herbal powder shampoo: A natural, sulfate-free hair care product made from a blend of herbs like Aloe Vera, Shikakai, and Reetha, promoting healthy hair growth and scalp health.

➤ Hair Follicles

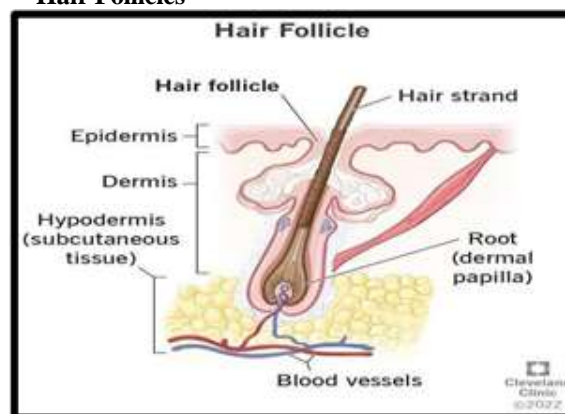


Fig:- Hair Follicles.

The hair follicle is where hair begins to grow and where it is held in place. It is a stocking like structure that starts in the epidermis. It extends to the dermis. The follicle is lined by an inner and outer sheath that protects and molds the growing hair and ends just before the opening

of sebaceous gland.

➤ Hair shaft

The hair shaft is the part of the hair that is made up of three layers of keratin. Those layers are :-

- **The inner layer:-** Also called as medulla. Depending on type of hair, the medulla is not always present.
- **The middle layer:-** This is called the cortex which makes the majority of the hair shaft.
- **The outer layer:-** Also called as cuticle, which is formed by tightly packed scales in an overlapping structure that resemble roof shingles.

➤ Hair Types

Hair type is primarily based on hair's curl pattern. The amount of curl in the hair is determined by hair follicle. Hair type is determined by genetics. Andre walker, known for decades as Oprah winfreys stylist, is credited with devising a system that classifies hair according to one of four curl pattern.

Type 1: Straight

Type 2: Wavy

Type 3:- Curly

Type 4:- Coily

➤ Hair Growth Cycle

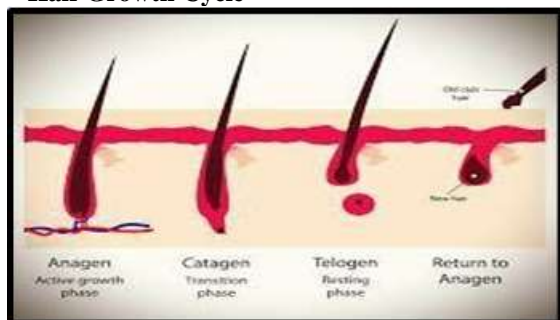


Fig:- Hair Growth Cycle.

➤ Hair growth cycle consists of 3 stages

- Anagen phase:** The hair grows during the anagen

phase. The duration of the anagen phase is two to six years. The newly grown hair that has ceased growing is forced out of the follicle by a fresh hair.

- Catagen phase:** 3% of all hairs are in this transitional stage at any given moment, which is known as the catagen phase. This stage lasts two to three weeks.
- Telogen phase:** This two to three month resting phase is known as the telogen phase. The hair follicle is at rest and the club hair is fully developed during the telogen phase

IDEAL PROPERTIES FOR DRY POLY HERBAL POWDER SHAMPOO

1. **Fine powder texture:** Easy to mix and apply.
2. **Uniform particle size:** Ensures even distribution of herbal ingredients.
3. **Low moisture content:** Prevents caking and spoilage.
4. **Good solubility:** Dissolves easily in water for effective cleansing.
5. **Stable:** Retains potency and effectiveness over time.
6. **Non-dusting:** Minimizes mess and inhalation risks.
7. **Good blend uniformity:** Ensures consistent product quality.
8. **PH balanced:** Suitable for scalp and hair Ph.

ADVANTAGES OF DRY POLY HERBAL POWDER SHAMPOO

1. Natural and gentle
2. Free from chemicals
3. Suitable for sensitive scalps
4. Effective cleansing
5. Balances scalp pH
6. Promotes healthy hair growth
7. Reduces dandruff
8. Improves hair texture
9. Eco-friendly
10. Reduced packaging waste
11. Biodegradable ingredients
12. Long-lasting
13. Can be blended with other herbs

INGREDIENTS OF DRY POLY HERBAL POWDER SHAMPOO

Sr.No.	Ingredients	Botanical name	Medicinal activity
1.	Hibiscus	Hibiscus rosa-sinensis	Anti-bacterial agent
2.	Amla	Phyllanthus emblica	Anti-microbial agent
3.	Reetha	Sapindus mukorossi	Natural Foaming agent
4.	Methi	Fenugreek	Conditioning agent
5.	Aloe	Aloe barbadensis miller	Moisturizing agent
6.	Neem	Azadirachta indica	Anti-microbial
7.	Glycerin	-	Humidity control
8.	Water	-	Vehicle

DRUG PROFILE

1. Hibiscus
2. Amla
3. Reetha
4. Methi
5. Aloe
6. Neem

1. HIBISCUS



Fig: - Hibiscus.

- **Scientific Name:** - Hibiscus rosa sinensis.
- **Synonyms:** - Cotton rore, Roselle, Mahoe.
- **Biological Source:** - It's obtained from flower of Hibiscus rosa-sinensis (Malvaceae).
- **Family:** - Malvaceae
- **Chemical Constituents:** Anthocyanins, Flavonoids, Phenolic acids
- **Uses:-** Reduce dandruff and scalp
- **Activity:** Anti-bacterial

2. AMLA



Fig: Amla

- **Scientific Name:-** Phyllanthus emblica
- **Synonyms:-** Emblica, Indian gooseberry, malacca tree.
- **Biological Source :-** It is obtained from fruit of Amla Emblica officinalis (Phyllanthocin).
- **Family:** - Euphorbiaceae
- **Activity:-** Antioxidant, Anti-inflammatory, Antibacterial.
- **Chemical Constituents:** Tannins, Flavonoids, Phenolic acids
- **Activity:** Anti-microbial
- **Uses:** - Strengthens hair, Promotes hair growth, Reduces dandruff

3. REETHA



Fig: Reetha.

- **Scientific Name :** Sapindus mukorossi
- **Synonym :** Soapnut, Soapberry
- **Biological Source:** The biological source of Reetha is the dried fruit of the Sapindus mukorossi tree.
- **Family:** Sapindaceae
- **Chemical Constituents:** Flavonoids, Triterpenoids, Phenolic acids.
- **Uses :** Nourishes scalp, Natural and Chemical free.
- **Activity :** Natural foaming agent

4. METHI



Fig:- Methi.

- **Scientific Name :-** Trigonella foenum-graecum
- **Synonyms :-** Chandrika, Egypt fenugreek, fenogreco, fenugrec
- **Biological Source :-** It consists of seeds and leaves of Trigonella foenum-graecum
- **Family :-** Fabaceae
- **Chemical Constituents:** Saponins, Flavonoids, Alkaloids.
- **Uses:-** Promote hair growth, Nourish scalp.
- **Activity :** Scalp soothing

5. Aloe Vera



Fig: Aloe Vera.

- **Scientific Name :-** Aloe vera
- **Synonyms :-** Aloe barbadensis, Aloe vulgaris lam
- **Biological Source :-** The dried juice of the leaves of the Aloe barbadensis miller plant also known as aloe vera plant
- **Chemical Constituents:** Polysaccharides, Anthraquinones, Flavonoids:
- **Family :-** Liliaceae
- **Uses :** Soothes scalp, Promote growth.
- **Activity :-** Moisturising agent, pH balancer

1. NEEM



Fig:- Neem.

- **Scientific Name :** Azadirachta indica
- **Family :** Meliaceae
- **Use :** Antidandruff, Scalp health, Reduce itchiness.
- **Chemical Constituents:** Azadirachtin, Nimbidin, Quercetin.
- **Activity :** Anti-dandruff
- **Chemical Structure**

MATERIAL AND METHOD

Ingredients

1. Hibiscus
2. Amla
3. Reetha
4. Methi
5. Aloe
6. Neem

1. Hibiscus Powder

Hibiscus Powder Benefits for Hair These nutrients also help help unseasonable hair greying and can be used as a natural color with henna greasepaint. Hibiscus greasepaint acts as a mild crown mite and since it has antimicrobial parcels, it can help reduce dandruff and itchiness from your crown.

Accoutrements

1. Hibiscus flowers(Hibiscus rosa- sinensis)
2. Drying outfit(sun drying)
3. Grinder
4. Sieve

Hibiscus Procedure

1. Gathering Collect fresh hibiscus flowers.
2. drawing Remove dirt and contaminations from the flowers.
3. Drying Sot the flowers using
 - Sun drying Spread flowers in a single subcaste, covered with cheesecloth.
4. Grinding Grind dried hibiscus flowers into a fine greasepaint using a grinder or shop.
5. Sifting Sieve the greasepaint to insure invariant flyspeck size.

2. Amla Powder

Amla greasepaint benefits to your soap is a great way to promote its health and vitality. Amla is a natural component rich in vitamin C and antioxidants, which can

promote healthy hair growth and ameliorate the overall condition of your hair.

Accoutrements

1. Fresh or dried amla fruits(Emblica officinalis)
2. Drying outfit(sun drying)
3. Grinder or shop
4. Sieve

1. Harvesting

- Collect fresh amla fruits(Emblica officinalis) from trees.
- Choose fruits that are ripe and free from damage.
- 2. drawing
 - Wash the amla fruits to remove dirt, stems, and leaves.
 - Clean and sanitize outfit to help impurity.
- 3. Drying
 - Sot amla fruits using
 - Sun drying Spread amla fruits in a single subcaste, covered with cheesecloth.
- 4. Grinding
 - Grind dried amla fruits into a fine greasepaint using a grinder.
- 5. Sifting
 - Sieve the greasepaint to insure invariant flyspeck size.
- 6. Packaging and storehouse
 - Store amla greasepaint in watertight holders, defended from light and humidity.
 - Marker holders with date, batch number, and storehouse instructions.

3. Reetha Powder

Reetha greasepaint can be mixed with warm water to form a paste which can be used to blarney the crown to help manage dandruff and also remove lice from the crown due to its insecticidal property.

Accoutrements

1. Reetha fruits(soapnuts) Sapindus mukorossi
2. Drying outfit sun drying
3. Grinder or shop To grind dried reetha fruits into greasepaint.
4. Sieve To sift the greasepaint and insure invariant flyspeck size. Step 1 Harvesting
 - Collect mature reetha fruits(soapnuts) from Sapindus mukorossi trees. Step 2 drawing
 - Wash reetha fruits to remove dirt, stems, and leaves.

Step 3 Drying

- Sot reetha fruits using
- Sun drying Spread reetha fruits in a single subcaste, covered with cheesecloth. Step 4 Grinding
 - Grind dried reetha fruits into a fine greasepaint using a grinder or shop. Step 5 Sifting
 - Sieve the greasepaint to insure invariant flyspeck size. Step 6 Packaging and storehouse
 - Store reetha greasepaint in watertight holders, defended from light and humidity.

4. Methi Powder

Methi(fenugreek) greasepaint can be effectively used in dry herbal greasepaint soap. It's a natural component known for its hair- strengthening and growth- promoting parcels, as well as its capability to nourish the crown.

Accoutrements

1. Methi seeds(Fenugreek seeds) Trigonella foenum-graecum
2. Drying outfit sun drying.
3. Grinder or shop To grind methi seeds into greasepaint
4. Sieve To sift the greasepaint and insure invariant flyspeck size.
5. Storage holders Airtight holders to store methi greasepaint.

Methi Greasepaint product Process

Step 1 Sourcing

- Gain high- quality methi seeds(Trigonella foenum-graecum). Step 2 drawing
- Clean methi seeds to remove contaminations, dirt, or debris. Step 3 riding(voluntary)
- rally methi seeds smoothly to enhance flavor and aroma. Step 4 Grinding
- Grind methi seeds into a fine greasepaint using a grinder or shop. Step 5 Sifting
- Sieve the greasepaint to insure invariant flyspeck size. Step 6 Packaging and storehouse
- Store methi greasepaint in watertight holders, defended from light and humidity.

5. Aloe Powder

Aloe vera, known for its soothing and moisturizing rates, helps to calm the crown and give hydration to the hair beaches.

Accoutrements

1. Aloe vera leaves Fresh or dried aloe vera leaves
2. Drying outfit Roaster, dehydrator, or sun drying setup(if using fresh aloe)
3. Scraper or cutter To prize aloe gel from leaves(if using fresh aloe)
4. Grinder or shop To grind dried aloe into greasepaint
5. Sieve To sift the greasepaint and insure invariant flyspeck size
6. Storage holders Airtight holders to store aloe greasepaint

Aloe Powder product Process

Step 1 Harvesting

- Collect fresh aloe vera leaves. Step 2 drawing
- Wash aloe leaves to remove dirt and contaminations. Step 3 Gel birth
- Excerpt aloe gel from leaves using a scraper or cutter. Step 4 Drying
- Sot aloe gel using
- Sun drying spread aloe gel in a thin subcaste,

covered with cheesecloth Step 5 Grinding

- Grind dried aloe into a fine greasepaint using a grinder or shop.

Step 6 Sifting

- Sieve the greasepaint to insure invariant flyspeck size. Step 7 Packaging and storehouse
- Store aloe greasepaint in watertight holders, defended from light and humidity.

6. Neem Greasepaint

Neem greasepaint can be used in dry herbal greasepaint soap to influence its antibacterial and antifungal parcels, which can help address dandruff, crown infections, and other hair- related issues. It also contributes to exertion, strengthening hair follicles, and nourishing the crown.

Accoutrements

1. Neem leaves or seeds Azadirachta indica
2. Drying outfit Roaster, dehydrator, or sun drying setup(if using fresh neem leaves)
3. Grinder or shop To grind dried neem leaves or seeds into greasepaint
4. Sieve To sift the greasepaint and insure invariant flyspeck size
5. Storage holders Airtight holders to store neem greasepaint

Neem Greasepaint product Process

Step 1 Harvesting

- Collect fresh neem leaves or seeds from Azadirachta indica trees. Step 2 drawing
- Wash neem leaves or seeds to remove dirt, stems, and contaminations. Step 3 Drying
- Sot neem leaves or seeds using
- Sun drying Spread neem leaves or seeds in a single subcaste, covered with cheesecloth. Step 4 Grinding
- Grind dried neem leaves or seeds into a fine greasepaint using a grinder. Step 5 Sifting
- Sieve the greasepaint to insure invariant flyspeck size. Step 6 Packaging and storehouse
- Store neem greasepaint in watertight holders, defended from light and humidity

EVALUATION RAW MATERIAL

1. Angle of repose
2. Tapped density
3. Bulk density
4. Carr's index
5. Hausner's ratio

Ideal range of dry powder

Test	Hibiscus	Amla	Reetha	Methi	Aloe Vera	Neem
Angle of Repose	33.42	26.56	33.42	33.42	29.24	32.61
Tapped Density	0.5	0.5	0.52	0.5	0.3	0.5
Bulk Density	0.42	0.43	0.45	0.43	0.41	0.42
Carr's Index	16	14	13.46	13	15	2
Hausner's Ratio	1.19	1.16	1.15	1.16	1.21	1.02

PROCEDURE**Procedure of formulation for dry herbal powder shampoo****Cleaning and Drying**

(Clean and dry all the herbal ingredients separately)

**Grinding**

(Grind each herbal ingredient into a fine powder using a grinder or mortar and pestle)

**Mixing**

(Mix all the powdered herbal ingredients together in a clean and dry container)

**Adding glycerin and Distilled Water**

(Add glycerin and distilled water to the mixture and stir well)

**Drying**

(Spread the mixture evenly on a clean surface and allow it to dry completely)

**Powdering**

(Once dry powder the mixture using a grinder or mortar and pestle)

**Sifting**

(Sift the powder to remove any lumps or large particles)

Step 1: Cleaning and Drying.**Cleaning**

- Cleaning the all herbal plants use in dry powder shampoo.

1. **Removing impurities:** Dirt, dust, and other contaminants.
2. **Washing and rinsing:** Herbal materials to ensure purity.

Method use for cleaning

1. Water washing

Drying

- Drying of all herbal plants in powder shampoo.

1. **Removing moisture:** Reducing water content to preserve herbs.
2. **Preserving potency:** Retaining active compounds and properties.

Method use for drying

1. Sun light

Step 2 – Grinding

Grinding of dry herbal plant

1. **Reducing particle size:** Herbal ingredients are ground into a fine powder.
2. **Ensuring uniformity:** Consistent texture and particle size.

METHOD**Mechanical grinding:** Using grinders.**Fig: Hibiscus Powder.****Fig: Neem Powder.**



Fig: Reetha Powder.



Fig: Amla Powder.



Fig: Aloe Powder.



Fig: Methi Powder.

Step 3 - Mixing

Mixing dry plant powder shampoo using a grinder Process

1. **Combine ingredients:** Add individual herbal powders to the grinder.
2. **Mixing:** Use the grinder to blend ingredients uniformly.
3. **Sifting:** Sieve the mixture to ensure consistent particle size.



Fig: Mixing.

Step 4- Adding glycerin and Distilled Water

Purpose

1. **Hydration:** Glycerin helps retain moisture in hair.
2. **Binding:** Glycerin and water mixture helps bind ingredients together.
3. **Texture:** Creates a paste or liquid shampoo.

Benefits

1. **Moisturizing:** Glycerin helps hydrate hair and scalp.
2. **Improved texture:** Easier application and spreadability.
3. **Enhanced user experience:** Gentle, nourishing shampoo.

Step 5 – Drying

Drying is the process of removing moisture or water content from a substance, material, or product. In the context of herbal powders, drying involves removing excess moisture from the herbs.

Drying method

- Oven drying

Step – 6: Powdering

Powdering is the process of reducing a substance into a fine powder. In the context of herbal powders, powdering involves grinding or milling dried herbs into a fine powder.

Powdering method

- Grinding

Mortar and Pestle: Manual grinding using a mortar and pestle.



Fig: Grinding.

Step – 7: Sifting

Sifting is the process of separating particles of different sizes using a sieve or mesh. In the context of herbal powders, sifting involves passing the powder through a sieve.

1. **Remove lumps:** Ensure uniform powder texture.
2. **Separate particles:** Achieve desired particle size.
3. **Improve quality:** Enhance powder consistency and purity.

FORMULATION OF DRY HERBAL POWDER SHAMPOO (25 gm)

Sr. No.	Ingredients	F1	F2	F3	F4
1.	Hibiscus	3.5 gm	3.5 gm	4.5 gm	2.5 gm
2.	Amla	2.5 gm	2.5 gm	3 gm	3 gm
3.	Reetha	4 gm	5 gm	6 gm	6 gm
4.	Methi	3.5 gm	4.5 gm	3 gm	3 gm
5.	Aloe	3 gm	1.5 gm	1.5 gm	1.5 gm
6.	Neem	8.5 gm	6.5 gm	7 gm	8 gm
7.	Glycerin	Qs	Qs	Qs	Qs
8.	Water	Qs	Qs	Qs	Qs

➤ Formula 1 = Fail

Reason: Foam is not produce as per requirement.

➤ Formula 2 = Fail

Reason: Strong, irritating smell due to excess use methi.

➤ Formula 3 = Fail

Reason: Very low neem powder is used which leads to reduce efficacy and no noticeable hair benefits.

➤ Formula 4 = Success

Reason:- In these formulation

1. Foam is produced as per the requirement.
2. There is no strong & irritating smell.
3. Formulation is effective & noticeable hair benefits.

EVALUATION TEST OF DRY POLY HERBAL POWDER SHAMPOO

1. Organoleptic characteristics
2. Tapped density
3. Angle of repose
4. Bulk density
5. Foaming test
6. Carr's index
7. Hausner's ratio
8. Irritancy test
9. Stability test

Evaluation Tests

Evaluation tests are procedures used to assess the quality, efficacy, and safety of a product, such as herbal powder shampoo.

Purpose

Evaluation tests help ensure the product meets quality

standards, is safe for use, and perform as claimed.

Organoleptic characteristics

Sr.No.	Parameter	Result
1.	Color	Brown
2.	Odour	Astringent
3.	pH	5 to 6
4.	Texture	Smooth/Gentle

Angle of repose

The angle of repose is the angle at which a powder or granular material comes to rest when poured onto a surface. It's a measure of the material's flowability and stability.

$$\theta = \arctan(h/r) \quad d = 9, r = 4.5$$

$$= 2.5/4.5$$

$$= 0.55$$

$$= \tan^{-1} = 28.81$$



Fig: Angle of repose.

Bulk density

Bulk density is determined by measuring the volume occupied by a known mass of the powder.

Weight of measuring cylinder =

Weight of measuring with powder = 23.91 gm

= $M_2 - m_1 / 100 \text{ ml}$

= $118.22 - 25 / 100$

= **0.9322**



Fig: Bulk Density.

Tapped density

Tapped density is a measure of the density of a powder after it has been tapped or vibrated to remove air pockets and settle the particles. It's an important parameter in powder characterization. Tapped Density = Mass of Powder / Tapped Volume

= $25/37$

= **0.67 g/cm³**



Fig: Tapped density.

Foaming test

The foaming test evaluates the ability of a shampoo to produce and maintain foam. For dry herbal powder shampoo



Fig: Foaming test.

Carr's index

Carr's Index, a measure of powder compressibility, is relevant when formulating dry herbal powder shampoos.

Tapped density – Bulk density / Tapped density [100]

= $0.67 - 0.93 / 0.67 [100]$

= $0.38 [100]$

= **38.8**

Hausner's ratio

Hausner's ratio is a measure of a powder's ability to flow and compress, essentially how well it can be handled in a manufacturing or packaging context.

= Tapped density / bulk density

= $0.67 - 0.93$

= **0.72**

Moisture content

Initial weight - Final weight / Initial weight (100)

= $25 - 24 / 25(100)$

= $0.04(100)$

= **4%**



Fig: Moisture content test.

Irritation test

Moisture content refers to the amount of water or moisture present in a substance, material, or product.



Fig: Irritation test.

Result: No Irritation.

Observation Table.

Sr. No.	Test	Observation
1.	Angle of repose	Excellent
2.	Bulk density	0.9322 g/cm ³
3.	Tapped Density	0.67 g/cm ³
4.	Carr's index	38.80
5.	Hausner's ratio	Excellent
6.	Moisture content	4%
7.	Irritation test	No Irritation
8.	Foaming test	3 ml

RESULT

We Prepared and evaluate Dry poly herbal powder shampoo. Which show brownish in color and odour is astringent also perform some other physiochemical parameters which includes Tab density, Bulk density, Angle of repose, Carr's index, Hausener's ratio, Moisture content, Irritation test, Stability test.

The result are as follows

Sr. No.	Parameter	Result
1.	Color	Brown
2.	Odour	Astringent
3.	pH	5 to 6
4.	Angle of repose	Excellent
5.	Tapped density	0.67 g/cm ³
6.	Bulk density	0.9322 g/cm ³
7.	Carr's index	38.80
8.	Hausner's ratio	Excellent
9.	Moisture content	4%
10.	Irritation test	No irritation
11.	Foaming test	3 ml

CONCLUSION

Dry herbal powder shampoo is a natural, effective, and convenient alternative to conventional liquid shampoos. The blend of herbal ingredients, such as Neem, Hibiscus, and Amla, provides numerous benefits.

- Promoting healthy hair growth
- Reducing dandruff and itchiness
- Soothing and calming the scalp
- Improving hair texture and manageability

- Being free from harsh chemicals and sulfates

The addition of glycerin helps to moisturize and condition the hair, while the powder form makes it easy to apply and travel-friendly.

Overall, dry herbal powder shampoo is a great option for those looking for a natural, gentle, and effective hair care solution.

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Links

19. https://www.researchgate.net/publication/355509340_Formulation_and_evaluation_of_dry
20. <https://www.ijpca.org/html-article/15057>
21. <https://www.ijpca.org/article-details/15057>
22. https://www.researchgate.net/figure/Physiochemical-Properties-of-Herbal-Shampoo_tbl3
23. <https://www.ijpca.org/html-article/15057>
24. <https://images.app.goo.gl/L4Lj97KiTpohHoG99>
25. <https://images.app.goo.gl/v5yUpr4AVN2uH7Fk9>
26. <https://images.app.goo.gl/oMT3P7ZqVb7aKva6A>
27. <https://images.app.goo.gl/JofBdHkZsCgagtFQ7>
28. <https://images.app.goo.gl/6xUnWstLsrrCZuKKA>
29. <https://images.app.goo.gl/YcLFz3XNSjYzV9h49>
30. <https://images.app.goo.gl/EMU9VNtZ7cecjxJw5>
31. <https://images.app.goo.gl/msPB9SMrNDR24bb67>