

## **Naming chemical compounds (chemical nomenclature)**

Is the substance a **pure** compound, a **hydrate** (which will have a “•H<sub>2</sub>O” at the end) or an **acidic solution**, signified by the state symbol (aq)?

If pure, go to the *Rules of chemical nomenclature for pure substances*

If a hydrate, name the non-hydrate part by the appropriate rules for pure substances, then at the end of the name, add “**(prefix indicating the number of water molecules attached)–hydrate**”

If an acid, go to the *Acid naming rules*

## **Rules of chemical nomenclature for pure substances**

Is the compound made of a combination of **metal and non-metal** elements (any number of atoms) or **two non-metal** elements (any number of atoms)?

If **both** elements are non-metals, go to *Covalent compound nomenclature rules*

Otherwise, is the compound made of **exactly** two elements or **more than** two elements?

If exactly two elements, go to *Binary ionic compound nomenclature rules*

If more than two elements, go to *Multi-atom ionic compound nomenclature rules*

## Covalent compound nomenclature rules

Name the elements in the order presented in the chemical formula.

The second element's ending is changed to “**-ide**”.

Add a prefix indicating the number of atoms of each element in the compound's chemical formula to the beginning of each element name. **Exception:** If the first element has only one atom, then the prefix “mono-“ is omitted.

## Binary ionic compound nomenclature rules

Name the elements in the order presented in the chemical formula.

The second element's ending is changed to “**-ide**”.

No prefixes are necessary.

In the case of a transition metal ion (where the metal is known to have more than one possible ionic charge), specify the charge by writing the number of the charge in **Roman numerals inside parentheses** after the transition metal element name. No plus sign needs to be included.

## **Multi-atom ionic compound nomenclature rules**

Determine the multi-atom cation or anion name.

Name the elements (or multi-atom ion) in the order presented in the chemical formula.

No prefixes are necessary.

## **Acid naming rules**

Is the acid made of hydrogen and one other atom?

If yes, then name the acid “**hydro–(element name root)–ic acid**”

If no, then the acid is made of hydrogen(s) and a multi-atom anion

Determine the multi-atom anion name.

If the name of the anion ends with “–ate”, then name the acid “**(multi-atom anion name root)–ic acid**”

If the name of the anion ends with “–ite”, then name the acid “**(multi-atom anion name root)–ous acid**”