



Chemical Changes

Multiple Choice Questions

Set 4 (HT Only)

Tick **one** box.

1. What is oxidation?

- A. the gain of electrons or gain of oxygen ☐
- B. the gain of electrons or loss of oxygen ☐
- C. the loss of electrons or gain of oxygen ☐
- D. the loss of electrons or loss of oxygen ☐

2. What is the correct ionic equation for the reaction between magnesium and copper sulfate solution?

- A. $\text{Mg} + \text{Cu}^+ \rightarrow \text{Mg}^+ + \text{Cu}$ ☐
- B. $\text{Mg} + \text{Cu}^{2+} \rightarrow \text{Mg}^{2+} + \text{Cu}$ ☐
- C. $\text{Mg}^+ + \text{Cu} \rightarrow \text{Mg} + \text{Cu}^+$ ☐
- D. $\text{Mg}^{2+} + \text{Cu} \rightarrow \text{Mg} + \text{Cu}^{2+}$ ☐

3. Which of the following is the correctly balanced half equation for the reduction of aluminium in its extraction from Al_2O_3 ?

- A. $\text{Al} \rightarrow \text{Al}^+ + \text{e}^-$ ☐
- B. $\text{Al} \rightarrow \text{Al}^{3+} + 3\text{e}^-$ ☐
- C. $\text{Al}^+ + \text{e}^- \rightarrow \text{Al}$ ☐
- D. $\text{Al}^{3+} + 3\text{e}^- \rightarrow \text{Al}$ ☐

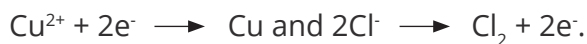
4. Which of the following is **not** an example of a strong acid?

- A. citric acid ☐
- B. hydrochloric acid ☐
- C. nitric acid ☐
- D. sulfuric acid ☐

5. Which of the following describes a weak acid?

- A. it has a pH value greater than 7 ☐
- B. it has a high concentration of H^+ ions ☐
- C. it is completely ionised in aqueous solutions ☐
- D. it is only partially ionised in aqueous solutions ☐

6. What happens to the pH of a solution if the hydrogen ion concentration increases by a factor of 1000?
- A. the pH decreases by 2 ☐
- B. the pH decreases by 3 ☐
- C. the pH increases by 1 ☐
- D. the pH increases by 3 ☐
7. A solution of 0.5mol/dm³ sulfuric acid has a pH of 0.3.
What will the pH of the solution be if it is diluted to 0.05mol/dm³?
- A. 0 ☐
- B. 1.3 ☐
- C. 2.3 ☐
- D. 3 ☐
8. What happens at the anode during electrolysis?
- A. positively charged ions gain electrons ☐
- B. positively charged ions lose electrons ☐
- C. negatively charged ions gain electrons ☐
- D. negatively charged ions lose electrons ☐
9. The half equations for the reactions that take place in the electrolysis of molten copper chloride are



Which of the following statements is correct?

- A. chloride ions gain electrons and are reduced ☐
- B. chloride ions lose electrons and are oxidised ☐
- C. copper ions gain electrons and are oxidised ☐
- D. copper ions lose electrons and are reduced ☐
10. Which of the following half equations represents the reaction that takes place at the cathode in the electrolysis of aqueous sodium chloride?
- A. $2\text{H}^{+} + 2\text{e}^{-} \longrightarrow \text{H}_2$ ☐
- B. $\text{Na}^{+} + \text{e}^{-} \longrightarrow \text{Na}$ ☐
- C. $4\text{OH}^{-} \longrightarrow \text{O}_2 + 2\text{H}_2\text{O} + 4\text{e}^{-}$ ☐
- D. $2\text{Cl}^{-} \longrightarrow \text{Cl}_2 + 2\text{e}^{-}$ ☐