

1. From the following list of compounds; zinc oxide, solid carbon (IV) oxide, sodium carbonate, nitric (V) acid, iron (III) chloride;

(i) Identify two that sublime. (2 mks)

Iron (III) chloride
Solid carbon (IV) oxide

(ii) Identify a pair that react to form salt and water only. (2 mks)

Zinc oxide and Nitric (V) acid



(iii) Write a word equation for the reaction between sodium carbonate and nitric (V) acid.

Sodium carbonate + Nitric (V) acid \rightarrow Sodium nitrate (2 mk)

Carbon (IV) oxide + Water

2. In an experiment to investigate the percentage of oxygen in air, 200 cm³ of air was passed over heated copper turning repeatedly until a constant volume of air remained. 160 cm³ of air remained at the end of the experiment.

(i) Name one gas remaining in the 160 cm³ of air. (1 mk)

Carbon (IV) oxide

(ii) Determine the percentage of air used up during the experiment. (2 mks)

$$\frac{200 - 160}{200} \times 100 = \frac{40}{200} \times 100$$

$$= \frac{1}{5} \times 100 = 20\%$$

(iii) What observation would be made during the experiment. (1 mk)

- ~~Red~~ Red-brown copper turns into a black solid copper (II) oxide

(iv) Write a word equation for the reaction between copper and oxygen. (1 mk)



3. Name the best method to use to separate the following mixtures. (4 mks)

(i) Common salt and water.

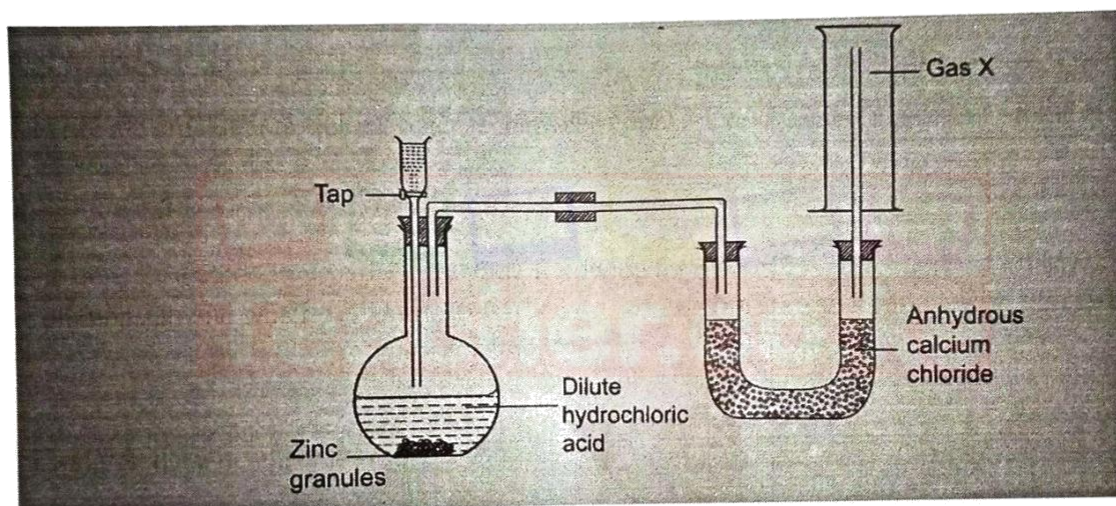
Simple distillation

(ii) Coloured dyes in ethanol.

Paper chromatography or ~~solvent extraction~~

(iii) Ammonium chloride and sodium chloride.

Sublimation of Ammonium chloride



(iv) Ethanol and water.

Fractional distillation

4. Study the set up below and answer the questions that follow.

(a) Identify gas X. (1 mk)

Hydrogen gas

(b) Name the method used to collect gas X and give the property of the gas that enables it to be collected using the method. (2 mks)

- Upward delivery
Reason - It is less dense than air

(c) Write a word equation for the reaction liberating gas X. (1 mk)



is it not advisable to use the following in this method of preparing hydrogen;

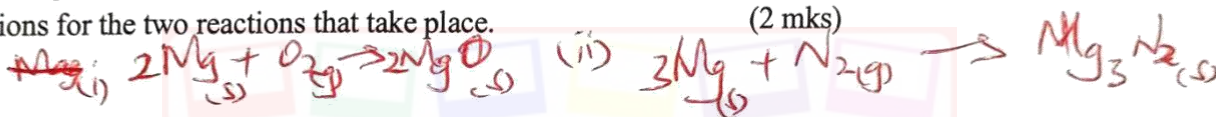
(i) Calcium and dilute sulphuric acid (1 mk)
 Calcium with sulphuric (VI) acid forms an insoluble salt that coats the calcium metal preventing further reaction.

(ii) Zinc and Nitric (V) acid. (1mk)
 Nitric (V) acid is a strong oxidising agent, it oxidises the hydrogen produced into water.

(e) What is the purpose of anhydrous calcium chloride in the U-tube? (1mk)
 Acts as a drying agent for the hydrogen gas.

(f) Name another compound that could serve the same purpose as anhydrous calcium chloride. (1 mk)
 Concentrated Sulphuric (VI) acid

5. When magnesium is burnt in air, it reacts with oxygen and nitrogen gas giving a white ash. Write two equations for the two reactions that take place. (2 mks)



6. The water on

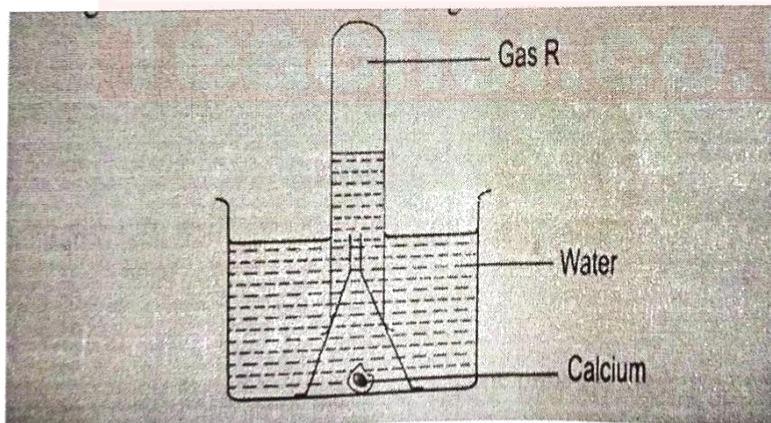


diagram below was used to investigate the action of calcium metal.

(a) Identify gas R. Hydrogen (1 mk)

(b) The remaining solution in the beaker changes red litmus paper to blue. What does this suggest about the resulting solution. It is basic (1 mk)

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