

NAME _____ INDEX NUMBER _____

SCHOOL _____ DATE _____

CARBON AND ITS COMPOUNDS

1. 1989 Q 12

On strong heating a substance R gives a gas which turns limewater cloudy and a black residue S remains. S dissolves in dilute nitric acid to give a solution T. When aqueous ammonia is added to T a light blue precipitate is formed. The precipitate dissolves in dilute nitric acid to give a deep blue solution.

Name:

Substance R

Ions in S

2. 1991 PPI Que 10.

Both graphite and molten lead (II) chloride conduct electricity. State how each of the substances conducts electricity.

(i) Graphite. (1 mark)

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(ii) Molten lead (II) chloride (1 mark)

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3. 1991 Q 22

When a salt T is heated, a black solid is left and a colourless gas which turns calcium hydroxide solution cloudy is evolved. Identify T and write an equation for the decomposition. (2 marks)

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4. 1994 PPIA Que 17.

Give two properties of carbon dioxide which makes it suitable for use in fire extinguishers? (2 marks)

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5. 1994 PPIA Que 27.

What is meant by the term allotropy? Give an example of an element that exhibits allotropy. (1 mark)

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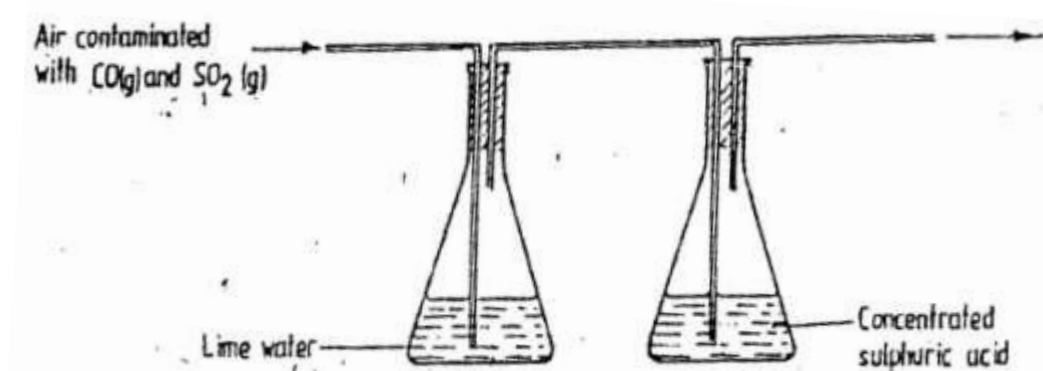
6. 1995 PPIA Que 27.

Give a reason why calcium hydroxide solution is used to detect the presence of carbon dioxide gas while sodium hydroxide solution is NOT. (1 mark)

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7. 1996 Q 8

A sample of air contaminated with carbon monoxide and sulphur dioxide was passed through the apparatus shown in the diagram below.



Which contaminant was removed by passing the contaminated air through the apparatus Explain . (2 marks)

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8. 1996 Q 23

Explain how you would obtain solid carbonate from a mixture of lead carbonate and sodium carbonate powders. (3 marks)

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9. 1997 Q 2

When extinguishing a fire caused by burning kerosene, carbon dioxide is used in preference to water .Explain

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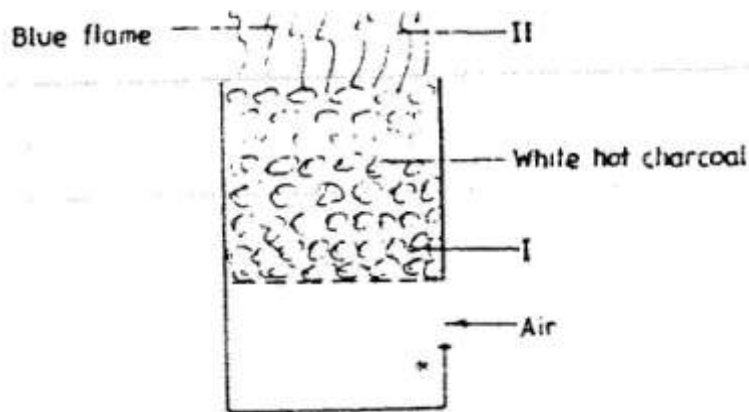
10. 1997 Q 4

When dilute nitric acid was added to a sample of solid C, a colourless gas that formed a white a white precipitate with limewater was produced. When another sample of solid C was heated strongly in a dry test – tube, there was no observable change.

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11. 1998 Q 20

The diagram below represents a charcoal burner. Study it and answer the questions that follow



Write equations for the reactions taking place at I and II

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12. 1999 Q 23

When excess carbon monoxide gas was passed over heated lead (II) oxide in combustion tube, lead (II) oxide was reduced

(a) Write an equation for the reaction, which took place

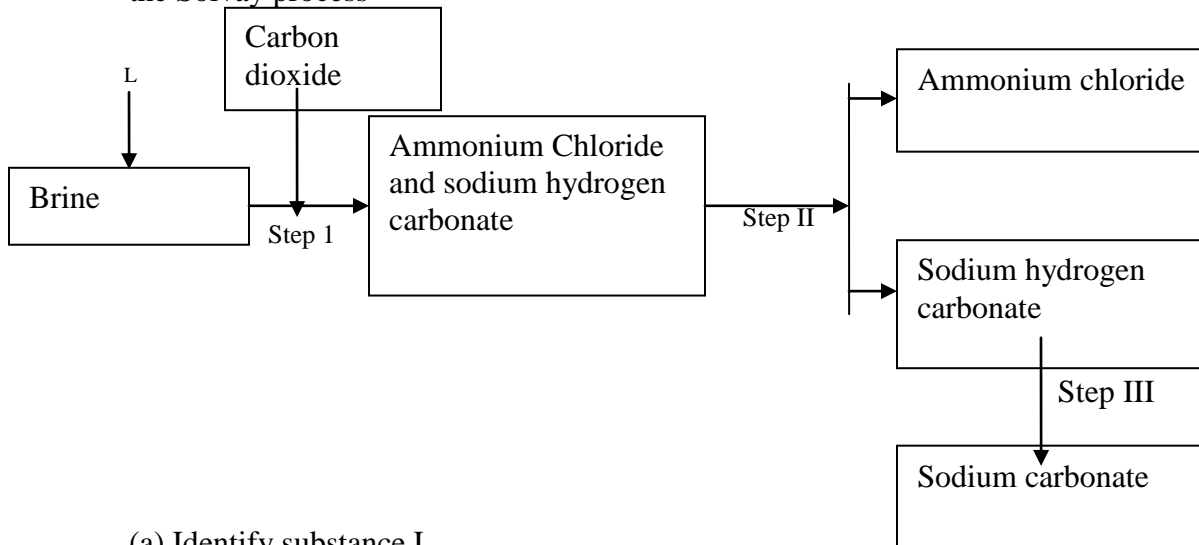
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(b) What observation was made in the combustion tube when the reaction was complete?

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(c) Name another gas, which could be used to reduce lead (II) oxide

13. 2000 Q 3

The simplified flow chart shows some of the steps in the manufacture of sodium carbonate by the Solvay process



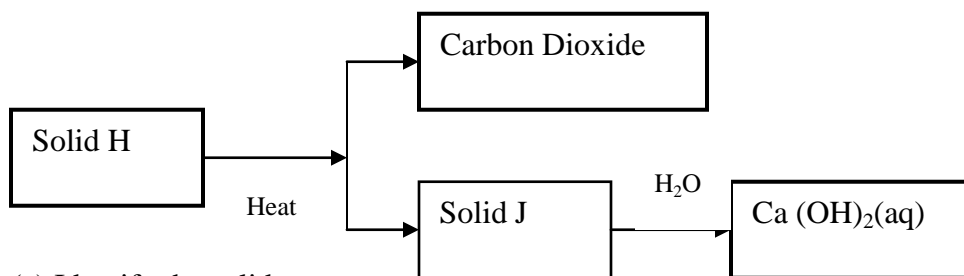
(a) Identify substance L

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(b) Name the process – taking place in step II

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(c) Write an equation for the reaction, which takes place in step III

14. 2000 Q 10

Use the scheme below to answer the questions that follow



(a) Identify the solid

H

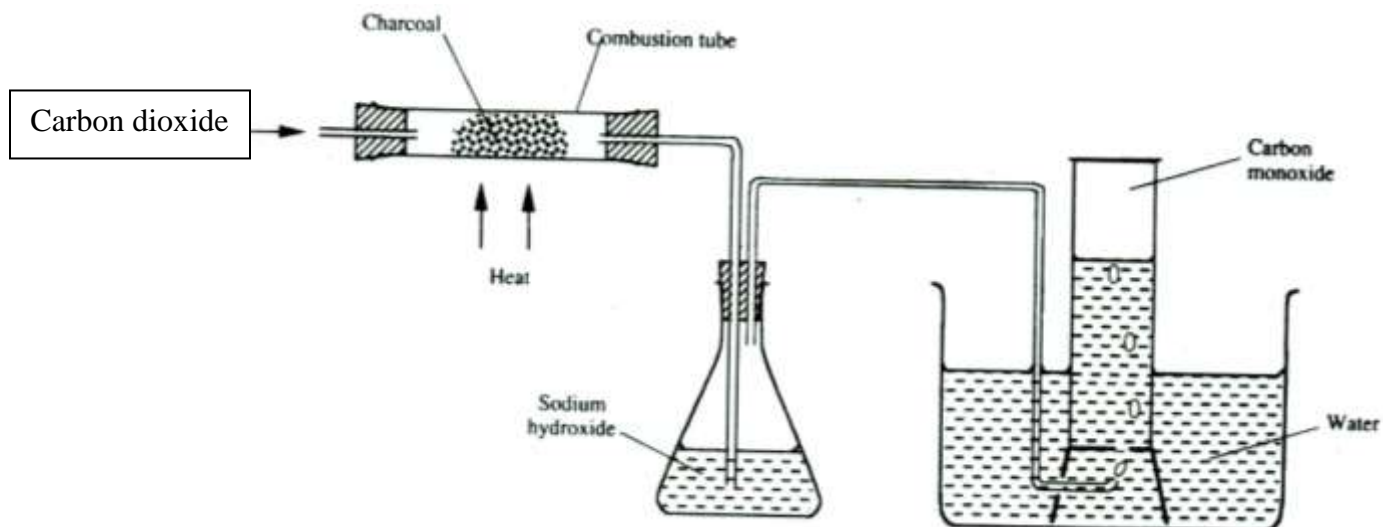
J

(b) State one commercial use of solid J

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15. 2000 Q 6b PP2

(b) In an experiment, carbon dioxide gas is passed over heated charcoal and the gas produced collected as shown in the diagram below



(i) Write an equation for the reaction that took place in the combustion tube

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(ii) Name another substance that can be used instead of sodium hydroxide

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(iii) Describe a simple chemical test that can be used to distinguish between carbon dioxide and carbon monoxide

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(iv) Give one use of carbon monoxide

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16. 2001 Q 14

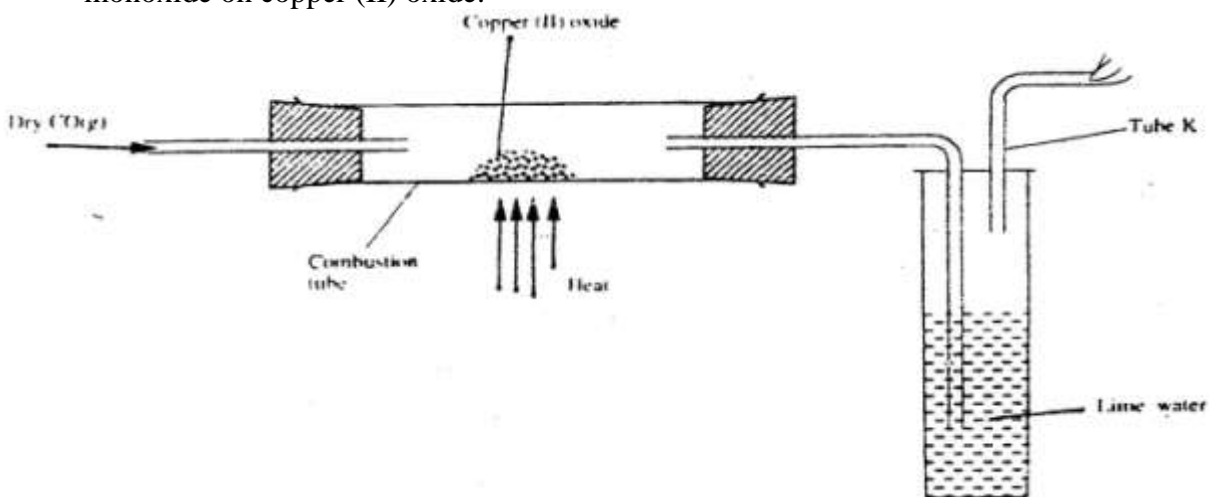
When the oxide of element H was heated with powdered carbon the mixture glowed and carbon dioxide was formed. When the experiment was repeated using the oxide of element J, there was no apparent reaction.

a) Suggest one method that can be used to extract element J from its oxide

b) Arrange the elements H, J and carbon in the order of their decreasing reactivity.

17. 2001 Q 21

The apparatus shown below was used to investigate the effect of carbon monoxide on copper (II) oxide.



a) State the observation that was made in the combustion tube at the end of the experiment.

b) Write an equation for the reaction that took place in the combustion tube

c) Why is it necessary to burn the gas coming out of tube K?

18. 2002 Q 15

When carbon dioxide gas was passed through aqueous calcium hydroxide a white suspension was formed

(a) Write an equation for the reaction that took place

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(b) State and explain the changes that would occur when carbon dioxide gas is bubbled through the white suspension

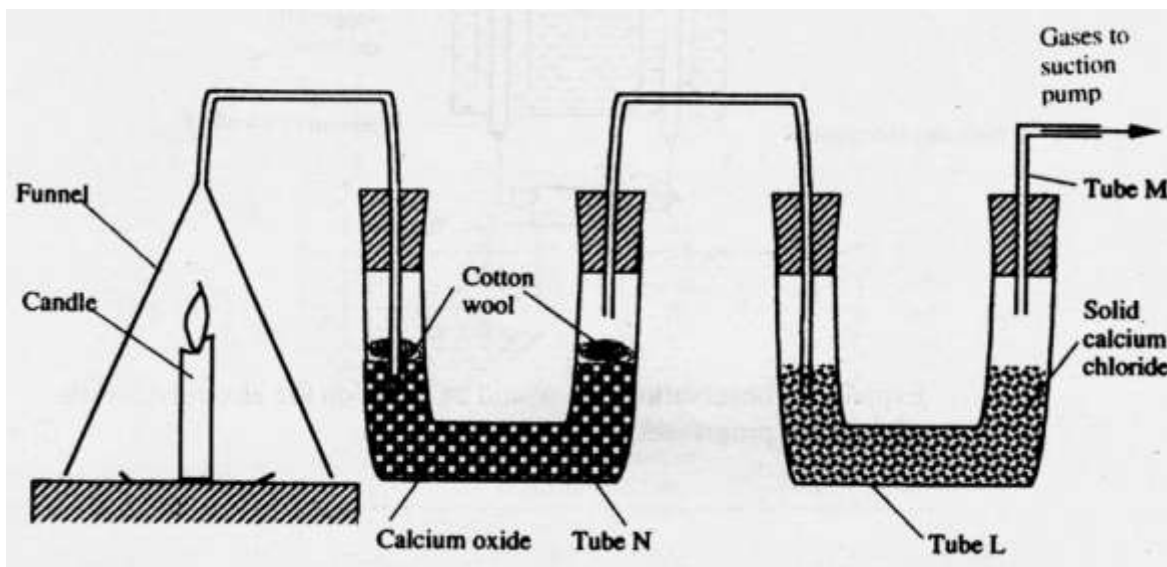
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19. 2002 Q 5 PP2

(a) Candle wax is mainly a compound consisting of two elements. Name the two elements (2 marks)

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(b) The set-up below was used to investigate the burning of a candle study it and answers the questions that follow



(i) What would happen to the burning candle if the pump was turned off? Give reasons

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(ii) State and explain the changes in mass that are likely to occur in tube N by the end of the experiment (3 marks)

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(iii) Name two gases that come out through tube M (2 marks)

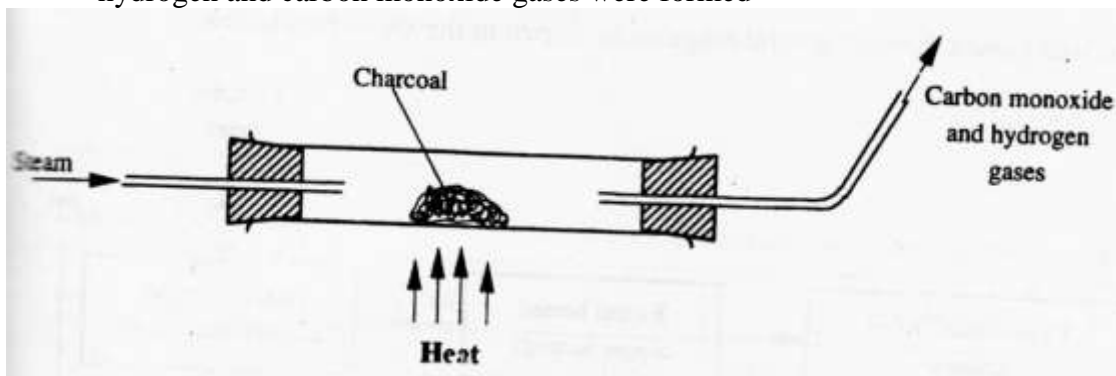
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(iv) Name another substance that could be used in the place of calcium oxide in tube N

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20. 2003 Q 12

When steam was passed over heated charcoal as shown in the diagram below, hydrogen and carbon monoxide gases were formed



(a) Write the equation for the reaction which takes place (1 mark)

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(b) Name two uses of carbon monoxide gas, which are also uses of hydrogen gas (2 marks)

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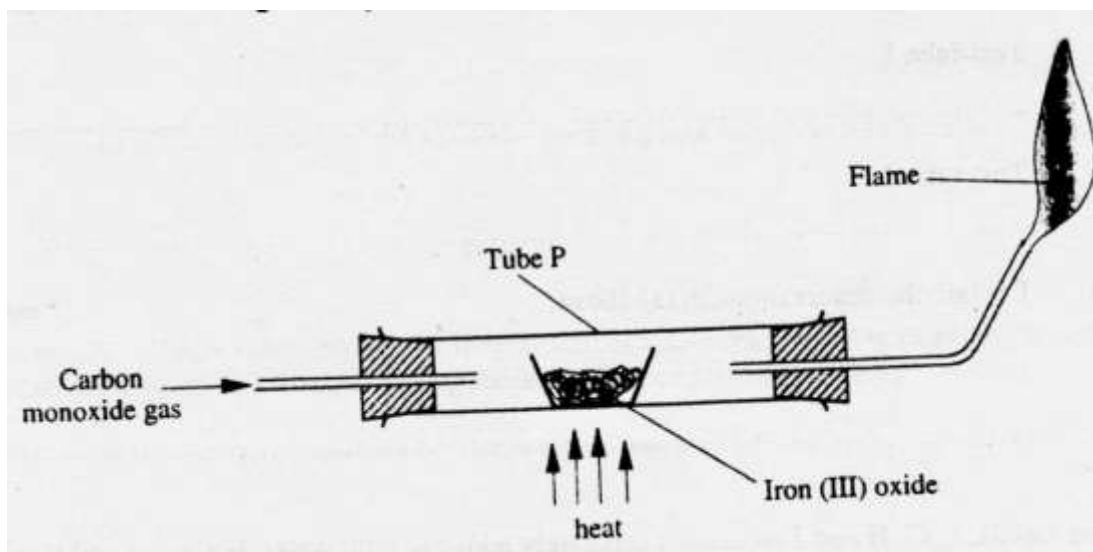
21. 2004 Q 1

When a candle was burnt completely. The total mass product was found to be greater than the original mass of the candle. Explain

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22. 2004 Q 18

Carbon monoxide gas passed over heated Iron (III) as shown in the diagram below.



a) Give the observation made in tube P. (1 mark)

b) Write the equation for the reaction which takes place in tube P. (1 mark)

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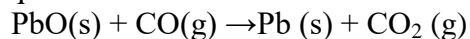
23. 2004 Q 7a PP2

(a) Brine usually contains soluble calcium and magnesium salts. Explain how sodium carbonate is used to purify brine. (2 marks)

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24. 2005 Q 27

Dry carbon monoxide gas reacts with heated lead (II) oxide as shown in the equation below



(a) Name the process undergone by the lead (II) oxide (1 mark)

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(b) Give a reason for your answer in (a) above (1 mark)

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(c) Name another gas that can be used to perform the same function as carbon monoxide gas in the above reaction.

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25. 2005 Q 28

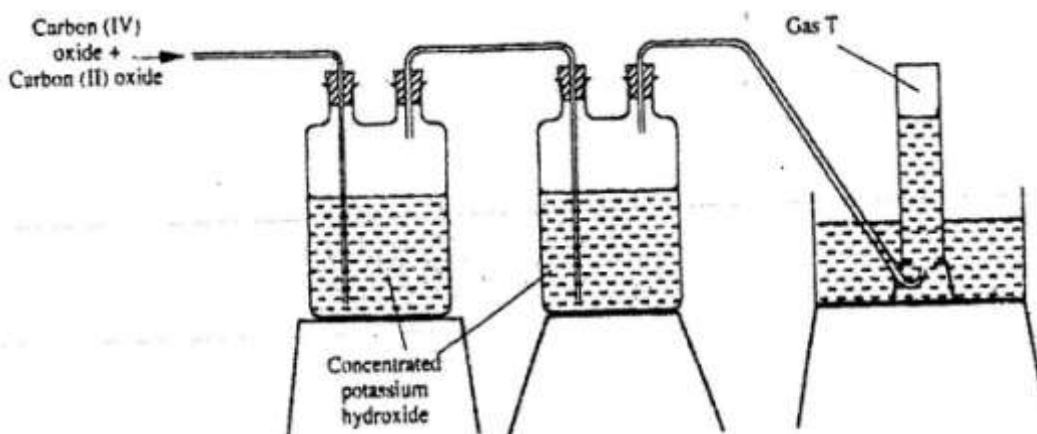
When a hydrocarbon was completely burnt in oxygen, 4.2g of carbon dioxide and 1.71 g of water were formed. Determine the empirical formula of the hydrocarbon
(H= 1.0 ; C=12.0 ; O = 16.0)

(3 marks)

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26. 2006 Q 22

The diagram below represents part of a set – up used to prepare and collect gas T.



a) Name two reagents that are reacted to produce both carbon (IV) oxide and carbon (II) oxide. (1 mark)

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b) Write the equation for the reaction which takes place in the wash bottles. (1 mark)

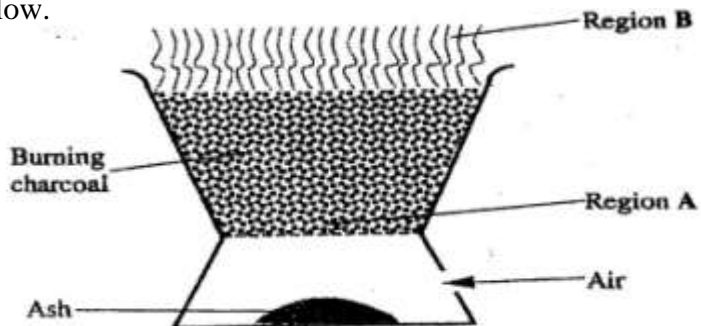
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c) Give a reason why carbon (II) oxide is not easily detected. (1 mark)

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27. 2007 Q 1

The diagram below shows a “Jiko” when in use. Study it and answer the questions that follow.



a) Identify the gas formed at region A. (1 mark)

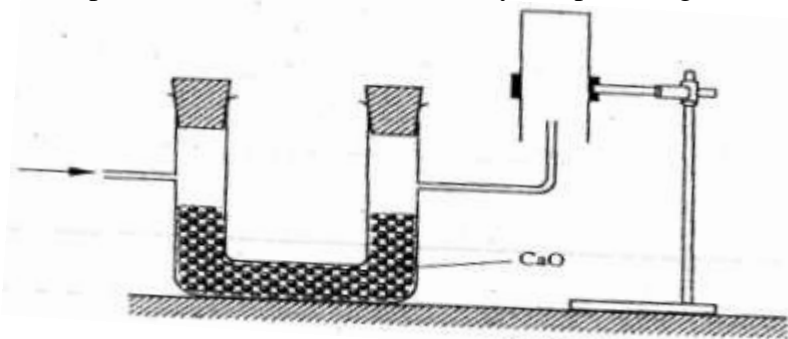
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b) State and explain the observation made at region B. (2 marks)

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28. 2007 Q 10

The set-up below was used to collect a dry sample of a gas.



Give two reasons why the set-up cannot be used to collect carbon (IV) oxide gas. (2 marks)

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29. 2007 Q 5d P2

(d) Carbon exists in different crystalline forms. Some of these forms were recently discovered in soot and are called fullerenes

(i) What name is given to different crystalline forms of the same element?

(1 mark)

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(ii) Fullerenes dissolve in methylbenzene while the other forms of carbon do not. Given that soot is a mixture of fullerenes and other solid forms of carbon, describe how crystals of fullerenes can be obtained from soot. (3 marks)

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(iii) The relative molecular mass of one of the fullerenes is 720. What is the molecular formula of this fullerene? (C=12.00) (1 mark)

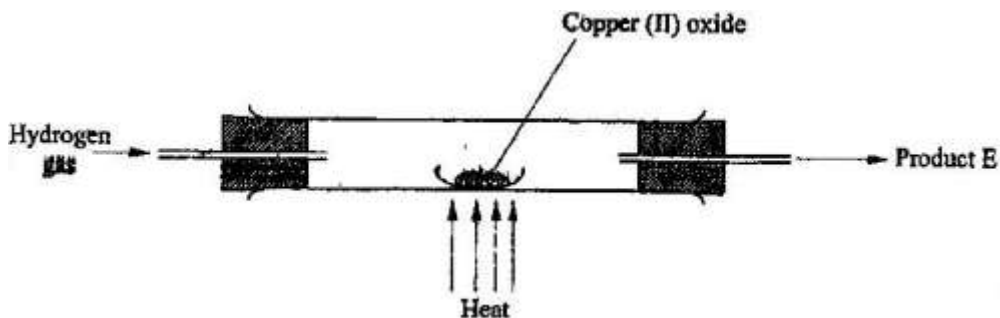
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30. 2008 Q 13

In a laboratory experiment hydrogen gas was passed over heated copper (II) oxide as shown the diagram below.



Describe a chemical test that can be used to identify the product E.

(2 marks)

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31. 2008 Q 26

When solid B₁ was heated, a gas which formed a white precipitate when passed through lime water was produced. The residue was dissolved in dilute nitric (V) acid to form a colourless solution B₂. When dilute hydrochloric acid was added to solution B₂ a white precipitate which dissolved on warming was formed.

a) Write the formula of the;
I Cation in solid B₁ (1 mark)

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II anion in solid B₁ (1 mark)

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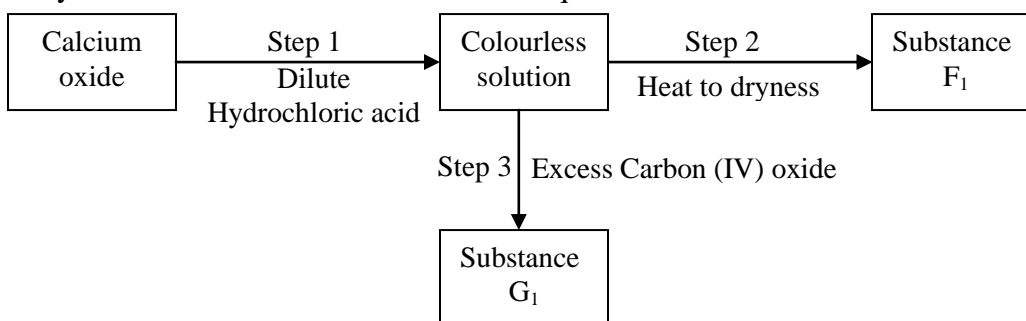
b) Write an ionic equation for the reaction between the residue and dilute nitric (V) acid. (1 mark)

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32. 2008 Q 31

Study the flow chart below and answer the questions that follow.



a) Give the name of the process that takes place in step 1. (1 mark)

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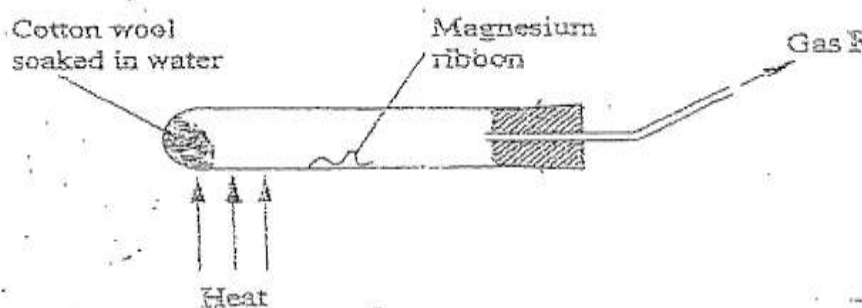
b) Give;

(i) The name of substance G₁

(ii) One use of substance F₁

33. 2009 Q 15

A student used the set up shown in the diagram below in order to study the reactions of some metals with steam. The experiment was carried out for ten minutes.



(a) What

observation would be made if gas F is ignited?

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(b) When the experiment was repeated using iron powder instead of magnesium ribbon, very little gas F was obtained.

(i) Give a reason for this observation (1 mark)

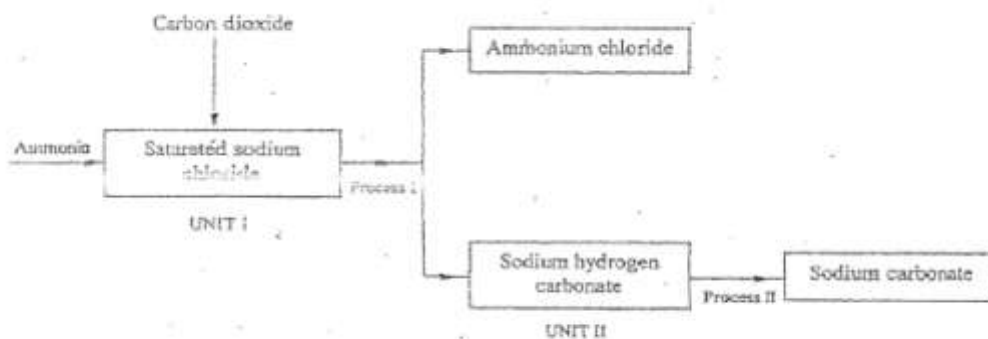
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(ii) What change in the conditions of the experiment should the student have made in order to increase the volume of gas F produces. (1 mark)

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34. 2009 Q 4 PP2

(a) The Schematic diagram shows part of the solvay process used for the manufacture of sodium carbonate



(i) Explain how the sodium chloride required for this process is obtained from sea water (2 marks)

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(ii) Two main reactions take place in UNIT 1. The first one is the formation of ammonium hydrogen carbonate
1. Write an equation for the reaction. (1 mark)

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2. Write an equation for the second reaction (1 mark)

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(iii) State how the following are carried out (2 marks)

1. Process I

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2. Process II

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(iv) In an experiment to determine the percentage purity of the sample of sodium carbonate produced in the Solvay process, 2.15 g of the sample reacted completely with 40.0cm of 0.5 m sulphuric acid

I. Calculate the number of moles of sodium carbonate that reacted (2 marks)

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II. Determine the percentage of sodium carbonate in the sample.

(Na=23.0, C=12, O=16.0)

(2 marks)

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(b) Name two industrial uses of sodium carbonate.

(2 marks)

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Carbon (II) oxide is described as a “silent killer”

- a) State **one** physical property of carbon (II) oxide that makes it a “silent killer” (1 mark)

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- b) State and explain **one** chemical property that makes carbon (II) oxide poisonous to human beings (2 marks)

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36. 2010 Q 26

A water trough, aqueous sodium hydroxide, burning candle, watch glass and a graduated gas jar were used in an experimental set up to determine the percentage of active part of air. Draw a labeled diagram of the set up at the end of the experiment.

(3 marks)

37. 2011 Q 11

Exhaust fumes of some cars contain carbon II oxide and other gases

- a) Explain how carbon (II) oxide is formed in the internal combustion engines (1 mark)

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- b) Name two gases other than carbon (II) oxide that are contained in exhaust fumes and are pollutants. (2 marks)

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38. 2011 Q 21

Graphite is one of the allotropes of carbon.

a) Name one other element which exhibits allotropy (1 mark)

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b) Explain why graphite is used in the making of pencil leads. (2 marks)

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39. 2012 Q23 P1

Describe how the percentage by mass of copper in copper carbonate can be determined.

(3 marks)

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