Laboratory Investigation Name _____

Chemistry: Form L4.4C Date _____ Period _____

Forming a Compound

PROBLEM

How can you tell a compound from its elements?

INTRODUCTION

When elements combine, a binary compound forms. Binary compounds often form from metals and nonmetals. The metals act like electron losers, while the nonmetals act like electron gainers. Electrons are not always transferred when the compound forms. Sometimes they are shared. Generally, if the electronegativity difference between the two elements is ≥ 1.7, the bond is ionic and electrons are actually transferred. Otherwise, the bond is covalent. In this laboratory investigation, you will form a binary compound, examine its properties, and determine the bond type.

MATERIALS (*per group*)

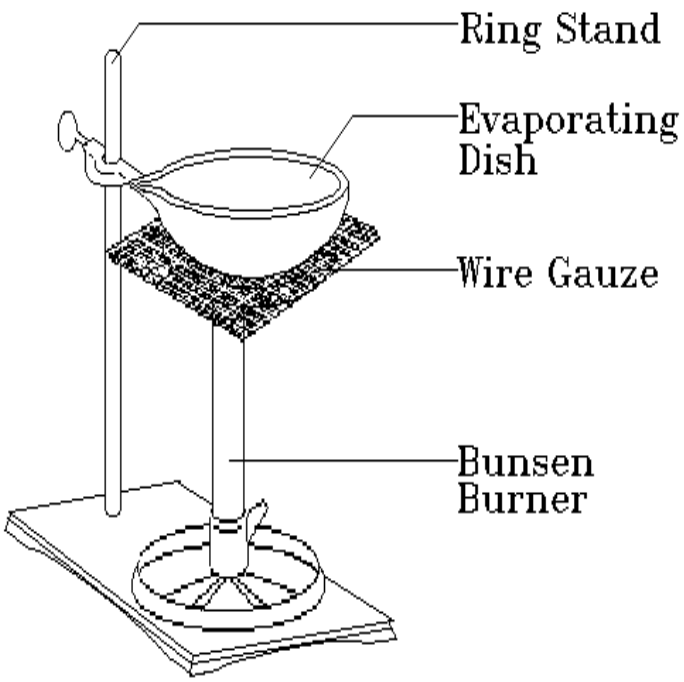
Bunsen burner; evaporating dish; metal (silver, or copper); ring stand and iron ring; safety goggles; scoop; striker; steel wool; sulfur; tongs

PROCEDURE

1. Polish a strip of sheet metal with steel wool. Examine the polished metal, noting the color, luster, and flexibility. You can test for flexibility by bending an object or pressing on it with a scoop to see if it breaks or crumbles. If it crumbles or doesn't bend, it is not flexible. Record your observations in the space provided on the next page.

2. Examine some sulfur, noting also the color, luster, and flexibility. Record your observations in the space provided on the next page.

3. Set up a ring stand and iron ring with a Bunsen burner, a wire gauze, and an evaporating dish as shown in the diagram to the right.



4. Place the strip of metal in the evaporating dish and, using a scoop, sprinkle some sulfur over it.

5. Put on safety goggles and ignite the Bunsen burner with a striker.

6. Continue heating until the sulfur melts. After the sulfur melts, turn off the flame and allow the contents of the evaporating dish to cool.

7. After the metal has cooled, examine it for changes. Check any areas that look different for color, luster, and flexibility. Record your observations in the space provided on the next page.

OBSERVATIONS

WHEN	Material	Description
Before Heating	Metal	
	Sulfur	
After Heating	Metal and Sulfur	

CONCLUSIONS

1. What evidence is there that a chemical change took place when you heated metal and sulfur? _____

2. What elements were involved in the reaction? _____

3. Based on the characteristics you observed, which element is a metal? _____

4. What are the electronegativities of the elements that combined? What type of bond formed?

5. How can you distinguish a binary compound from its elements? _____

6. What is the name of the binary compound that formed? _____

7. What is the formula of the binary compound that formed? _____

8. Considering the new compound's hardness, appearance, and bond type, how would it be classified (ionic, covalent, metallic, or molecular)? Explain. _____