SCIENCE FOUNDATIONS

Writing chemical formulas

Difficulty level: Intermediate

Science Foundations

This document was made by AI and there may be mistakes. If a question or answer looks wrong, use the Flag a mistake button to let Brett know so he can fix it.

Overview of the concept

This is how you turn a chemical name on a label into the symbols that tell you exactly which atoms it contains, like knowing the formula of the salt in your kitchen. A cook reading a packet of baking soda can tell from its formula that it carries sodium, hydrogen, carbon, and oxygen. A pool owner reading a chlorine product label knows which atoms are doing the sanitising. Knowing how to write chemical formulas tells you how to read a label as a recipe of atoms, not just a name to memorise.



© 2026 Brett Robbins. All Rights Reserved.

Rule

Writing chemical formulas: in a compound, total positive charge = total negative charge, so the charges balance.

Write the positive ion first, then the negative ion, and use subscripts to show how many of each ion are needed to balance the charges.

Worked examples

EXAMPLE 1

Q **Write the formula for calcium chloride.**

SOLUTION

Write the ions: calcium is Ca 2+, chloride is Cl -1.

Balance: one Ca 2+ needs two Cl -1 to reach zero.

Write subscripts: $CaCl_2$.

The result is $CaCl_2$.

EXAMPLE 2

Q **Write the formula for aluminium oxide.**

SOLUTION

Write the ions: aluminium is Al 3+, oxide is O 2-.

Balance: $2 \times (+3) = +6$, $3 \times (-2) = -6$

Write subscripts: Al_2O_3.

The result is Al_2O_3.

© 2026 Brett Robbins. All Rights Reserved.

Practice questions

1 **Give the formula for calcium oxide and state the ions and charges you balanced.**

- **A** CaO; Ca2+ with one O_2- ion
- **B** CaO_2; Ca2+ with two O_2- ions
- **C** Ca_2O; two Ca2+ ions with one O_2- ion
- **D** CaO; Ca+ with one O_2- ion

Understand It with Pulse | Flag a mistake

© 2026 Brett Robbins. All Rights Reserved.

2 **Give the formula for magnesium chloride and state the ions and charges you balanced.**

- **A** MgCl; Mg2+ with one Cl- ion
- **B** Mg_2Cl; two Mg2+ ions with one Cl- ion
- **C** $MgCl_2$; Mg2+ with two Cl- ions
- **D** $MgCl_2$; Mg+ with two Cl- ions

Understand It with Pulse | Flag a mistake

© 2026 Brett Robbins. All Rights Reserved.

3 **Give the formula for aluminium chloride and state the ions and charges you balanced.**

- **A** $AlCl_2$; one Al3+ ion with two Cl- ions
- **B** $AlCl_3$; one Al3+ ion with three Cl- ions
- **C** Al_2Cl_3; two Al3+ ions with three Cl- ions
- **D** $AlCl_3$; one Al2+ ion with three Cl- ions

Understand It with Pulse | Flag a mistake

© 2026 Brett Robbins. All Rights Reserved.

4 **Give the formula for aluminium sulfide and state the ions and charges you balanced.**

- **A** AlS; one Al3+ ion with one S_2- ion
- **B** Al_2S; two Al3+ ions with one S_2- ion
- **C** Al_3S_2; three Al3+ ions with two S_2- ions
- **D** Al_2S_3; two Al3+ ions with three S_2- ions

Understand It with Pulse | Flag a mistake

5 **What is the formula for sodium chloride?**

- **A** NaCl
- **B** KCl
- **C** Na_2Cl
- **D** $NaCl_2$

Understand It with Pulse | Flag a mistake

© 2026 Brett Robbins. All Rights Reserved.

6 How many oxide ions are in one formula unit of aluminium oxide, Al_2O_3?

- **A** 3
- **B** 2
- **C** 1
- **D** 6

Understand It with Pulse | Flag a mistake

7 What charge does a calcium ion carry?

- **A** +2
- **B** +1
- **C** -2
- **D** -1

Understand It with Pulse | Flag a mistake

© 2026 Brett Robbins. All Rights Reserved.

8 What charge does a chloride ion carry?

A -1

B +1

C -2

D +2

Understand It with Pulse | Flag a mistake

9 What is the formula for potassium sulfide?

A K_2S

B KS

C KS_2

D K_3S

Understand It with Pulse | Flag a mistake

© 2026 Brett Robbins. All Rights Reserved.

10 **What is the name of the compound with the formula $CaCl_2$?**

A Calcium chloride

B Calcium chlorine

C Calcium dichloride

D Sodium chloride

Understand It with Pulse | Flag a mistake

© 2026 Brett Robbins. All Rights Reserved.

ANSWER KEY

1. CaO; Ca2+ with one O_2- ion

2. $MgCl_2$; Mg2+ with two Cl- ions

3. $AlCl_3$; one Al3+ ion with three Cl- ions

4. Al_2S_3; two Al3+ ions with three S_2- ions

5. NaCl

6. 3

7. +2

8. -1

9. K_2S

10. Calcium chloride

© 2026 Brett Robbins. All Rights Reserved.