

NAMING IONIC COMPOUNDS

INQUIRY

How do we name different ionic compounds?

MATERIALS

- Pipets with cation labels (Ni^{+2} , Fe^{+3} , Co^{+2} , Cu^{+2})
- Pipets with anion labels (OH^- , CO_3^{-2} , PO_4^{-3})
- Plastic wrap
- Spot Plate Template

BACKGROUND

Ionic compounds are formed when a cation and anion form an ionic bond to make a compound. Cations are formed by metal atoms that lose valence electrons, and anions are formed by nonmetal atoms that gain valence electrons. Some ions can also be formed by more than one atom. These are known as polyatomic ions. Ionic compounds are electrically neutral. The cation and anion charges balance to zero, so the chemical formula is based off the charges of the cation and anion.

In this lab, you will be doing a set of reactions between different cations and anions, recording your observations, writing out the chemical formula based off the charges of the ions, and then naming the new compound. Typically, reactions between cations and anions in solution can have two outcomes: either a solid is formed (known as a precipitate - ppt), or the ions don't react and the ions stay in solution.

SAFETY

Follow these important safety precautions in addition to your regular lab 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 pipets with cations and anions.
2. Use the spot plate template, or on a white sheet of paper, trace layout of Data Table 1 as large as possible.
3. Stretch a piece of plastic wrap over the white sheet of paper – NO WRINKLES. Tape three sides. This is your disposable “spot plate.”
4. In each “square well” on your spot plate you will be mixing one cation with one anion. Be careful to make sure that the tips of the pipets do not touch any other liquid. If one does, report it IMMEDIATELY so it doesn't contaminate the other
5. Place 1-2 drops of cation and anion each into the squares, being careful to not dip the tip of the pipets into any solution.
6. Record what you observed in the top of the square in Table 1. If a precipitate (ppt) formed, record the color. If there was no reaction, record NR.
7. Record the name and formula for every combination that produces a precipitate at the bottom of the square in Table 1.
8. To clean up, return all unused chemicals to the correct container in the front of the room. Carefully remove the plastic wrap and dispose of it in the chemical trash. Wash your hands when you are done.

Data Table 1

	Ni^{+2}	Fe^{+3}	Co^{+2}	Cu^{+2}
OH^-				
CO_3^{-2}				
PO_4^{-3}				

Questions

1. How many chemical reactions did you have out of 12? How did you know these were chemical reactions?

2. Using what you practiced, name the following ionic compounds.

NaCl _____

MgBr₂ _____

AgCl _____

Ca₃P₂ _____

LiOH _____

ZnCO₃ _____

Spot Plate Template

PO_4^{-3}				
CO_3^{-2}				
OH^-				
	Ni^{+2}	Fe^{+3}	Co^{+2}	Cu^{+2}