

Epsom College — 13+ Chemistry Scholarship 2019

Hearthprep practice paper · 10 questions

1. [2 marks]

Many everyday items are made of metal. The picture shows four objects made of metals or alloys: electrical wire, an aeroplane, a piece of jewellery (a diamond ring with a gold band), and a knife. Explain why gold is a suitable metal to make jewellery.

2. [2 marks]

Overhead power cables supported on pylons are used to carry electricity. [Image: a high-voltage electricity pylon with cables.] The table shows information about three metallic substances. | metallic substance | density / kg m⁻³ | cost per tonne / GBP | relative strength | relative ability to conduct electricity | relative resistance to corrosion | | copper | 8920 | 5279 | high | very good | good | | aluminium | 2700 | 1425 | high | good | good | | steel | 7820 | 505 | very high | good | poor | The pylons are made of steel. Use information from the table to explain which properties of steel make it the most suitable of these three metals for the pylons.

3. [2 marks]

Use information from the table (showing density, cost per tonne, strength, electrical conductivity and corrosion resistance for copper, aluminium and steel) to explain which properties of aluminium make it more suitable than copper for making overhead power cables.

4. [2 marks]

Indigestion is caused by excess hydrochloric acid in the stomach. Calcium carbonate neutralises the excess hydrochloric acid, producing calcium chloride, a gas and water. Use words from the box to complete the word equation for this reaction. [Word box: calcium hydroxide, calcium oxide, carbon dioxide, chlorine, hydrochloric acid, hydrogen.] Calcium carbonate + _____ -> calcium chloride + _____ + water

5. [1 mark]

A mixture of copper oxide and carbon powder was heated. Carbon dioxide was produced. It was bubbled into limewater. [Diagram: a test tube containing copper oxide + carbon powder is being heated with a Bunsen burner; the test tube has a delivery tube leading to a test tube X containing limewater, into which the gas bubbles.] The word equation for the reaction is: copper oxide + carbon -> copper + carbon dioxide. Complete the sentence by underlining your answer. When carbon dioxide is bubbled into limewater, the limewater: a. changes from orange to colourless; b. remains colourless; c. becomes milky; d. becomes blue.

- (A) changes from orange to colourless
- (B) remains colourless
- (C) becomes milky
- (D) becomes blue

6. [1 mark]

The mass of test tube X and its contents was measured before heating and after heating. There was a change in mass. Explain why the total mass of the test tube and contents changes during the reaction.

7. [1 mark]

Hydrochloric acid is produced in the stomach. When too much acid is produced it can cause indigestion. Give a reason why hydrochloric acid is present in the stomach.

8. [1 mark]

Complete the sentence by underlining your answer. The formula of hydrochloric acid is: A. HCl, B. H₂Cl, C. HCl₂, D. HCl².

- (A) HCl
- (B) H₂Cl
- (C) HCl₂
- (D) HCl²

9. [1 mark]

Which of these hazard symbols should be used on a container of dilute hydrochloric acid to show that it is an irritant? Put a cross in the box next to your answer. [Four hazard symbols are shown: A - flame (highly flammable); B - skull and crossbones (toxic); C - black X on white background (irritant / harmful); D - hand and surface being eaten away by liquid drops (corrosive).]

- (A) A - flame (flammable)
- (B) B - skull and crossbones (toxic)
- (C) C - black X (irritant / harmful)
- (D) D - hand being eaten away (corrosive)

10.

[2 marks]

Indigestion can cause pain in the chest. Indigestion tablets can be taken to relieve this pain. [Image: a packet of indigestion relief tablets containing magnesium carbonate, 500 mg.] Explain how indigestion tablets relieve this pain.

Answers are in the Answer Book at hearthprep.com (paid).