FORM TP 2013154

TEST CODE **02112032**

MAY/JUNE 2013

CARIBBEAN EXAMINATIONS COUNCIL

CARIBBEAN ADVANCED PROFICIENCY EXAMINATION®

CHEMISTRY

UNIT 1 – Paper 032

ALTERNATIVE TO SCHOOL-BASED ASSESSMENT

2 hours

READ THE FOLLOWING INSTRUCTIONS CAREFULLY.

1. This paper consists of THREE questions. Answer ALL questions.
2. Write your answers in the spaces provided in this booklet.
3. ALL working MUST be shown.
4. You may use a silent, non-programmable calculator to answer questions.
5. A data booklet is provided.

DO NOT TURN THIS PAGE UNTIL YOU ARE TOLD TO DO SO.

Answer ALL questions.

1. Solid **P** is a mixture of two simple salts of an alkali metal. You are required to carry out the following tests, being careful to add reagents gradually until no further change is observed, and gently shaking after each addition.

Record your observations and relevant deductions in the table provided.

Include in your recordings

- details of colour changes and precipitates formed
- the names of gases evolved and details of the tests used to identify EACH.

Test	Observations	Deductions
Using small quantities of **P**: (a) Add dilute HCl. Test for gas evolved.	• **[1 mark]**	• **[1 mark]**
(b) Add with care approximately 1 cm^3 conc. H_2SO_4 and warm gently. Test for gases evolved.	• • **[2 marks]**	• • • **[3 marks]**
(c) Shake **P** with distilled water and carry out the following tests on three separate portions.		
(d) To firs portion add $AgNO_3(aq)$ and allow to stand for 1 minute; then add $NH_3(aq)$.	• **[1 mark]** • **[1 mark]**	• **[1 mark]** • **[1 mark]**

Test	Observations	Deductions
(e) To second portion add $Pb(NO_3)_2$ (aq); allow to stand for 1 minute.	• **[1 mark]**	• **[1 mark]**
(f) To third portion add $BaCl_2$(aq) slowly, followed by dil HCl(aq).	• • • **[3 marks]**	• • **[2 marks]**

Total 18 marks

NOTHING HAS BEEN OMITTED

2. An experiment is carried out to investigate the rate of reaction between an excess of dolomite chips (magnesium carbonate) and 50 cm^3 of dilute hydrochloric acid. The volume (cm^3) of carbon dioxide is measured at regular intervals using a gas syringe. Figure 1 shows six readings of the volume of carbon dioxide as given by the gas syringe, and the corresponding time(s) taken.

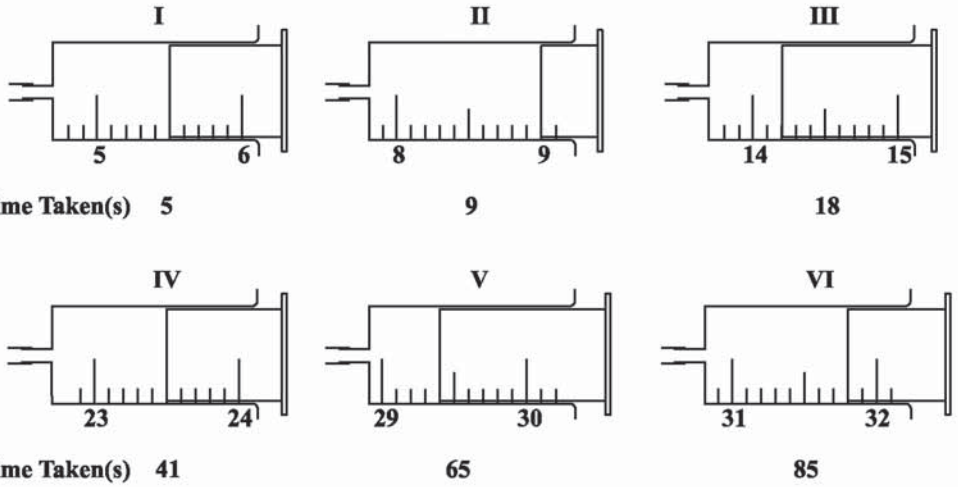


Figure 1. Volume of CO_2 measured by the gas syringe

(a) From the results shown in Figure 1, construct a table to show number of readings, volume of CO_2 evolved, the time taken and the inverse of the time taken (1/t).

[5 marks]

(b) **On the grid on page 7**, plot a graph of volume CO_2 evolved against time taken.

[5 marks]

(c) State a reason for the shape of the graph.

_____

_____

_____

[1 mark]

(d) From your graph, determine the rate of reaction at 30 seconds and 60 seconds respectively. Show ALL your working.

30 s _____

_____

60 s _____

_____

[4 marks]

(e) State what can be deduced about the rate of reaction from your answer in (d) above.

_____

[1 mark]

(f) Suggest the property of the reaction measured by the value, 1/t (the inverse of the time).

_____

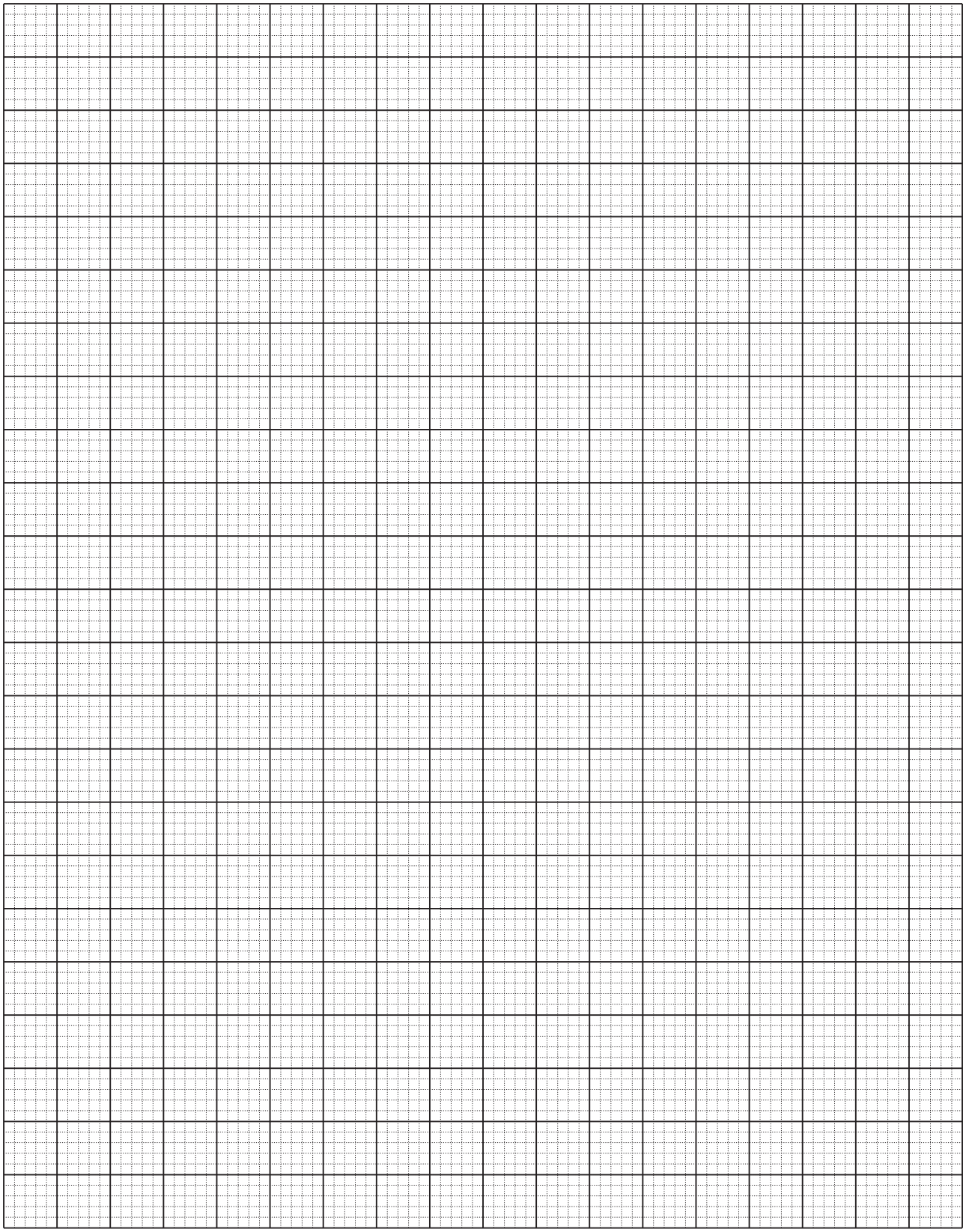
[1 mark]

(g) Suggest a reason for the use of excess dolomite (magnesium carbonate).

_____

[1 mark]

Total 18 marks



3. A student was taught that transition metals possessed catalytic properties.

Plan and design an experiment that would allow the student to test the truth of this principle.

Your answer should include:

(a) Hypothesis

_____

_____

[1 mark]

(b) Aim

_____

_____

[1 mark]

(c) Apparatus/Materials

_____

_____

_____

_____

[2 marks]

(d) Experimental procedure

_____

_____

_____

_____

_____

_____

[2 marks]

(e) Variables

(i) Manipulated

_____

[1 mark]

(ii) Responding

_____

[1 mark]

(iii) Controlled

_____

[1 mark]

(f) Data to be collected

_____

_____

[1 mark]

(g) Discussion of expected results

_____

_____

_____

_____

_____

[2 marks]

Total 12 marks

END OF TEST

IF YOU FINISH BEFORE TIME IS CALLED, CHECK YOUR WORK ON THIS TEST.