

Unique Properties of Water Lab

Purpose:

To examine, measure and explain some of the unique properties of water.

Materials:

penny, pipette, 2 graduated cylinder, alcohol, Vernier LabQuest and probes

Procedure:

A. Cohesion of Water vs. Alcohol

1. Using a pipette count how many drops of water you can place on a penny without letting it spill off. Record your data.
2. Repeat step 1 using alcohol instead of water. Record your observations and data.
3. Analyze and explain your results.

B. Evaporative Cooling of Water vs. Alcohol

1. Smear one drop of water on your arm (about the size of a pea).
2. Fan it with your other hand while timing how long it takes the spot to evaporate. Record your observations and data.
3. Repeat step 1 and 2 using alcohol instead of water. Record your observations and data.
4. Analyze and explain your results.

C. Solvency of Water

1. Measure out exactly 5 ml of water into a graduated cylinder.
2. Measure out exactly 5 ml of water into another graduated cylinder.
3. Pour the water from one cylinder into the water of the other and record the final volume of the mixture. Clean and dry each cylinder.
4. Repeat steps 1 through 3 using alcohol instead of water.
5. Measure out exactly 5 ml of water into a graduated cylinder.
6. Measure out exactly 5 ml of alcohol into another graduated cylinder.
7. Pour the alcohol into the water from on cylinder into the water of the other and give a gentle tap, or cover the top and shake it once. Record the final volume of the mixture. Clean and dry each cylinder.
8. Put back all equipment.
9. Analyze and explain your results.

Data/Observations:

A. Cohesion of Water vs. Alcohol

water drops on penny _____ # alcohol drops on penny _____

B. Evaporative Cooling of Water vs. Alcohol

Time for water to evaporate _____

Observations of Water: _____

Time for alcohol to evaporate _____

Observations of Alcohol: _____

C. Solvency of Water

Final volume of H₂O mixture _____

Final volume of Alcohol mixture _____

Final volume of H₂O and Alcohol mixture _____

Inquiry Experiment:

Use the Vernier LabQuest to design and implement an experiment to compare the specific heat of water to that of alcohol. Follow the Science Report format to write up the Exploration and Analysis part of the lab. I am not looking for a long lab write-up, just try and cover the highest level of each aspect of the grading rubric. Even though you have worked with a partner, it is important for your write-up to be individualized. Use your own ideas and words. One write-up per person.