



KS3 Science

Earths Resources

Question Paper

Time available: 39 minutes

Marks available: 39 marks

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1.

In this question you will be assessed on using good English, organising information clearly and using specialist terms where appropriate.

Aluminium is used to make many items.



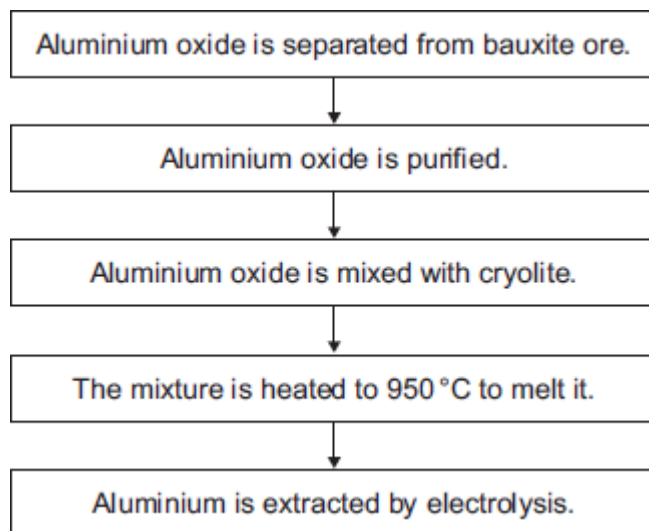
Window © Sergei Popov/iStock Airplane © Luminis/iStock

Pylon © afj1977/iStock Can © fotofermer/iStock

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Aluminium is extracted from aluminium ore. Aluminium ore is called bauxite, which is impure aluminium oxide.

The flow chart shows the main steps in the extraction of aluminium from aluminium ore.



Most aluminium is recycled.

Aluminium is recycled by melting scrap aluminium at 700 °C.

Use your own knowledge and the information given to answer the question.

Suggest why most aluminium is recycled.

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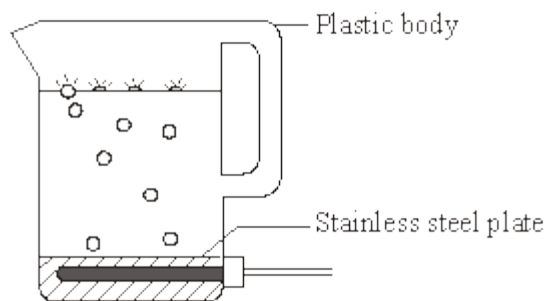
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(Total 6 marks)

2.

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)

3.

Water sold in plastic bottles has a high 'carbon cost'.

The 'carbon cost' depends on the amount of carbon dioxide emitted in making and transporting the product.

The more carbon dioxide emitted, the higher the 'carbon cost'.

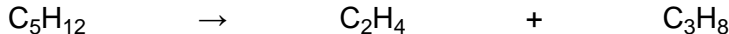
- (a) Plastic water bottles are made from a polymer.
The polymer is made from ethene.
Ethene is made by cracking hydrocarbons.

- (i) Name the polymer made from ethene.

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(1)

- (ii) Ethene can be made by cracking the hydrocarbon pentane, C₅H₁₂.

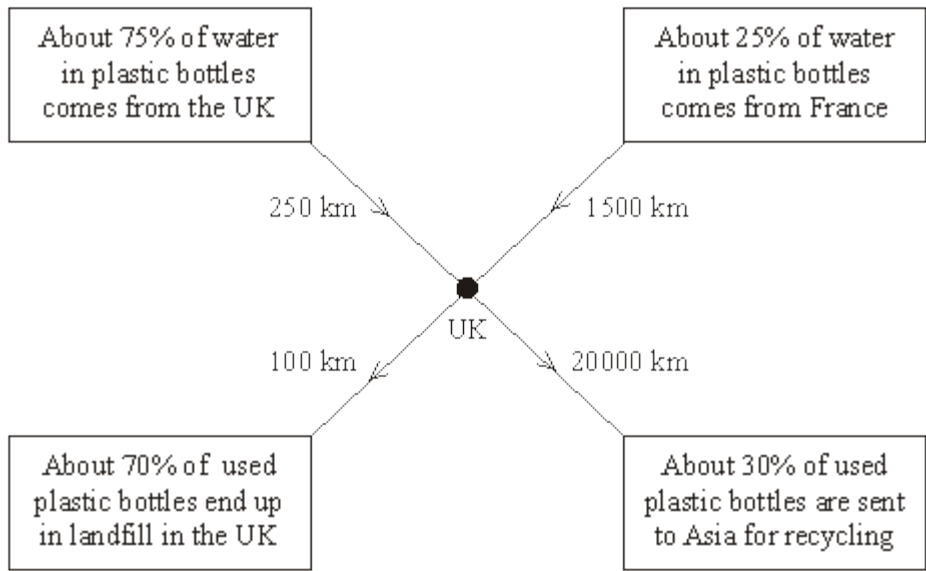


Explain why there is a 'carbon cost' for the process of cracking a hydrocarbon.

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(2)

- (b) The diagram shows information about water sold in plastic bottles in the UK. The diagram also shows the average distances that water and plastic bottles are transported.



Suggest how the high 'carbon cost' of water sold in plastic bottles could be reduced.

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(3)
(Total 6 marks)

4.

Supermarkets in the UK have been advised by the Government to stop giving plastic bags to customers. The Government states that this is because plastic bags use up resources that are not renewable and that the manufacture of plastic bags produces carbon dioxide. Most of these plastic bags are made from poly(ethene). The table shows methods to deal with large numbers of used plastic bags.

Method	Description of what happens to the plastic bag
Reused	used again by the customer
Recycled	collected, transported, washed and melted to make new plastic items
Burned	collected, transported and burnt to release heat energy
Dumped	mixed with other household waste, collected, transported and disposed of at a landfill site

Use the information and your knowledge and understanding to briefly give **one advantage and one disadvantage** for each of these methods.

Reused
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Recycled
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Burned
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Dumped
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(4)
(Total 4 marks)

5.

Read the article and then answer the questions.

Supermarkets launch eco-friendly plastic milk bags. Could this be the end of the milk bottle?



Milk bottles are made from glass or from plastic.

Glass milk bottles contain 0.5 litres of milk. When the milk is used up the empty bottles are returned to be re-used. Glass milk bottles are re-used 24 times on average. The glass to make new milk bottles is produced when a mixture of sand, limestone, soda and recycled glass is heated to about 1600 °C in a furnace. There are almost unlimited amounts of the raw materials needed to produce this glass. About 35% of used glass is recycled.

The most common plastic milk bottles contain 2 litres of milk. When the milk is used up the empty bottles are discarded as waste. The plastic used to make these milk bottles is poly(ethene). Poly(ethene) is produced from crude oil by first using fractional distillation, then cracking the naphtha fraction and finally polymerising the ethene. About 5% of used poly(ethene) is recycled.

The new plastic milk bags contain 2 litres of milk. The milk bags are also made from poly(ethene). A milk bag uses 75% less poly(ethene) than is used to make the poly(ethene) milk bottles. When the milk is used up the empty bags are discarded as waste.

- (a) Describe what happens in fractional distillation so that fractions, such as naphtha, are separated from crude oil.

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(3)

(b) Supermarkets claim that using milk bags instead of milk bottles would have less environmental impact.

Do you agree with this claim?

Use the information in the article and your knowledge and understanding to make appropriate comparisons to justify your answer.

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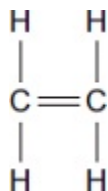
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(4)
(Total 7 marks)

6.

Crude oil is used to make useful substances such as alkenes and plastics.

(a) The alkene shown is ethene.



(i) Tick (✓) the correct formula for ethene.

Formula	Tick (✓)
CH ₄	
C ₂ H ₄	
C ₂ H ₆	

(1)

(ii) Tick (✓) the name of the plastic formed when many ethene molecules join together.

Name of plastic	Tick (✓)
Poly(ethene)	
Poly(ethenol)	
Poly(propene)	

(1)

(b) Read the article about plastics and then answer the questions.

THE PROBLEM WITH PLASTIC WASTE

Millions of tonnes of plastics are made from crude oil every year.

Most of the litter found on beaches is plastic waste.

80 % of plastics produced end up in landfill sites.

(i) Draw a ring around the correct answer in the box to complete the sentence.

Plastic waste needs to be removed from beaches because it

- decomposes.
- is reactive.
- is not biodegradable.

(1)

(ii) Suggest a problem caused by 80 % of plastics going to landfill sites.

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(1)

(iii) Suggest **one** way of reducing the amount of plastics going to landfill sites.

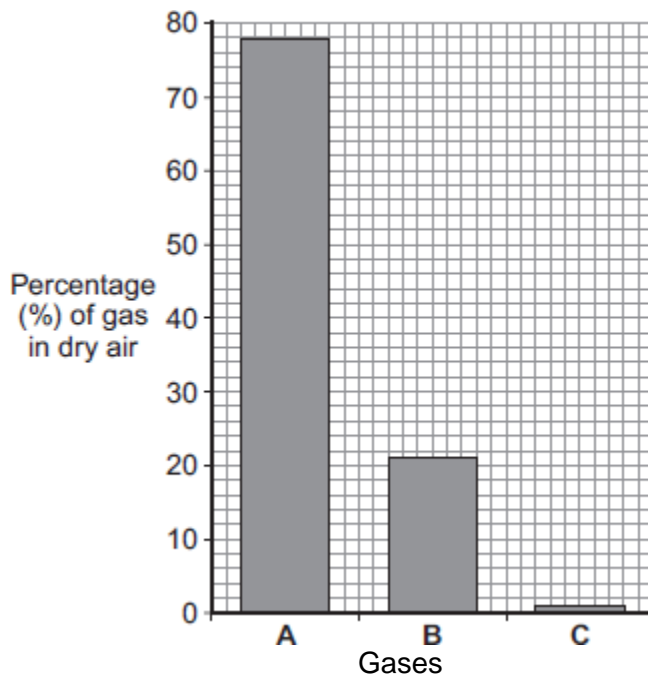
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(1)

(Total 5 marks)

7. This question is about the Earth's atmosphere today.

(a) The bar chart shows the percentage by mass of the gases in dry air from the atmosphere.



(i) What percentage of the atmosphere is gas **A**? % (1)

(ii) Use gases from the box to answer this question.

bromine	hydrogen	nitrogen	oxygen
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Name gas **A** and gas **B** shown on the bar chart.

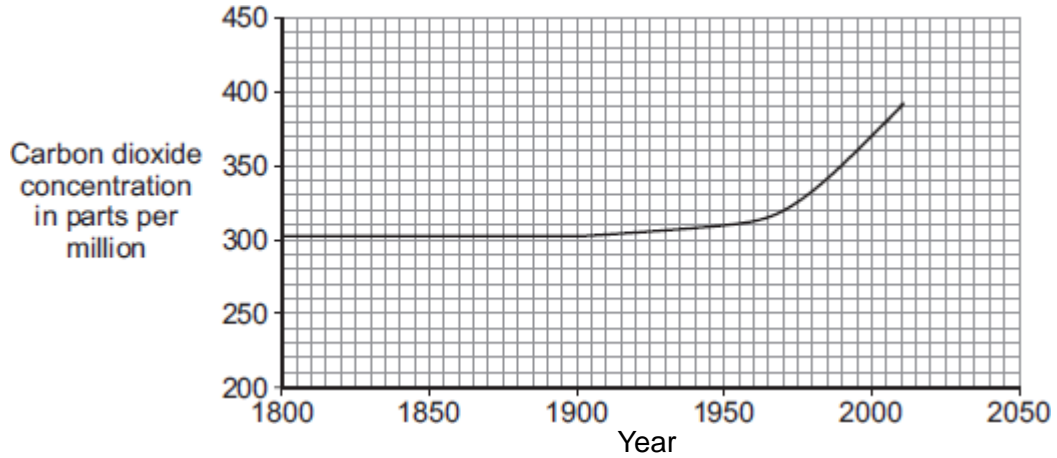
Gas **A**:

Gas **B**:

(2)

(b) The concentration of carbon dioxide in the atmosphere has changed.

The graph shows how the concentration of carbon dioxide has changed since 1800.



(i) Describe how the concentration of carbon dioxide has changed since 1800.

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(2)

(ii) Complete the following sentence.

The main process that has caused the change in carbon dioxide is the burning
of

(1)

(Total 6 marks)