

FORM 3 2023 MIDTERM 1 EXAM

CHEMISTRY

PAPER 3

FORM THREE

TIME:2 HOURS

You are provided with the following:

- 3.3g metal carbonate, MCO_3 , labeled solution Q
- 2M hydrochloric acid, labeled solution P
- Sodium hydroxide, labeled solution R containing 40g/L of solution

You are required to determine the relative atomic mass of metal M

Procedure

- Measure accurately 100cm^3 of solution P into clean 250cm^3 conical flask and add all the 3.3g of solid Q, MCO_3
- Shake the mixture well and wait for effervescence to stop. Label the resulting solution as S
- Pipette 25cm^3 of solution R into a conical flask and add 2-3 drops of phenolphthalein indicator.
- Fill the burette with solution S and titrate against the solution R until the end point.
- Record your results in the table below. Repeat the procedure at least two times to complete the table. (4 mks)

	i	ii	Iii
Final burette reading (cm^3)			
Initial burette reading (cm^3)			
Volume of solution S used (cm^3)			

- a) What is the average volume of solution S used? (1mk)

- b) Calculate the moles of sodium hydroxide, solution R used. (2mks)
- c) Calculate the moles of hydrochloric acid in the average volume of solution S used. (2mks)
- d) Calculate the moles of hydrochloric acid in 100cm³ of solution S. (2mks)
- e) Calculate the moles of hydrochloric acid in the 100cm³ of the original solution P. (2mks)
- f) Calculate the moles of hydrochloric acid, solution P that reacted with solid Q, MCO₃. (2mks)
- g) Calculate the moles of MCO₃ that reacted. (2mks)

h) Calculate the relative formula mass (RFM) of MCO_3 . (2mks)

i) Calculate the relative atomic mass (RAM) of metal M. (1mk)