**CHEMISTRY**

**FORM 4**

**MID TERM**

**TERM 1 2021**

**TIME: 2HRS**

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

***Instructions*:**

***Answer all the questions in the spaces provided***

1. Define a soluble base. (1mk)

b. Aqueous solutions of 2M ethanoic acid and 2M nitric (v) acid were tested for electrical conductivity. Which solution is a better conductor of electricity? Explain. (2mks)

1. Explain why it is not advisable to prepare a sample of carbon (IV) oxide using lead (II) carbonate and dilute sulphuric (VI) acid. (2mks)

b. State a method that can be used to collect dry carbon (IV) oxide gas. Give a reason. (1mk)

1. The following are formulae of organic compounds. Use the formular to answer the questions that follow.

CH3CH2CH2OH;

CH3COOH;

CH3CH2CH2CH3;

CH3CCCH3;

Select;

1. i. Two compounds which when reacted together produce a pleasant smelling compound. (1mk)

ii. Name the compound formed in (i) above. (1mk)

iii. Select an unsaturated hydrocarbon.

1. Name the compound selected in a (iii) above. (1mk)
2. State Boyle’s law. (1mk)

b. Explain why a balloon filled with helium gas deflates faster than a balloon of the same size filled with argon gas. (2mks)

1. 30.0cm3 of aqueous sodium hydroxide containing 8.0g per litre of sodium hydroxide were completely neutralized by 0.294g of a dibasic acid. Determine the relative formula mass of the dibasic acid. (Na=23, O=16, H=1) (3mks)
2. Study the flow chart in figure below and answer the questions that follow.

Gas N

Barium

Nitrate solution

Nitric (v) acid

Dilute

Solid M

Aqueous Potassium salt

Gas N forms a white suspension with aqueous calcium hydroxide.

1. Name the anion present in the potassium salt. (1mk)
2. Write an ionic equation for the formation of solid M. (1mk)
3. Give the uses of gas N. (2mks)
4. Element U has atomic number 12 while element V has atomic number 16.
5. Using dot (.) and cross(x) diagram show bonding in the two elements. (1mk)
6. State the bond type in the compound formed in (a) above. Explain. (2mks)
7. When ethane gas is compressed at a high temperature, a solid is formed.
8. Give the name of the solid. (1mk)
9. Explain why it is not advisable to allow the solid accumulate in the environment. (2mks)
10. In the Harber process, nitrogen reacts with hydrogen according to the following equation.

3H2(g) + N2(g) 2NH3(g) ; H= -92KJmol-1

1. What would be the effect of adding a catalyst on the position of the equilibrium?

***(1mk)***

1. What would be the effect of increasing the pressure to the system on the position of the equilibrium? Explain. (2mks)

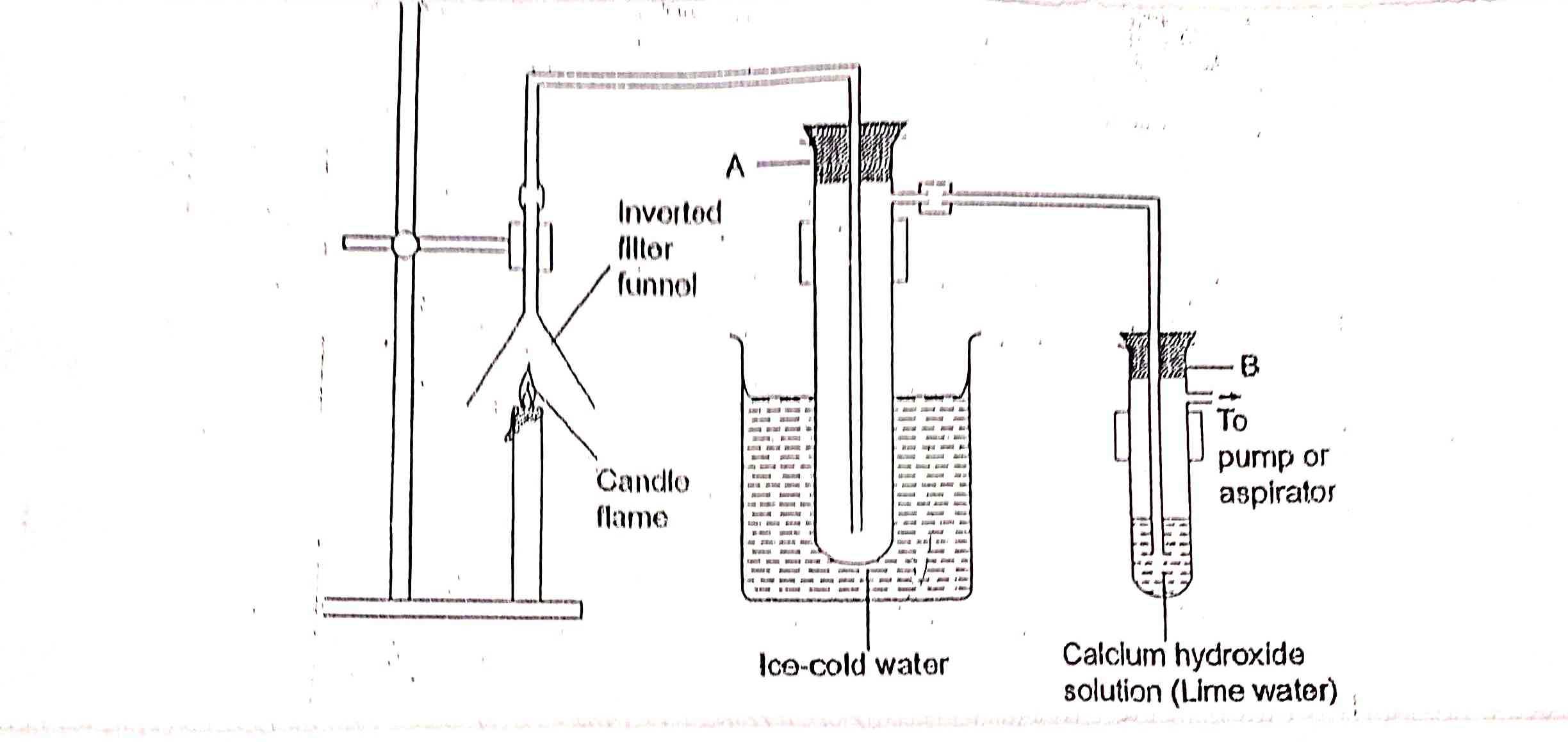
1. Explain why it is not advisable to use temperatures higher that 773K in the haber process. (2mks)
2. You are provided with solid potassium hydrogen carbonate. Describe how a solid sample of potassium nitrate can be prepared. (2mks)
3. Define the term molar heat of displacement. (1mk)

b. The following ionic equation represents the reaction between Zinc metal and an aqueous solution of copper ions.

Zn(s) + Cu2+(aq) Zn2+(aq) + Cu(s) H =-ve

Draw an energy level diagrams to represent the reaction. (2mks)

1. Study the setup below and answer the questions that follow.



1. Name the substance that was collected in test tube A. (1mk)
2. Write an equation for the reaction which occurs in tube B: in
3. In the first few minutes of the experiment. (1mk)
4. After a long time. (1mk)
5. Explain the equations in (b) above. (2mks)
6. Give a suitable conclusion for the experiment in the set up. (1mk)
7. Explain why a solution of sodium chloride conducts electricity while that of sugar does not. (2mks)
8. Explain why commercial indicators are preferred to flower extracts as acid-base indicators. (2mks)
9. (NH4)2HPO4 is a fertilizer used by farmers to boost their crop production.
10. Calculate the mass of phosphorous in a 20kg packet of (NH4)2HPO4 (N=14, H=1, P=31, O=16) (2mks)
11. State one advantage of this fertilizer, (NH4)2HPO4 over urea CO(NH2)2 (1mk)
12. Name the technique used to separate coloured substances in green leaves. (1mk)