

The Synthesis and Properties of Soaps and Detergents

Standard(s): 3.4, 3.7

Objective(s):

1. Students will synthesize soap and compare its properties with the properties of a commercial soap and detergent.
2. Students will make observations, design experiments, record and analyze data, make models, and infer their findings.

Procedure:

1. Lecture discussion:
 - a. Briefly discuss background information on soap.
 - b. Discuss the physical process by which soap solubilizes dirt.
 - c. Discuss why hard water causes a “bathtub ring.” What is a “bathtub ring?”
 - d. Discuss the experiment and basic setup.
2. Use the textbook, internet, or various other sources to find information on the following questions relating to the soap experiment:
 - a. Solid vs. liquid soaps
 - b. Saponification
 - c. pH
 - d. Cleaning ability
 - e. Behavior in acidic water
 - f. Behavior in hard water
 - g. Phosphates

Find the definitions to the following soap vocabulary:

- a. long-chain fatty acid
 - b. non-polar end
 - c. polar end
 - d. hydrophobic
 - e. hydrophilic
 - f. emulsifying agent
 - g. lye
 - h. potash
 - i. hydrolysis (saponification)
 - j. glycerol
3. After the textbook, internet, or various other sources research is completed we will have a class discussion on what we have found

Follow-up Activities:

1. Students can make other types of soap.