Developing Biodegradable Liquid Soap Detergent Solution for Domestic and Industrial Applications

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ABSTRACT

Liquid soap solution is a versatile and widely used personal care product, offers a convenient and hygienic way to maintain cleanliness. This abstract summarizes the key aspects of liquid soap. This is soap in a liquid form. Generally liquid detergent are used with soft water. Where as in case of detergent powder cloths can be washed in hard as well as soft water. Liquid soap for Industrial use as well as house hold use can be manufactured by employing a very simple process. A typical formula for 1 kg of product is given below. This is called 25% liquid soap, since the acid slurry (active matter) used is 25% For lesser Concentration the quantity of acid slurry may be decreased correspondingly. The main aim of this project is to develop the liquid soap solution.

INTRODUCTION:

Liquid soap was invented in the nineteenth century; in 1865, William Sheppard patented a liquid version of soap. In 1898, B.J. Johnson developed a soap derived from palm and olive oils; his company, the B.J. Johnson Soap Company, introduced "Palmolive" brand soap that same year. This new brand of soap became popular rapidly, and to such a degree that B.J. Johnson Soap Company changed its name to Palmolive[1].

In the early 1900s, other companies began to develop their own liquid soaps. Such products as Pine-Sol and Tide appeared on the market, making the process of cleaning things other than skin, such as clothing, floors, and bathrooms, much easier. Liquid soap also works better for more traditional or non-machine washing methods, such as using a washboard[2].

MATERIALS AND METHODS:

Liquid soap with caustic soda: Sodium hydroxide, also called caustic soda or lye, is a traditional chemical for soap-making. While potassium hydroxide is more common in liquid soap-making, it is possible to produce liquid soaps using caustic soda.

One of the most commonly used chemicals in the soap industry, sodium hydroxide is a strong base with a broad range of potential applications. Sodium hydroxide is a water-soluble compound that comes in pellets, granules, flakes, or powders. Sodium hydroxide forms through the electrolysis of sodium chloride, and is a powerful alkali. When added to water, sodium hydroxide increases the pH of a substance, which makes it a valuable pH adjuster in acidic formulas.

An inorganic base, sodium hydroxide does not contain any carbon atoms, similar to water. When mixed with water, sodium hydroxide dissociates completely to just hydroxyl and sodium ions. The hydroxyl ions carry a negative charge, and the sodium ions have a positive one. This influx of ions leads to a strong exothermic reaction, which helps hydrolyze fats in the saponification process to form soaps.
Sodium hydroxide is a reagent, or a substance used in a chemical reaction to produce other substances. Caustic soda causes saponification and is an essential ingredient in soap-making. When flakes or beads of sodium hydroxide get added to a liquid, it forms a lye solution. This solution, when mixed with oils or fats, will lead to the chemical reaction called saponification.

Ingredients of 1ltr of Liquid soap solution:
Table 1: Ingredients of 1ltr of Liquid soap solution

Sl.No.	Ingerdients	Mass
1	Acid Sulurry(L.A.B)	25%
2	Water	20%
3	Caustic Soda	4%
4	Water	16%
5	Urea	10%
6	Water	20%

The slurry used for this is generally soft and is made from LAB manufactured indigenously by Indian Petro Chemical Corporation Boards. This is Biodegradable and does not produce foam in sewage.

SAMPLE PREPARATION:

- Detergent in a liquid form. Generally liquid detergent are used with soft water.
- Where as in case of detergent powder cloths can be washed in hard as well as soft water.
- Liquid soap for Industrial use as well as house hold use can be manufactured by employing a very simple process. A typical formula for 1 kg Of product is given below.
- This is called 25% liquid soap, since the acid slurry (active matter) used is 25% For lesser Concentration the quantity of acid slurry may be decreased correspondingly.
- The slurry used for this is generally soft and is made from LAB manufactured indigenously by Indian Petro ChemicalCorporation Boards.
- This is Biodegradable and does not produce foam in sewage.

Process of manufacturing liquid soap:

Step 1:

Add equal quantity of water to acid slurry and mixed well.

Step 2:

Prepare a solution of caustic soda by dissolving 40g of NaOH in 160ml of water.

Step 3:

Add caustic soda solution to the acid slurry. Water mixed till it is neutralized when a white colored mass would be obtained. Test with pH paper for the Neutrality. The pH should be 7.

Step 4:

Add urea to the above mixture.

Step 5:

Add the quantity of water to make a 1ltr or 1kg.

Step 6:

Add any perfume of color of your choice if required (0.1-1.25) packed it in suitable container.

RESULTS:

The ability of soaps and detergents to lower the surface tension of water, emulsify oil or grease, and hold it in suspension in water results in their cleansing action. The structure of soaps and detergents contributes to this ability. A sodium soap dissolves in water, forming soap anions and sodium cations. Soap molecules have on one end what's known as a polar salt, which is hydrophilic, or attracted to water

CONCLUSION:

Liquid Soap is the best way to clean your skin without stripping its natural oils, and it also has the added bonus of leaving behind a wonderful scent. Made from similar ingredients to a bar soap, liquid soap tends to create a richer lather, a factor many prefer and believe. Hence we recomend the liquid degtergent solution.

REFERENCES:

1. IUPAC, Compendium of Chemical Terminology, 2nd ed. (the "Gold Book") (1997).
2. "The history of soap making". The history of soap making.