

UNIVERSITY OF CAMBRIDGE INTERNATIONAL EXAMINATIONS

Specimen for 2007

GCE A LEVEL

MARK SCHEME

MAXIMUM MARK: 30

SYLLABUS/COMPONENT: 9701/05

**CHEMISTRY
PRACTICAL**



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Skill	Total marks	Approximate breakdown of marks		Question 1	Question 2
Planning	15 marks	Defining the problem	4 marks	4	0
		Methods	11 marks	11	0
Analysis, conclusions and evaluation	15 marks	Dealing with data	8 marks	0	8
		Evaluation	4 marks	0	4
		Conclusion	3 marks	0	3

PLAN = Planning
 Problem = Defining the problem
 Methods
 ACE = Analysis, conclusions and evaluation
 Data = Dealing with data
 Evaluation
 Conclusions

Question	Sections	Learning outcomes	Indicative material	mark
1	(a) (i)	PLAN Problem	• identify the independent variable in the experiment or investigation	temperature and size of marble chips 2
	(ii)		• identify the dependent variable in the experiment or investigation	volume or mass of CO ₂ 1
	(b)	PLAN Problem	• express the aim in terms of a prediction or hypothesis, and express this in words or in the form of a predicted graph	suitable hypothesis proposed e.g. rate of production of CO ₂ increases with increasing concentration of hydrochloric acid. 1

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	(c)	PLAN Methods	<ul style="list-style-type: none"> describe how the dependent variable is to be measured describe the arrangement of apparatus and the steps in the procedure to be followed describe the method to be used to vary the independent variable, and the means to ensure that its value is measured accurately describe how each of the other key variables is to be controlled describe precautions that should be taken to keep risks to a minimum suggest appropriate volumes and concentrations of reagents 	<p>appropriate apparatus to measure volume or mass of CO₂;</p> <p>diagram showing appropriate apparatus and stepwise description including time measurement</p> <p>appropriate volumes of acid and water;</p> <p>use of appropriate apparatus in measuring volumes of acid and water;</p> <p>control of temp and constant number and size of marble chips (e.g. same mass and number of chips)</p> <p>care when making up HCl from conc. HCl</p> <p>moles/mass of CaCO₃ calculated;</p> <p>initial [HCl] calculated</p>	<p>1</p> <p>1</p> <p>1</p> <p>1</p> <p>1</p> <p>1</p> <p>1</p> <p>1</p> <p>1</p> <p>1</p> <p>9 max 8</p>
	(d)	PLAN Methods	<ul style="list-style-type: none"> draw up tables for data that they might wish to record describe how the data might be used in order to reach a conclusion 	<p>columns for mass/concentration/time</p> <p>units correct</p> <p>calculation of CO₂ evolved, appropriate statement relating to hypothesis in (b)</p>	<p>1</p> <p>1</p> <p>1</p>
1 Total					15

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	(f)	ACE Conclusions	<ul style="list-style-type: none"> draw conclusions from an investigation, providing a detailed description of the key features of the data and analyses, and considering whether experimental data supports a given hypothesis 	makes appropriate comment on whether prediction is supported by data i.e. straight line graph	1
		ACE Evaluation	<ul style="list-style-type: none"> make informed judgements on the confidence with which conclusions may be drawn 	makes appropriate comment on whether procedure is suitable for determination of M_r	1
	(g)	ACE Conclusions	<ul style="list-style-type: none"> make further predictions, ask informed and relevant questions and suggest improvements 	suggests appropriate modification to experimental procedure such as more points in range where accuracy is greatest	1
	(h)	ACE Conclusions	<ul style="list-style-type: none"> make detailed scientific explanations of the data, analysis and conclusions that they have described make further predictions, ask informed and relevant questions and suggest improvements 	uses knowledge of acid/base chemistry to describe a more appropriate way of determining M_r such as titration.	1
2 Total					15