

Chemistry 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.

- S
- Na ✓
- Sn
- N

■ 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.

- SO_4^{2-} ✓
- NO_3^- ✓
- Cl
- NH_4^+ ✓

■ Polyatomic ions include SO_4^{2-} , NO_3^- , and NH_4^+ .

Explain the difference between a cation and an anion.

Hint: Consider their charges.

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

List the chemical symbols for the following elements:

Hint: Refer to the periodic table for symbols.

1. Oxygen

O

2. Calcium

Ca

3. Iron

Fe

The chemical symbols are O for Oxygen, Ca for Calcium, and Fe for Iron.

Which of the following compounds is ionic?

Hint: Consider the types of elements involved.

- CO₂
- H₂O

NaCl ✓

CH₄

NaCl is an ionic compound.

Part 2: Comprehension and Application

What does the subscript '2' indicate in the chemical formula H₂O?

Hint: Think about the number of atoms.

Two molecules of water

Two atoms of hydrogen ✓

Two atoms of oxygen

Two ions of hydrogen

The subscript '2' indicates there are two atoms of hydrogen.

Which of the following statements are true about covalent compounds?

Hint: Consider the nature of bonding in these compounds.

They involve the sharing of electrons. ✓

They are typically formed between metals and nonmetals.

They can have prefixes like mono-, di-, and tri-. ✓

They are always neutral. ✓

True statements include that they involve sharing of electrons, can have prefixes, and are always neutral.

Describe how the charges of ions are balanced in an ionic compound.

Hint: Think about the overall charge of the compound.

The charges of cations and anions balance to create a neutral compound.

Which formula correctly represents calcium nitrate?

Hint: Consider the composition of the compound.

- CaNO_3
- $\text{Ca}(\text{NO}_3)_2$ ✓
- Ca_2NO_3
- $\text{Ca}_3(\text{NO}_3)_2$

The correct formula for calcium nitrate is $\text{Ca}(\text{NO}_3)_2$.

Identify the correct formulas for compounds containing the sulfate ion.

Hint: Look for the sulfate ion in the formulas.

- Na_2SO_4 ✓
- K_2SO_4 ✓
- MgSO_4 ✓
- $\text{Al}_2(\text{SO}_4)_3$ ✓

Correct formulas include Na_2SO_4 , K_2SO_4 , MgSO_4 , and $\text{Al}_2(\text{SO}_4)_3$.

Write the chemical formula for a compound formed between aluminum and oxygen. Explain your reasoning.

Hint: Consider the charges of the ions formed.

The formula is Al_2O_3 , formed by balancing the charges of Al^{3+} and O^{2-} .

Part 3: Analysis, Evaluation, and Creation

Which of the following compounds has a transition metal with a variable charge?

Hint: Identify compounds with transition metals.

- FeCl_3 ✓
- NaCl
- MgO
- CO_2

✓ FeCl_3 has iron, a transition metal with a variable charge.

Analyze the following compounds and select those that are correctly balanced.

Hint: Check the ratios of elements in the formulas.

- K_2O ✓
- AlCl_3 ✓
- CaCl_2 ✓
- Na_2O_2

✓ Correctly balanced compounds include K_2O , AlCl_3 , and CaCl_2 .

Analyze the compound Fe_2O_3 and explain the oxidation state of iron in this compound.

Hint: Consider the overall charge of the compound.

✓ In Fe_2O_3 , the oxidation state of iron is +3.

Which of the following best explains why water (H_2O) is a covalent compound?

Hint: Think about the nature of the bond between hydrogen and oxygen.

- It contains a metal and a nonmetal.
- It involves the transfer of electrons.
- It involves the sharing of electrons between hydrogen and oxygen. ✓

It forms a crystal lattice structure.

Water is a covalent compound because it involves the sharing of electrons between hydrogen and oxygen.

Evaluate the following statements and identify which are true about ionic compounds.

Hint: Consider the properties of ionic compounds.

- They conduct electricity when dissolved in water. ✓
- They have high melting and boiling points. ✓
- They are formed by the sharing of electrons.
- They are typically soluble in nonpolar solvents.

True statements include that they conduct electricity when dissolved in water and have high melting and boiling points.

Design a new compound using the elements potassium and sulfur. Write its chemical formula and explain the process of balancing the charges.

Hint: Consider the charges of potassium and sulfur ions.

The formula is K_2S , formed by balancing the +1 charge of potassium with the -2 charge of sulfur.