

JOINT EVALUATION TERM 3 2023

CHEMISTRY FORM 2

1. Distinguish between a dropping funnel and a thistle funnel (2mks)
 Dropping funnel has a tap while thistle funnel has no tap/dropping funnel is used to add controlled amounts of liquids into vessels while thistle funnel is used for delivering liquid substances

2. What is a fume chamber/cupboard and give its use (2mks)
 is a special enclosed room in the laboratory where experiments in which poisonous gases are produced are carried out.

3. The setup below was used to prepare and collect hydrogen gas
 - (a) write an equation for the reaction that produces hydrogen gas (2mks)

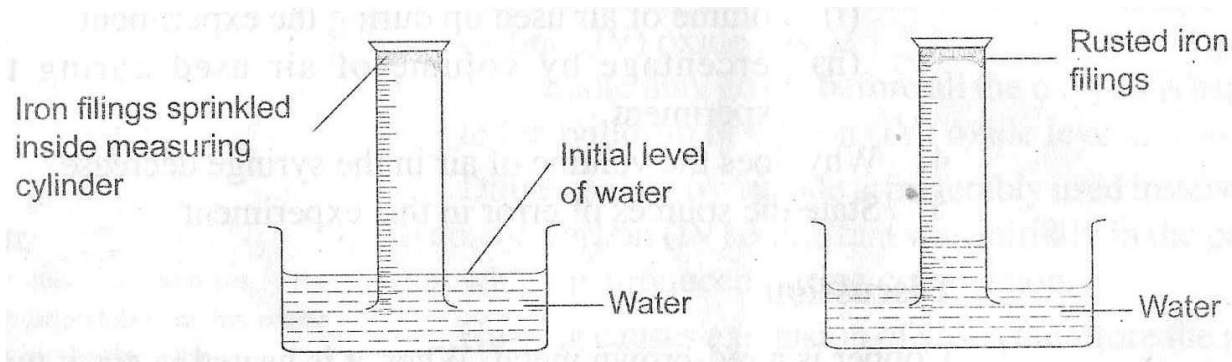
$$\text{Zn}_{(s)} + 2\text{HCl}_{(aq)} \longrightarrow \text{ZnCl}_{2(s)} + \text{H}_{2(g)}$$

 - (b) Why is hydrogen gas collected over water (1mk)
 because it is insoluble in water/slightly soluble in water

 - (c) State what is observed when a few drops of phenolphthalein indicator were added to the solution of wood ash (1mk)
 A pink colour is seen.

4. Fractional distillation of liquid air is a method used to separate various gaseous mixture in air. State how to (3mks)
 - i) remove carbon(IV) oxide –by passing through a solution of concentrated sodium hydroxide/potassium hydroxide
 - ii) remove water-by cooling to -25°
 - iii) obtain nitrogen-fractional distillation of liquefied air

5. The following apparatus and chemicals are used to investigate the percentage of air used when iron rusts: iron fillings 100ml measuring cylinder, trough and water.
 - a) Draw a setup of the experiment (2mks)



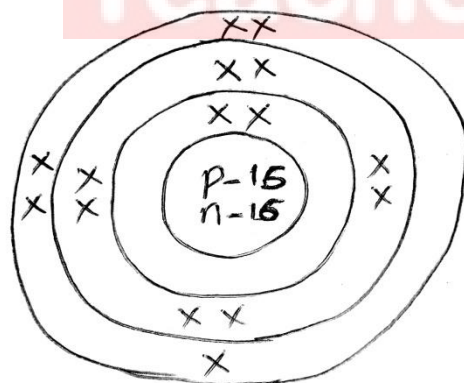
6. What is the method used to obtain sunflower oil from sunflower seeds (1mk)

Solvent extraction

7 why should a non luminous flame be put off or adjusted to a luminous flame after use (2mks)

luminous flame is yellow hence it can easily be seen and minimizes fire accidents in the lab and also to save on fuel.

8. Draw and show the electron arrangement of phosphorus (atomic number 15)



(2mks)

9 Atoms are made up of subatomic particles.name them (3mks)

Protons

Electrons

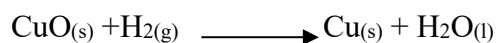
neutrons

10. In an experiment hydrogen gas was passed over heated copper (II) oxide as shown.

i) State the observations made in the combustion tube after the experiment (2mks)

The black copper(II) oxide changes into a brown solid and colourless liquid collects on the cooler parts of the tube.

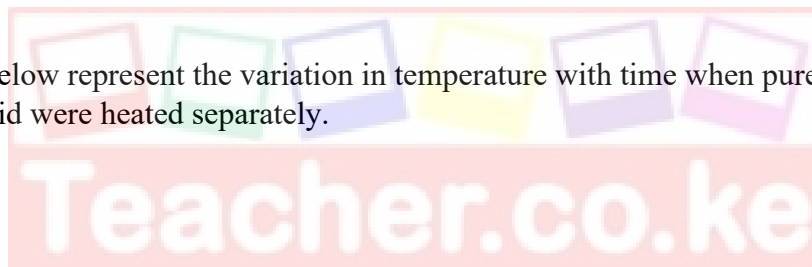
ii) Write the equation for the reaction between copper (II) oxide and hydrogen gas (1mk)



iii) Explain why heat is necessary in this experiment. (1mk)

To speed up the reaction

11. The curves below represent the variation in temperature with time when pure and impure samples of a solid were heated separately.



i) Which curve shows variation in temperature of a pure solid. Explain curve B. It has a sharp melting and boiling point. (2mks)

ii) State the effect of an impurity on the melting and boiling points of a pure substance (2mks)

Impurities raise the boiling points of liquids and lower the melting points of substances

12. The table below gives the atomic number of elements M, N, P, Q, R, S and T. The letters are not the actual symbols of the elements.

i) Write the electron arrangement of element P (1mk)

2,8,4

ii) The stable ion of N 2,8 (1mk)

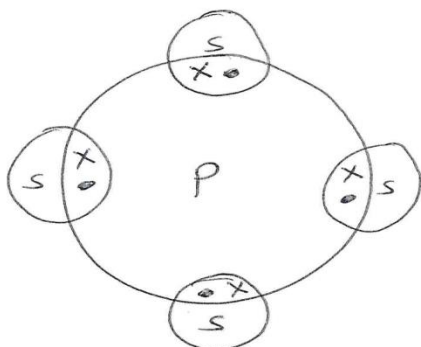
b) Write the formula of the compound formed between N and S



(2mks)

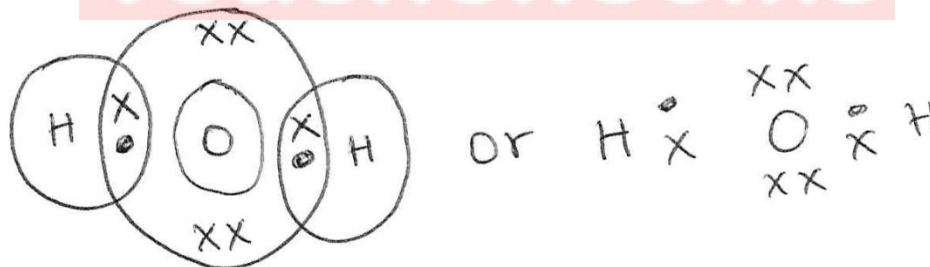
c) Using dot (.) and cross (x) diagram show how bonding occurs between P and S

(2mks)



d) Using dot (.) and cross (x) diagram show how bonding occurs in water molecule. H_2O

(2mks)



13 .Explain the following observations

- i) Noble gases are generally unreactive
This because they neither gain nor loose electrons

(1mks)

- ii) Atomic radius of alkali metals increase down the group (1mk)
This is because of the increase in number of occupied energy levels
- iii) Aluminium is a better conductor of electricity than sodium (1mk)
Conductivity increase with increase in number of delocalized electrons.

14. An element Q consists of three isotopes with mass number of 22,24 and 25 with percentage abundance of 89.6%,6.4% and 4% respectively. Find the relative atomic mass of element Q. (2mks)

$$\left(\frac{22 \times 89.6 + 6.4 \times 24 + 4 \times 25}{100} \right)$$

$$\text{Ram} = 19.712 + 1.536 + 1$$

$$= 22.248$$

15. Write the formula of the of the compounds below.

(3mks)

NAME	FORMULA OF COMPOUND
Copper(II) oxide	CUO
Iron(II)sulphate	FeSO ₄
Sulphur(IV)oxide	SO ₂

16 .List any 3 elements that belong to group (VIII) of the periodic table

(3mks)

Helium

Neon

argon

17. The following diagrams show the structures of two allotropes of carbon .Study them and answer the questions that follow.

i) Name allotrope
(2MKS)

M-diamond

N-graphite

ii) Give one use of N (1mk)

used as an electrode

iii) Which allotrope conducts electricity? Explain (2mks)

N-it has delocalized electrons in its structure.

18 .Below is a structure of Aluminium chloride.

i) Identify the bonds labelled A and B (2mks)

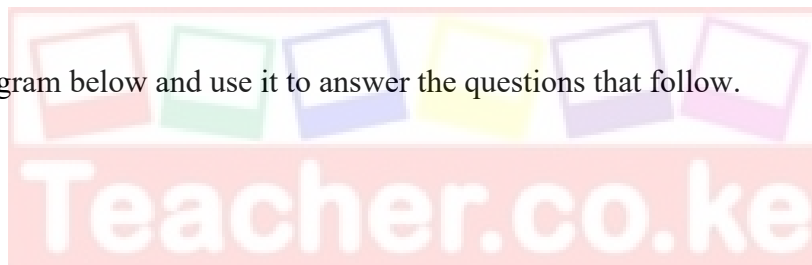
A-covalent

B-Dative/Coordinate

ii) Aluminium oxide is said to be an amphoteric oxide ,what is an amphoteric oxide(2 mks)

it is an oxide that reacts with both acids and alkalis

19 study the diagram below and use it to answer the questions that follow.



i) Differentiate between electrolyte and non-electrolyte (2mks)

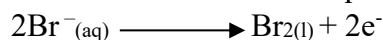
electric current and gets decomposed while non electrolytes are composed of molecules hence do not conduct an electric current when dissolved or melted.

ii) Identify electrode A and B (2mks)

A-Anode

B-Cathode

iii) Write the electrode half equation at electrode A (1mk)



Iv) state any two applications of electrolysis (2mks)
extraction of metals like sodium

Purification of metals

Electroplating of metals

Manufacture of pure chemicals

20 Write the chemical equation for the effect of heat on



II) state two uses of carbon(IV)oxide (2mks)

Used as a refrigerating agent for perishable goods

Used as a fire extinguisher

Manufacture of sodium carbonate in the solvay process.

21. (a). it can lose or gain one electron to become stable (2mks)

(b) alkaline earth metals (1mk)

(c) $\text{P} + \text{V} \longrightarrow \text{PV}_2$ (1mk)

(d). Q has a higher melting point than V because Q has strong metallic bonds while V has weak vanderwaals forces (2mks)

(e) $\text{T} + \text{O}_2 \longrightarrow \text{TO}_2$ (1mk)

(f). it is used in light bulbs to provide an inert environment to prevent oxidation of the filament

It is used as an insulator in arch welding (2mk)

22. it is a process where a salt lose some water of crystallization when exposed to air (2mks)