

# Chemical Names And Formulas Worksheet Questions and Answers PDF

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## Part 1: Building a Foundation

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**What is the correct chemical formula for water?**

*Hint: Think about the common name for water.*

- H<sub>2</sub>O ✓
- HO<sub>2</sub>
- H<sub>2</sub>O<sub>2</sub>
- OH<sub>2</sub>

■ The correct chemical formula for water is H<sub>2</sub>O.

**Which of the following are polyatomic ions? (Select all that apply)**

*Hint: Look for ions that consist of more than one atom.*

- NO<sub>3</sub><sup>-</sup> ✓
- Cl<sup>-</sup>
- SO<sub>4</sub><sup>2-</sup> ✓
- Na<sup>+</sup>

■ Polyatomic ions include NO<sub>3</sub><sup>-</sup> and SO<sub>4</sub><sup>2-</sup>.

**Explain the difference between an ionic and a covalent compound.**

*Hint: Consider the types of bonds and the elements involved.*

Ionic compounds are formed by the transfer of electrons between metals and non-metals, while covalent compounds are formed by the sharing of electrons between non-metals.

List the chemical formulas for the following compounds:

Hint: Use the common names to find the formulas.

1. Sodium chloride

NaCl

2. Carbon dioxide

CO<sub>2</sub>

3. Ammonium nitrate

NH<sub>4</sub>NO<sub>3</sub>

The chemical formulas are NaCl for sodium chloride, CO<sub>2</sub> for carbon dioxide, and NH<sub>4</sub>NO<sub>3</sub> for ammonium nitrate.

Which prefix is used to indicate two atoms of an element in a covalent compound?

Hint: Think about the Greek prefixes used in naming.

Mono-

- Di- ✓
- Tri-
- Tet-

■ The prefix used to indicate two atoms is 'Di-'.

## Part 2: Comprehension and Application

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**What is the name of the compound with the formula CO<sub>2</sub>?**

*Hint: Consider the common name for this compound.*

- Carbon monoxide
- Carbon dioxide ✓
- Carbon oxide
- Dicarbon monoxide

■ The name of the compound CO<sub>2</sub> is carbon dioxide.

**Which of the following are characteristics of ionic compounds? (Select all that apply)**

*Hint: Think about the properties of ionic compounds.*

- High melting points ✓
- Conduct electricity when dissolved in water ✓
- Formulated between non-metals
- Generally soluble in water ✓

■ Ionic compounds typically have high melting points, conduct electricity when dissolved in water, and are generally soluble in water.

**Describe how the charge of a transition metal ion is indicated in its name.**

*Hint: Consider the naming conventions for transition metals.*

The charge of a transition metal ion is indicated by Roman numerals in parentheses following the metal's name.

Write the chemical formulas for the following compounds using the given names:

Hint: Use the names to determine the correct formulas.

1. Calcium phosphate

Ca<sub>3</sub>(PO<sub>4</sub>)<sub>2</sub>

2. Iron (III) chloride

FeCl<sub>3</sub>

3. Dinitrogen tetroxide

N<sub>2</sub>O<sub>4</sub>

The chemical formulas are Ca<sub>3</sub>(PO<sub>4</sub>)<sub>2</sub> for calcium phosphate, FeCl<sub>3</sub> for iron (III) chloride, and N<sub>2</sub>O<sub>4</sub> for dinitrogen tetroxide.

Given the compound name "sulfur hexafluoride," write its chemical formula and explain the reasoning behind your answer.

Hint: Consider the prefixes used in the name.

The chemical formula for sulfur hexafluoride is  $\text{SF}_6$ , derived from the prefix 'hexa-' indicating six fluorine atoms.

### Part 3: Analysis, Evaluation, and Creation

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Analyze the compound  $\text{H}_2\text{SO}_4$  and explain how its name is derived from its components.

*Hint: Consider the elements and their quantities in the formula.*

The name sulfuric acid is derived from the presence of sulfur, hydrogen, and oxygen in the compound, with the 'acid' suffix indicating its acidic nature.

Which of the following statements are true about polyatomic ions? (Select all that apply)

*Hint: Think about the structure and charge of polyatomic ions.*

- They are composed of multiple atoms. ✓
- They always carry a positive charge.
- They can form ionic compounds. ✓
- They are always anions.

True statements include that polyatomic ions are composed of multiple atoms, can form ionic compounds, and can be anions.

Which of the following is the correct name for the compound with the formula  $\text{K}_2\text{SO}_4$ ?

Hint: Consider the components of the formula.

- Potassium sulfide
- Potassium sulfate ✓
- Potassium sulfite
- Dipotassium sulfate

■ The correct name for  $K_2SO_4$  is potassium sulfate.

**Evaluate the naming system for acids and propose a method to simplify it for beginners.**

Hint: Consider the common challenges faced by students.

■ The naming system for acids can be simplified by using consistent rules for naming based on the anions present, such as using 'ic' for anions ending in 'ate' and 'ous' for those ending in 'ite'.

**Create a balanced chemical equation for the reaction between hydrochloric acid and sodium hydroxide. List the reactants and products.**

Hint: Consider the products of an acid-base reaction.

1. Reactants

■ HCl and NaOH

2. Products

■ NaCl and H<sub>2</sub>O

The balanced equation is  $\text{HCl} + \text{NaOH} \rightarrow \text{NaCl} + \text{H}_2\text{O}$ , with HCl and NaOH as reactants and NaCl and H<sub>2</sub>O as products.

**Reflect on the importance of chemical nomenclature in scientific communication and propose two ways it could be improved for clarity.**

*Hint: Consider the challenges faced by students and professionals.*

**Chemical nomenclature is crucial for clear communication in science; improvements could include standardized naming conventions and educational resources that simplify complex terms.**

**Which of the following compounds would you expect to have the highest melting point based on its ionic nature?**

*Hint: Consider the properties of ionic compounds.*

- H<sub>2</sub>O
- NaCl ✓
- CO<sub>2</sub>
- CH<sub>4</sub>

The compound with the highest melting point based on ionic nature is NaCl.