

LESSON 25

LAB

You Light Up My Life Classifying Substances

Name _____

Date _____ Period _____



Purpose

To collect evidence regarding some of the properties of substances and look for patterns in the results.

Materials

- bulb with wires attached
- 9-volt battery with snap connector
- wire with stripped ends
- 100 mL beakers
- paper clips
- salt, NaCl
- sand, SiO₂
- paraffin (wax), C₂₀H₄₂
- calcium chloride, CaCl₂
- ethanol, C₂H₆O
- copper, Cu
- copper (II) sulfate, CuSO₄
- aluminum foil, Al
- sucrose, C₁₂H₂₂O₁₁
- distilled water

Safety Instructions



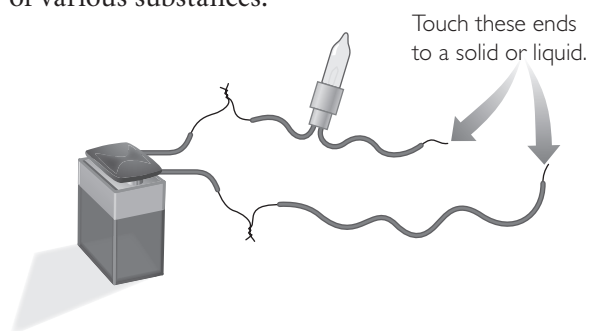
Safety goggles must be worn at all times.

Predictions and Data

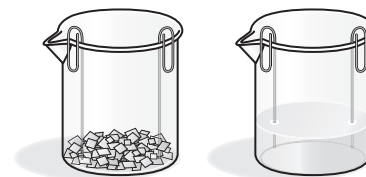
Predict whether each substance will conduct electricity. Predict whether each substance will dissolve in water. Write your predictions in the left side of the table and your test results in the right side.

Procedure

- Assemble your conductivity tester. You will use this apparatus to test the conductivity of various substances.



- Take your conductivity tester to each station. Test the pure substance for conductivity. Record your result (Yes or No).
- Next, observe the substance in water. Did the substance dissolve? Record your data (Yes or No).
- Finally, if the substance is dissolved, test the solution for conductivity. Record your results (Yes or No).



Test substances	Predictions		Test Results		
	Conduct? Yes/No	Dissolve? Yes/No	Conduct? Yes/No	Dissolve? Yes/No	Conduct when dissolved?
H ₂ O(l), distilled water		yes			
Al(s), aluminum foil					
C ₁₂ H ₂₂ O ₁₁ (s), sucrose (sugar)					
NaCl(s), sodium chloride (salt)					
SiO ₂ (s), silicon dioxide (sand)					
C ₂₀ H ₄₂ (s), paraffin (wax)					
C ₂ H ₆ O(l), ethanol					
Cu(s), copper					
CaCl ₂ (s), calcium chloride					
CuSO ₄ (s), copper (II) sulfate					

Analysis

- Which substances conduct electricity but do not dissolve in water? What other things do these substances have in common?
- Divide the substances that dissolve in water into two categories: those that conduct electricity once they are dissolved, and those that don't.

Substances that dissolve in water	
Conduct when dissolved	Don't conduct when dissolved

- What do the substances that conduct electricity once they are dissolved have in common?
- What do the substances that do not conduct electricity once they are dissolved have in common? (Don't include water.)

5. Write a statement about the substances that *do* light up the bulb.
6. Write a statement about the substances that *do not* light up the bulb.
7. Predict whether isopropanol, $C_3H_8O(l)$, will conduct electricity. State your reasoning.
8. **Making Sense** The sports drink we tested dissolved in water and was a good conductor. Based on this activity, what conclusions can you make about the sports drink?
9. **If You Finish Early** If it is dangerous to take a bath with a blow dryer, what must also be true about the water in the bathtub?

Solubility and Conductivity

