

**FORM THREE CHEMISTRY  
HOLIDAY ASSIGNMENT  
APRIL, 2024**

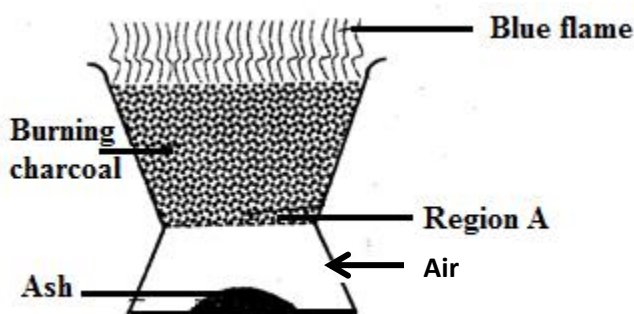
- 1** The diagram below shows part of the periodic table. The letters do not represent the actual symbols of the elements. Study it and answer the questions that follow.

A							
	B		C				D
E			F		G		H
I							

- (a) Select from the table;
- the most reactive metal (1 mark)
  - the least reactive element (1 mark)
- (b) State and explain the trend in :
- Reactivity of elements **A** and **E**. (2 marks)
  - Atomic radii of elements **F** and **G**. (2 marks)
- (c) What name is given to the elements in the same group as element **H**? (1 mark)
- (d) Write down the formula of the sulphite of element **E** (1 mark)
- (e) The atomic number of an **element J** is 8. Locate **element J** on the grid. (1 mark)
- (f) Name the type of structure present in :
- Chloride of **F** (1 mark)
  - element **C** (1 mark)
- (g) A sample of the oxide of **I** was dissolved in distilled water. Both blue and red litmus papers were dipped into this solution. State and explain the observations made. (2 marks)
- (h) Give **one** use of element **B** (1 mark)

- 2** (a) One of the naturally occurring allotropes of carbon is graphite.
- Give the other allotrope of carbon. (1 mark)
  - Name **one** use of the allotrope in **a (i)** above (1 mark)
  - Name **one** other element which exhibit allotropy (1 mark)

- (b) Fullerenes are synthetic allotropes of carbon obtained by manipulating carbon using laser beams. Given that the molecular formula of fullerene is  $C_{60}$ , determine its molar mass. (3 marks)
- (c) Carbon (IV) oxide may be prepared by reacting dilute sulphuric (VI) acid and a carbonate.
- Explain why lead (II) carbonate wouldn't be suitable for use in this reaction
  - State and explain the observations made when carbon (IV) oxide is bubbled through a solution of calcium hydroxide. (2 marks)
  - Name **one** use of carbon (IV) oxide other than in fire extinguishers. (1 mark)
- (d) The diagram below shows a Jiko when in use. Study it and answer the questions that follow.

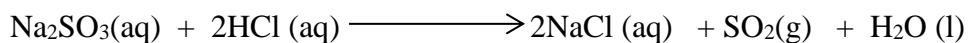


- Write the equation taking place at region A. (1 mark)
  - Why is not advisable to place such a Jiko in a closed room? (2 marks)
- 3 (a) What is the effect of impurities on the;
- boiling point of water (1 mark)
  - melting point of naphthalene (1 mark)
- (b) Why is rock salt poured on roadways during winter in some countries in Europe?
- (c) In an experiment to determine the freezing point of a certain solid, solid **G**, students heat the solid to melting and then allowed to cool. The temperature was recorded after every 30 seconds and the table below was obtained

<b>Time (seconds)</b>	0	30	60	90	120	150	180	210	240	270
<b>Temperature (°C)</b>	85.0	80.0	75.5	72.0	70.0	68.0	66.0	65.0	65.0	62.5

- On the grid provided, plot a graph of temperature (vertical axis) against time.
  - From the graph determine the freezing point of **solid G** (1 mark)
- (d) Give the type of change that occurs when;
- Iron nail rusts (1 mark)
  - lead (II) nitrate is heated (1 mark)
- 4 (a) Other than manufacture of dyes and fireworks, Name **two** uses of sulphur (2 marks)

(b) Sodium sulphite reacts with hydrochloric acid according to the equation below.

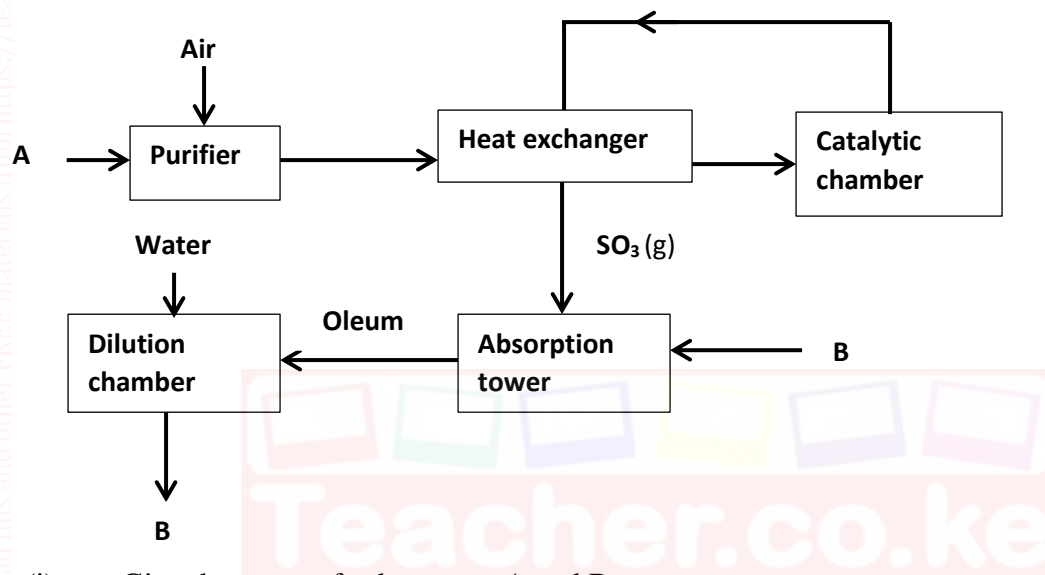


25.0 cm<sup>3</sup> of 2 M sodium sulphite was reacted with excess hydrochloric acid.

Determine the volume of SO<sub>2</sub>(g) produced. (Molar gas volume at r.t. p = 24 dm<sup>3</sup>)

(c) State and explain the observations made when a moist blue litmus paper is dropped in gas jar full of sulphur (IV) oxide gas. (2 marks)

(d) Study the flow chart below which shows the preparation of sulphuric (VI) acid and answer the questions that follow



(i) Give the name of substances; A and B.

(ii) Name the catalyst used in the above process. (1 mark)

(iii) Write the equation for the reaction between water and oleum (1 mark)

(iv) State **two** uses of sulphuric (VI) acid (2 marks)