Simple Binary Ionic Compounds

Ionic compounds are compounds formed by the combination of a **cation** and a **anion**. **(Think: "metal plus nonmetal").** Ionic compounds are more commonly known as "salts." Binary ionic compounds are compounds containing only two elements, as demonstrated in the examples below.

When writing formulas for ionic compounds, we use **subscripts** to indicate how many of each atom is contained in the compound. Remember that even though ions have charges, ionic compounds must be **neutral**. Therefore, the charges on the cation and the anion must cancel each other out. In other words, the **net charge** of an ionic compound equals zero.

Example 1:

For a salt containing sodium ion, **Na^+,** and chloride, **Cl^-**, the ratio is one to one. The positive charge on the sodium ion cancels out the negative charge on the chloride.

(+1) + (-1) = 0

Therefore, the formula for the salt is **NaCl.** (The actual formula is Na_1Cl_1, but chemists omit subscripts of 1).

Example 2:

For a salt containing calcium ion, Ca^{2+}, and chloride, Cl^-, the ratio can't be one to one.

(+2) + (-1) = +1

Remember that ionic compounds must be neutral. In order to yield a neutral compound, **two** chlorides must bond to the calcium ion:

(+2) + 2(-1) = 0

So, the formula for this salt is **$CaCl_2$.**

Nomenclature:

When naming ionic compounds, simply write the *element name* of the metal followed by the *ion name* of the nonmetal. **(Remember: the metal ion (cation) is always written first!)**

NaCl is called "**sodium chloride**," and $CaCl_2$ is called "**calcium chloride.**"

Nomenclature Worksheet 2:
Simple Binary Ionic Compounds

Please complete the following table:

Name of Ionic Compound	Formula of Ionic Compound
1. Sodium bromide	
2. Calcium chloride	
3. Magnesium sulfide	
4. Aluminum oxide	
5. Lithium phosphide	
6. Cesium nitride	
7. Potassium iodide	
8. Barium fluoride	
9. Rubidium nitride	
10. Barium oxide	
11.	K_2O
12.	MgI_2
13.	$AlCl_3$
14.	$CaBr_2$
15.	Na_3N
16.	LiF
17.	Ba_3P_2
18.	Cs_2S
19.	SrF_2
20.	NaCl