# Dry Shampoo: A Quick Fix for Fresh Hair

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## ABSTRACT

The growing demand for natural hair care products has led to the formulation of dry shampoos incorporating traditional botanicals known for their cleansing, nourishing, and therapeutic properties. This review explores the synergistic benefits of shikakai (Acacia concinna), amla (Emblica officinalis), reetha (Sapindus mukorossi), and turmeric (Curcuma longa) in dry shampoo products. Shikakai, with its mild saponin content, serves as a gentle cleanser that removes excess oil and dirt without stripping natural moisture from the hair. Reetha, rich in saponins, provides effective foaming action, aiding in the removal of impurities while maintaining scalp health. Amla, packed with vitamin C and antioxidants, not only strengthens the hair follicles but also promotes hair growth and enhances shine, making it ideal for maintaining overall scalp vitality. Turmeric, renowned for its anti-inflammatory and antioxidant properties, helps soothe scalp irritation, reduce dandruff, and prevent oxidative stress, ensuring healthier hair. Together, these botanicals provide a holistic approach to hair care by combining gentle cleansing, nourishment, and protection. The review also addresses formulation challenges, such as ensuring proper ingredient dispersion, texture, and stability in dry shampoo powders. Furthermore, with an increasing consumer preference for natural, sustainable, and eco-friendly products, the incorporation of these ingredients reflects a growing trend toward plant-based hair care solutions. This combination offers an effective, safe, and gentle dry shampoo alternative for consumers seeking both convenience and scalp health.

## INTROUCTION

Hair is protein filament that grows from follicles found in the dermis. One of the traits that distinguishes animals is their hair. Aside from patches of glabrous skin, the human body is covered in follicles that generate fine vellus hair and thick terminal hair. Although hair development, kinds, and care are the most frequently discussed topics, hair is also a significant biomaterial that is mostly made of proteins, particularly alpha-keratin.

Although opinions on various hairstyles and hair removal techniques varies greatly throughout cultures and historical eras, they are sometimes utilized to reveal a person's age, gender, or religion as well as their personal beliefs or social standing [1].

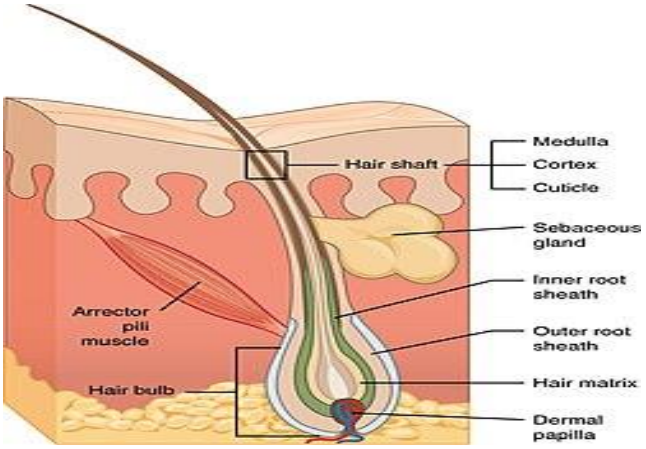


Figure:1 Structure of hair

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Dandruff is a skin condition of the scalp (2). Symptoms include flaking and sometimes mild itchiness (2,3). It can result in social or self- esteem problems. A more severe form of the condition, which includes inflammation of the skin, is known as seborrhoeic dermatitis (2).

The cause is unclear, but believed to involve a number of genetic and environmental factors;(4) the condition may worsen in the winter (5). It is not due to poor hygiene, and the underlying mechanism involves the excessive growth of skin cells (5). Diagnosis is based on symptoms (6). There is no known cure for dandruff. (7) Antifungal cream, such as ketoconazole, or the keratolytic agent salicylic acid may be used to try to improve the condition(2,3). Dandruff affects about half of adults, with males more often affected than females.(2) In addition, people in all areas of the world are affected.(2) Onset is usually at puberty, and it becomes less common after the age of 50.(2)

Shampoos are hair care solutions used primarily to remove product buildup, excess oil, and grime from the scalp and hair. To clean and nurture hair, they contain a blend of conditioning ingredients, surfactants, preservatives, and perfumes. Shampoo formulations differ according to hair type, scalp health, and particular issues like damage, dryness, or dandruff (8). Over time, shampoos have developed from basic soap-based recipes to complex treatments that address a range of hair care requirements. In order to enhance hair health, contemporary shampoos may also contain natural extracts, keratin, and biotin (9)

Dry shampoo otherwise known as hybrid shampoo is a type of shampoo which reduces hair greasiness without the need for water. It is in powder form and is typically administered from an aerosol can. Dry shampoo is often based on corn starch or rice starch. In addition to cleansing hair, it can also be used as a tool for hair-styling as it can create volume, help tease hair, keep bobby pins in place, and be used in place of mousse in wet hair (10).Dry shampoo proponents attest that daily wash-and-rinse with detergent shampoo can strip away natural oils from hair(11).However, others attest that spraying dry shampoo every day will lead to a build-up of product that can dull hair color and irritate the scalp, arguing that the scalp needs regular cleansing and exfoliating to get rid of bacteria, remove dead skin cells, and stay healthy(12).

## HISTORICAL BACKGROUNG

### Ancient Origins-

The earliest forms of shampoo were used in ancient India, where herbal extracts like soapberries (reetha), amla (Indian gooseberry), and shikakai were mixed with water to cleanse the hair. The word "shampoo" itself is derived from the Hindi word "champo", meaning to press or massage (13). Ancient Egyptians used animal fats and plant oils for hair cleansing, while Greeks and Romans used olive oil and ashes to maintain scalp hygiene (14).

### Medieval and Early Modern Period

In 16th-century Europe, hair was rarely washed with water due to the fear of illness from damp conditions. Instead, powdered starch and perfumes were used to absorb oils and mask odors (15). In 17th-century Britain, visitors from India introduced the concept of scalp massage with natural cleansers to European traders (16).

### Modern Shampoo and Industry Development

The 20th century saw advancements in pH-balanced shampoos, specialized formulations for different hair types, and sulfate-free options for gentler cleansing (17).Today, shampoo production is a multi-billion-dollar industry, with a focus on sustainability, organic ingredients, and scalp health.

### Types of Shampoos

1. Clarifying Shampoo – Removes product buildup and deep cleans the scalp. (18)

Example: Neutrogena Anti-Residue Shampoo.

ISSN No. 2454-6194 | DOI: 10.51584/IJRIAS |Volume X Issue IV April 2025

2. Moisturizing Shampoo – Hydrates and nourishes dry hair. (19)

Example: Shea Moisture Raw Shea Butter Moisture Retention Shampoo

3. Volumizing Shampoo – Adds body and thickness to fine hair. (20)

Example: Biotin & Collagen Thickening Shampoo (OGX)

4. Sulfate-Free Shampoo – Gentle formula, suitable for sensitive scalps and color-treated hair. (21)

Example: Pureology Hydrate Shampoo

5. Anti-Dandruff Shampoo – Helps control dandruff and scalp irritation. (22)

Example: Head & Shoulders Clinical Strength Shampoo

6. Color-Protecting Shampoo – Preserves and enhances dyed hair. (23)

Example: Redken Color Extend Magnetics Shampoo.

7. Keratin Shampoo – Strengthens hair and reduces frizz. (24)

Example: Tresemme Keratin Smooth Shampoo.

8. Medicated Shampoo – Treats scalp conditions like psoriasis and seborrheic dermatitis. (25)

Example: Nizoral A-D Anti-Dandruff Shampoo (contains ketoconazole).

9. Dry Shampoo – Absorbs oil and refreshes hair without water. (26)

Example: Batiste Dry Shampoo.

10. Organic/Natural Shampoo – Made with plant-based ingredients and free from harsh chemicals. (27)

Example: Avalon Organics Nourishing Lavender Shampoo.

**Advantages of Shampoos:**

- **Cleansing the Scalp and Hair**: Shampoos effectively remove dirt, oil, and product buildup. Surfactants, such as Sodium Lauryl Sulfate (SLS), help emulsify and rinse away sebum and environmental pollutants. (28)
- **Scalp Health and Dandruff Control**: Medicated shampoos with ketoconazole, zinc pyrithione. (29)
- **Hair Conditioning and Moisturizing**: Many shampoos contain conditioning agents like silicones, proteins, and oils to improve hair texture and prevent dryness. (30)
- **Specific Treatments** (e.g., Anti-Hair Loss, Color Protection): Shampoos with caffeine and biotin claim to promote hair growth, while sulfate-free shampoos help retain hair dye for color-treated hair. (31)

**Disadvantages of Shampoos:**

- **Harsh Surfactants Can Cause Dryness and Irritation:** Sulfates like Sodium Lauryl Sulfate (SLS) can strip natural oils, leading to dryness and scalp irritation. (32)
- **Product Buildup and Residue:** Silicones like dimethicone may create buildup over time, making hair feel heavy and requiring clarifying shampoos. (33)

ISSN No. 2454-6194 | DOI: 10.51584/IJRIAS |Volume X Issue IV April 2025

- **Potential Allergies and Sensitivities**: Some shampoos contain fragrances, parabens, or formaldehyde-releasing preservatives, which may trigger allergic reactions. (34)

- **Environmental Concerns**: Ingredients like microplastics and non-biodegradable silicones can be harmful to the environment. (35).

**Composition for Dry Shampoo:**

Typical Dry Shampoo Composition:

1. Absorbent Agents (20-50%): Absorb excess oil and impurities, e.g., silica, kaolin clay, starches (36).

2. Powdered Surfactants (10-30%): Cleanse and remove impurities, e.g., sodium lauryl sulfate, sodium laureth sulfate (37).

3. Anti-Static Agents (5-15%): Reduce static electricity and prevent flyway's, e.g., cationic polymers, silicones (38).

4. Moisturizing Agents (5-10%): Hydrate and nourish hair, e.g., panthenol, argania spinosa kernel oil (39).

5. Fragrances (1-5%): Provide scent, e.g., essential oils, fragrance oils (40).

6. Preservatives (1-5%): Prevent microbial growth, e.g., parabens, formaldehyde-releasing agents (41).

7. Anti-Dandruff Agents (optional): Treat dandruff and scalp irritations, e.g., zinc pyrithione, ketoconazole (42).

**AMLA**:

- Amla is commonly known as **Indian gooseberry**.

- Other names include Amalaki (in Sanskrit), Nellikai (in Tamil), Amlaki (in Hindi), and Emblica officinalis (its scientific name).

Fig:2 Amla

**Phytochemicals**:

Amla is rich in a variety of bioactive compounds, making it an important fruit in both traditional and modern medicine. It includes Vitamin C, Tannins, Flavonoids, Polyphenols, Minerals, Other Organic like gallic acid, ellagic acid, emblicanine A, emblicanine B, etc…, were found to have various biological activities such as antidiabetic, promoting hair health, reducing hair fall and preventing premature greying, anti-oxidant etc…

**Scientific classification**:

- Kingdom: Plantae

- Division: Angiosperms

ISSN No. 2454-6194 | DOI: 10.51584/IJRIAS |Volume X Issue IV April 2025

- Class: Eudicots
- Order: Rosales
- Family: Phyllanthaceae
- Genus: Phyllanthus
- Species: *Phyllanthus emblica*

**Uses:**

1. Promotes Hair Growth
2. Prevents Premature Graying
3. Strengthens Hair.

**Shikakai:**

- Shikakai is scientifically known as *Acacia concinna*.
- Other names for shikakai include: Soap pod (due to its saponin content)

Fig3: Shikakai

**Phytoconstituents:**

Shikakai is rich in bioactive compounds that offer various benefits for hair health. These include Saponins, Flavonoids, Alkaloids, Vitamins (A, C, and D), Tannins, Other Components are contains proteins and natural oils that nourish the scalp, making hair more manageable and soft.

**Scientific classification:**

- Kingdom: Plantae
- Division: Angiosperms
- Class: Eudicots
- Order: Fabales
- Family: Fabaceae

ISSN No. 2454-6194 | DOI: 10.51584/IJRIAS |Volume X Issue IV April 2025

- Genus: Acacia
- Species: *Acacia concinna*

**Uses:**

Shikakai has been used in traditional hair care for centuries and is considered a natural, effective alternative to chemical shampoos. Some of its primary uses include Natural Shampoo, Prevents Dandruff, Conditioning and Strengthening**.**

**Reetha**:

- Reetha is commonly known as Soapnut or Soapberry.
- It is scientifically known as *Sapindus mukorossi***.**

Fig4: Reetha

**Phytoconstituents:**

Reetha contains several bioactive compounds that contribute to its medicinal and hair care properties are Triterpenoid Saponins, Saponins, Polyphenols, flavonoids.

**Scientific classification**:

- Kingdom: Plantae
- Division: Angiosperms
- Class: Eudicots
- Order: Sapindale
- Family: Sapindaceae
- Genus: Sapindus
- Species: *Sapindus mukorossi*

**Uses:**

Reetha has been used in traditional hair care for centuries due to its numerous benefits. Natural Shampoo, Dandruff and Scalp Health, Detangling Hair.

ISSN No. 2454-6194 | DOI: 10.51584/IJRIAS |Volume X Issue IV April 2025

**Turmeric:**

- Turmeric is scientifically known as *Curcuma longa*.

Fig5: Turmeric

**Phytochemicals:**

Turmeric is known for its high concentration of bioactive compounds that contribute to its medicinal properties, especially its primary compound, curcumin.

**Curcumin:**

Benefits for Hair: Curcumin helps improve scalp circulation, which can stimulate hair follicles, promoting hair growth. It also helps reduce scalp inflammation and is beneficial in treating dandruff and itchiness**.**

**Scientific classifiaction:**

- Kingdom: Plantae
- Division: Angiosperms
- Class: Monocots
- Order: Zingiberales
- Family: Zingiberaceae
- Genus: Curcuma
- Species: *Curcuma longa*

**Uses:**

Turmeric has several benefits for hair care, particularly due to its antioxidant, anti-inflammatory, and antimicrobial properties. Reduces Dandruff, Fights Scalp Infections, Soothes Scalp Inflammation.

**Aloe-vera:**

- Common Names of Aloe, True aloe, Burn plant, Miracle plant, Elephant’s gall, First aid plant.

ISSN No. 2454-6194 | DOI: 10.51584/IJRIAS |Volume X Issue IV April 2025

Fig6: Aloe vera

**Phytochemicals:**

Aloe vera contains over 75 active compounds, Polysaccharides, Anthraquinones, Vitamins (A, C, E, B12), Folic acid, choline, Minerals…etc

**Scientific classifiaction:**

| | |
|---|---|
| • Kingdom | : Plantae |
| • Division | : Angiosperms |
| • Class | : Monocots |
| • Order | : Asparagales |
| • Family | : Asphodelaceae |
| • Subfamily | : Asphodeloideae |
| • Genus: *Aloe* | |
| **Uses:**<br>Scalp health, Moisturizing, Hair growth, *Natural conditioner.* | |

**Neem:**

- Azadirachta indica, commonly known as neem, margosa, nimtree or Indian lilac, is a tree in the mahogany family Meliaceae.

Fig7: Neem

ISSN No. 2454-6194 | DOI: 10.51584/IJRIAS |Volume X Issue IV April 2025

**Phytochemicals:**

- Azadirachtin – Insecticidal
- Nimbin, Nimbidin – Antiviral, anti-inflammatory

**Scientific Classification:**

- Kingdom: Plantae
- Order: Sapindales
- Family: Meliaceae
- Genus: *Azadirachta*
- Species: *Azadirachta indica* A. Juss**.**

**Uses:**

Fights dandruff & itchy scalp, Promote hair growth, Prevent hair fall, Kills lice & scalp infections, Conditions & adds shine, Balances scalp oil.

**Onion:**

The botanical name of onion is *Allium cepa*, which belongs to the Amaryllidaceae family**.**

Fig8: Onion

**Phytochemicals:**

Onions are rich in beneficial phytochemicals that offer a variety of health benefits, including for hair care. It includes Flavonoids, Vitamin C and B6…etc

**Scientific Classification:**

- Kingdom: Plantae
- Clade: Angiosperms
- Clade: Monocots
- Order: Asparagales
- Family: Amaryllidaceae
- Genus: *Allium*

ISSN No. 2454-6194 | DOI: 10.51584/IJRIAS |Volume X Issue IV April 2025

- Species: *Allium cepa* L.

**Uses:**

Onion has been traditionally used for promoting hair health due to its rich nutritional profile. Promotes Hair Growth, Prevents Hair Loss, Reduces Premature Graying…etc**.**

**Curry Leave:**

Curry leaves are aromatic leaves native to India and are widely used in cooking for their flavor and health benefits. They're rich in vitamins, minerals, and antioxidants that can help in promoting healthy hair growth and improving scalp health**.**

Fig9: Curry leaves

**Phytochemicals:**

Alkaloids, Iron, Antioxidants, Proteins and Amino Acids, Vitamin A,B,C…etc.

**Uses:**

- **Treats Dandruff:**

  Curry leaves' antibacterial and antifungal properties help treat dandruff and keep the scalp clean, which is essential for hair health.

- **Prevents Hair Loss:**

  Regular use of curry leaves can strengthen hair roots, reducing hair fall. The amino acids and antioxidants nourish the scalp, keeping it healthy.

## MECHANISM OF ACTION DRY SHAMPOO:

1. **Cleansing Action:**

Reetha (Sapindus mukorossi) contains natural saponins, which act as surfactants, producing foam and effectively removing oil, dirt, and pollutants from the scalp. Unlike synthetic detergents, these saponins cleanse the hair without disrupting the natural pH balance of the scalp (43).

2. **Conditioning and Strengthening:**

Shikakai (Acacia concinna) contains natural surfactants and tannins, which act as mild cleansing agents while conditioning the hair shaft, reducing tangles, and improving overall hair texture.

Amla (Phyllanthus emblica) is rich in Vitamin C, flavonoids, and polyphenols, which strengthen hair follicles, reduce oxidative stress on the scalp, and promote hair growth. (44)

ISSN No. 2454-6194 | DOI: 10.51584/IJRIAS |Volume X Issue IV April 2025

3. **Dandruff and Scalp Care:**

Turmeric (Curcuma longa) contains curcumin, which has antimicrobial and anti-inflammatory properties that help combat dandruff and prevent scalp infections. Curcumin reduces fungal growth (such as Malassezia), the primary cause of dandruff, and soothes an irritated scalp (45).

**Method of Preparation:**

1. Mix Amla Powder, Shikakai Powder, Reetha Powder, and Turmeric Powder in a bowl.

2. Add Corn Starch, mixing until uniform.

3. Add, Tween80 mixing until well combined.

4. Add Fragrance and Preservative, mixing well.

5. Shift the mixture through a fine-mesh sieve to ensure uniform particle size.

**Physicochemical Tests for Dry Shampoo**

1. **pH Measurement**

Method: pH meter in aqueous dispersion (1:10 dilution of dry shampoo in distilled water).

2. **Particle Size Analysis**

Method: Laser Diffraction (e.g., Malvern Mastersizer) or Microscopic Analysis.

3. **Bulk Density & Tapped Density**

Method: Graduated Cylinder Method.

4**. Flowability (Angle of Repose, Compressibility Index, Hausner Ratio)**

Method: Powder Flow Tester or Manual Angle of Repose Measurement.

5. **Residue & Visibility on Hair**

Method: Subjective evaluation or Image Analysis (e.g., Colorimeter, Scanning Electron Microscopy).

6. **Irritation & Sensory Evaluation**

Method: Patch Test, Human Sensory Panel.

## PACKAGING AND DESIGN FOR DRY SHAMPOO:

**Packaging Options**

1. Tin or Aluminum Can: A compact, cylindrical can with a lid that can be easily opened and closed. (e.g., Batiste Dry Shampoo).

2. Plastic Bottle: A lightweight, shatter-resistant bottle with a spray nozzle or cap. (e.g., Suave Dry Shampoo).

3. Stand-Up Pouch: A flexible, resealable pouch that can be stood upright on a shelf. (e.g., Oribe Dry Shampoo).

4. Glass Jar: A premium, eco-friendly jar with a lid that can be easily opened and closed. (e.g., Bumble and bumble Dry Shampoo).

ISSN No. 2454-6194 | DOI: 10.51584/IJRIAS |Volume X Issue IV April 2025

**Design Elements**

1. Color Scheme: A palette of calming, natural colors such as green, blue, and beige. (e.g., Moroccanoil Dry Shampoo)

2. Typography: A clean, modern sans-serif font that is easy to read. (e.g., Pantene Dry Shampoo).

3. Imagery: A simple, elegant image of a hair style or a natural ingredient. (e.g., Aveda Dry Shampoo).

4. Texture: A tactile, embossed or debossed design element that adds depth and interest to the packaging. (e.g., Redken Dry Shampoo).

**Sustainability Features**

1. Recyclable Materials: Use of recyclable materials such as plastic, glass, or aluminum. (e.g., L'Oréal Paris Dry Shampoo).

2. Refillable: Design of a refillable packaging system that reduces waste. (e.g., Klorane Dry Shampoo).

3. Biodegradable: Use of biodegradable materials such as plant-based plastics or paper. (e.g., Acure Dry Shampoo).

## CONCLUSION

Dry shampoo offers a unique solution to modern hair care by cleansing and refreshing hair without water. Its ability to absorb excess oil and add volume makes it a vital product for individuals with busy schedules or those looking to reduce daily washing. Enhanced with natural ingredients like shikakai, amla, reetha, and turmeric, dry shampoo not only improves the look of hair but also nourishes the scalp and promotes healthy hair growth. Compared to regular shampoo, it provides a more sustainable and gentle way to maintain fresh, healthy hair without the drawbacks of frequent washing. It allows users to refresh and cleanse their hair quickly without the need for water, making it perfect for travel, busy days, or extending the life of a hairstyle. With its easy application, time-saving benefits, and natural ingredients, dry shampoo is the future of efficient, eco-friendly, and effective hair care.

## REFERENCES


1. Sherrow, Victoria (2006). Encyclopaedia of Hair: A Cultural History. Westport, CT: Greenwood Press.
2. Tucker D, Masood S (August 2021). "Seborrheic Dermatitis". Stat Pearls [Internet]. Treasure Island (FL): Stat Pearls Publishing.
3. "Dandruff". nhs.uk. 18 October 2017, the original 1 January 2020.
4. Grimalt R (December 2007). "A practical guide to scalp disorders". The Journal of Investigative Dermatology. Symposium Proceedings. **12** (2): 10–14.
5. Ranganathan S, Mukhopadhyay T (2010). "Dandruff: the most commercially exploited skin disease". Indian Journal of Dermatology. **55** (2): 130–134.
6. Patient education: Seborrheic dermatitis (including dandruff and cradle cap) (Beyond the Basics)"(2020).
7. Turkington C, Dover JS (2007). The Encyclopaedia of Skin and Skin Disorders (Third ed.). Facts On File, Inc. p. 100.
8. Robbins, C. R. (2012). Chemical and Physical Behavior of Human Hair. Springer Science & Business Media.
9. Draelos, Z. D. (2015). Cosmetic Dermatology: Products and Procedures. John Wiley & Sons.
10. Allison Cooper (14 December 2016). "How To Use Dry Shampoo as a Styling Tool". Ravishly.
11. "How Dry Shampoo Works - HowStuffWorks". 14 October 2009.
12. Morris, J. (1992). The Origins of Shampoo and Personal Care. London: Routledge.
13. Smith, K. (2001). Ancient Hair Care Practices: From Egypt to Greece. Cambridge University Press.
14. Kern, L. (1996). European Hygiene Practices in the 16th and 17th Century. Oxford University Press.

ISSN No. 2454-6194 | DOI: 10.51584/IJRIAS |Volume X Issue IV April 2025

15. Mukherjee, A. (2010). Colonial Influence on European Hygiene. Delhi: Penguin India.
16. Gonzalez, R., & Kumar, P. (2018). Modern Shampoo Formulations and Their Effects on Scalp Health. International Journal of Cosmetic Science, 40(4), 234-245.
17. Neutrogena Anti-Residue Shampoo (Neutrogena, 2023).
18. Shea Moisture Raw Shea Butter Moisture Retention Shampoo (Shea Moisture, 2023).
19. OGX Biotin & Collagen Thickening Shampoo (OGX, 2023).
20. Pureology Hydrate Shampoo (Pureology, 2023).
21. Head & Shoulders Clinical Strength Shampoo (P&G, 2023).
22. Redken Color Extend Magnetics Shampoo (Redken, 2023).
23. Tresemme Keratin Smooth Shampoo (Tresemme, 2023).
24. Nizoral A-D Anti-Dandruff Shampoo (Johnson & Johnson, 2023).
25. Batiste Dry Shampoo (Batiste, 2023).
26. Avalon Organics Nourishing Lavender Shampoo (Avalon Organics, 2023).
27. Ananthapadmanabhan et al. (2013) discuss the role of surfactants in cleansing the scalp and hair.
28. Ravichandran et al. (2019) in the International Journal of Trichology explain the antifungal effects of ketoconazole in dandruff treatment.
29. Robbins (2012) in Chemical and Physical Behavior of Human Hair details how conditioning shampoos improve hair manageability.
30. Fischer et al. (2014) in the British Journal of Dermatology discuss caffeine's potential role in hair follicle stimulation.
31. Draelos (2010) in the Journal of Cosmetic Dermatology highlights the potential irritant effects of surfactants on the scalp.
32. Robbins (2012) discusses how silicones affect hair coating and manageability.
33. Frosch et al. (2005) in Contact Dermatitis report common allergens in cosmetic formulations.
34. Zeng et al. (2021) in Environmental Pollution review the ecological impact of cosmetic ingredients.
35. Xu, W., & Patel, S. (2013). Absorbent materials for dry shampoo applications. Journal of Cosmetic Science, 64(3), 239-246.
36. Hunting, A. L. (1983). Foaming surfactants. Journal of the American Oil Chemists' Society, 60(10), 1713-1718.
37. Lochhead, R. Y. (2001). Anti-static agents for hair care. Journal of Cosmetic Science, 52(2), 113-122.
38. Kamath, Y. K. (2002). Moisturizing properties of hair care products. Journal of Cosmetic Science, 53(3), 245-255.
39. Massey, L. (2001). Fragrance chemistry. Journal of Cosmetic Science, 52(3), 185-194.
40. Orth, D. S. (1993). Handbook of cosmetic microbiology. Marcel Dekker.
41. Schwartz, J. R. (2005). Anti-dandruff shampoos. Journal of Cosmetic Dermatology, 4(2), 131-136.
42. Gupta, R., & Chauhan, M. (2021). Sapindus mukorossi: A review of its applications in hair cleansing and skin care. Ayurvedic Research Journal, 6(1), 45-55.
43. Sharma, V., & Patel, D. (2019). Phyllanthus emblica: A natural source of hair strengthening compounds. Journal of Herbal Medicine, 10(4), 55-65.
44. Patel, R., & Sharma, N. (2020). Curcuma longa in dermatological applications: A review. Indian Journal of Ayurveda, 12(3), 78-85.
45. Choudhary, A., & Patel, M. (2021). Aloe Vera: A natural moisturizer for hair and scalp health. Cosmetic Science Journal, 9(3), 99-110.
46. United States Pharmacopeia (USP) <791>, British Pharmacopoeia (BP), and ISO 4316:1977.