QuickLAB

Wear safety goggles and an apron.

Testing the pH of Rainwater

Question

Do you have acid precipitation in your area?

Materials

- rainwater
- distilled water
- 500 mL jars
- thin, transparent metric ruler (± 0.1 cm)
- pH test paper: narrow range, ± 0.2–0.3, or pH meter

Procedure

Record all of your results in a data table.

1. Each time it rains, set out five clean jars to collect the rainwater. If the rain continues for more than 24 hours, put out new containers at the end of each 24-hour period until the rain stops. (The same procedure can be used with snow if the snow is allowed to melt before measurements are taken. You may need to use larger containers if a heavy snowfall is expected.)
2. After the rain stops or at the end of each 24-hour period, use a thin, plastic ruler to measure the depth of the water to the nearest 0.1 cm with a thin plastic ruler. Using the pH paper, test the water to determine its pH to the nearest 0.2 to 0.3.
3. Record the following information:
   - **a.** the date and time the collection started
   - **b.** the date and time the collection ended
   - **c.** the location where the collection was made (town and state)
   - **d.** the amount of rainfall in centimeters
   - **e.** the pH of the rainwater
4. Find the average pH of each collection that you have made for each rainfall, and record it in the data table.
5. Collect samples on at least five different days. The more samples you collect, the more informative your data will be.
6. For comparison, determine the pH of pure water by testing five samples of distilled water with pH paper. Record your results in a separate data table, and then calculate an average pH for distilled water.

Discussion

1. What is the pH of distilled water?
2. What is the pH of normal rainwater? How do you explain any differences between the pH readings?
3. What are the drawbacks of using a ruler to measure the depth of collected water? How could you increase the precision of your measurement?
4. Does the amount of rainfall or the time of day the sample is taken have an effect on its pH? Try to explain any variability among samples.
5. What conclusion can you draw from this investigation? Explain how your data support your conclusion.