

Starters for 10

Transition skills answers

0.1 Basic chemistry competencies

0.1.1. Balancing equations

Accept multiples or appropriate fractions, 1 mark each.

1. $2\text{C} + \dots\text{O}_2 \longrightarrow 2\text{CO}$
2. $\dots\text{Ba} + 2\text{H}_2\text{O} \longrightarrow \dots\text{Ba(OH)}_2 + \dots\text{H}_2$
3. $\dots\text{C}_2\text{H}_6 + 3.5\text{O}_2 \longrightarrow 2\text{CO}_2 + 3\text{H}_2\text{O}$
4. $2\text{HCl} + \dots\text{Mg(OH)}_2 \longrightarrow \dots\text{MgCl}_2 + 2\text{H}_2\text{O}$
5. $\dots\text{N}_2 + \dots\text{O}_2 \longrightarrow 2\text{NO}$
6. $2\text{Fe}_2\text{O}_3 + \dots 3\text{C} \longrightarrow 4\text{Fe} + 3\text{CO}_2$
7. $\dots\text{CH}_3\text{CH}_2\text{OH} + 2[\text{O}] \longrightarrow \dots\text{CH}_3\text{COOH} + \dots\text{H}_2\text{O}$
8. $2\text{HNO}_3 + \dots\text{CuO} \longrightarrow \dots\text{Cu(NO}_3)_2 + \text{H}_2\text{O}$
9. $\dots\text{Al}^{3+} + 3\text{e}^- \longrightarrow \dots\text{Al}$
10. $2\text{Fe(H}_2\text{O)}_6^{3+} + 3\text{CO}_3^{2-} \longrightarrow 2\text{Fe(OH)}_3(\text{H}_2\text{O)}_3 + 3\text{CO}_2 + 3\text{H}_2\text{O}$

0.1.2. Constructing ionic formulae

1.

- a. $\text{Mg}^{2+} \text{O}^{2-} = \text{MgO}$ (1 mark)
- b. $\text{Na}^+ \text{SO}_4^{2-} = \text{Na}_2\text{SO}_4$ (1 mark)
- c. $\text{Ca}^{2+} \text{OH}^- = \text{Ca(OH)}_2$ (1 mark)
- d. $\text{Al}^{3+} \text{O}^{2-} = \text{Al}_2\text{O}_3$ (1 mark)
- e. $\text{Cu}^+ \text{O}^{2-} = \text{Cu}_2\text{O}$ (1 mark)

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2.

- a. SO_4^{2-} (1 mark)
- b. NO_3^- (1 mark)
- c. PO_4^{3-} (1 mark)
- d. HCOO^- (1 mark)
- e. CO_3^{2-} (1 mark)

0.1.3. Writing equations from text

1 mark each, accept multiples for all except question 9.

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|---|--------|--|
| 1. $3\text{Si} + 2\text{N}_2$ | —————→ | Si_3N_4 |
| 2. $\text{H}_2\text{SO}_4 + 2\text{NaOH}$ | —————→ | $\text{Na}_2\text{SO}_4 + 2\text{H}_2\text{O}$ |
| 3. $\text{B} + 1.5\text{Cl}_2$ | —————→ | BCl_3 |
| 4. $\text{N}_2 + \text{O}_2$ | —————→ | 2NO |
| 5. $\text{C}_2\text{H}_5\text{OH} + 3\text{O}_2$ | —————→ | $2\text{CO}_2 + 3\text{H}_2\text{O}$ |
| 6. $\text{SiO}_2 + \text{C} + 2\text{Cl}_2$ | —————→ | $\text{SiCl}_4 + \text{CO}_2$ |
| 7. $\text{Fe}_2\text{O}_3 + 3\text{CO}$ | —————→ | $2\text{Fe} + 3\text{CO}_2$ |
| 8. $\text{CH}_4 + 2\text{O}_2$ | —————→ | $\text{CO}_2 + 2\text{H}_2\text{O}$ |
| 9. $0.5\text{Cl}_2 + 1.5\text{F}_2$ | —————→ | ClF_3 |
| 10. $2\text{NO}_2 + \text{H}_2\text{O} + 0.5\text{O}_2$ | —————→ | 2HNO_3 |