

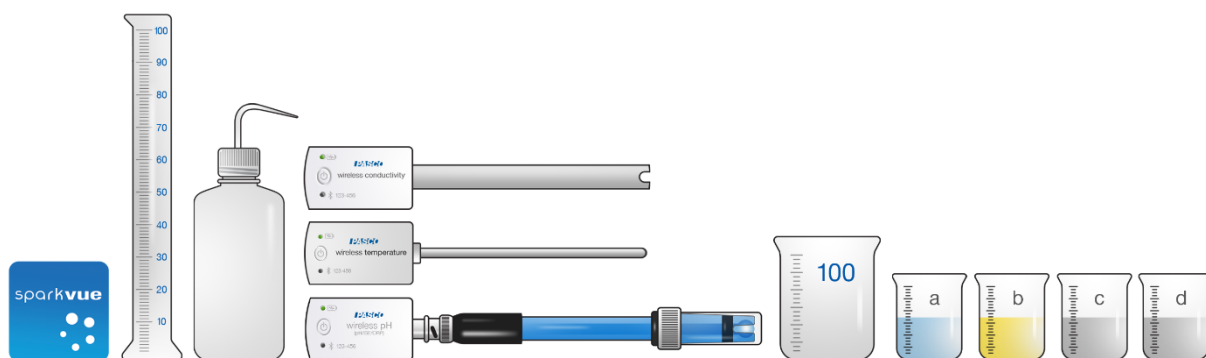
3C – PHYSICAL OR CHEMICAL CHANGE

INQUIRY

How can we tell the difference between a chemical change and a physical change?

MATERIALS

- Device with SPARKvue software
- Temperature sensor
- pH sensor
- Conductivity sensor
- Beaker, 50-mL (4)
- Beaker, 100-mL (2)
- Graduated cylinder, 100-mL
- Solution A, 25 mL
- Solution B, 25 mL
- Solution C, 25 mL
- Solution D, 25 mL
- Wash bottle with DI water



BACKGROUND

Chemistry is the study of matter and how it is organized. Matter can undergo two different kinds of changes, physical and chemical. Physical changes do not change the composition of matter, but a change will affect the physical appearance. Chemical changes do change the composition of matter. During a chemical change, new matter with different properties is produced.

SAFETY

Follow these important safety precautions in addition to your regular classroom procedures.

- Wear safety goggles at all times.
- Notify your teacher of all spills and dispose of your chemicals in the proper waste container.

PROCEDURE

1. Obtain 4 clean, dry 50-mL beakers and label them A, B, C and D.
2. Use a graduated cylinder to fill each beaker with 25 mL each of the four labeled solutions (A, B, C, and D) making sure to match the solution with the label. Rinse the graduated cylinder between each solution.
3. Record the color of solutions A, B, C and D in Table 1 on your answer sheet.
4. Open SPARKvue. Open the 03C Physical or Chemical Change lab file in SPARKvue.
5. Use the Bluetooth icon to connect the pH, Conductivity and Temperature sensors.

PROCEDURE

6. Start collecting data.
7. Place the temperature sensor in beaker A (note: hold either the sensor or beaker to avoid tipping the beaker over). When the temperature stabilizes, record the value in Table 1.
8. Remove the sensor and use the wash bottle to rinse it thoroughly.
9. Repeat steps 7-8 with the conductivity and pH sensors. For the pH sensor, rinse before placing it in the beaker.
Note: For best results, fill a 250-mL beaker with distilled water. Stir the pH probe in the distilled water between samples for a more thorough rinse. Give the probe a final rinse with the wash bottle.
10. Repeat steps 7-8 with solutions B, C and D. Always rinse sensors between solutions.
11. Obtain 2 clean, dry 100-mL beakers. Label one AB and the other CD.
12. Mix solutions A and B together in beaker AB. Record the color, temperature, conductivity and pH of mixture AB in Table 1, then rinse the sensors with the wash bottle.
13. Mix solutions C and D together in beaker CD. Record the color, temperature, conductivity and pH of mixture CD in Table 1. Rinse the sensors and stop collecting data. Return the storage solution container to the pH probe.

ANALYSIS

Complete the analysis on your answer sheet.

QUESTIONS

Answer the questions on your answer sheet.