

NAMING IONIC COMPOUNDS

INQUIRY

How do we name and write formulas for different ionic compounds formed from chemical reactions?

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, 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. Prepare a beaker of soapy water to use between tests.
3. Use the spot plate template, or on a white sheet of paper, trace layout of Data Table 1 as large as possible.
4. Stretch a piece of plastic wrap over the white sheet of paper – NO WRINKLES. Tape three sides. This is your disposable “spot plate.”
5. 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
6. Place 4 drops of cation and anion each into the squares, being VERY careful to not touch the tip of the pipets into any solution. If the tip does touch, bring it to Ms. Skinner to be fixed.
7. Use your stirring rod to “streak” through any precipitates that form to see their true color. Wash the stirring rod in a beaker of soapy water and rinse and dry between tests!!
8. Record what you observed in the top of the square in Table 1. If a precipitate (ppt) formed, record the color. If something else is formed, record that. If there was no reaction, record NR.
9. When you are finished with all the reactions, VERY CAREFULLY, slowly slide out the sheet of white paper from underneath the plastic wrap. Do you see anything new? If so, record it in your Data Table.
10. Record the name and formula for every combination that has a reaction at the bottom of the square in Table 1. (Hint – they all will!)
11. To clean up, return all unused chemicals to the correct container in the front of the room.
12. Carefully remove the plastic wrap and dispose of it in the chemical trash. Wash your hands when you are done.

Name _____

Data Table 1

	Ni^{+2}	Fe^{+3}	Co^{+2}	Cu^{+2}
OH^{-1}				
CO_3^{-2}				
PO_4^{-3}				

Name _____

Questions

1. What evidences for chemical reactions did you see? (List)

2. What patterns or similarities among the reactions did you see? (List)

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

MgF_2 _____

PbO_2 _____

AgCl _____

Ca_3P_2 _____

LiOH _____

ZnCO_3 _____

Spot Plate Template

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

