

Ionic Bonding Puzzle Lab

Introduction

When metals and non-metals chemically react, the atoms will tend to form **ions** or charged atoms. Ions form because **electrons** are either gained or lost. Metals will generally form **cations** or positive ions, since they tend to **donate (give) electrons**. Non-metals will form **anions** or negative ions, since they tend to **accept (take) electrons**.

Activity

In this activity you will create models of ionic compounds and observe the chemical formula of the binary molecules you have created. Your data will be recorded in a data table or chart, similar to the one below.

Cation name	Anion name	Chemical Formula	Name

Discussion/Conclusion

- Notice the shape and charge of each cation model. Why do you think there are slots in the metal atoms? (TIP: How do the atoms become ions?) Notice the shape and charge of the anion models. Why do you think there are tabs in the non-metal atoms?
- In the compounds you formed, what do you notice about the ion charges, the net or final charge of the compound and how the charge relates to the chemical formula of the compound?
- What do you notice about the names of the cations and anions on the cards. How do they compare with the name of the neutral atom or element. Do all metals have a number in parenthesis? Do the non-metals have anything in common about their name?
- Summarize the pattern between elements in a group or family and any numbers on the Periodic Table? (Think octet rule and how many electrons are involved to meet octet.)

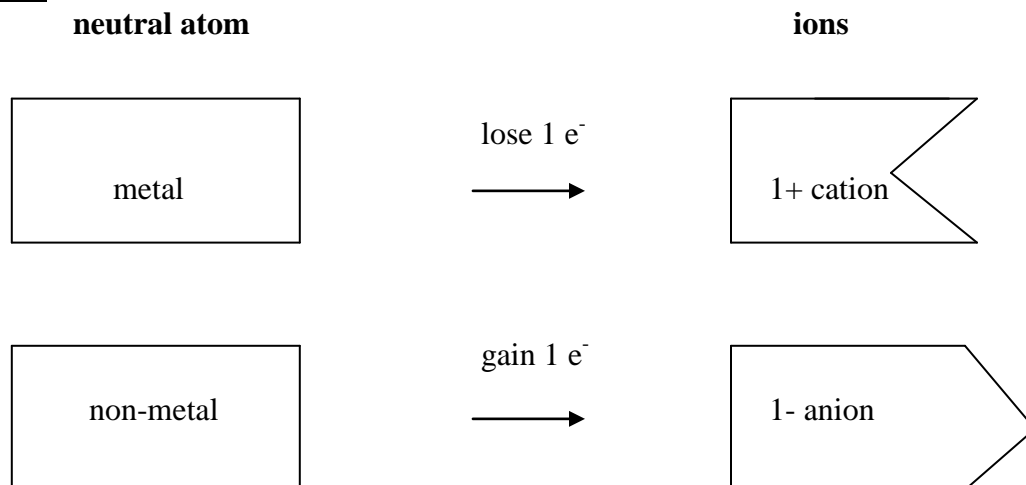
Ionic Bonding Puzzle Activity Notes

Fill in the blanks below with these words: lose, cations, gain, anions

Metals _____ electrons and become positive ions or _____.

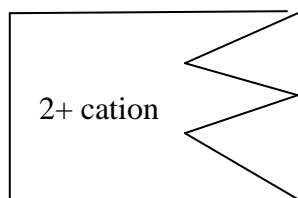
Non-metals _____ electrons and become negative ions or _____.

The Model

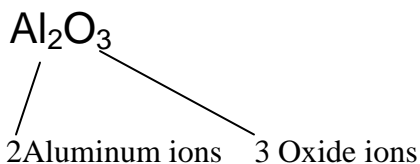


Similarly, a 2+ cation would look like this:

Draw a 2- anion:



Bonding and Predicting Chemical Formulas



Fill in the blanks below with these words: subscripts, compound, ions, charge, number, ratio, formula, balance, zero

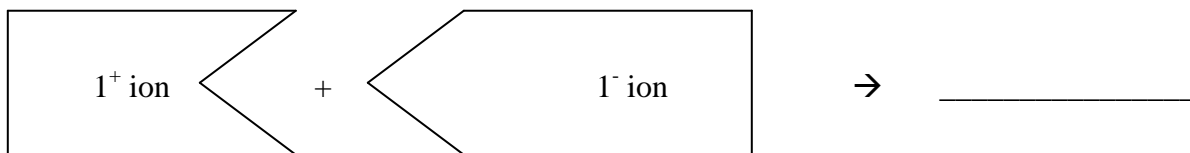
The _____ show the _____ of each atom in the _____.

For an ionic bond, the charges of the _____ need to add up to _____.

The chemical _____ shows how many of each ion is needed to _____ the _____ and make the compound neutral.

The _____ of the ions should be in lowest terms.

What ratio will the +1 and -1 ions combine to balance the charge?



What ratio will the 2+ and 1- ions combine to balance the charge?

