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## Assessment of Marketed Shampoo Preparations

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### ABSTRACT

The shampoo is a hair care product, having a thick, viscous fluid like consistency that is utilized for cleaning hair. Shampoos (different diverse brand shampoos were acquired from nearby market), i.e To assess the details, quality control tests including visual evaluation and physicochemical controls, for example, pH, thickness and many others were performed. The shampoos are evaluated for various tests like PH determination, solid content, rheological behaviour, dirt dispersion etc. obtained results are compared with national results i.e. reference. It was seen that numerous qualities of these shampoos were in the standard range, some were out of range for some shampoo standard but it is acceptable. Therefore, plainly, all tried shampoos can be alternatives for one another since they had undistinguishable outcomes for the different test.

## INTRODUCTION

The shampoo is a hair care product, having a thick, viscous fluid like consistency that is utilized for cleaning hair. The shampoo is utilized by applying it to wet hair, kneading the item into the hair, and afterward washing it out. A few clients may pursue a shampooing with the utilization of hair conditioner. The reason for utilizing cleanser is to expel the undesirable develop of sebum in the hair without stripping out to such an extent as to make hair unmanageable. The cleanser is commonly made by consolidating a surfactant, frequently sodium lauryl sulfate with a co-surfactant.

Shampoos are accessible for individuals with dandruff, shading treated hair, gluten or wheat hypersensitivities, an enthusiasm for utilizing a natural item, and babies and youthful youngsters ("infant cleanser" is less bothering). There are additionally shampoos expected for creatures that may contain bug sprays or different prescriptions to treat skin conditions or parasite pervasions, for example, insects.

Shampoos have different use not only it cleans the scalp but also prevent the hair that damage. Commercial shampoo contains various ingredients like (1) Cleansing agents; (2) additives that contribute to the stability and comfort of the product; (3) conditioning agents, intended to impart softness and gloss, to reduce flyaway and to enhance disentangling facility, and (4) special care ingredients, designated to treat specific problems.

This study aimed to evaluate various brands of shampoo present in the local market of Maharashtra India based on scientifically proven quality control tests like ph, viscosity also with their physicochemical properties. Specific tests like solid content, dirt dispersion are also performed to check individual characteristics of shampoo.

Shampoos are blends of numerous synthetic chemicals and water.

Cleaning agents: the prime fixings in all shampoos are substances called surfactants. In the case of cleaning activity and lathering properties, they determine the hairs condition after shampooing. Cleaning Agent depending on their capacities are utilized as cleaning specialists for corrective purposes, antidandruff operators, antiseborrheic operators, and keratolytic operators.

As for cleaning agent: these shampoos ought to be gentle, compelling, without causing aggravation and ought to be utilized day by day or on substitute days as required. They expel residue and overabundance oil from the hair.

As antidandruff agent: these treat dandruff because of parasites like pityriasis versicolor. Quickly diminishes scaling and pruritus which are related to contagious contaminations.

As anti seborrhoeic operators: they have a cytostatic impact on cells of the epidermis and follicular epithelium, accordingly lessening coenocyte creation.

As kareolytic operators: they expel balm, glues, which are utilized in the treatment of psoriasis. They likewise expel hard scales from the scalp.

PH agent: In solid hair, the skin of cuticle comprises of translucent cells covering like shingles on a rooftop. In harmed hair, these shingles are increasingly open and ragged. As the harsh adjoining hairs rub against one another, the exchange of electrons can create a static electrical charge. The outcome is the feared burden of flyaway hair. Ideally, a cleanser should smooth down the cuticle skin and cover it with a perfect covering of a sebum-like material. The smoothing impact is promptly accomplished by controlling the cleanser's acidity. All shampoos, regardless of whether they make the case or not, are pH balanced. The correct pH extend is kept up by the expansion of buffering operators,

Fragrance: Fragrance oils are included with the goal that hair is left smelling new and fresh, which pulls in purchasers.

## **MATERIALS AND METHODS:**

Shampoos (different diverse brand shampoos were acquired from the nearby market), i.e to assess the details, quality control tests including visual evaluation and physicochemical controls, for example, pH, thickness and many others were performed.

### **Physical Appearance/Visual Inspection:**

The details condition arranged were assessed as far as their color, odor, clearness, foaming capacity and smoothness.

### **Determination of pH**

The pH levels of different shampoo brands with concentration 1% and 10% are determined using pH meter at room temperature. i.e.  $25 \pm 2$  °C, most of the shampoo shows slight acidic or neutral nature. pH of shampoo determined by using pH meter (equiptronics model no EQ614A) and by using pH paper. At the point when alkali ingredients are added to the hair, it has an impact that Rather than the closing of the cuticle skin, they open up the cuticle skin, which can make the hair look dull and feel somewhat harsh. While adding the ingredient with acidic nature causes the closing of cuticle and having a shrinking effect.

### **Dirt dispersion**

(1%) the arrangement of each shampoo (1 g of sample in 100 mL of water) was taken and one drop of India ink was added; the test tube was stoppered and shaken multiple times. The amount of ink in the froth was assessed as none, light, moderate, or substantial. Shampoos that reason the ink to pack in the foam are thought about low quality.

### **Viscosity Measurement:**

The viscosity of 10% shampoo solution was measured by using a Brookfield viscometer. The consistency of the shampoo is the thickness or stickiness of a fluid. The viscosity of a cleanser or shampoo is connected at any rate to a limited extent to the measure of solids that are present. Thickness assumes a vital job in defining various properties of shampoo.

### **Foaming ability and stability**

The cylinder shake method is used for determining foaming capacity. At room temperature, 1% of 50 mL of the shampoo solution was put into a 100-mL graduated cylinder, which was then covered by a hand and shaken ten times. The total volume of the foam content after 1.0 min of shaking was recorded. The height of the foam generated was measured. To evaluate foam stability, the same procedure was performed and the foam volume from 1 to 9 min was measured.

### **Determination of Solid Contents**

Solid content is determined by taking 4g of shampoo in evaporating dish and placing it on a hot plate until the whole liquid portion get evaporated and remaining part indicating a solid

portion of the formulation. The initially empty weight of evaporating dish is noted. Then the weight of the evaporating dish along with shampoo is noted. In addition, at the end, the exact weight of the shampoo was calculated.

### Surface tension –

The surface tension of shampoo is determined to check the amount of surfactant, which indicates the property of the agent to reduce interfacial tension. Surface tension indicates detergency of shampoo. Less the surface tension more will be the cleansing activity of shampoo. The given samples of shampoo show surface tension range.

The formula for calculating surface tension

$$R_2 = \frac{(w_3 - w_2) n_1}{R_1 (W_2 - w_2) n_2}$$

Where W1 is the weight of empty beaker.

W2 is the weight of beaker with distilled water.

W3 is Weight of beaker with shampoo solution.

n1 is no. of drops of distilled water.

n2 is no. of drops of shampoo solution.

R1 is surface tension of distilled water at room

Temperature.

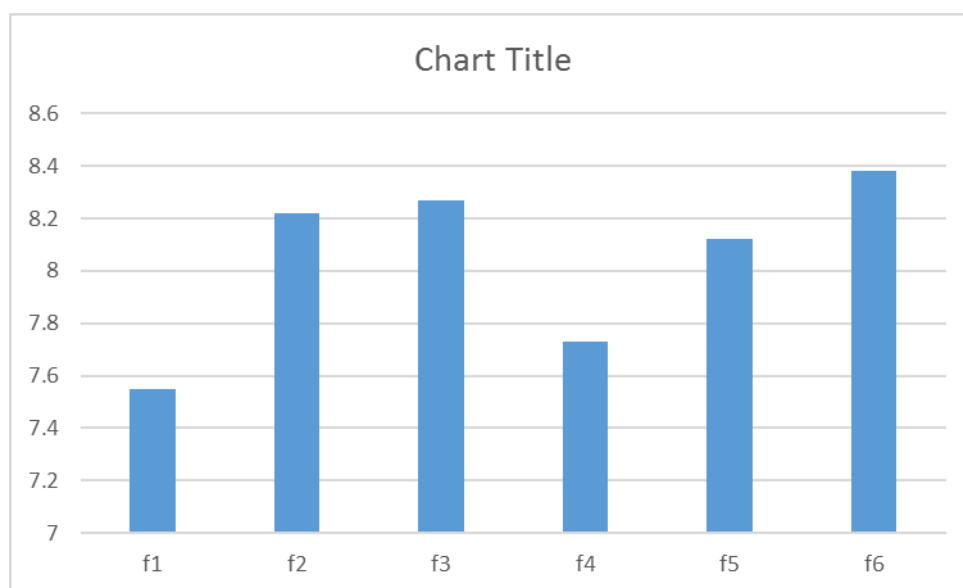
R2 is the surface tension of the shampoo solution

### RESULTS

Shampoo name	Reference code
Loreal Paris	F1
Head and shoulder	F2
Sunsilk	F3
Pentene	F4
Dove	F5
Clinic plus	F6

**Physical appearance and pH**

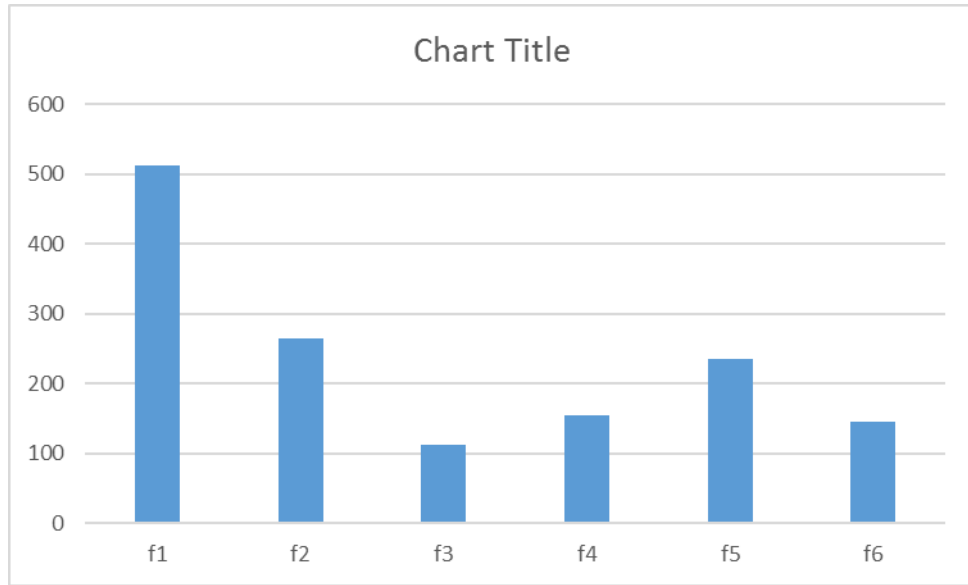
Shampoo name	Appearance	pH
F1	White shiny	7.55±0.20
F2	Shiny	8.22±0.42
F3	White	8.27±0.30
F4	Black shiny	7.73±0.52
F5	White transparent	8.12±0.56
F6	Blue opaque	8.38±0.71



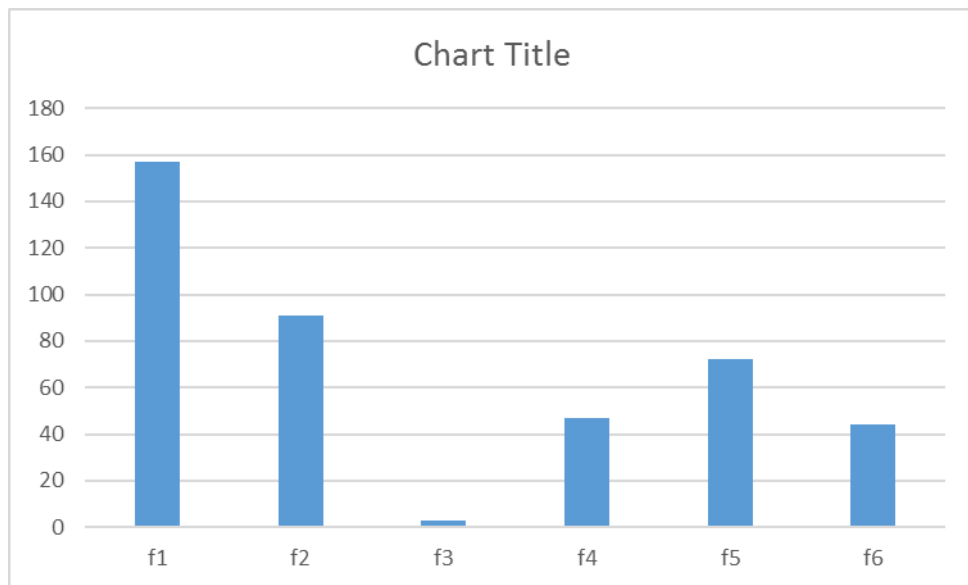
**Fig no. 1 pH of various shampoos at room temperature**

**Rheological behaviour**

Shampoo name	Viscosity in Eta	Viscosity in tau
Loreal Paris	511	157.579
Head and shoulder	265	91.579
sunsilk	111.775	34.59
pentane	155.165	47.696
Dove	234.49	72.081
Clinic plus	144.551	44.433



**Fig.2 – Viscosity in Eta at room temperature**



**Fig 3 – Viscosity in Tau at room temperature**

**Foaming test**

Shampoo name	1 min	3 min	5min	7 min	9 min
F1	40	28	24	16	10
F2	75	69	61	57	50
F3	40	36	35	35	32
F4	41	35	30	30	28
F5	46	46	42	30	25
F6	58	56	51	40	36

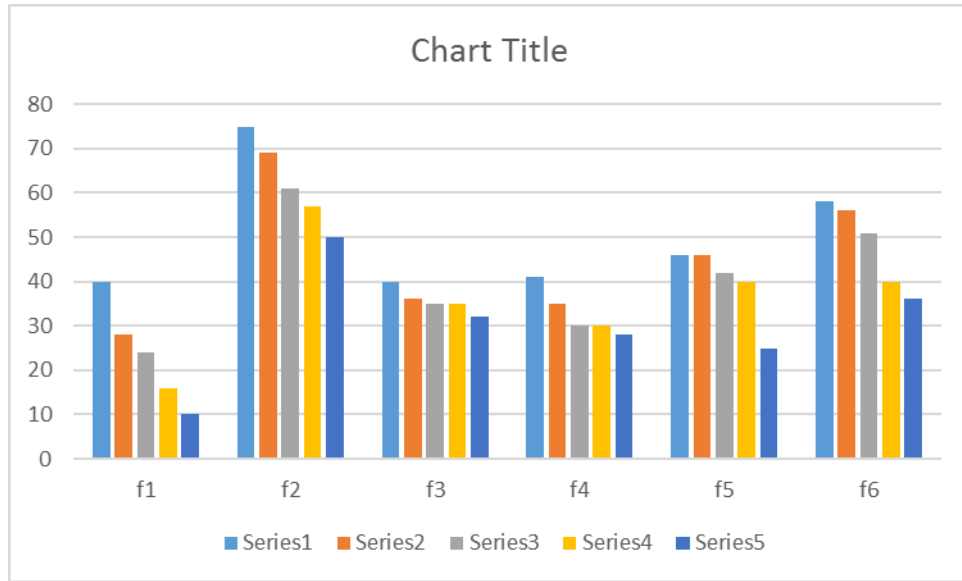


Fig.4 – Foam retention of shampoo in time range 1 min to 9 min

Dirt dispersion-

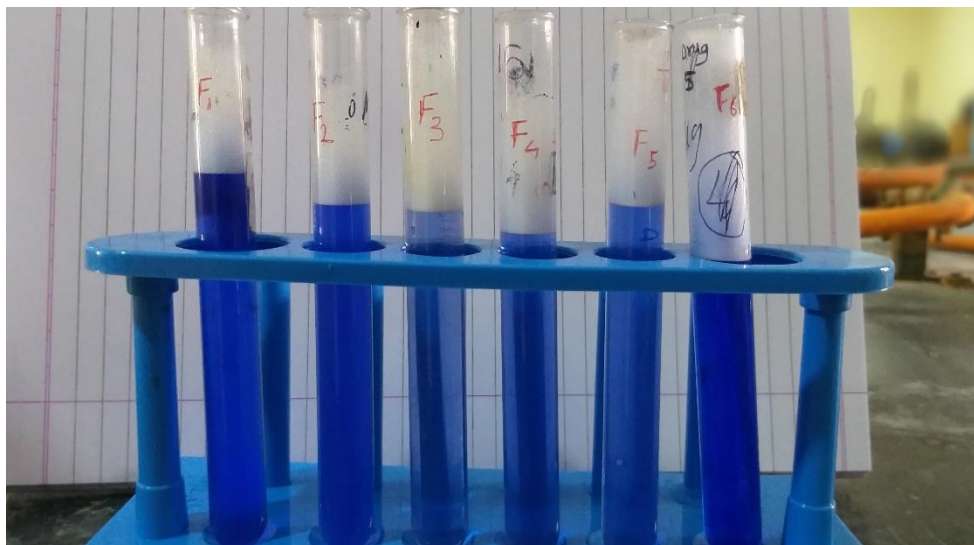


Fig. 5 - Dirt dispersion test



### Surface tension

Name of shampoo	Surface tension (at room temp.)
F1	37.23 ±0.25
F2	34.5 ±1.57
F3	35.2 ±0.80
F4	36.8 ±0.56
F5	31.2 ±0.80
F6	34.3 ±0.86

### Solid content

Shampoo name	Solid content
F1	24 ±0.57%
F2	20 ±0.51%
F3	16 ±1.070%
F4	13 ±0.550%
F5	15 ±0.37%
F6	21 ±0.65%

### DISCUSSION

The shampoos are evaluated for various tests like pH determination, solid content, rheological behaviour, dirt dispersion etc. obtained results are compared with national results i.e. reference. Various tests are performed to check the effectiveness of shampoo, hair cuticles play important role in hair physiology with acidic pH it causes the closing of cuticle having shrinkage effect alkali nature of shampoo causes opening of cuticle having the effect of dullness. Solid content is another test, which used to determine the residue of shampoo less the solid content more efficient would shampoo. The viscosity of shampoo indicates the spreading capacity and product consistency. All brands of shampoo show viscosity from range 157 to 44 tau. Shampoo brands show good dirt dispersion test as no ink will present in foam. It is difficult to figure out which shampoo is the best amongst those tried in light of the fact that nobody proved superior to the others in all the performed tests. It is additionally difficult to rank the tests according to their significance, as each one has its unique nature. It was seen that numerous qualities of these shampoos were in the standard range, some were out of range for some shampoo standard but it is acceptable. Therefore, plainly, all tried

shampoos can be alternatives for one another since they had undistinguishable outcomes for the different test.

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