

# Naming Chemical Compounds Worksheet

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## Part 1: Building a Foundation

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### What is the charge of a cation?

*Hint: Consider the definition of cations.*

- Negative
- Positive
- Neutral
- Variable

### What is the charge of an anion?

*Hint: Recall the definition of an anion.*

- Negative
- Positive
- Neutral
- Variable

### Which of the following are examples of polyatomic ions?

*Hint: Look for ions that consist of multiple atoms.*

- $\text{NO}_3^-$
- $\text{CO}_3^{2-}$
- $\text{Na}^+$
- $\text{Cl}^-$

### Which of the following are examples of polyatomic ions?

*Hint: Consider ions that consist of multiple atoms.*

- $\text{NO}_3^-$

$\text{CO}_3^{2-}$   $\text{Na}^+$   $\text{Cl}^-$ 

**Explain the difference between ionic and covalent compounds in terms of their composition and bonding.**

*Hint: Consider how the atoms are held together in each type of compound.*

**Explain the difference between ionic and covalent compounds in terms of their composition and bonding.**

*Hint: Consider the types of elements involved and how they bond.*

**List the prefixes used for the numbers 1 to 4 in naming covalent compounds.**

*Hint: Think about the common prefixes used in chemistry.*

1. 1

2. 2

3. 3

4. 4

## Part 2: Understanding and Interpretation

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**What is the correct name for the compound NaCl?**

*Hint: Consider the naming conventions for ionic compounds.*

- Sodium chlorine
- Sodium chloride
- Sodium chlorate
- Sodium chlorite

**What is the correct name for the compound NaCl?**

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

- Sodium chlorine
- Sodium chloride
- Sodium chlorate
- Sodium chlorite

**Which of the following statements are true about transition metals?**

*Hint: Think about the properties of transition metals.*

- They always have a fixed oxidation state.
- They can have multiple oxidation states.
- They are typically non-metals.
- Their oxidation state is indicated by Roman numerals in compound names.

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*Hint: Think about the properties of transition metals.*

- They always have a fixed oxidation state.
- They can have multiple oxidation states.
- They are typically non-metals.
- Their oxidation state is indicated by Roman numerals in compound names.

**Describe how you would name a binary ionic compound formed between a metal and a non-metal.**

*Hint: Consider the rules for naming ionic compounds.*

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### Part 3: Application and Analysis

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**What is the correct name for the compound  $\text{CuSO}_4 \cdot 5\text{H}_2\text{O}$ ?**

*Hint: Consider the naming conventions for hydrates.*

- Copper(II) sulfate pentahydrate
- Copper sulfate hydrate
- Copper(II) sulfate monohydrate
- Copper sulfate dihydrate

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*Hint: Consider the naming conventions for hydrates.*

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- Copper(II) sulfate monohydrate
- Copper sulfate dihydrate

**Given the compound  $\text{FeCl}_3$ , which of the following are correct interpretations?**

*Hint: Think about the oxidation states of iron and chloride.*

- Iron(III) chloride
- Iron(II) chloride
- The iron ion has a +3 charge.
- The chloride ion has a -1 charge.

**Given the compound  $\text{FeCl}_3$ , which of the following are correct interpretations?**

*Hint: Think about the oxidation state of iron.*

- Iron(III) chloride
- Iron(II) chloride
- The iron ion has a +3 charge.
- The chloride ion has a -1 charge.

**Write the chemical formula for carbon tetrachloride.**

*Hint: Consider the number of chlorine atoms in the compound.*

**Write the chemical formula for carbon tetrachloride.**

*Hint: Consider the elements involved in the compound.*

**Analyze the compound H<sub>2</sub>SO<sub>4</sub>. Which of the following statements are true?**

*Hint: Consider the composition and properties of H<sub>2</sub>SO<sub>4</sub>.*

- It is a binary compound.
- It contains a polyatomic ion.
- It is an acid.
- It is named sulfuric acid.

**Analyze the compound H<sub>2</sub>SO<sub>4</sub>. Which of the following statements are true?**

*Hint: Consider the structure and properties of H<sub>2</sub>SO<sub>4</sub>.*

- It is a binary compound.
- It contains a polyatomic ion.
- It is an acid.
- It is named sulfuric acid.

**Explain how the naming of acids differs from the naming of other types of compounds.**

*Hint: Consider the specific rules for naming acids.*

**Explain how the naming of acids differs from the naming of other types of compounds.**

*Hint: Consider the rules specific to acids.*

## Part 4: Evaluation and Creation

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**Which of the following compounds is likely to be ionic?**

*Hint: Consider the types of elements involved in the compounds.*

- CO<sub>2</sub>
- Na<sub>2</sub>O
- H<sub>2</sub>O
- CH<sub>4</sub>

**Which of the following compounds is likely to be ionic?**

*Hint: Consider the types of elements involved in the compounds.*

- CO<sub>2</sub>
- Na<sub>2</sub>O
- H<sub>2</sub>O
- CH<sub>4</sub>

**Create a name for the compound with the formula Al<sub>2</sub>(SO<sub>4</sub>)<sub>3</sub>. Which of the following names are correct?**

*Hint: Consider the naming conventions for compounds with polyatomic ions.*

- Aluminum sulfate
- Aluminum sulfide
- Aluminum(III) sulfate
- Dialuminum trisulfate

**Create a name for the compound with the formula Al<sub>2</sub>(SO<sub>4</sub>)<sub>3</sub>. Which of the following names are correct?**

*Hint: Consider the naming conventions for compounds with polyatomic ions.*

- Aluminum sulfate
- Aluminum sulfide
- Aluminum(III) sulfate
- Dialuminum trisulfate

**Evaluate the following compound name: Iron(II) oxide. Provide the correct chemical formula and explain your reasoning.**

*Hint: Consider the oxidation state of iron in the compound.*

**Evaluate the following compound name: Iron(II) oxide. Provide the correct chemical formula and explain your reasoning.**

*Hint: Consider the oxidation state of iron.*