Origin of word shampoo

The word “shampoo” is thought to come from the Hindu word *champo*, which means “to massage” or “to knead.”

The first shampoo

The first successful retail shampoo was developed in 1930. Until that time, the cleansing agent in shampoos was soluble soap. At that time usually sodium and/or potassium salts were preferred. Soap-based shampoos eagerly formed insoluble calcium and magnesium salts in the presence of hard water, thereby leaving a dulling film on hair. Clients would often apply a rinse containing vinegar or lemon juice to remove the “scum” film.

The modern shampoo

It consists of the following fractions.

Primary surfactants

The most common primary surfactants used in modern shampoos are the lauryl sulfates and lauryl ether sulfates.

Counter-ions

The preferred counter-ions for these anionic surfactants are sodium, ammonium, or potassium to grant good water solubility.

Co-surfactants

Co-surfactants, which are frequently included for their ability to enhance foaming power, include chemicals such as coco monoethanolamide, lauric acid diethanolamine, coco diethanolamide, cocamidopropyl betaine, and other betaines (e.g., lauramidopropyl betaine).

Foaming agents

The foaming ability of shampoos may be additionally boosted by adding compounds such as fatty acid alkanolamides.

Amphoteric surfactants

Amphoteric surfactants are often used to allow for skin mildness (e.g., in shampoos designed for infants) and include chemicals such as sodium alkyl amphoacetates, sodium 3-dodecylaminopropionate, sodium 3-dodecylaminopropane sulfonate, and N-alkyltaurines.

Modifiers

Modifiers are added to confer desirable flow properties and to stabilize suspensions of insoluble particulate components (e.g., volatile silicones, carbomers [cross-linked polyacrylic acids], acrylates,
cellulosics [e.g., hydroxypropylmethylcellulose], xanthan gum, glycol stearate, cetyl palmitate, glycercyl distearate, sodium sulfate).

**Solvent fillers**
Water and propylene glycol.

**Preservatives**
Formaldehyde, DMDM hydantoin, BHT, methylisothiazolinone, methylchloroisothiazolinone, parabens).

**pH adjusters**
These enhance foaming action (e.g., triethanolamine, myristic acid, sodium chloride, citric acid, lactic acid), chemical sequestrants/ligands (e.g., EDTA), herbal extracts (e.g., lavender, bergamot, rosemary, peppermint, soapwort, yucca, Iceland moss, orange flower, lemongrass, grapefruit seed, cucumber, watercress, parsley, matricaria, mushroom, chamomile, jojoba, fennel seed, golden seal), vitamins (e.g., panthenol, ascorbic acid, retinyl palmitate, riboflavin, tocopheryl acetate).

**Colours**
Caramel, henna, D&C colours, FD&C colours etc.

**Fragrance**
Fragrance also can be added to enhance the composition, purity, chemical effectiveness, and aesthetic quality of the product.

**Other functional ingredients**
Other functional ingredients included in modern shampoos are those that confer benefits other than cleaning.

**Moisturizers**
Proteins such as keratin, collagen, silk protein, lysed soy protein, hydrolysed wheat protein.

**Conditioners**
Oleyl alcohol, glycerine, stearyl stearate, glycerides derived from natural plant and animal oils, Shea butter, allantoin, Aloe vera gel, dimethicone, and cationic polymers such as polyquaternium-10 and polyquaternium-7.

**Antistatics**
Cationic detergents such as trimethyl alkyl ammonium chloride, tricetyl methyl ammonium chloride

**UV protectors**
Benzophenone-3

**Antidandruff agents**
Piroctone olamine, zinc pyrithione, ketoconazole etc.

**Types of shampoos**
Shampoos designed for oily, normal, and dry hair seem to differ primarily in the concentration of surfactants. Oily hair: more concentrated detergent; dry hair: more dilute detergent.

**Mechanism of action of shampoo**
The average human scalp contains approximately 125,000 to 150,000 hair fibres. Hair is a living material composed mostly of the fibrous protein keratin.
As a protein, keratin consists of amino acid chains sustained by different types of forces, including hydrogen bonds, salt bridges, disulfide linkages, and hydrophobic interactions. Of these forces, hydrogen bonds and salt bridges are the most important when considering the action of shampoo, as hydrogen bonds between protein chains are disrupted by water and salt bridges are destroyed by changes in pH. A filament of hair is most stable and strongest at a slightly acidic pH of 4 to 6, as the maximum number of salt bridges exists at a pH of about 4.1. Under basic conditions, the cuticle cells tend to become unstacked, and this dislodging of the shielding tile cells leads to reduced light reflection and the appearance of hair lacking lustre. In addition, the raised cuticle cells may also lead to tangling and the escape of cortex humidity leads to dry and brittle hair. Thus, the control of pH (between pH 4 and 9) is paramount when considering the chemistry of hair care products.

Rinsing hair with water alone will cause the keratin to become more stretchable by absorbing water and softening. However, adding a synthetic cleansing agent such as those found in shampoo to the hair during water rinsing will also allow for the removal of the water-insoluble oily sebum and associated debris from the hair shaft. Detergent action associated with shampoos is the result of surfactants. Surfactant is an abbreviation for “surface-active agent.” Surfactants possess hydrophilic (water soluble) heads and hydrophobic (water-insoluble) fatty acid tails. The water-soluble head of the surfactant may carry a negative charge (anionic surfactant), a positive charge (cationic surfactant), may lack any charge (nonionic surfactant), or the surfactant molecule may carry both a positive and a negative charge (amphoteric surfactant). Most major surfactants used in modern shampoos include all but cationic surfactants because of their skin-irritating potential. Surfactants promote the solubilization of sebum-based oil and dirt in water by lying across the oil-water interface and emulsifying the oil droplets, thereby allowing the oily soil to be removed from the hair via water rinsing.

### Side effects of various ingredients of shampoo

1. **Acrylates** - Contact can irritate and burn the skin and eyes.
2. **Allantoin** - Prolonged or excessive skin contact with this product may cause mild skin irritation.
3. **Ascorbic acid** - Slightly hazardous in case of skin contact (irritant).
4. **Benzophenone-3** - It is known that benzophenone-3 can cause contact eczema.
5. **Bergamot** - When this oil contacts the skin and the skin is exposed to sunlight, the oil of Bergamot causes the skin to discolour. With repeated exposures to sunlight, the discoloration becomes permanent.
6. **BHT** - Skin contact may cause allergic reaction.
7. **Cellulosics** - Allergic reactions can occur, including swelling of the tongue or face and itching skin.
8. **Cetyl palmitate** - Hazardous in case of skin contact irritant of eye contact irritant.
9. **Chamomile** - Skin reactions have occurred after contact with the chamomile plants or chamomile-containing ointment and conjunctivitis developed in hay fever patients following eye washing with chamomile tea.
10. **Citric acid** - Skin contact can produce inflammation and blistering.
11. **Cocamidopropyl betaine** - Cause skin to redden, itch or flake.
12. **Coco diethanolamide** - Repeated skin contact can cause severe irritation experienced as redness, swelling and possible chemical burns.
13. **Coco monoethanolamide** - Repeated skin contact can cause severe irritation experienced as redness, swelling and possible chemical burns.
14. **Dimethicone** - Dimethicone many have the unintended effect of causing more skin dryness and irritation. Itching, redness and skin irritation may also be developed.
15. **DMDM hydantoin** - Some individuals develop allergic skin reactions when exposed to DMDM hydantoin. These irritations typically appear as eczema or contact dermatitis.
16. **EDTA** - May cause eye and skin irritation.
17. **Fatty acid alkanolamides** - Prolonged or repeated skin contact can cause irritation and inflammation.
18. **Fennel seed** - Is said to cause photosensitivity and/or dermatitis in some people.
19. **Formaldehyde** - Contact with formaldehyde solutions or resins can cause eczema and in extreme cases can lead to dermatitis.
20. **Glycerides** - Glycerides may cause allergic reaction upon prolonged or repeated contact.
21. **Glycerine** - Skin lotions and products containing vegetable glycerin may cause redness and irritation for some users.
22. **Glyceryl distearate** - Prolonged or excessive skin contact may cause mild skin irritation.
23. **Glycol stearate** - Prolonged contact with skin will cause mild skin irritation.
24. **Golden seal** - Goldenseal (Hydrastis can) can irritate the skin, mouth, throat, and vagina.
25. **Grapefruit seed** - Is severely irritating to the skin in its undiluted form.
26. **Hydroxypropyl methylcellulose** - Slightly hazardous in case of skin contact (irritant), of eye contact (irritant).
27. **Iceland moss** - There are rare cases of skin irritation caused by contact with Iceland Moss.
28. **Jojoba oil** - Jojoba oil may lead to contact dermatitis.
29. **Ketoconazole** - Infrequently, patients develop contact dermatitis while using Ketoconazole cream, a red, itchy rash and inflammation in the area of application.
30. **Lactic acid** - Prolonged skin contact may cause skin burns or ulceration.
31. **Lauramidopropyl betaine** - Prolonged or repeated contact may dry the skin.
32. **Lauric acid diethanolamine** - Some evidence of carcinogenic effects.
33. **Lauryl ether sulfates** - Can be irritating to the eyes and skin.
34. **Lauryl sulfates** - Sodium lauryl sulfate-induced irritant contact dermatitis in vulvar and forearm skin of premenopausal and postmenopausal women. Elsner P, Wilhelm D
35. **Lavender** - Lavender applied to skin may cause irritation in some people.
36. **Lemongrass** - May cause sensitisation by skin contact.
37. **Matricaria** - Some people react allergic by contact with Chamomile.
38. **Methylchloroisothiazolinone** - Methylchloroisothiazolinone causes allergic reactions in some people.
39. **Methylisothiazolinone** - Prolonged or widespread skin contact may result in allergic skin reactions.
40. **Mushroom** - Allergic contact dermatitis from mushrooms has only seldom been reported.
41. **Myristic acid** - Mild, primary skin irritation with prolonged or repeated contact.
42. **N-alkyltaurines** - Skin rash in sensitive individuals.
43. **Oleyl alcohol** - Causes skin irritation.
44. **Orange flower** - No known side effect.
45. **Panthenol** - Prolonged skin contact may cause irritation with local redness.
46. **Parabens** - The parabens are preservatives that may irritate your skin and can cause allergic reactions.
47. **Parsley** - Parsley contains furocoumarins-compounds that can cause photosensitivity in fair-skinned persons exposed to sunlight after "intensive skin contact".
48. **Peppermint** - Drugs.com states that peppermint oil can cause allergic reactions that cause the skin to flush, headaches and contact dermatitis.
49. **Piroctone olamine** - Irritation tests indicated that PO was slightly irritating to the skin.
50. **Polyacrylic acids** - Contact can severely irritate and burn the skin and eyes.
51. **Polyquaternium-10** - Irritating to eyes, respiratory system and skin.
52. **Polyquaternium-7** - A study was published in Contact Dermatitis in 2001 about cases of ... From Lauareth-9 and Polyquaternium 7 in a skin-care product.
53. **Propylene glycol** - Propylene glycol may produce eczematous skin.
54. **Retinyl palmitate** - Some common side effects of Retinyl Palmitate are increased sensitivity to the sun, reddening of the skin, and dry skin but not everyone will experience these.
55. **Riboflavin** - Slightly hazardous in case of skin contact (irritant).
56. **Rosemary** - Slightly hazardous in case of skin contact (permeator).
57. **Shea butter** - There are individuals who may have a skin reaction when in contact with shea nuts.
58. **Soapwort** - Caution should also be taken as this can cause skin irritation in some people.
59. **Sodium 3-dodecylaminopropane sulfonate** - Irritating to eyes, respiratory system and skin.
60. **Sodium 3-dodecylaminopropionate** - Contact Dermatitis.
61. **Sodium alkyl amphotacettes** - There may be mild irritation at the site of contact.
62. **Sodium chloride** - Sodium chloride may cause skin irritation.
63. **Sodium sulfate** - Sodium sulfate is considered non-irritating after prolonged skin contact and slightly irritating in contact with the eye.
64. **Stearyl stearate** - May cause local skin reactions (e.g. Contact dermatitis).
65. **Tocopheryl acetate** - Alpha Tocopherol may result in an allergic contact dermatitis.
66. **Tricetyl methyl ammonium chloride** - Skin contact with these colorants can lead to unwanted reactions.
67. **Triethanolamine** - Contact causes severe irritation, burns, redness, and pain.
68. **Trimethyl alkyl ammonium chloride** - Irritating to skin and causes serious eye damage.
69. **Volatile silicones** - Repeated or excessive contact can cause moderate irritation, de-fattning etc.
70. **Watercress** - Watercress may cause hives, rash, itching or swollen skin.
71. **Xantha gum** - Exposure to Xanthan Gum may cause skin irritation if contact is prolonged.
72. **Yucca** - Has been known to cause skin irritation and even allergic reactions upon contact.
73. **Zinc pyrithione** - Prolonged or repeated skin contact may cause allergic dermatitis or photosensitivity dermatitis.

**Homoeopathy and Shampoo**

**Chief remedies for hair disorders**-

**Repertorial sequence of Hair disorder remedies**-
Sulph, Phos, Lyc, Nat-m, Sil, Bell, Carb-v, Puls, Ars, Sep, Graph, Psor, Nit-ac, Hep, Calc, Ph-ac, Zinc, Thus t, Tub, Mez, Fl-ac, Borx, Thuj, Bry, Bar-c, Kali-n, Lach, Merc, Dulg, Petr etc.

**Further readings**
- RADAR 10
- CHEMICAL COMPOSITION OF EVERYDAY PRODUCTS by John Toedt, Darrell Koza, and Kathleen Van Cleef-Toedt
- Wikipedia.com
- Chemadvisor.com
- Cosmeticdatabase.com
Reperatory of Hair disorders

EYE - HAIR - Eyelashes - complaints of- alum. borx. graph. sel. stagn-i.  
EYE - HAIR - Eyelashes - fine; are- calc-p. phos. TUB.  
EYE - HAIR - Eyelashes - long; are - curved; and- phos.  
EYE - HAIR - Eyelashes - long; are- calc-p. carb-c. gaert. phos. syc. tub.  
EYE - HAIR - Eyelashes - stiff, pointing to nose- nit-ac.  
EYE - HAIR - ingrowing eyelashes - Lids; upper- Puls.  
EYE - HAIR - ingrowing eyelashes- bell. borx. graph. merc. nat-m. Puls. sil.  
HEAD - ERUPTIONS - crusts, scabs - destroying hair- Dulc.  
HEAD - ERUPTIONS - crusts, scabs - white - thick - chalk; hair like deposits of- calc.  
HEAD - ERUPTIONS - destroying hair- ars. bell. dulc. lyc. med. merc. mez. rhus-t. sabad.  
HEAD - ERUPTIONS - eczema - Margin of hair - Ear to ear posteriorly; from- hydr. kali-sil. mez. morg-p. Nat-m. nit-ac. onld. petr. SULPH.  
HEAD - ERUPTIONS - eczema - Margin of hair- kali-sil. nat-sil.  
HEAD - ERUPTIONS - impetigo - Margin of the hair- Nat-m.  
HEAD - ERUPTIONS - moist - Margin of hair - left- galeoc-c-h.  
HEAD - ERUPTIONS - moist - Margin of hair - pustular- galeoc-c-h.  
HEAD - ERUPTIONS - pimples - inflamed - Scalp; hairy- sulph.  
HEAD - ERUPTIONS - pimples - Margin of hair in front- ambr. dulc. gink-b. nat-sil. nit-ac. symph.  
HEAD - ERUPTIONS - vesicles - Margins of hair- nat-m. nat-sil.  
HEAD - FULLNESS - Forehead - Eyes - Above - pulling hair amel.- lac-cp.  
HEAD - HAIR - baldness - gonorrhoea; after- kali-s.  
HEAD - HAIR - binding up hair - agg. - External head- bry.  
HEAD - HAIR - binding up hair - amel. - kali-n. sul-i.  
HEAD - HAIR - black - Roots; at- thal-xyz.  
HEAD - HAIR - bristling - chill; during- acon. am-c. am. BAR-C. canth. hep. laur. mag-m. meny. Puls. spong. verat. zinc.  
HEAD - HAIR - bristling - coming in from open air- am-c.  
HEAD - HAIR - bristling - dinner; during- sil.  
HEAD - HAIR - bristling - electrified; as if- rhod.  
HEAD - HAIR - bristling - painful part- sulph.  
HEAD - HAIR - bristling - seem- acon.  
HEAD - HAIR - bristling - sensation of - eating; while- sil.  
HEAD - HAIR - bristling - sensation of - Occiput- lachn.  
HEAD - HAIR - brittle - air; in open - amel.- psor.  
HEAD - HAIR - brittle - night- psor.
HEAD - HAIR - brittle - warm wet application - agg.- psor.
HEAD - HAIR - brown stripe - Edges; at- kali-p.
HEAD - HAIR - brushing hair agg. - External head- arn. PulS. Rhus-t. sil. vib.
HEAD – HAIR – coarse- sil.
HEAD - HAIR - cold agg.- sabad. sulph.
HEAD - HAIR - color changes- kali-i. sarr.
HEAD - HAIR - combed - cannot be- borx. thuj.
HEAD - HAIR - combed - uncombed - looks as if- med.
HEAD - HAIR - combed – uncombed- sulph.
HEAD - HAIR - combing - amel. - form. glon. tarent.
HEAD - HAIR - crowns; two- calc-p. puls.
HEAD - HAIR - curly, becomes- mez.
HEAD - HAIR - cutting hair; complaints of head after- bell. glon. led. phos. puls. sabad. sep.
HEAD - HAIR - darker, becomes- jab. pilo. wies. wildb.
HEAD - HAIR - dryness - Roots; at- phos.
HEAD - HAIR - electrical - combed; when- sanic.
HEAD – HAIR – electrical- med.
HEAD - HAIR - falling - accompanied by- itching- ant-c.
HEAD - HAIR - falling - changing color; after- kali-i.
HEAD - HAIR - falling - children; in- nat-m.
HEAD - HAIR - falling - combing the hair; when- canth. tritici-vg. vanil.
HEAD - HAIR - falling - disease - abdominal; after- lyc.
HEAD - HAIR - falling - disease - acute exhausting disease; following- carb-v. manc. Thal-met. thal.
HEAD - HAIR - falling - Ears; behind- Phos.
HEAD - HAIR - falling - fevers; after- fl-ac.
HEAD - HAIR - falling - grief; from- caust. graph. ign. lach. lyc. nat-m. Ph-ac. staph.
HEAD - HAIR - falling - hard brittle- graph.
HEAD - HAIR - falling - lactation; during- nat-m.
HEAD - HAIR - falling - night; in one- ph-ac.
HEAD - HAIR - falling - pain in head; with- ant-c. nit-ac. sil.
HEAD - HAIR - falling - pregnancy agg.; during- LACH.
HEAD - HAIR - falling - Sides – left- ars.
HEAD - HAIR - falling - spots, in - emotions; after suppressed- staph.
HEAD - HAIR - falling - spots, in - grief; after- ign. staph.
HEAD - HAIR - falling - spots, in - replaced by; and is - gray hair- vinc.
HEAD - HAIR - falling - spots, in - replaced by; and is - white hair- vinc.
HEAD - HAIR - falling - spots, in - replaced by; and is - wooly hair- vinc.
HEAD - HAIR - falling - typhoid fever – after- chlororam.
HEAD - HAIR - falling - typhoid fever – during- FL-AC.
HEAD - HAIR – fluffy- med. ph-ac.
HEAD - HAIR - gray; becoming - grief; after- ph-ac.
HEAD - HAIR - gray; becoming – prematurely- ambr. camph. emb-r. graph. Lyc. ph-ac. salv. sec. sul-ac. syph.
HEAD - HAIR - gray; becoming – right- Lyc.
HEAD - HAIR - gray; becoming - spots, in- krees. Lyc. psor.
HEAD - HAIR - growing fast- arg-s. gink-b. sacch. thuj.
HEAD - HAIR - hang down; letting hair - amel.- bell. bry. cina ferr. kali-m. kali-n. kali-p. phos.
HEAD - HAIR – hard- Sulph.
HEAD - HAIR - moving sensation- falco-pe. stann.
HEAD - HAIR - odors – offensive- bufo Lyc. staph. sulph. vinc. viol-t.
HEAD - HAIR - odors – sour- bufo
HEAD - HAIR - painful - falling of hair; with- ant-c.
HEAD - HAIR - painful - letting hair hang down - amel.- bell. cina dirc. ferr. phos.
HEAD - HAIR – painful - Roots- acon. chel. chin. coloc. sep.
HEAD - HAIR - painful - shivering; during- hep.

HEAD - HAIR - painfull- anh. ph-ac.

HEAD - HAIR - plica polonica- ant-t. bar-c. borx. carb-v. graph. lyc. merc. nat-m. phos. psor. sars. sil. sulph. tub. ust. VERAT. Vinc. viol. viol-t.


HEAD - HAIR - pulled out, sensation- Acon. aeth. alum. Arg-n. canth. chin. iod. kali-n. lach. lyc. mag-c. rhus-t. sel.

HEAD - HAIR - pulls the- ars. BELL. CUPR. lil-t. med. mez. tarent. tub.

HEAD - HAIR - sandy- sil.

HEAD - HAIR - soft- borx. phos.

HEAD - HAIR - splitting- borx. thuji. ZINC.

HEAD - HAIR - stand-up spots on hair of scalp- agar.

HEAD - HAIR - sticks together - combing difficult- psor.

HEAD - HAIR - sticks together - ends at- Borx.

HEAD - HAIR - sticks together - hairdressing difficult- psor.

HEAD - HAIR - sticks together - washing; after- hydrog.


HEAD - HAIR - stiff- ars. canth. iod. sel.

HEAD - HAIR - stroking hair back - agg.- Puls. rhus-t.


HEAD - HAIR - thin- psor. sil. tarent. tub. vanil.

HEAD - HAIR - white - patch- psor.

HEAD - HAIR - white- apis bell. ph-ac.

HEAD - HAIR - withered- ph-ac.

HEAD - HAIR - yellow - Edges- med.


HEAD - HEAVINESS - accompanied by - Hair being pulled; sensation of the- allox.

HEAD - PAIN - accompanied by - Hair; falling of- ant-c. hep. nit-ac. sep. sil. syph. thuji.


HEAD - PAIN - combing hair - amel.- form. glon. plut-n. tarent. vanil.

HEAD - PAIN - combing hair - backward agg.- kola puls. rhus-t.


HEAD - PAIN - Forehead - junction with hairy scalp- stroph-h.

HEAD - PAIN - Forehead - Margin of hair- spong. stroph-h.

HEAD - PAIN - hair must hang down -- sore- bry.

HEAD - PAIN - Margin of hair - pressing pain - band; as from a- ozone

HEAD - PAIN - Occiput - binding up hair - amel.- kali-n.

HEAD - PAIN - Occiput - pulled; sensation as if hair were- arn. cocc. kali-n. kali-p. laur. Nux-v.
HEAD - PAIN - Occiput - unbinding hair - amel.- kali-n.
HEAD - PAIN - pulled; sensation as if hair were – out- arn. ars. bell. caps. prun. Sulph.
HEAD - PAIN - pulling hair - amel.- lac-cp.
HEAD - PAIN - Sides - combing hair agg.- merc-i-f. nat-sil.
HEAD - PAIN - Sides - pulled; sensation as if hair were- phos.
HEAD - PAIN - Temples - pulled; sensation as if hair were- bry.
HEAD - PAIN - Temples - touch - hair agg.; touching the - pressing pain- agar.
HEAD - PAIN - touch - hair agg.; touching the- agar. carb-v. dulc.
HEAD - PAIN - Vertex - pulled; sensation as if hair were- Acon. alum. bell. coloc. eupi. ferr. indg. kali-n. lachn. lyc. Mag-c. Mag-m. mag-s. mur-ac. phos. spong. Sulph.
HEAD - PAIN - Vertex - touch - hair agg.; phos. - pressing pain- Carb-v. kreos.
HEAD - PAIN - Vertex - touch - hair agg.; touching the- Carb-v. nit-ac.
HEAD - PRICKLING - Hair; under- melal-alt.
HEAD - SENSITIVENESS - brushing of hair; to - children; in- cina
HEAD - STIFFNESS, sensation of - hair feels stiff- sarr.
HEAD - TOUCH - hair agg.; touching the- agar. ambr. carb-v. carb-n-s. chin. ferr. kreos. Puls. rhus-t.