**NAME………………………………………………………ADM………………….CLASS………………….**

**CHEMISRTY**

**FORM 1, MID TERM 3 EXAM – 2022**

**Time 2 Hours 30 Minutes**

***Answer ALL Questions in the spaces provided***

1. Give three reasons why laboratory apparatus are made of glass. (3mks)
* **Easy to clean**
* **For easy visibility**
* **Most of them don’t react with most chemicals.**
1. A wooden splint was slipped through a region of a particulars flame in the laboratory and was shown in the diagram below.

 Unburnt part

 Burnt part

1. Name the type of flame the splint was slipped through. (1mk)

**Nom – luminous flame**

1. Explain why the splint was burnt the way it is shown in the diagram. (2mks)

**The charred part was in contact with the outer part of the flame which is hotter. The inner part of the flame contains un burnt gases due to incomplete combustion hence not charred.**

1. .
2. Define the following terms;
3. Drug (1mk)

**It is substance, natural or manufactured which when used alters the way the body fuctions.**

1. Drug abuse (1mk)

 **It is the use of a drug for a purpose other than what it is meant for**.

1. Mention any two side effects of drug abuse. (2mks)
* **Smoking tobacco leads to lung cancer and heart failure.**
* **Addiction**
* **Liver cirrhosis**
* **death**
1. State any four differences between luminous and non – luminous flames. (4mks)

|  |  |
| --- | --- |
| **Luminous flame** | **Non luminous flame** |
| **- It is yellow** | **- it is blue** |
| * **It is large and wavy**
 | * **It is small and straight**
 |
| * **It has four zone**
 | * **It has three zones**
 |
| * **It produces soot**
 | * **It does not produce soot**
 |

1. State one use of each of the following apparatus in the laboratory
2. Dessicator (1mk)
* **Used for drying**
* **Used for keeping substances free from moisture**
1. Crucible (1mk)

**Used when heating solid substances that required strong heating.**

1. State the correct method of separating the following mixtures. (4mks)
2. A mixture of iron fillings and sulphur – **Use of a magnet**
3. Sugar and iodine -  **Sublimation**
4. Sand and water mixture - **Filtration**
5. Kerosene and water – **Separating funnel**
6. .
7. State the role of the following parts during fractional distillation of a mixture of water and ethanol.
8. Fractional column. (1mks)

**To allow water vapor to condense into liquid and flow back into the flask before boiling point of water is reached.**

1. Glass beads. (1mk)
* **To increase the surface area for condensation.**
1. What property of the mixture makes it possible to be separated by fractional distillation. (1mk)

**The liquids must have different boiling points.**

1. State any two application of fractional distillation. (2mks)
* **Distillation of crude oil**
* **Recycling of used oil**
* **Distillation of liquid air in the manufacture of nitrogen and oxygen**
1. In an experiment to separate a mixture of two liquids A and B a student set up the apparatus as shown below.
2. Name the apparatus. (1mk)

**Separating funnel**

1. Which liquid is denser? (1mk)

**B**

1. Which other methods can be used to separate the two liquids. (1mk)

 **Decantation**

1. State three differences between temporary and permanent change. (3mks)

|  |  |
| --- | --- |
| **Temporary changes** | **Permanent changes** |
| They are easily reversible | Irreversible  |
| No new substance is formed | New substance are formed |
| The mass of the substance does not change  | There is change in mass |
| Not accompanied by net heat change | Heat energy is released or absorbed |

1. .
2. What is an acid – base indicator? (1mk)
3. Fill in the table below to show the colour of the following indicators. (3mks)

|  |  |  |
| --- | --- | --- |
| Indicator | Colour in acid | Colour in alkali |
| Litmus | **Red**  | **Blue** |
| Phenolphthalein | **Colorless** | **Pink** |
| Methyl orange | **pink** | **yellow** |

1. Unknown substance had Ph values as shown in the table below.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Substance | A | B | C | D |
| Ph value | 6.0 | 2.0 | 12.0 | 7.0 |

State which substance was likely to be; (3mks)

1. Lemon juice **A**
2. Sodium chloride solution **D**
3. Potassium hydroxide solution **C**
4. State three uses of acids. (3mks)
* **Carbonic acid is used in aerated drinks to enhance taste**
* **Hydrochloric acid is used to clean metal surface.**
* **Nitric acid is used to manufacture dyes, paints, explosives and fertilizers.**
1. Complete the word equation below. (4mks)
2. Sodium hydroxide + Dilute hydrochloric acids **Sodium chloride + water**

1. Calcium carbonate + Dilute sulphuric acid  **Calcium sulphate +Carbon (iv) oxide + water**
2. Magnesium oxide + Dilute nitric (v) acid **Magnesium nitrate + water**
3. Zinc + dilute hydrochloric acid  **Zinc chloride + hydrogen gas**
4. .
5. Give the chemical name for the rust. (1mk)

**Hydrated iron (iii) oxide.**

1. Apart from oiling and greasing, state two methods that can be used to prevent rusting. (2mks)
* **Painting**
* **Alloying**
* **Sacrificial protection**
* **Coating with other metals through galvanization and electroplating**
1. State two conditions that accelerate rusting. (2mks)
* **High temperatures**
* **Acidic conditions**
* **Salty conditions**
1. The diagram below is set – up for the laboratory preparation of oxyen
2. Name solid R (1mk)

**Manganese (iv) oxide**

1. Name the apparatus X. (1mk)

**Dropping funnel**

1. Write an equation for the reaction that takes place in the flask. (2mks)

**Hydrogen peroxide manganese (iv) Oxygen gas + water**

 **Oxide**

1. Give a test for oxygen gas. (1mk)

**It relights a glowing wooden splint**

1. State two uses of oxygen gas. (2mks)
* **Used in hospital by patients with breathing difficulties**
* **Used by mountain climbers and deep – sea divers.**
* **Used to burn fuel such as those used for propelling rockets.**
* **Used as one of the reactants in fuel cells.**
* **A mixture of oxygen and acetylene (hydrogen) burns to produce a very hot flame used in welding and cutting metals.**
* **During steel making, oxygen is used to remove iron impunities.**
1. Name the product formed when kerosene is burned in air. (2mks)
* **Carbon (iv) oxide**
* **Water.**
1. State two chemical tests for the presence of water. (2mks)

**Water turns white anhydrous copper (ii) sulphate to blue.**

**It turns blue cobalt (ii) chloride paper to pink**

1. State three observations made when a small piece of potassium is placed in water. (3mks)

**It melts into a silvery ball**

**It darts on the surface of water**

**A lilac flame is produced.**

1. Explain why the following reagents are not used in the laboratory preparation of hydrogen gas. (2mks)
2. Nitric acid

**Because the hydrogen produced is oxidized to water**

1. Potassium

**Because it reacts explosively with dilute acids**

1. Metal X reacts with cold water slowly while Y does not react with neither cold nor hot water. Metal Z react with both cold water and hot water vigorously and explosively respectively. Arrange those metals in order of increasing reactivity. (2mks)

**YXZ**

1. The set – up below is used to investigate the properties of hydrogen gas.
2. On the diagram, indicate what should be done for the reaction to occur. (1mks)

**Below copper (ii) oxide there must be heating**

1. Write an equation for the reaction that occurs in the combustion tube. (1mk)

**Copper (ii) oxide + Hydrogen copper +water**

1. Hydrogen gas is allowed to pass through the tube for sometime before it is lit. Explain. (1mk)

**To drive out air because mixture of air and hydrogen is explosive when lit**

1. What property of hydrogen gas is being investigated? (1mk)

**Reduce property**

1. State and explain the observations made in the combustion tube. (3mks)

**The black copper (ii) oxide changes to red – brown. Hydrogen reduces copper (ii) oxide to copper metal which is brown. A colorless liquid condenses and collects on the cooler parts of the combustion tube. Hydrogen combines with oxygen from copper (ii) oxide to form water.**

1. State two uses of hydrogen gas. (2mks)
* **Used in the large scale manufacture of ammonia in Haber process.**
* **Used to produce oxy-hydrogen flame used in welding and for cutting metals**
* **Used in the manufacture of hydrochloric acid**
1. In an experiment to investigate the percentage of oxygen in air, 200cm3 of air was passed over heated copper turnings repeatedly until a constant volume of air remained. 160cm3of air remained at the end of the experiment.
2. Name the gases remaining in the 160cm3 of air. (2mks)
* **Nitrogen**
* **Carbon (iv) oxide**
* **Noble gases eg Argon**
1. Determine the percentage of air used during the experiment. (2mks)

**% of air= 200 -160 x 100%**

 **200**

**40 /200 x 100% = 20%**

1. State one possible source of error in the experiment. (1mk)

**The air initially present in the tube is not accounted for**

1. Write a word equation for the reaction. (1mk)

**Copper + oxygen Copper (ii) oxide**

1. Explain how you would obtain sand from a mixture of sand and common salt. (3mks)
* **Add water to the mixture and stir.**
* **Filter to obtain common salt solution as the filtrate and sand as the residue.**
1. State two apparatus used to measure accurate volume. (2mks)

**Burette**

**Pipette**

**Volumetric flask**

**syringe**

1. Give two reasons why solid carbon (iv) oxide is preferred over ordinary ice for use by ice cream vendors. (2mks)
* **Dry ice sublimes leaving no wetness**
* **It is a better coolant compared to ordinary ice.**
1. The diagram below shows a chromatogram of pure dyes A,B and C. it also contains that of an impure substance K.
2. Name lines A and B. (2mks)

**A – Baseline**

**B – Solvent front**

1. Identify which pure dyes does substance K contains. (2mks)

**A and C**

1. .
2. Which two property of the component of the mixture facilitate separation? (2mks)
* **Difference in solubility in the solvent**
* **Difference in extent of absorption on the filter paper**
1. Normally line A is drawn using a pencil and not ink. Explain why the pencil is preferred to ink. (2mks)

**Ink contain different dyes thus will also separate**

1. State two applications of chromatography. (2mks)
* **In sports, it’s used to identify banned substances**
* **To detect poison in food**
* **In pharmaceutical industry, to test purity of drugs**
* **In cosmetics industry to identify harmful substances.**