

Saponification - lab report example

[Science](#), [Chemistry](#)



Saponification

Saponification Lab Report Background The Purpose of experiment is to produce potassium soap from saponification of fat. Saponification refers to the process of soap synthesis from fats. Saponification takes place when triglycerides which are present in fats react with bases such as potassium or sodium hydroxide. The end result is usually fatty acid salt or soap or Glycerol. Lipids that have fatty acid esters undergo hydrolysis reaction catalyzed by strong acid or base to yield products of saponification process. Saponification was popular in the early 20th century that saw the development of technology to increase the quality of soaps. Although soaps and detergents are surfactants they are different in that soaps are made from natural products while detergents are made from man-made product which may have some negative effect on the environment. Soaps work through a process called emulsification. This is where soap combines with non water soluble agents detaching them from the material. A micelle can be found in colloidal electrolyte solutions of soaps and detergents. It is formed from an aggregate of molecules resulting in charged particles (Herz 136).

Fig 1. Polarity differences that occur in soap molecules during micelle formation

Procedure

Equipment material

Burner 10% KOH

Test tube 95% ethyl alcohol

Beaker fat

Stop watch detergent and water

1. 5 g of solid fat was placed into a large test tube.
2. 10mL of 10% solution of 95% of ethyl alcohol was added to the test tube
3. The large test tube was placed in a 250mL beaker half full of boiling water.
4. Evaporated alcohol was replaced to maintain its level at a constant.
5. The reaction mixture was heated for fifteen minutes testing it with water to check for saponification.
6. The end product was placed in a 100mL beaker and alcohol evaporated from the solution.
7. 30mL of distilled water was added to the mixture and heated while stirring.
8. 1mL of the final product was tested for action against grease.
9. 0.5mL of detergent was mixed with distilled water and pH noted.
10. A mixture of water and soap each 1mL were tested for precipitates.

Results

Mass of fat= 1.5g

Time of experiment 7.49-8.06pm

pH of end product 9

pH of detergent in water 13

No precipitate formed from the mixture of water and potassium soap.

Formation of potassium soap is as a result of carboxylate anions and univalent cation to form a soap salt. A mixture of anions is due to the fatty acid residue present in the triglyceride molecule. No precipitate is formed with water because potassium soaps are highly soluble.

Conclusion

The experiment was a success as potassium soap which was the required product was achieved at the end of the experiment. The potassium soap was able to remove grease thus proving the efficiency of the product. Hard water contains minerals that easily react with soap to form a solid precipitate called scum, detergents do not react with the minerals in hard water thus the lack of scum while using detergents, this one demerit of using soap over detergent. Soap is cheap and does not damage the fabric compared to detergent. Detergents on the other hand are effective against tough stains compared to soaps (Herz 139).

Saponification mechanism

Work cited

Herz, W. Fortschritte Der Chemie Organischer Naturstoffe: Progress in the Chemistry of Organic Natural Products. Wien: Springer-Verlag, 1999. Print.