



**PHYSIO-CHEMICAL EVALUATION OF TWO MAJOR MARKETED HANDWASH BRANDS A COMPARATIVE STUDY**

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**ABSTRACT**

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Hand liquid soap is formulated to wash and clean hands. Liquid hand soap is the best-selling and most widely used in detergent products groups. Liquid hand soaps may contain anionic surfactant, cocamide dea surfactant, coco betaine as amphoteric surfactant, opaque agent as making opaque, dye, fragrance, glycerine for prevention of hand from outside conditions and etc. In addition, antibacterial agents are used for making antibacterial hand liquid. Objective of this work is to perform the comparative study of two major brands of liquid hand wash which are available in local market and evaluate physical and chemical parameters. Different methodologies have been used for this work. We evaluate pH values, dirt disparity, wetting property, foaming index, total solid content and their smell.

**INTRODUCTION**

Hand washing is the process of cleaning hands for the purpose of removing dirt, soil, and microorganisms. Hand washing is considered as a cost-effective means of prevention of communicable diseases in various developed countries.[1] Hand washing is most important for hospital staff in a study it is found that most of the communicable diseases are transmitted through the health care workers because many of the hospital staff do not follow the step given by WHO for hand washing[8,9] Hand washing is most important for children and old age people also, as they are the most immune to infections caused from unwashed hands.[2] Many types of infections should start when hands come in contact with disease-causing bacteria. This may happen after the use of toilet, blowing your nose or coughing, handling garbage and touching other contaminated surfaces, while playing etc.[3]

Most bacterial/viral diseases such as pneumonia, diarrhea, tuberculosis, COVID 19, these are transmitted mainly through contaminated hands[7]. An estimated 1.7 million children's are died because of diarrhea and pneumonia every year. These deaths can be prevented by washing of hand with soap[4] In many developed country; Hand is washed with soap. In a study it is found that 54 countries in 2015 on average, 38.7% of households practiced hand washing with soap. [5] Washing of hands with soap after going to toilet or before eating, reduces the risk of affecting from diarrhea by more than 40%. Proper washing of hand helps to healthier growth of children by the awareness program which was organized in school. Washing of hand actually improve the school attendance by preventing the spreadable diseases, which means children are not staying at home because of illness. [6]

## **MATERIALS AND METHOD**

Firstly, we choose two different type of liquid Hand wash Brand which is available in the market such as Dettol and Lifebuoy. Then we did study of different Physical, Chemical and Rheological Parameters we study of selected samples by different methods of Calculating. All samples were analyzing Physical and chemical properties three times for all parameters.

**METHODS: -pH-** Firstly we prepare 1% of sample solution for determination of pH or hydrogen ion concentration. We make buffer solution of pH 4 and pH 7. Immerse the Electrode in the solution under examination and measure pH at the room temperature as for the standard solution. Record the pH of the solution used to standardize the meter and the Electrode. All the samples were tested for 3 times and average of all 3 readings was used as final readings.

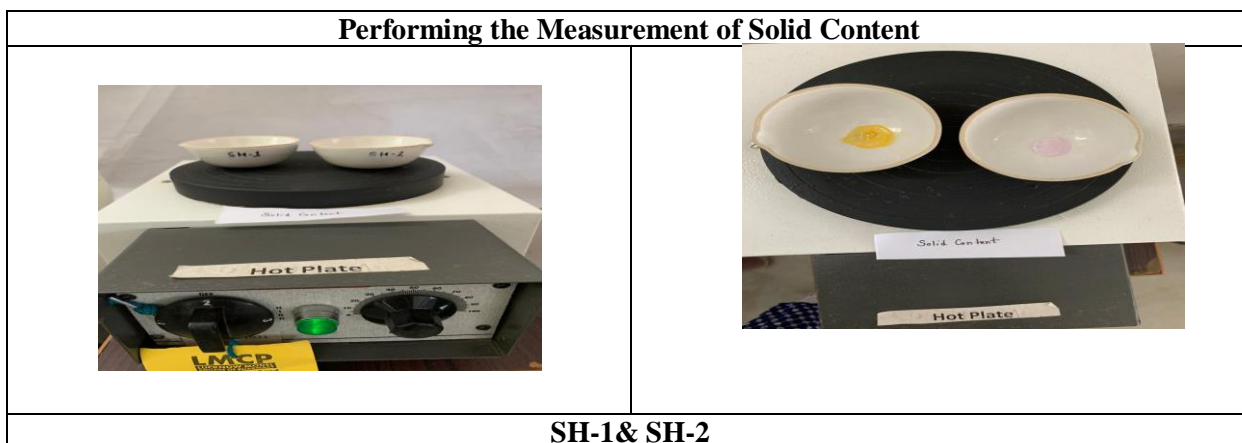
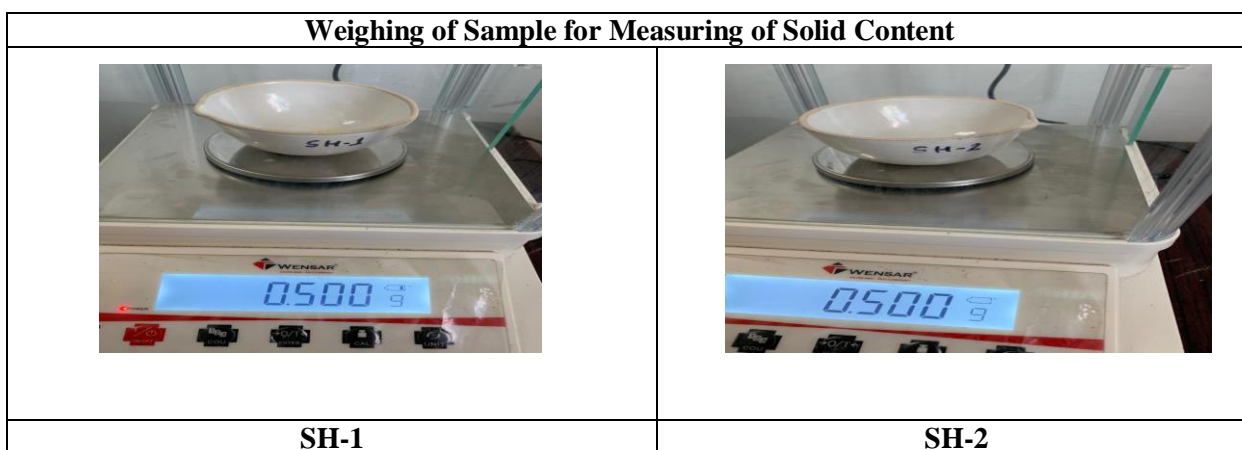
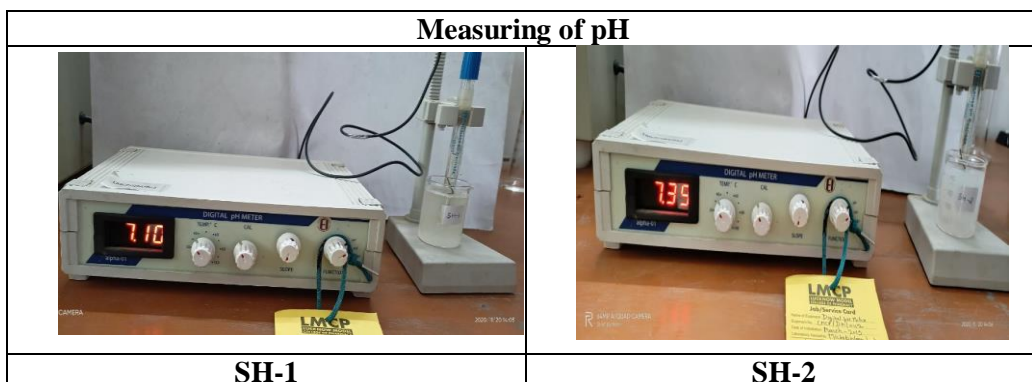
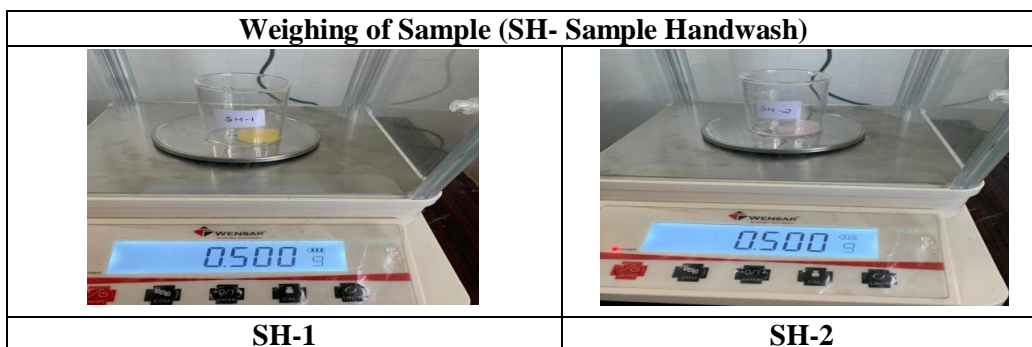
- 1- Foaming Ability-** For the determination of Foaming Ability we used Cylinder shake method. Firstly we prepare 1% of 50 ml dilute sample solution of Hand Wash and kept in a 100 ml of Stoppard measuring cylinder and Shake well 10 times. The Total volume of Foam Content after 1 minute of shaken was recorded the Height of the Foam generated was measured immediately. Then Evaluate the foam stability the procedure was performed and the foam volume after 10 min was measured.
- 2- Dirt Dispersion-** Firstly we prepare 1% sample solution of each sample (500 mg sample in 50 ml of water) were taken and 2 droop of ink was added. The measuring cylinder was Stoppard and shaken 10 times. Sample that because the ink to concentrate in the foam is considered poor quality. Then we identify in water portion the remaining particles of Dirt. The portion of ink in the foam of was observed.
- 3- Wetting Time-** For the determination of wetting time of the sample solution we take a Cotton cloth peace and cut into a 1

diameter disc shape and measure its weight. Then prepare dilute sample (1% solution) and cotton cloth piece placed on the sample. Then cloth disc was floated on the surface of 1 % sample solution and the stop watch was started. The time taken by the cloth disc to float to sink was recorded accurately and noted as the wetting time. The lower the time required for sinking, the greater the wetting Efficiency.

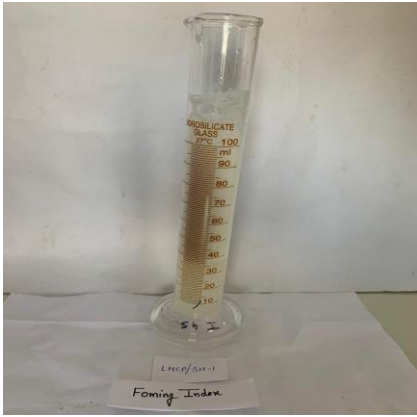
- 4- Total Solid Content-** Firstly we take known amount of sample into Evaporation disc then heat it into heating mental at 80degree centigrade temperature for 35 minutes. After that we collect the sample again and find the solid content value
- 5- Smell-** We Determined smell by using two procedures one is by heating sample on Hot Plate. Second is by inhaling direct sample by 5 persons including male and female.

## **RESULT & DISCUSSION:**

- 1- pH-** pH is very Important parameters for the skin so the High pH means much damage. The pH is also the responsible for the quality of the handwash. The entire sample evaluated in current research found with suitable pH range 7 to 8.
- 2- Foaming Ability-**All hand wash samples have same foaming capacity. Researcher evaluated and found all the sample range between 2 to 3.
- 3- Dirt Dispersion-** if we found the concentrated ink in the sample the its clearly means the quality of cleaning is low. After evaluation of the dispersion the SH-1 is the best one and then the SH-2.
- 4- Wetting Time-** Wetting is also one of the important parameters for any hand wash and the result is SH-1 is 3.5 second & SH-2 is 18.2 second.
- 5- Total Solid Content-**The Result of total Solid content remain in the measurable and shown in the table.
- 6- Smell-**The smell of hand wash SH-1 is very strong and then the SH-2.



**Measuring of Foaming Index**

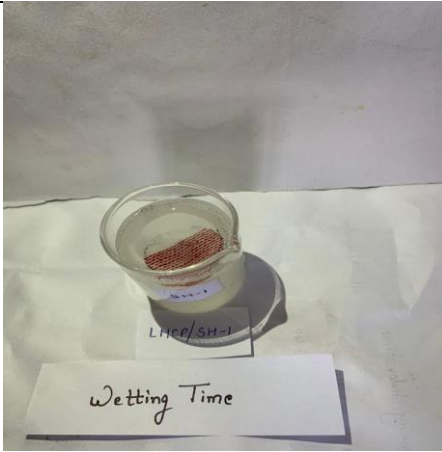


**SH-1**

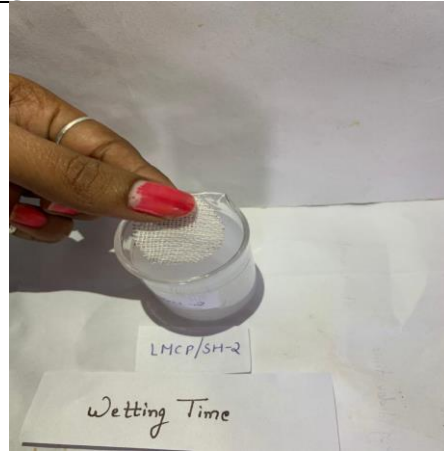


**SH-2**

**Measuring of Wetting Time**

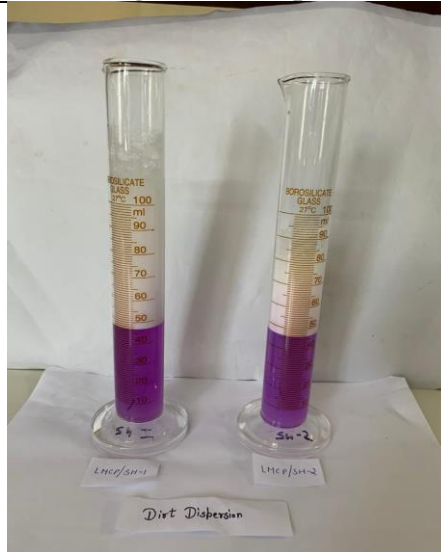


**SH-1**



**SH-2**

**Measuring of Dirt Dispersion**



**SH-1& SH-2**

**Table No 1: Evaluation marketed hand wash**

S.NO.	PARAMETERS	SAMPLE-1(SH-1)	SAMPLE-2 (SH-2)
1.	pH	7-8	7-8
2	Solid Content (%)	0.78	0.64
3	Foaming Index (cm)	2.8	2.3
4	Wetting Time (Sec)	3.5	18.2
5	Dirt Dispersion	Better	Best
6	Smell	Very Strong	Strong

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