

Name Index No

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S4 Mock Examinations 2004
545/2 Chemistry Paper 2
2 Hours

INSTRUCTIONS TO CANDIDATES:

Section A consists of 10 structured questions.

Attempt all questions in this section

Answers to questions must be written in the spaces provided.

In both sections all working must be shown clear

1. (a) Define the term hard water

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(b) What ions are responsible for the hardness of water.

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(c) State two advantages of hard water

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2. The atom of an element W has 19 electrons.

(a) Write the electronic configuration of the element

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(b) State the group and period in which the element is found

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(c) (i) Write the formula of the oxide of W.

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.....

(ii) State two physical properties of the oxide of W

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.....

3. (a) Give the names of the following compounds
- (i) CH_3CH_3
- (ii) $\text{CH}_3\underset{\text{OH}}{\text{CH}}\text{CH}_3$
- (iii) $\text{CH}_2 = \text{CHCH}_3$
- (b) Concentrated sulphuric acid was added to ethanol and the mixture heated to 180°C .
- (i) Write the equation for the reaction

- (ii) State what is observed when the gas produced is bubbled through bromine water

4. 5.30g of anhydrous sodium carbonate were dissolved in 250cm^3 of water
- (a) Calculate the molarity of the solution formed
 (Na = 23, O = 16, C = 12 H = 1)

- (b) Determine the volume of 0.5M sulphuric acid that can react completely with 15cm^3 of the sodium carbonate solution

5. A little sulphur is added to natural rubber to improve the elasticity, temperature working range, bulkiness etc.
- (a) What name is given to this process?

- (b) State two uses of rubber

6. During the extraction of copper, the ores are passed through the following processes. Concentration, roasting, addition of silicon dioxide, reduction and finally purification

(a) What is meant by the term roasting?

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(b) Write the equation (s) for the reaction(s) that take place during the purification process

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(c) State two uses of copper

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7. (a) State two factors that affect the type of ion to be discharged during electrolysis

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(b) Determine the mass of silver that can be deposited by the same quantity of electricity that deposits 12.8g of copper

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8. (a) Define the term endothermic reaction

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(b) The combustion of carbon is exothermic

(i) Write the equation for the combustion of carbon

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(ii) Briefly explain why charcoal is used for cooking

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(iii) State the danger of using a charcoal stove in a small poorly ventilated room

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9. During the preparation of oxygen in the laboratory a few gramms of manganese dioxide are added to hydrogen peroxide and the gas collected over water.

(a) (i) What is the use of the manganese dioxide added?

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(ii) Why is it possible to collect the oxygen gas over water?

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(b) State two uses of oxygen gas

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(c) Write the equation for the reaction between magnesium ribbon and steam

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10. (a) Zinc carbonate powder was heated strongly until there was no further change. The residue was added to a little nitric acid. To the resultant solution was added ammonia solution dropwise until excess.

(i) State what was observed

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(ii) Write the equation (s) for the reaction (s) between ammonia solution and the final solution

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(b) Apart from identification of cations, state two other uses of ammonia

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SECTION B:

11. (a) Define the following terms

- (i) polymer
- (ii) monomer

(b) Give two examples of polymers and their monomers.

(c) state two advantages and one disadvantage of synthetic polymers over natural polymers

(d) Given the polymer $\left[\underset{\text{Cl}}{\text{CH}} - \text{CH}_2 - \underset{\text{Cl}}{\text{CH}} - \text{CH}_2 \right]_n$

Write the structural formula and name of the monomer.

(e) (i) State two uses of polyethene

(ii) Give one disadvantage of the extensive use of polyethene

12. (a) Chlorine gas is prepared by reacting sulphuric acid and potassium permanganate

- (i) State the conditions necessary for the reaction to proceed successfully.
- (ii) Write the equation for the reaction

(b) State two physical properties of chlorine gas

(c) State what is observed when chlorine gas is

- (i) bubbled through potassium bromide solution
- (ii) bubbled through silver nitrate solution
- (iii) bubbled through hydrogen sulphide solution

Write the equation(s) for each of the above reactions

(d) State three uses of chlorine.

13. (a) Carbon can naturally exist as graphite, diamond, soot, coke or charcoal

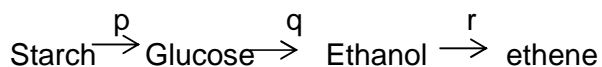
- (i) What name is given to these different forms of carbon?
- (ii) State two chemical properties of carbon. Include equations to illustrate your answer
- (iii) Draw a simplified structure of graphite

(d) Carbon dioxide gas can be prepared by reacting Marble chips with dilute hydrochloric acid

- (i) Draw a well-labelled diagram for the set of apparatus used to prepare a dry sample of carbon dioxide gas
- (ii) Write the ionic equation for that reaction

(e) State three uses of carbon dioxide

14. Given a series of reactions



(a) Name the type of reaction represented by

- (i) q
- (ii) r

- (b) What are the conditions necessary for reaction r to take place. Write the equation for the reaction.
- (c) (i) State what is observed when ethene is bubbled through bromine water
(ii) Write the equation for the reaction in c(i) above
- (d) (i) State two main components of biogas
(ii) With reference to one of the components, briefly explain the use of biogas
(iii) State two advantages of biogas production

END