

Life Cycle Assessment + Recycling

Question Paper 1

Level	GCSE (9-1)
Subject	Combined Science: Trilogy - Chemistry
Exam Board	AQA
Topic	5.10 Using Resources
Sub-Topic	Life Cycle Assessment + Recycling
Difficulty Level	Bronze Level
Booklet	Question Paper 1

Time Allowed: 27 minutes

Score: /26

Percentage: /100

Grade Boundaries:

Q1.Hydrocarbons are used to make useful products.

(a) What are the elements in hydrocarbons?

Tick **one** box.

Carbon and hydrogen only

☐

Carbon, hydrogen and oxygen

☐

Carbon and nitrogen only

☐

Carbon, nitrogen and oxygen

☐

(1)

(b) **Table 1** gives some information about four hydrocarbons.

Table 1

Hydrocarbon	Melting point in °C	Boiling point in °C
Methane	–183	–162
Ethene	–169	–104
Octane	–57	+126
Decane	–30	+174

What are two correct statements about the four compounds?

Tick **two** boxes.

Methane has the lowest boiling point and decane has the highest melting point

☐

Methane and decane are both gases at 20 °C

☐

Ethene and octane are both alkanes

☐

Decane and ethene are both liquids at 0 °C

☐

Octane is liquid over a larger temperature range than methane

☐

(2)

- (c) Ethene can be produced from long-chain hydrocarbons by cracking.

Give the conditions needed for cracking.

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(2)

- (d) Poly(ethene) is a polymer made from ethene. Poly(ethene) is used to make plastic bags.

Table 2 is from a life cycle assessment comparing paper bags and plastic bags.

Table 2

	Paper bag	Plastic bag
Raw material	Wood (renewable)	Oil or gas (non-renewable)
Energy used to make in MJ	1.7	1.5
Solid waste produced in g	50	14
Carbon dioxide produced in kg	0.23	0.53

Evaluate which type of bag is more environmentally friendly.

Use data from **Table 2** and your own knowledge to support your answer.

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(6)
(Total 11 marks)

Q2. This question is about metals.

- (a) Which unreactive metal is found in the Earth as the metal itself?

Tick (✓) **one** box.

aluminium

☐

gold

☐

magnesium

☐

(1)

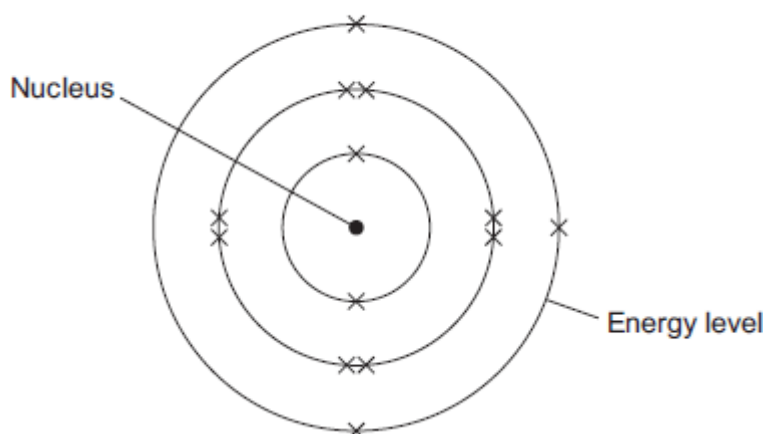
- (b) Complete the sentence.

Aluminium is an element because aluminium is made of
only one type of

(1)

- (c) **Figure 1** shows the electronic structure of an aluminium atom.

Figure 1



- (i) Use the correct words from the box to complete the sentence.

electrons	ions	protons	neutrons	shells
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The nucleus of an aluminium atom contains and

(2)

- (ii) Complete the sentence.

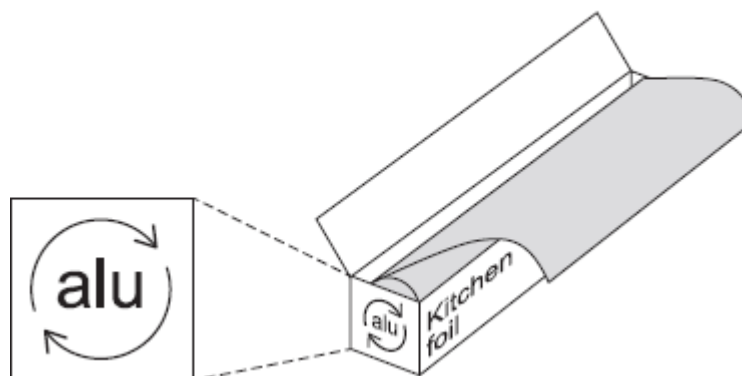
In the periodic table, aluminium is in Group

(1)

- (d) Aluminium is used for kitchen foil.

Figure 2 shows a symbol on a box of kitchen foil.

Figure 2



The symbol means that aluminium can be recycled. It does not show the correct

chemical symbol for aluminium.

- (i) What is the correct chemical symbol for aluminium?

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(1)

- (ii) Give **two** reasons why aluminium should be recycled.

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(2)

- (e) Aluminium has a low density, conducts electricity and is resistant to corrosion.

Which **one** of these properties makes aluminium suitable to use as kitchen foil?
Give a reason for your answer.

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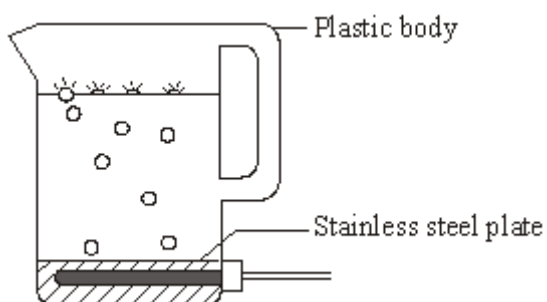
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(2)

(Total 10 marks)

- Q3.** Plastics are used to make many everyday items, such as the body of the kettle.



- (a) Complete the sentences by drawing a ring around the correct words.

(i) The plastic is made from many small molecules called	catalysts
	monomers
	polymers

(1)

- (ii) Propene is produced by cracking some of the fractions that are

separated from	crude oil
	limestone
	metal ores

(1)

- (b) After a few years the kettle no longer worked.

- Some parts of the kettle are made of plastic.
- Some parts of the kettle are made of stainless steel.
- The owner of the kettle disposed of it in a landfill site.

Consider these statements.

Suggest **three** reasons why the kettle should **not** be disposed of in a landfill site.

1

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2

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3

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(3)

(Total 5 marks)

