Name _____

Binary Ionic Nomenclature Activity

Part I: Determining the charge for each ion

Ionic compounds are held together by the attraction between positive ions and negative ions. The first step of dealing with ionic compounds is to find the charges for the positive and negative ions.

The charges for the representative elements follow a simple pattern shown below. Notice that the number comes before the positive or negative sign.

Group 1	Group 2	Group 13	Group 14	Group 15	Group 16	Group 17	Group 18
1+	2+	3+	skip	3-	2-	1-	zip

The charges are written as superscripts above the chemical symbol. The magnesium ion, for example, is written as Mg^{2+}. For ions with 1+ and 1- charges, the 1 is usually understood and is not written, so the potassium ion is written as K^{+}.

The positive ions have the same names as their parent atom, so an ion of sodium is called a sodium ion. The negative ions have the end of their parent names changed to "-ide", so an ion of oxygen is called an oxide ion.

Fill in the table below.

Element	Charge	Ion Name	Ion Symbol
aluminum			
calcium			
chloride			
nitrogen			
sodium			
sulfur			

Part II: Making ion models

Cut out the ion cards on the last two pages of this activity.

Part III: Determining the ionic formulas

Ionic compounds may contain ions, but the compounds must be neutral. This means that the positive and negative charges in the compound have to cancel each other out.

You will use the cards to find out how many of each ion you need in order to cancel out the charges. Lets look at aluminum and chloride as an example. Aluminum has a 3+ charge and has three + signs on its card. If you place a single chloride card next to it, then you should see that they do not cancel out. You have to add two more chloride ions for all of the charges to cancel. It takes one aluminum and three chlorides to cancel out, so the formula for aluminum chloride is $AlCl_3$.

Repeat this process to determine the formulas for the following ionic compounds.

Positive ion	Negative ion	Formula
aluminum	chloride	
sodium	sulfide	
calcium	sulfide	
sodium	nitride	
aluminum	sulfide	
calcium	nitride	
calcium	chloride	
aluminum	nitride	
sodium	chloride	

Part IV: Practice by determining the charges and formulas for the following ionic compounds.

Positive ion	Symbol with charge	Negative ion	Symbol with charge	Formula
strontium		phosphide		
potassium		oxide		
aluminum		bromide		
magnesium		iodide		
calcium		oxide		
cesium		sulfide		
sodium		selenide		
aluminum		phosphide		
aluminum		oxide		
barium		fluoride		
strontium		nitride		

Cut out the model ion cards.

aluminum	Al^{3+}	+ + +
aluminum	Al^{3+}	+ + +
calcium	Ca^{2+}	+ +

- - -	N^{3-}	nitride
- - -	N^{3-}	nitride
- -	S^{2-}	sulfide

calcium	Ca^{2+}	+ +	- -	S^{2-}	sulfide
calcium	Ca^{2+}	+ +	- -	S^{2-}	sulfide
sodium	Na^{+}	+	-	Cl^{-}	chloride
sodium	Na^{+}	+	-	Cl^{-}	chloride
sodium	Na^{+}	+	-	Cl^{-}	chloride