

The Properties of Water

Water is so central to our lives that we take it for granted. In this lab, you will explore some of water's unique properties.

Materials

Droppers

Green food coloring (optional: to color the water to make it easier to distinguish)

Two Beakers:

Beaker with ~25 ml water (tap water is fine)

Beaker with ~25 ml of rubbing alcohol (2-propanol)

Small bottle of vegetable oil

Liquid soap

2-3 closed staples

Parafilm

Salt

Toothpicks

Cotton balls

Procedure 1: Water's adhesion

1. Place a drop of water from beaker A onto the Parafilm
2. Place a drop of rubbing alcohol (beaker B) onto the Parafilm (away from the water)
3. Draw the profile of each drop (what it looks like from the side)

Procedure 2: Water's surface tension

1. Delicately float a closed staple at the surface of beaker A (water)
2. Delicately float a closed staple at the surface of beaker B (propanol)

Procedure 3: Miscibility of water and oil and the effect of soap

1. Place two large drops of water from beaker A each onto 2 bits of Parafilm
2. Add a large drop of oil to each of the water drops
3. Use a toothpick to stir each
4. What happened to the oil and water?

5. Now add a drop of dish soap to one of the drops and stir
6. What difference did the soap make?

Procedure 4: Water as a solvent

1. Add a few grains of salt to the beaker of water
 2. Add a few grains of salt to the beaker of propanol
 3. Did you notice any difference between them?
-
4. What do you think would happen if you added salt to vegetable oil? Put a small amount of vegetable oil in a beaker, then try it and see!

Procedure 5: Evaporative cooling

1. Rub a little propanol on your forearm
2. Rub a little water on your forearm
3. Describe the difference of temperature as they evaporate

Procedure 6: Comparing the solubility of sugar (sucrose) and salt (NaCl) in water

1. Add 2 grams of NaCl to 5 ml of water, and mix. Does all the salt dissolve?
2. If all the NaCl dissolves, add another gram
3. Now add 3 grams of sucrose ($C_{12}H_{24}O_{12}$) to 5 ml of water and mix. Does all the sugar dissolve?
4. Which is more soluble in water: sugar or salt?

Procedure 7: Design your own experiment

How is water different from oil or isopropanol? What are you curious about? How can you test it?