

Chemical Formula Writing Worksheet Questions and Answers PDF

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Part 1: Building a Foundation

What is the chemical symbol for Sodium?

Hint: Think about the periodic table.

- A) S
- B) Na ✓
- C) N
- D) So

■ The chemical symbol for Sodium is Na.

Which of the following are polyatomic ions?

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

- A) NH_4^+ ✓
- B) Cl
- C) SO_4^{2-} ✓
- D) O^{2-}

■ Polyatomic ions are ions made up of two or more atoms. NH_4^+ and SO_4^{2-} are examples.

Explain the difference between a cation and an anion.

Hint: Consider the charge of each type of ion.

A cation is a positively charged ion, while an anion is a negatively charged ion.

List the chemical symbols for the following elements: Hydrogen, Oxygen, Calcium.

Hint: Refer to the periodic table for symbols.

1. Hydrogen

H

2. Oxygen

O

3. Calcium

Ca

The chemical symbols are H for Hydrogen, O for Oxygen, and Ca for Calcium.

Which of the following is the correct formula for water?

Hint: Consider the elements that make up water.

- A) H_2O ✓
- B) HO_2

- C) H_2O_2
 D) OH

■ The correct formula for water is H_2O .

Part 2: Comprehension and Application

What is the charge on a sulfate ion (SO_4)?

Hint: Consider the common charges of sulfate.

- A) 1^-
 B) 2^- ✓
 C) 1^+
 D) 2^+

■ The charge on a sulfate ion is 2^- .

Which of the following correctly describe ionic compounds?

Hint: Think about how ionic compounds are formed.

- A) They are formed by the transfer of electrons. ✓
 B) They are usually formed between metals and non-metals. ✓
 C) They are formed by sharing electrons.
 D) They have high melting and boiling points. ✓

■ Ionic compounds are formed by the transfer of electrons, usually between metals and non-metals, and they have high melting and boiling points.

Describe how to determine the formula of an ionic compound from its constituent ions.

Hint: Consider the charges of the ions involved.

To determine the formula of an ionic compound, balance the total positive and negative charges from the constituent ions.

What is the correct formula for aluminum oxide, given that aluminum forms a 3^+ ion and oxide forms a 2^- ion?

Hint: Think about the charges and how they balance.

- A) AlO
- B) Al_2O_3 ✓
- C) Al_3O_2
- D) AlO_2

The correct formula for aluminum oxide is Al_2O_3 .

Identify the correct formulas for compounds formed between the following ions: Ca^{2+} and Cl^- , Na^+ and SO_4^{2-} .

Hint: Consider how the charges of the ions balance.

- A) CaCl
- B) CaCl_2 ✓
- C) NaSO_4
- D) Na_2SO_4 ✓

The correct formulas are CaCl_2 and Na_2SO_4 .

Write the chemical formula for a compound formed between magnesium ions (Mg^{2+}) and nitrate ions (NO_3^-).

Hint: Consider the charges of the ions involved.

The chemical formula for the compound is $\text{Mg}(\text{NO}_3)_2$.

Part 3: Analysis, Evaluation, and Creation

Which of the following compounds is covalent?

Hint: Think about the types of bonds formed.

- A) NaCl
- B) CO₂ ✓
- C) MgO
- D) KBr

■ The covalent compound among the options is CO₂.

Analyze the following statements and select those that are true about covalent compounds:

Hint: Consider the properties of covalent compounds.

- A) They conduct electricity when dissolved in water.
- B) They have low melting and boiling points. ✓
- C) They are formed by sharing electrons. ✓
- D) They are usually formed between non-metals. ✓

■ True statements about covalent compounds include that they are formed by sharing electrons and are usually formed between non-metals.

Explain why ionic compounds tend to have higher melting points than covalent compounds.

Hint: Consider the forces holding the compounds together.

■ Ionic compounds have higher melting points due to the strong electrostatic forces between oppositely charged ions, compared to the weaker forces in covalent compounds.

Which of the following best explains why water (H₂O) is a polar molecule?

Hint: Think about the shape and electron distribution in the molecule.

- A) It has a linear shape.
- B) It has a bent shape and an unequal distribution of electrons. ✓
- C) It is made of hydrogen and oxygen.
- D) It is a covalent compound.

Water is a polar molecule because it has a bent shape and an unequal distribution of electrons.

Evaluate the following scenarios and identify which describe a chemical reaction:

Hint: Consider the changes that occur during a chemical reaction.

- A) Ice melting into water.
- B) Iron rustling. ✓
- C) Salt dissolving in water.
- D) Baking soda reacting with vinegar. ✓

The scenarios that describe a chemical reaction are iron rustling and baking soda reacting with vinegar.

Design a simple experiment to demonstrate the formation of an ionic compound from its elements. Describe the materials and procedure you would use.

Hint: Think about the elements you would choose and how they react.

A simple experiment could involve combining sodium and chlorine to form sodium chloride, using appropriate safety measures.