**CHEMISTRY**

**DECEMBER ASSIGNMENT**

**FORM ONE**

1. Hydrogen can be prepared by reacting zinc with dilute hydrochloric acid.

a) Write an equation for the reaction.

b) Name an appropriate drying agent for hydrogen gas.

c) Explain why copper metal cannot be used to prepare hydrogen gas.

d) Hydrogen burns in oxygen to form an oxide.

(i) Write an equation for the reaction.

(ii) State **two** precautions that must be taken before the combustion begins and at the end of

the combustion.

e) Give **two** uses of hydrogen gas.

f) When zinc is heated to redness in a current of steam, hydrogen gas is obtained. Write an

equation for the reaction.

g) Element **Q** reacts with dilute acids but not with cold water. Element **R** does not react with

dilute acids. Elements **S** displaces element **P** from its oxide. **P** reacts with cold water. Arrange

the four elements in order of their reactivity, starting with the most reactive.

h) Explain how hydrogen is used in the manufacture of margarine.

2. (a) Hydrogen can reduce coppers Oxide but not aluminium oxide. Explain

(b) When water reacts with potassium metal the hydrogen produced ignites

Explosively on the surface of water.

(i) What causes this ignition?

(ii) Write an equation to show how this ignition occurs

3. Element **E** has an atomic number of 5.

In a sample of **E** there are two isotopes. One isotope has a mass number of 10 and the

other isotope has a mass number of 11.

a. Explain, in terms of subatomic particles, what is meant by the term isotopes.

b. Element **X** has an atomic number of 18.

c. State the electronic configuration of an atom of element **X**.

4. The electronic structures of five atoms, A, B, C, D and E, are shown.



Answer the following questions about these structures. Each structure may be used

once, more than once or not at all. State which structure, A, B, C, D or E, represents:

1. An atom of a metallic element. ……………………………………………………
2. An atom with a proton number of 13. ……………………………………………
3. An atom of phosphorus. ………………………………………………………
4. An atom with only two shells of electrons. ……………………………………
5. An atom which forms a stable ion with a single negative charge. …………….

5. In an experiment, a piece of magnesium ribbon was cleaned with steel wool. 2.4g of

the clean magnesium ribbon was placed in a crucible and completely burnt in oxygen.

After cooling the product weighed 4.0g

a) Explain why it is necessary to clean magnesium ribbon

b) What observation was made in the crucible after burning magnesium ribbon?

c) Why was there an increase in mass?

d) Write an equation for the major chemical reaction which took place in the crucible

e) The product in the crucible was shaken with water and filtered. State and explain the

observation which was made when red and blue litmus paper were dropped into the filtrate

6. A group of students burnt a piece of Mg ribbon in air and its ash collected in a Petri dish.

The ash was found to comprise of magnesium Oxide and Magnesium nitride

(i) Write an equation for the reaction leading to formation of the magnesium nitride

(ii) A little water was added to the products in the Petri dish. State and explain the

observation made.

(iii) A piece of blue litmus paper was dipped into the solution formed in (b) above.

State the observation made.

7. A piece of phosphorous was burnt in excess air. The product obtained was shaken with a small

amount of hot water to make a solution

i) Write an equation for the burning of phosphorus in excess air

ii) The solution obtained in (b) above as found to have pH of 2. Give reasons for this

observation

8. a) Fraction distillation of liquid air usually produces nitrogen and oxygen as the major

products.

i) Name one substance that is used to remove carbon dioxide from the air

before it is changed into liquid.

ii) Describe how nitrogen gas is obtained from the liquid air.

(Boiling points nitrogen = - 1960C, oxygen = -1830C

9. Iron (III) oxide was found to be contaminated with copper (II) sulphate. Describe how a pure sample of iron (III) oxide can be obtained.

10. a) Biogas is a mixture of mainly carbon (IV) oxide and methane.

(i) Give a reason why biogas can be used as a fuel. (1 mark)

(ii) Other than fractional distillation, describe a method that can be

used to determine the percentage of methane in biogas. (3 marks)