

END TERM 3 2026

FORM 3

CHEMISTRY PRACTICAL

MARKING SCHEME

1. You are provided with the following

-7grams of Solid P which is a mixture of anhydrous sodium carbonate and sodium chloride

-0.4M sulphuric (vi) acid

You are required to determine the percentage of sodium carbonate in the mixture

Procedure

-Fill the burette with the acid

-Place the entire solid in 100ml beaker. Add 50.0cm³ of distilled water and stir.

-When all the solid has dissolved transfer it into a 250ml volumetric flask

-Top up the solution to the 250ml mark.using distilled water

-Using a pipette transfer 25.0cm³ of the solution formed into a conical flask

-Carry out titration using methyl orange indicator

-Repeat the titration twice and complete the table

titration	1	2	3
Final burette reading (cm ³)	12.5	12.5	12.5
Initial burette reading(cm ³)	0.0	0.0	0.0
Vol of acid used (cm ³)	12.5	12.5	12.5

4mks

a) Determine the average titre volume (1mk)

$$\frac{12.5 + 12.5 + 12.5}{3} = 12.5$$

b) Calculate the number of moles of acid used (1mk)

$$\frac{12.5}{1000} \times 0.4 = 0.005$$

c) Write an equation for the reaction that took place (1mk)



d) Calculate the moles of sodium carbonate that reacted (1mk)

Mole ratio $\text{Na}_2\text{CO}_3:\text{H}_2\text{SO}_4$

1:1

moles of sodium carbonate = 0.005

e) Calculate the mass of sodium carbonate in P ($\text{Na}=23, \text{O}=16, \text{C}=12$) (3mk)

0.005 ————— 25.0cm³

? ————— 250cm³

$$\frac{250 \times 0.005}{25} = 0.05$$

0.05 X RFM

0.05 X 106 = 5.3g

f) Calculate the percentage of sodium carbonate in the mixture (1mk)

$$\frac{5.3}{7} \times 100 = 75.71$$

2. You are provided with solid B Carry out the tests below and record your observations and inferences in the spaces provided

- a) Carefully observe the appearance of the solid and with a reason, suggest the bonds and structure in B (2mks)

Structure-giant ioni

Bond-ionic

Reason-crystalline solid

- b) Place a spatulaful of B in dry test tube. Heat it strongly.

observation	inferences
Droplets of a colourless liquid form on cooler parts of the test tube	B is hydrated/contains water of crystallisation

2mks

- c) Place the remaining solid in a boiling tube and add 10cm^3 of water and shake.

observations	inferences
Dissolves $\checkmark$ $\frac{1}{2}$ forming a colourless $\checkmark$ $\frac{1}{2}$ solution	B is soluble $\checkmark$ or $\text{Fe}^{2+}, \text{Fe}^{3+}, \text{Cu}^{2+}$ absent (all the 3 must be given)

2mks

- d) Divide the resulting mixture into 5 portions

- i) To the first portion add sodium hydroxide drop wise till in excess

observations	inferences
White ppt soluble in excess	$\text{Zn}^{2+}, \text{Al}^{3+}, \text{Pb}^{2+}$

2mk

- ii) To the second portion add ammonia solution drop wise till in excess

Observations	inferences
White ppt soluble in excess	Zn^{2+} present Pb^{2+}, Al^{3+} absent

2mks

- iii) To the third portion add 4 drops of sodium chloride and shake

observations	inferences
No white ppt/solution remains colourless	Pb^{2+} absent

2mks

- iv) To the fourth portion add Barium nitrate solution

observations	inferences
No white ppt/solution remains colourless	$SO_4^{2-}, SO_3^{2-}, CO_3^{2-}$ Absent

2mks

- v) To the fifth portion add lead (ii)nitrate and warm the mixture

observations	inferences
White ppt soluble on warming	Cl^-

2mks

3. You are provided with solid Q which is an organic compound. Carry out the tests below and record your observations and inferences in the spaces provided.

- a) Ignite one spatulaful of solid Q on a non luminous flame.

observations	inferences
Burns with aluminous/yellow flame	$\begin{array}{c} \diagup \\ \text{C}=\text{C} \\ \diagdown \end{array}$ or $-\text{C}\equiv\text{C}-$

2mks

- b) Place the remaining solid in a boiling tube. Add 10cm³ of water and shake.

observations	inferences
Dissolves forming a colourless solution	B is polar

2mk

- c) divide the resulting mixture into 3 portions

- i) Test the nature of the mixture formed using both red and blue litmus papers using the first portion

observations	inferences
Blue litmus turns red	H ⁺
Red litmus remains red	Accept solution is acidic

2mks

- ii) To the third portion add acidified KMnO₄

observations	inferences
Purple colour of acidified KMnO ₄ turns colourless/decolourised	$\begin{array}{c} \diagup \\ \text{C}=\text{C} \\ \diagdown \end{array}$ or $-\text{C}\equiv\text{C}-$

2mks

- iii) Describe how you can measure the pH of the mixture using universal indicator

Put the universal indicator strip in the solution and match the colour with the colours on the pH chart

2mks

Carry out the test you have described above using the fourth portion and record your observations and inferences in the spaces below.

observations	inferences
pH 4/5	Weakly acidic

2mks

