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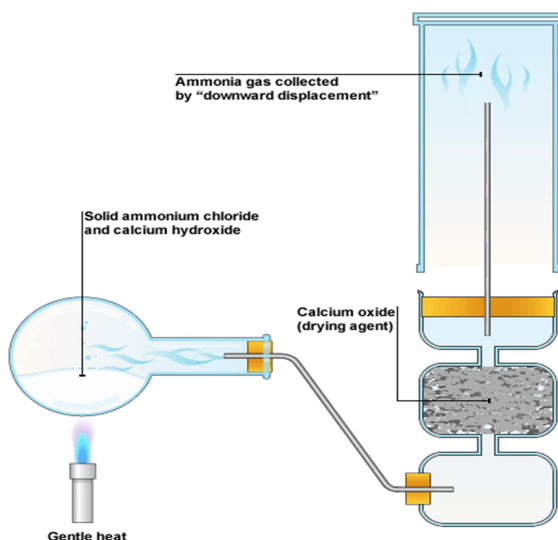
The Sign of Knowledge

Tr. Stephen O. Oketch

MARKING SCHEME

(CALL TR. STEPHEN O. OKETCH FOR COMPLETE MARKING SCHEME & QUESTIONS)

INDUSTRIAL CHEMISTRY BASED QUESTIONS

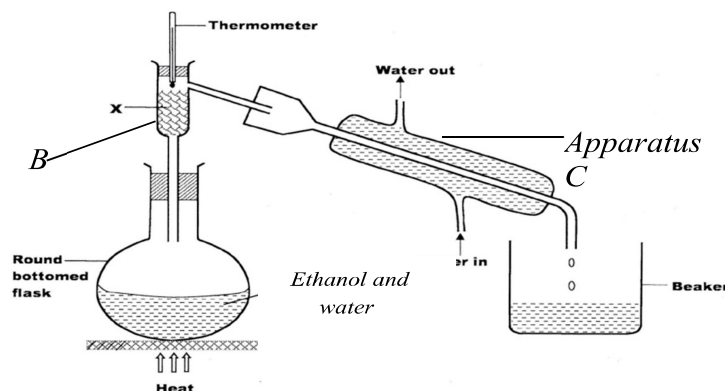


For the complete questions and marking schemes based on industrial chemistry call tr. stephen 0711410583.

The following are new resources and they are available:

- ✓ Document of questions based on flow charts. (chemistry)
- ✓ Document of questions based on structural diagrams. (chemistry)
- ✓ Brilliant pre-mocks and mocks.
- ✓ Brilliant holiday assignments trial 2.
- ✓ Document of questions on lab. preparation of gases.

1. The set up below was used by a student of St. Kevin Nyali Elite High School to separate a mixture of water and ethanol with the boiling points 100°C and 78°C respectively. Use it to answer the questions that follow.



- (i) Name the method of separation used above.

✓ **Fractional distillation**

- (ii) Name the parts label X and B

✓ **X- glass beads**

✓ **B- fractionating column**

- (iii) Name the apparatus marked C and state its role.

✓ **Liebig,s condenser**

- (iv) Explain the role played by the part marked B.

✓ **To allow water vapour to condense and flow back into the flask before its boiling point is reached.**

- (v) State the role of the part marked X.

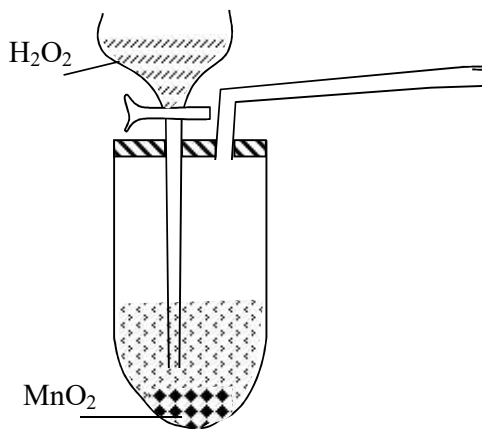
✓ **To increase the surface area for the condensation.**

- (vi) Explain why it is possible to the separate a mixture of water and ethanol by method named in (i) above.

✓ **They form a solution with one layer which has different but close boiling points.**

- (vii) Which liquid will be collected as the first distillate? Explain
 ✓ **Ethanol ;it has lower lower boiling than water.**
- (viii) What would happen if the inlet and outlet were exchanged in the apparatus marked C.
 ✓ **The condensation would still occur but with less efficient.**
- (ix) State the three applications of method named in (i) above.
 ✓ **Distillation of liquefied air in the manufacture of nitrogen and oxygen.**
 ✓ **Distillation of crude oil.**
 ✓ **Recycling of used oil.**

2. The set-up below was used to prepare a sample of dry oxygen gas. Study it and answer the questions that follow.



- (i) Complete the diagram to show how dry Oxygen can be collected. (3 marks)

- ✓ **The gas must be passed through a conical flask containing a concentrated sulphuric (VI) OR a U-tube containing anhydrous calcium chloride for the gas to be dried up.**
 ✓ **The gas must be collected using syringe because the gas has the same density with air; draw gas into the syringe.**

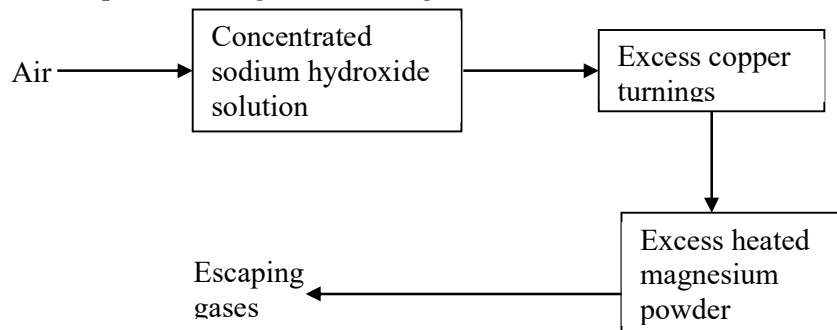
(Marks are awarded to the student who completes the diagram using the above points).

- (ii) Write a chemical equation of the reaction to produce oxygen. (1 mark)

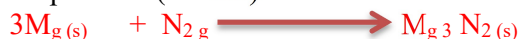




3. Air was passed through several reagents as shown below:



- (a) Write an equation for the reaction which takes place in the chamber containing magnesium powder. (1 mark)



- (b) Give another solution that can be used in place of sodium hydroxide solution. (1 mark)

✓ **Concentrate potassium hydroxide solution./KOH**

- (c) State the observation made at the chamber containing copper. (1 mark)

✓ **A brown colour turns black.**

NB// both colours must be there.

- (d) The product of the chamber containing magnesium powder was added water and a colourless solution was formed. A gas with a pungent choking irritating was also formed.

- (i) State and explain the observation that would be made if red litmus was dipped in the solution above. (1 mark)

✓ **The red litmus paper would turn blue; the solution is magnesium hydroxide which is a basic.**

- (ii) Write a balance chemical equation of the reaction that took place in the reaction of the product and water. (1 mark)



- (e) Name **one** gas which escapes from the chamber containing magnesium powder. Give a reason for your answer. (1 mark)

✓ **Argon; it is inert**

