



Surname _____

Other Names _____

Centre Number _____

Candidate Number _____

Candidate Signature _____

Level 3 Certificate / Extended Certificate

APPLIED SCIENCE

Unit 1 Key Concepts in Science
Section B – Chemistry

ASC1C

Monday 11 June 2018 Afternoon

Time allowed: 1 hour 30 minutes.

You are advised to spend approximately 30 minutes on this section.

For this paper you must have:

- a calculator
- Periodic Table
- formulae sheet.

At the top of the page, write your surname and other names, your centre number, your candidate number and add your signature.

[Turn over]



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INSTRUCTIONS

- Use black ink or black ball-point pen.
- Answer ALL questions in each section.
- You must answer the questions in the spaces provided. Do not write on blank pages.
- Do all rough work in this book. Cross through any work you do not want to be marked.

INFORMATION

- You will be provided with a copy of the formulae sheet.
- There are three sections in this paper:
SECTION A – Biology
SECTION B – Chemistry
SECTION C – Physics.
- The marks for questions are shown in brackets.
- The maximum mark for this paper is 60 and the maximum mark for this section is 20.

ADVICE

Read each question carefully.

DO NOT TURN OVER UNTIL TOLD TO DO SO



SECTION B – CHEMISTRY

Answer ALL questions in this section.

0 1

The Periodic Table is a valuable tool that has been developed by chemists over many years.

0 1 . 1

Complete the sentence. [1 mark]

The Periodic Table lists elements in order of

0 1 . 2

The elements in group VII (17) all have similar chemical properties.

What is the name given to the elements in group VII (17)? [1 mark]



01.3 State the trend shown in electronegativity in group VII (17) elements. [1 mark]

[Turn over]



0 1 . 4 Explain why elements in the same group of the Periodic Table have similar chemical properties. [2 marks]

5



0	2
---	---

Silicon has three stable isotopes.

0	2
---	---

1

State what is meant by the term isotope.
[2 marks]

[Turn over]



02.2 TABLE 1 shows information about isotopes of silicon.

TABLE 1

Isotope	Symbol	Isotopic abundance / %
Silicon-28	^{28}Si	92
Silicon-29	^{29}Si	5
Silicon-30	^{30}Si	3

Calculate the relative atomic mass of silicon.

Give your answer to 3 significant figures.

[3 marks]

Relative atomic mass = _____



02.3 Silicon has a structure similar to diamond.

**Explain why silicon has a high melting point.
[3 marks]**

8

[Turn over]



03

Chemical engineers often use Hess's Law to calculate enthalpy changes.

03.1

TABLE 2 shows the enthalpy change of combustion of carbon, hydrogen and butane.

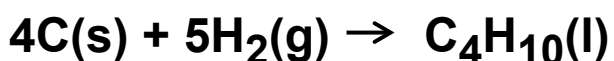
TABLE 2

	Carbon C(s)	Hydrogen H ₂ (g)	Butane C ₄ H ₁₀ (g)
Enthalpy change of combustion (kJ mol ⁻¹)	-393.5	-285.8	-2877.5

Use information from TABLE 2 to determine the accurate value of the enthalpy change of formation of butane.

Give your answer to 1 decimal place.

[4 marks]



Enthalpy change of formation =

_____ kJ

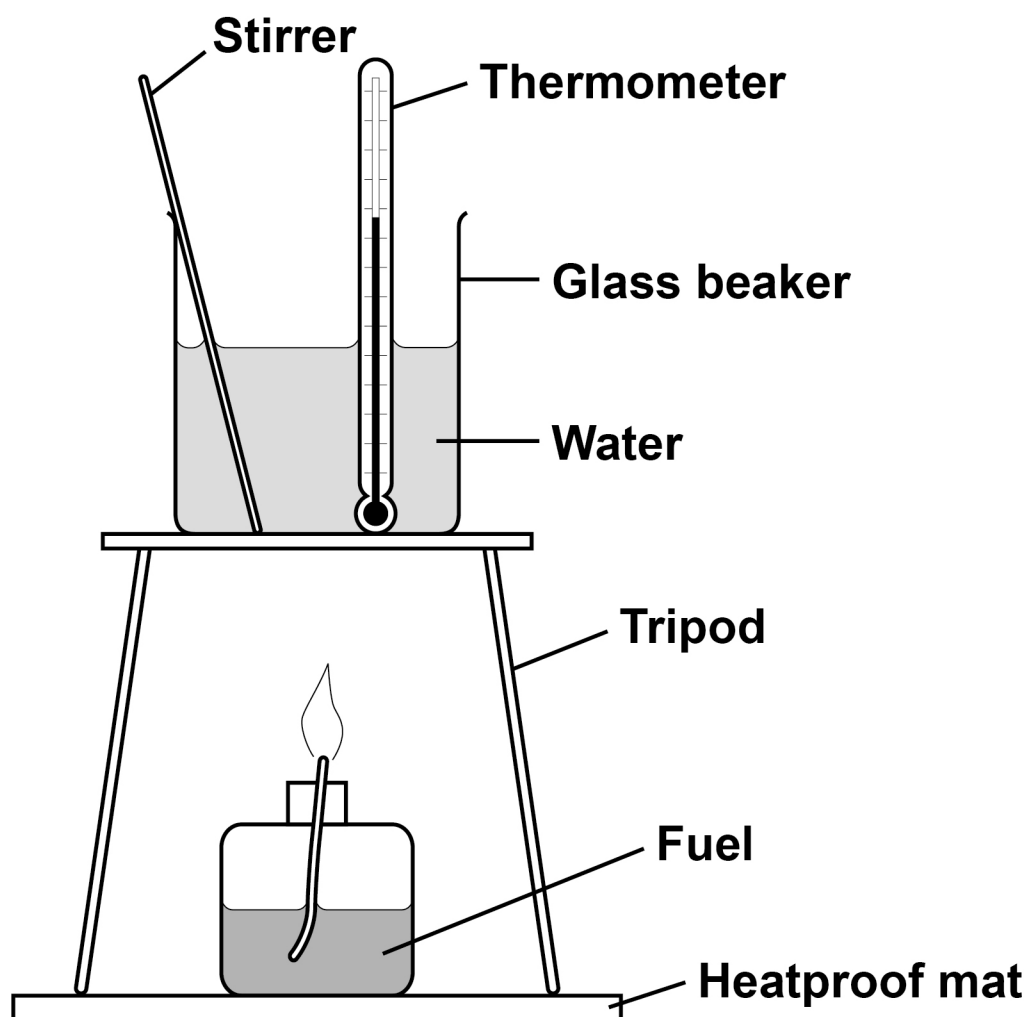
[Turn over]



A student wants to determine the enthalpy change of combustion of a fuel.

FIGURE 1 shows the equipment the student used.

FIGURE 1



- 03.2** It is difficult to determine accurate enthalpy of combustion, as heat loss is a major error.

Give TWO ways that the design of the experiment in FIGURE 1 could be improved to reduce the amount of heat loss. [2 marks]

1

2

- 03.3** Give ONE other possible source of error that would affect the enthalpy change value. [1 mark]

END OF QUESTIONS

7



There are no questions printed on this page

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Question	Mark
1	
2	
3	
TOTAL	

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