

## 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.

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### **Example 1:**

For a salt containing sodium ion,  $\text{Na}^+$ , and chloride,  $\text{Cl}^-$ , 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  $\text{Na}_1\text{Cl}_1$ , but chemists omit subscripts of 1).

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### **Example 2:**

For a salt containing calcium ion,  $\text{Ca}^{2+}$ , and chloride,  $\text{Cl}^-$ , 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<sub>2</sub>**.

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### **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  $\text{CaCl}_2$  is called “**calcium chloride**.”

## Writing Ionic Formulas - Binary Compounds

Fill in the correct symbols and charges of the ions and then write the correct formulas in the corresponding boxes.

<u>IONS</u>	bromine	oxygen	chlorine	nitrogen	sulfur	fluorine
sodium						
beryllium						
aluminum						
hydrogen						
strontium						
barium						
potassium						
magnesium						