

Writing formulae and balancing equations

Chemistry grades 9-10 (GCSE · IGCSE · O Level · Class 9-10) · Test answers (mark scheme)

Use the model answers and marking points to score your paper out of 20. For balancing marks, an equation counts only if every coefficient is correct. Note any wrong formulae first, because a wrong formula makes an equation impossible to balance.

Level: Chemistry grades 9-10 (GCSE · IGCSE · O Level · Class 9-10) · **Curriculum:** HS-PS1-7

Question 1 Write formulae (3 marks)

- a. MgCl_2
- b. Na_2SO_4
- c. $\text{Al}(\text{OH})_3$

Marking: 1 mark each.

Question 2 Balance the equations (3 marks)

- a. $\text{N}_2 + 3\text{H}_2 \rightarrow 2\text{NH}_3$
- b. $2\text{Al} + 3\text{Cl}_2 \rightarrow 2\text{AlCl}_3$
- c. $2\text{KClO}_3 \rightarrow 2\text{KCl} + 3\text{O}_2$

Marking: 1 mark for each fully correct equation.

Question 3 State symbols (2 marks)

(aq) means dissolved in water. The symbol for a gas is (g).

Marking: 1 mark each.

Question 4 Precipitate of silver bromide (3 marks)

- a. $\text{AgNO}_3(\text{aq}) + \text{NaBr}(\text{aq}) \rightarrow \text{AgBr}(\text{s}) + \text{NaNO}_3(\text{aq})$
- b. Na^+ and NO_3^-
- c. $\text{Ag}^+(\text{aq}) + \text{Br}^-(\text{aq}) \rightarrow \text{AgBr}(\text{s})$

Marking: 1 mark each part.

Question 5 Changing a subscript (2 marks)

MgO_2 is a different substance from magnesium oxide, so a subscript must not be changed.

The correct equation is **$2\text{Mg} + \text{O}_2 \rightarrow 2\text{MgO}$** .

Marking: 1 mark for the explanation, 1 mark for the correct equation.

Question 6 Burning aluminium (3 marks)

a. $10.2 - 5.4 = \mathbf{4.8\text{ g}}$.

b. The law of conservation of mass.

Marking: 1 mark for the method, 1 mark for 4.8 g, 1 mark for the law.

Question 7 Formula from ion cards (2 marks)

2 Fe^{3+} give 6+ and 3 SO_4^{2-} give 6−, so the formula is **$\text{Fe}_2(\text{SO}_4)_3$** .

Marking: 1 mark for the formula, 1 mark for the charge calculation.

Question 8 Charge on zinc (2 marks)

Two nitrate ions carry $2 \times 1- = 2-$, so the zinc ion must carry 2+. The ion is **Zn^{2+}** .

Marking: 1 mark for the nitrate charge total, 1 mark for 2+.