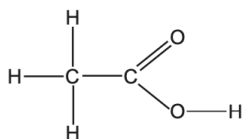


Paper 3

[Conservation of mass and balanced symbol equations]

Q1.a(2018)

Look at the molecule below:



(a) Write down the **empirical formula** for this molecule.

..... [1]

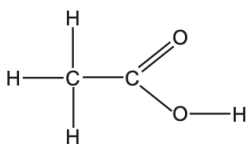
Q1.b(2018)

Calculate the **relative formula mass**, M_r , for this molecule.

Answer = ... [1]

Q1.c(2018)

The displayed formula for the molecule does not show the exact length of the bonds.



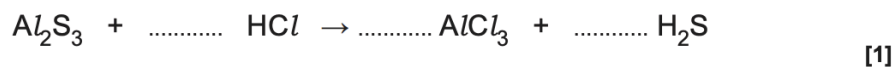
Write down **two** other limitations of the displayed formula.

.....
.....
.....
.....
..... [2]

Q2.a(2018)

Aluminium sulfide reacts with dilute hydrochloric acid.

(i) Balance the equation for this reaction.



Q2.b(2018)

The table shows the melting point and boiling point of H_2S .

Melting point	-85.5°C
Boiling point	-60.7°C

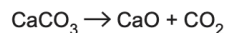
What state does H_2S exist in at room temperature?

..... [1]

Q3.(2019)

Calcium carbonate, CaCO_3 , decomposes when heated. Calcium oxide, CaO , and carbon dioxide, CO_2 , are made.

Look at the equation for the reaction.



In an experiment, 20.0 g of CaCO_3 are used. 11.2 g of CaO are made.

What is the mass of CO_2 made?

- A 8.8 g
- B 11.2 g
- C 20.0 g
- D 31.2 g

Your answer

[1]

Q4.(2019)

The molecular formula of a compound is $\text{C}_{12}\text{H}_{26}$.

What is its **empirical formula**?

- A C_2H_4
- B C_2H_6
- C C_4H_6
- D C_6H_{13}

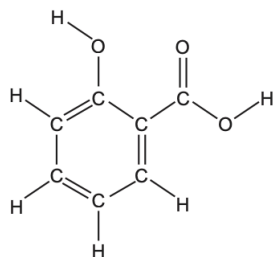
Your answer

[1]

Q5.(2019)

Aspirin is a widely used painkiller and is sold as tablets.

One of the chemicals in aspirin is salicylic acid. The structure of salicylic acid is shown below.



Salicylic acid

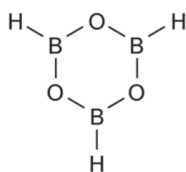
(a) What is the **empirical formula** of salicylic acid?

.....

[1]

Q6.(2020)

Look at the molecule below.



What is the **empirical formula** of the molecule?

- A BHO
- B BHO₂
- C B₃(OH)₃
- D B₃H₃O₃

Your answer

[1]

Q7.(2020)

Magnesium carbonate, MgCO₃, reacts with dilute hydrochloric acid, HCl.

Magnesium chloride, MgCl₂, water and carbon dioxide are made.

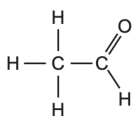
Write the **balanced symbol equation** for the reaction.

..... [2]

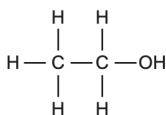
Q8.(2021)

Which molecule has the **empirical formula** CH_2O ?

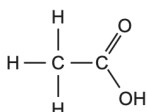
A



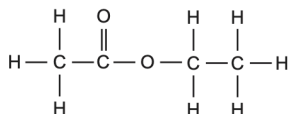
B



C



D



Your answer

[1]

Q9.(2021)

Sodium and chlorine react to make sodium chloride, NaCl .

Fig. 15.1 shows the structure of sodium chloride.

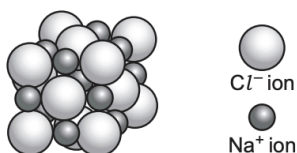
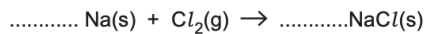


Fig. 15.1

(a) Complete the **balanced symbol** equation for the reaction of sodium and chlorine to make sodium chloride.



[1]

Q10.(2022)

A molecule of glucose has the molecular formula $\text{C}_6\text{H}_{12}\text{O}_6$.

What is the **empirical formula** of glucose?

A CHO

B CH_2O

C $\text{C}_6\text{H}_{12}\text{O}_6$

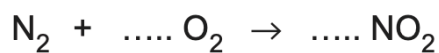
D $(\text{CO}_6)\text{H}_{12}$

Your answer

[1]

Q11.(2022)

The equation shows the formation of nitrogen dioxide.



Complete the **balanced symbol** equation for the reaction.
Use Fig. 11.1.

[1]

Q12.(2023)

The **law of conservation of mass** states that the total mass stays the same during a chemical reaction.

Which is an explanation for the law of conservation of mass?

- A All the atoms in a chemical reaction are the same size.
- B All the atoms in a chemical reaction have the same mass.
- C No atoms are created or destroyed during a chemical reaction.
- D The atoms of each reactant and product have the same mass.

Your answer

☐

[1]

Q13.(2023)

Zinc, Zn, reacts with sulfuric acid, H_2SO_4 , to form the salt, ZnSO_4 , and hydrogen.

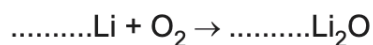
(a) Write the **balanced symbol** equation for the reaction of zinc with sulfuric acid.

..... [1]

Q14.(2024)

Lithium reacts with oxygen to make lithium oxide.

Complete the **balanced symbol** equation for the reaction.



[2]