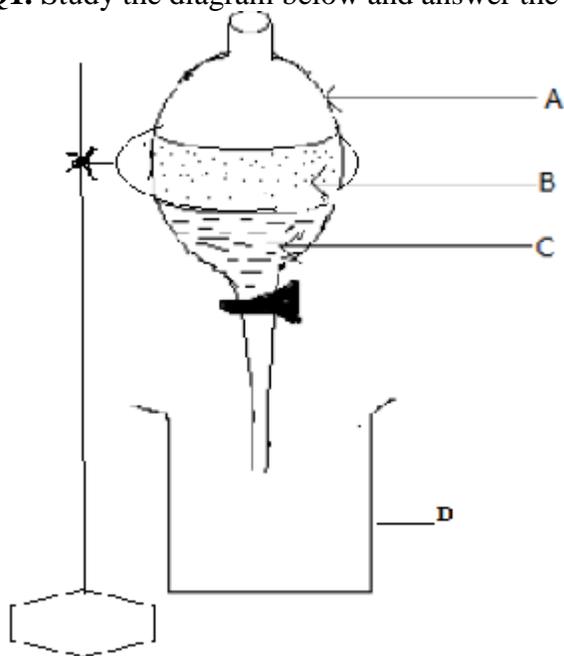


Senior two chemistry questions

Q1. Study the diagram below and answer the questions that follow:



- What method of separating mixtures does the above diagram represent? /0.5 marks
- Name the parts labeled B and C. /3 marks
- Name the apparatus labelled A and D /1 mark
- When are you going to use this method? /0.5 marks

Q2. The following methods are commonly used to separate mixtures: Filtration, Chromatography, Simple distillation and Fractional distillation.

State the method that would be used to:

- Separate ethanol and water. /1 mark
- Separate the dyes in ink. /1 mark
- Obtain pure water from sea water. /1 mark
- Separate chalk particles and water. /1 mark

Q3.a) Calculate the percentage of oxygen in the salt $\text{CuSO}_4 \cdot 5\text{H}_2\text{O}$ (Cu=64, S=32, O=16, H=1) /4 marks

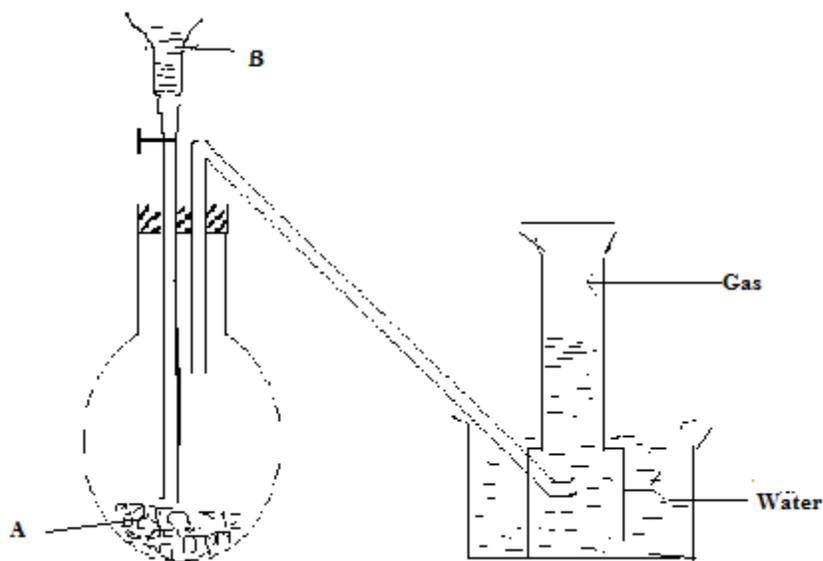
b) Give the meaning of the following terms

- Isotopes
- Allotropes /2 marks

Q4. Oxygen can be prepared from Hydrogen peroxide in the presence of a catalyst.

- Name the catalyst that is used in the above preparation. /1 mark
- Write a balanced equation for the reaction. /1 mark
- State two ways of increasing the rate of formation of oxygen. /2 marks

Q5. The apparatus below is used to prepare only one of the two gases mentioned below. Hydrogen and Ammonia



a) Which of the mentioned gases can be prepared in the laboratory using the apparatus (diagram) shown? /1 mark

b) State the names of the substances A and B indicated in the diagram. /2 marks

c) Give a reason why the other gas cannot be prepared using the apparatus shown. /1 mark

Q6. a) Oxygen gas is prepared by adding hydrogen peroxide solution drop by drop to manganese (IV) oxide in a flat-bottomed flask. The gas is collected over water.

i) Draw a labeled diagram to show the preparation and collection of oxygen gas./ 5 marks

ii) What is the role of manganese (IV) oxide in this reaction?/ 1 mark

b) Different elements are burned in gas jars of oxygen and each product is shaken with water.

Each mixture is tested with litmus paper to find out if it is acidic or alkaline. In each case, state whether the mixture is acidic or alkaline and write an equation for the reaction between the oxide and water.

i) Sulphur /2 marks

ii) Sodium /2 marks

iii) Carbon /2 marks

c) Give one large scale use of

i) oxygen /1 mark

ii) Sulphur /1 mark

d) Each year a lot of money is used to protect iron against corrosion/rusting. State two methods used to prevent rusting. /2 marks

Q7. Discuss deeply the different methods (over water collection, downward and upward delivery) of collecting the following gases: ammonia NH_3 , Carbon dioxide (CO_2), Hydrogen chloride (HCl), Hydrogen (H_2), Nitrogen (N_2). /5 marks

Q8. The table below shows part of the periodic table. Use it to answer the following questions.

| | | | | | | |
|----|--|--|---|---|---|----|
| H | | | | | | He |
| | | | C | N | O | |
| Na | | | | | | Cl |
| K | | | | | | Br |

a) Which of the elements Na and K is more reactive? /1 mark

b) Which of the elements Cl and Br is more reactive? /1 mark

c) Select one element that will form ionic bond (electrovalent bond) with O. /1 mark

d) Write the electronic configuration of K. /1 mark

Q9. Element M belongs to group III of the periodic table.

a) How many electrons does M have in the outer shell?/ **1 mark**

b) Write the formula for:

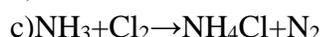
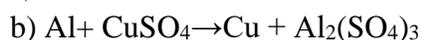
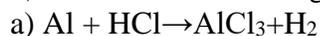
i) Oxide of M /**1 mark**

ii) Chloride of M /**1 mark**

iii) Nitride of M /**1 mark**

Q10. a) State the law of conservation of matter /**2 marks**

b) Balance the following equations



Q11. Match the substances in List A with the corresponding environmental problems in List B.

List A

List B

a) Carbon dioxide

Ozone Layer depletion

b) Sulphur dioxide

Green-house effect

c) Chlorofluoro hydrocarbons

Acid rain

Soil erosion

Q12. With the aid of relevant diagrams, describe:

a) An experiment to show that rusting of Iron requires both oxygen and water. /**6 marks**

b) State four ways of preventing rusting /**4 marks**

Q13. The table below shows results of an experiment to determine the rate of reaction between Zinc and Sulphuric Acid in presence of a catalyst.. Study the table below and answer the questions that follow.

| Time in minutes | 0 | 5 | 10 | 15 | 20 | 25 | 30 | 35 |
|---|---|----|----|------|------|----|----|----|
| Volume of gas produced in cm^3 | 0 | 10 | 20 | 25.5 | 29.5 | 32 | 32 | 32 |

a) Suggest the catalyst for the reaction /**1 mark**

b) Plot a graph of volume of the gas evolved (Y-axis) against time (X-axis). /**9 marks**

c) Explain why the volume of the gas increases and then remains constant after 25 minutes. /**2 marks**

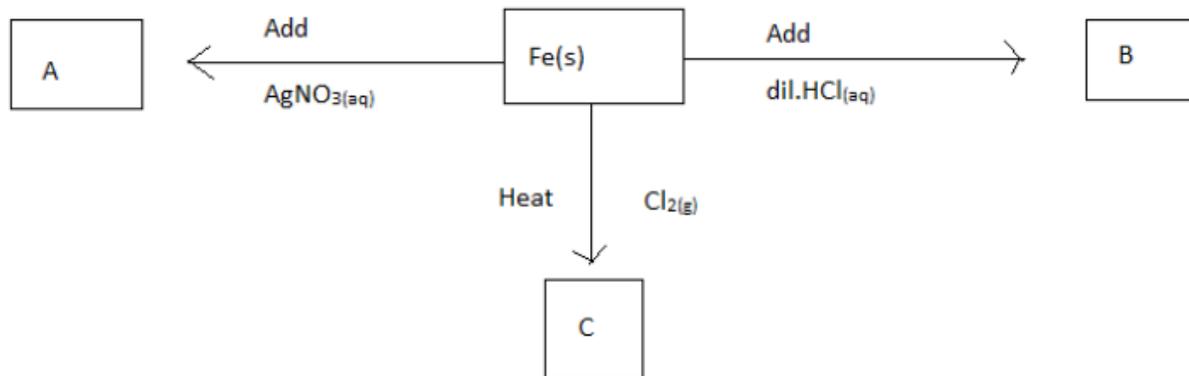
d) Suggest the Ions present in the mixture at the end of the experiment. /**3 marks**

Q14. Acid rain can cause damage to plant and animal life. It is formed when gases produced in industry are allowed to escape and react with moisture in the atmosphere. If this rain has a pH of less than seven then it is acidic. Sulphur dioxide and an oxide of nitrogen are the main gases responsible for acid rain.

a) Give the name of the acid formed when sulphur dioxide dissolves in water. /**1 mark**

b) Write a balanced equation for the reaction of sulphur dioxide with water. /**1 mark**

Q15. Some reactions involving iron are shown below



- a) Give the formulae of the products formed in box A. /1 mark
- b) Give the formulae of the products formed in box B. /1 mark
- c) What is the formula of the compound formed in box C. /1 mark
- Q16. a) Discuss the major air pollutants and their sources. /4 marks**
- b) Discuss the different ways of preventing air pollution / 5 marks
- Q17. a) Distinguish between an element and a compound. / 2 marks**
- b) Justify the difference between compound and mixture /4 marks
- c) Explain the trends in the physical properties across a period and down a group in the Periodic Table. / 4 marks
- Q18. Explain the nature of ionic, covalent and metallic bonding. / 4 marks**
- Q19. a) Identify the main water pollutants. / 2 marks**
- b) Describe the dangers of polluted water. / 3 marks
- c) Examine the steps involved in effective waste / 3 marks
- Q20. Discuss with your family member the**
- a) various effects of waste materials and poor waste disposal. / 3 marks
- b) contribution of chemistry to prevent **coronavirus COVID-19**. / 5 marks

All the best!