

Physiochemical Analysis of Different Soap and Shampoo Collected from the Different Local Market of District Karak, KP, Pakistan

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Abstract: The aim of this study was to investigate the content of pH, viscosity, conductivity, temperature, TDS (Total dissolved solid), TS (Total solute), color, odor, taste, effect on the human being. Sixteen samples were collected from different local markets in district Karak Pakistan. The results were analyzed that the pH of shampoo range from 7.04 to 7.64 and pH of soap range from 10.32 to 10.74, viscosity of shampoo range from 1.09 to 2.532 η and viscosity of soap range from 0.127 to 2.436 η . Conductivity of shampoo range from 117.9 to 340 μ and the conductivity of soap range from 101.9 to 248 μ . TS of shampoo range from 0.95 to 1.85 and in soap range from 0.8 to 2.55. TDS of shampoo range from 0.09 to 0.24 and the TDS of soap range from 0.6 to 1.63. Temperature in shampoo range from 30 to 32.7°C and temperature of soap range from 29.1 to 32.2°C. Most of the soap and shampoo have different color, pleasant smell and bitter in taste.

Key words: Shampoo • Soap • Physiochemical Analysis

INTRODUCTION

Physiochemical analysis is a procedure of investigating physiochemical systems which made possible a determination of the nature interaction between the component of a system through the study of systems physical properties and composition. The principles of physiochemical analysis were established in the late 19th century by the analytical procedure received its development in the research of H. Lechaterlier, G. Tommann and his school. Physiochemical analysis contains the measurement of different physical properties (Thermal conductivity) and optical properties. They were fined the density, viscosity and hardness also they depend on the rate of transformation occurring in a system composition [1]. Physiochemical analysis of various shampoo, shows that all shampoo, are best for your hairs. All sample of shampoo panel tastes of the same sample have given the hairs wash with good result. The shampoo and soap are clean the hair from oil, which was applied prior to the application of shampoo and soap. The test result can show that shampoo and soap have

chemical like SLS and SLES, or any other surfactant ingredient, which are not good quantity, which can be very toxic for the hair and skin. Result of Pentene, head shoulder, sun silk and Dove are on the top. All the sample of shampoo and soap has no harmful elements. Modern shampoo and soap using different chemicals and fragrances which can make the ability to clean the hair [2]. Normally human healthy skin has (PH) ranging from 5.4-5.9 and a normal bacterial flora. Soap and shampoo have high pH are used to causes an increase in skin pH. Soap and shampoo are used for cleaning purpose which are usually made by reacting alkali i.e. (Sodium hydroxide) with naturally occurring fat and fatty acids [3, 4]. Taste of some soap and shampoo is a salt of fatty acid. House hold uses for soaps include washing, bathing and other types of housekeeping, where soaps act as surfactants. In industry they are also used in textile. Viscosity is a liquids resistance to flow. When the intermolecular forces of attraction are strong with in a liquid there is a larger viscosity. So some sample of soap and shampoo have high viscosity in our analyzed data, it means that their intermolecular forces of attraction are strong [5, 6]. Aim of

the current study was to check the Physiochemical parameters of different Soap and Shampoo collected from the different Local Market of District Karak, KP, Pakistan.

MATERIALS AND METHODS

Samples of soap and shampoo were collected from the different local markets in district karak in from Jan to Jun 2017, in order to analyze it for different physiochemical parameter.

Determination of pH: Reading of pH was taken by using the pH meter (model-5603 Jenway, temperature-26°C). The samples were coded before the analyzing of PH.

Procedure Used for Soap: Soap sample weighted 10mg mixed in 100ml distilled water without producing much lather. It was kept undisturbed for 24 hours for maximum dissolution of soap.

Procedure Used for Shampoo: Sample of shampoo of 10ml is taken in a glass beaker and then 100ml distilled water is mixed to form a solution. The solution is kept undisturbed for 30 minutes. Then the pH, conductivity, viscosity, temperature, TS, TDS, odor, taste color of each sample are measured.

Determination of Viscosity: Ostwald Viscometer was used to determine the viscosity of different shampoo and soap samples. Lower bulb of Viscometer was filled with sample and upper bulb was filled by pipette pillar up to the mark. Then the sample was flowing freely from upper bulb and at the same time, the rate was detected by stop watch. The process was made twice to find the accurate value of the rate of flow. Standard Distilled Water was used to calculate the relative viscosity of water sample. Total rate of flow of the sample was calculated by following method,

Rate of flow of time $T = \text{Sum of time taken} / \text{No. of Time} = T_1 + T_2 / 2$

Relative Viscosity $n_1 = d_1 t_1 / d_2 t_2$, n_2

$D_1 =$ density of sample, $d_2 =$ density of standard water, $n_1 =$ coefficient of viscosity of sample, $n_2 =$ viscosity of standard water.

$n_2 = 0.890$ at STP

Hence density of water for d_1 & $d_2 = \text{constant} = 1.0 \text{ g/cm}^3$.

Determination of TDS: Two beakers, 100ml volume were used to determine TDS and every sample of 10ml was taken number wise. Each sample was first filtered with filter paper Whatman No.42. The beaker was first weight by digital balance and then the filtered sample was poured into specific beaker and finely solvent of sample evaporated by using hotplate. In this way two types of weight were obtained as given below,

$W_1 =$ Weight of empty, clean beaker.

$W_2 =$ Weight of dissolved Solute in Sample.

Total dissolved solute is calculated by following method

$$\text{TDS} = W_2 - W_1$$

Hence two beakers are used so their weight in gram is

Weight of Beaker (a) is $W_1 = 101.23 \text{ g}$

Weight of Beaker (b) is $W_2 = 110.60 \text{ g}$

Each sample used $V = 10 \text{ ml}$.

Determination of Total Solid (TS): About 10 ml of different samples of soap and shampoo which collected from different local shop in distract Karak were placed in 100ml clean and dry beaker and weight it, then the samples were evaporated with the help of hot plate until the solute in sample left behind. The beaker was then weighted; two values were calculated for each sample after the process. These values are given below [7].

$W_1 =$ Weight of Beaker

$W_2 =$ Weight of solute sample

Total solute (TS) value was calculated by following method

$$\text{TS} = W_2 - W_1$$

Weight of 100ml beaker $W_1 = 150.10 \text{ g}$

Each sample were used $V = 10 \text{ ml}$.

Electrical Conductivity: Electrical conductivity of the assembled shampoo & soap samples was measured under the laboratory conditions using JENWAY portable Conductivity meter model No.4520. The shampoo and soap samples temperature was determined with the help of mercury in glass thermometer (0-110°C), graduated with 0.1°C interims. The odor and taste were physically observed with nose and tongue.

Table 1: Physiochemical parameters of Soap & Shampoo collected from district Karak.

Sample	Viscosity	pH	Conductivity	Temperature	TS	TDS	Odor	Taste	Color
Life buay Shampoo	2.532 η	7.25	180.0 κ	30°C	1.11	0.14	Pleasant	Bitter	Green
Clear Shampoo	1.350 η	7.27	162.8 κ	32°C	1.9	0.1	Pleasant	Bitter	White
Sunsilk Shampoo	1.078 η	7.22	149.8 κ	32.7°C	1.2	0.15	Light Pleasant	Bitter	Black
Dove Shampoo	1.110 η	7.04	182.8 κ	31.4°C	1.8	0.15	Slightly Pleasant	Salty Bitter	White
Onic Shampoo	0.934 η	7.41	340.0 κ	31.5°C	1.85	0.09	Odorless	Slightly Bitter	Brown
Selsun Shampoo	1.090 η	6.61	117.9 κ	31.3°C	1.1	0.13	Light Pleasant	Bed Taste	Blue
Head Shoulder Shampoo	0.962 η	7.64	190.6 κ	31.1°C	0.95	0.24	Light Pleasant	Mint Fresh	White
Pantene Shampoo	0.949 η	7.50	186.6 κ	32.5°C	1.55	0.11	Light Pleasant	Bitter	White
Life buay Soap	0.158 η	10.66	183.4 κ	30°C	1.25	0.75	Pleasant	Salty	Red
Lux Soap	0.127 η	10.34	110.5 κ	31.7°C	1.7	0.21	White Rose	Bitter Salty	White
Silk Soap	0.159 η	10.65	248.0 κ	29.1°C	2.55	0.63	Pleasant	Salty	Blue
Safeguard Soap	0.236 η	10.36	150.0 κ	31°C	1.2	0.6	Pleasant	Salty	Cream
Dettol Soap	2.436 η	10.68	174.2 κ	30.5°C	1.2	0.76	Dettol Like	Mint Fresh	Yellow
Dove Soap	0.156 η	10.32	199.9 κ	30.9°C	0.8	0.42	Pleasant	Salty	White
Luv Soap	0.151 η	10.59	146.6 κ	32.2°C	1.15	0.62	Red Rose	Bitter Salty	Pink
Imperial Soap	0.230 η	10.74	101.9 κ	31.2°C	1.15	0.45	Light Pleasant	Salty	Cream

RESULTS AND DISCUSSION

The results of our study contain that the pH of the skin was about same to that of the pH of soap and shampoo. Upon reviewing these products have mentioned their pH and the finding of our study was consistent in the pH claimed by them. But in our study, most of the sample of soap had a pH ranges between 10.32 and 10.74, while the pH of the shampoo ranging between 6.61 and 7.64. With our analyzed data the pH of the soap were higher as compared to the pH of the skin. While the pH of the shampoo is about same to the pH of the skin. High pH causes dehydrated effects for skin. The temperature of the soap and shampoo are different, the temperature of the soap ranging between 29.1-32.2°C through thermometer. While the temperature of the shampoo ranging between 31.1-32.7°C. The high temperature soap and shampoo are used in different product that are used in cleaning agents, i.e. clothes, hands, dishes, pretty, or car are everything that needs cleaning. Conductivity also the effects on soap and shampoo, more conducted soap and shampoo were used for people with dandruff, color treated hair. From the tabulated data, it could be noticed that the conductivity of soap ranging between 101.9-248 κ , while the conductivity of shampoo ranging between 117.9-340 κ . Viscosity have an important role in the explaining and controlling many attributes shelf life stability and product aesthetics such as clarity, ease of flow on removal from packing and spreading on apply to hair. Soap and shampoo should effectively and completely remove the dust, excessive sebum. More viscosity of soap and shampoo should produce a good amount of foam. The viscosity of soap ranging between 0.151-0.436 η , while in shampoo ranging between 0.934-2.532 η . TS in shampoo

and soap are an OTC product which can affect the thickening of the hair and hair loss. It can also make healthy hair with the ingredients of biotin, dexpanthenol, nicotinic acid. The analyzed data of TS in soap are 0.8-2.55, while the TS in shampoo are 0.95-1.55. The analyzed data of TDS in soap ranging between 0.6-1.76. While the TDS in shampoo ranging between 0.1-0.24.

CONCLUSION

From the above discussion, it is clear that the pH, conductivity, temperature, TS and TDS of soap and shampoo are high from the normal skin level. They can affect the hair and skin and also causes different diseases.

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