

Ionic Compounds

Naming transition metal cations (table 4.1, new names)

Many transition metals can form two or more cations. When naming the compound, we use the Roman numeral corresponding to the charge in parentheses.

For example, Fe^{+3} is iron(III); Cr^{+2} is chromium(II); Sn^{+4} is tin(IV).

EXAMPLES: iron(III) iodide is FeI_3 since it is the combination of Fe^{+3} and I^{-1}

Naming polyatomic ions (from Table 4.3)

Cations:

NH_4^+ ammonium

Anions:

-1	-2	-3
HCO_3^- bicarbonate	CO_3^{2-} carbonate	PO_4^{3-} phosphate
NO_3^- nitrate	SO_4^{2-} sulfate	
NO_2^- nitrite	SO_3^{2-} sulfite	
$\text{C}_2\text{H}_3\text{O}_2^-$ acetate	HPO_4^{2-} hydrogen phosphate	
OH^- hydroxide	$\text{C}_2\text{O}_4^{2-}$ oxalate	
CN^- cyanide		

EXAMPLES: magnesium cyanide is $\text{Mg}(\text{CN})_2$ since Mg is $^{+2}$ and CN is $^{-1}$. If there are 2 or more polyatomic ions in the formula, they must be in parentheses.

1) Give the formula for the following binary ionic compounds (binary compounds contain only 2 elements):

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|--------------------|----------------------|----------------------|
| a) sodium oxide | b) calcium bromide | c) aluminum chloride |
| d) lithium sulfide | e) magnesium nitride | f) aluminum oxide |

2) Name the following ionic compounds:

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|----------------------|---------------------------|--------------------------|--------------------|
| a) KBr | b) MgI_2 | c) NaNO_3 | d) CaCO_3 |
| d) iron(II) chloride | e) copper (I) oxide | f) iron(III) bicarbonate | |
| g) ammonium sulfate | h) chromium(II) hydroxide | | |