



Dr. BRR. GOVERNMENT COLLEGE,
JADCHERLA, MAHABUBNAGAR (Dist.)

Student Study Project

2021 -22

DEPARTMENT OF CHEMISTRY

Topic

Saponification-The Process of Making Soap

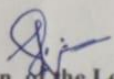
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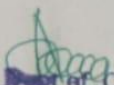
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Introduction

Soaps are the sodium salts or potassium salts of stearic acids or any other fatty acids. They are prepared by the saponification process, which is, reacting the oil which contain triglycerides with caustic soda (NaOH) to give the soap. However different oils have different composition of fatty acids which are responsible for different properties of soaps made out of them. In the present work 5 different types of oils are taken. They are blended in various ratios to prepare 14 different samples of soap. Different properties of these samples were analyzed to see which soap is the best one. The cleansing and lathering properties of all samples were compared. The blend of coconut oil and castor oil at 3:1 ratio is found out to be the best with 76.8% of TFM and 89.46% of yield. The best blend is analyzed for various properties and they were compared with that given in the literature. The saponification values, iodine values of coconut oil and castor oil were found out and these values were also found for the blend. It was found that the blend was having SAP value of 230.4 and iodine value of 40 which are higher than the individual values. Thus soap prepared using blend of both these oils has better properties than the soaps prepared by individual oils.

Materials required:

- Vegetable oil (castor oil, olive oil, coconut oil or palm oil)
- 20% sodium hydroxide solution
- Common salt
- Measuring cylinders
- Glass beaker (250 ml)

- Blue and red litmus papers
- Glass rod
- Bunsen burner
- Wire gauze
- Tripod stand
- Filter funnel
- Filter paper
- Spatula
- Knife

Lab Procedure:

- Take 25 ml of coconut oil in a measuring cylinder and pour it into a 250 ml glass beaker.
- Measure 30 ml of 20% NaOH solution in another measuring cylinder and add it into the beaker containing vegetable oil.
- Vigorously stir the mixture using a glass rod.
- Touch the beaker from outside. It is observed that the beaker is warm.
- Place the beaker on a wire gauze placed over a tripod stand.
- Heat the beaker using a Bunsen burner till the mixture become a whitish paste.
- Remove the beaker from the flame and allow it to cool.

- Dip a red litmus paper in the suspension formed.
- When dipped in the suspension, the red litmus paper changes its colour to blue.
- Dip a blue litmus paper in the suspension.
- The colour of blue litmus paper remains the same.
- To the above suspension, add 15g of common salt and stir it well with a glass rod.
- After adding common salt, soap in the suspension gets precipitated out as solid.
- Take a filter funnel and place a filter paper in it and fix it in a stand.
- Place a beaker below the funnel.
- Pour the contents of the beaker into the funnel over a glass rod and filter the contents of the beaker.
- After filtration, soap is left behind in the filter paper.
- Transfer the soap into another filter paper using a spatula and dry it by pressing with another filter paper.
- Then, cut it into desired shape with a knife

Observations:

- When 20% NaOH solution was added to the beaker containing vegetable oil, it was observed that the beaker was warm when touched from the outside.
- A whitish suspension was formed by heating the mixture of vegetable oil and 20% NaOH solution.

- Red litmus paper changed colour to blue when dipped in suspension. Blue litmus paper was not affected by the suspension.
- After adding common salt, the soap in suspension form precipitated out as solid.

Conclusions:

- The reaction between vegetable oil and sodium hydroxide solution is exothermic in nature because heat is liberated during the reaction.
- The white suspension formed is made up of soap and glycerol. The process of formation of soap is called saponification.
- Test using red and blue litmus papers shows that soap suspension is basic in nature and not acidic in nature.
- The process of precipitation of soap from the suspension is called salting out.

Precautions:

- Do not touch the NaOH solution with bare hands as it may burn the skin.
- Do not breathe the fumes of NaOH or let the fumes get in your eyes. Keep the windows of the laboratory open.
- The mixture of oil and alkali should be stirred thoroughly.

.It is necessary to stir the soap solution after adding common salt to it, in order to precipitate out the soap in solid form