Naming Ionic Compounds

Part 3: Naming Cations and Anions

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Learning to Name Ionic Compounds

In part 2, we learned to write the empirical formula for ionic compounds.

Our example: KBr

In order to name this compound, we need to know how to name cations and anions separately.

Naming Cations

Rule 1: Naming main group cations

Cation names are the *same as the element name.*

For instance, Na^+ is a "sodium" cation

Mg^{2+} is a "magnesium" cation

Naming Transition Metal Cations

Rule 2: Naming transition metal cations:

Transition metal cations are named just like the main group cations, except the ***charge on the ion is added in Roman numerals in parentheses*** after the cation (element) name.

For instance, Cu^{+} is a "copper (I)" cation

Cu^{2+} is a "copper (II)" cation

Caution: Do NOT indicate charges in parentheses for main group cations, such as Na^{+}, Mg^{2+}, Al^{3+}, etc. These elements only have one cation charge.

Mini Quiz: Naming Cations

Name the following cations:

Au^{+}

Ca^{2+}

Fe^{2+}

Al^{3+}

HINT: Remember to identify whether an element a main group metal or transition metal before naming the cation.

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Mini Quiz Solution: Naming Cations

Name the following cations:

Au^{+} is a "gold (I)" cation

Mini Quiz Solution: Naming Cations

Name the following cations:

Au^{+} is a "gold (I)" cation

Ca^{2+} is a "calcium" cation

Mini Quiz Solution: Naming Cations

Name the following cations:

Au^{+} is a "gold (I)" cation

Ca^{2+} is a "calcium" cation

Fe^{2+} is an "iron (II)" cation

Mini Quiz Solution: Naming Cations

Name the following cations:

Au^{+} is a "gold (I)" cation

Ca^{2+} is a "calcium" cation

Fe^{2+} is an "iron (II)" cation

Al^{3+} is an "aluminium" cation

NOTE: It is incorrect to name Al^{3+} as "aluminium (III)" and Ca^{2+} as "calcium (II)"

Naming Anions

Rule 3: Naming anions

Anion names are formed from the *root* of the element name with the suffix *-ide* added.

For instance, Cl^- is formed from the element chlorine.

Remove the *-ine* ending and add *-ide*

a "chlor*ide*" anion

Naming Anions

More examples:

F^- is formed from the element Fluorine.

Remove the *-ine* ending and add *-ide*

a "Fluor*ide*" anion

O^{2-} is formed from the element oxygen.

Remove the *-ygen* ending and add *-ide*

an "ox*ide*" anion

Mini Quiz: Naming Anions

Name the following anions:

Br^-

S^{2-}

Se^{2-}

I^-

Mini Quiz Solutions: Naming Anions

Name the following anions:

Br^- is formed from bromine. Brom- is the root name of the element. Remove the *-ine* and add *-ide*

"Brom*ide*" anion

S^{2-}

Mini Quiz Solutions: Naming Anions

Name the following anions:

Br^- is formed from bromine. Brom- is the root name of the element. Remove the *-ine* and add *-ide*

"Brom*ide*" anion

S^{2-} is formed from sulfur. Sulf- is the root name of the element. Remove the *-ur* and add *-ide*

"Sulf*ide*" anion

Mini Quiz Solutions: Naming Anions

Se^{2-} is formed from selenium. Selen- is the root name of the element. Remove the *-ium* and add *-ide*

"Selen*ide*" anion

Mini Quiz Solutions: Naming Anions

Se^{2-} is formed from selenium. Selen- is the root name of the element. Remove the *–ium* and add *-ide*

"Selen*ide*" anion

I^- is formed from iodine. Iod- is the root name of the element. Remove the *–ine* and add *-ide*

"Iod*ide*" anion