

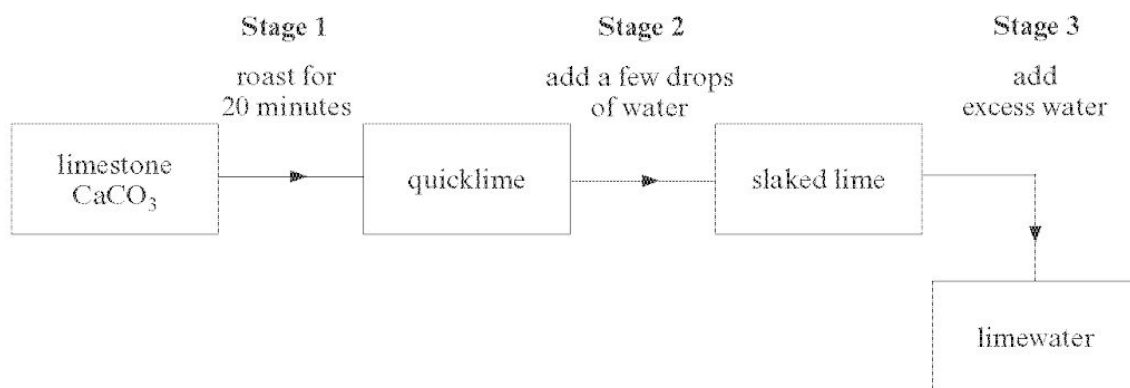
WJEC Chemistry GCSE

1.6: Limestone

Practice Questions

Wales Specification

2. (a) The flow chart below outlines the stages involved in the preparation of limewater from limestone.



- (i) Write a balanced symbol equation for the reaction taking place in stage 2. [3]



- (ii) Give the stage in the flow chart which

I is extremely exothermic,

[1]

II demonstrates thermal decomposition.

[1]

- (iii) Describe a simple test you would carry out to show that limewater is formed in stage 3. Include the result of the test. [1]

.....

- (b) Limestone is an important raw material obtained by quarrying. There are advantages and disadvantages associated with limestone quarrying.

In your opinion do the advantages of limestone quarrying outweigh the disadvantages? Give two reasons to support your answer. [2]

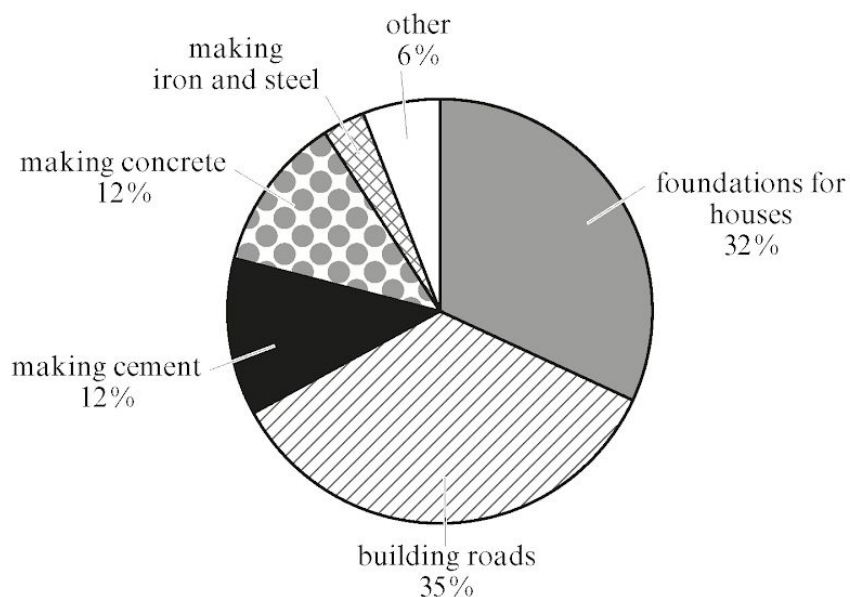
Opinion (Yes or No)

Reasons to support your opinion

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3. Limestone is an important raw material.

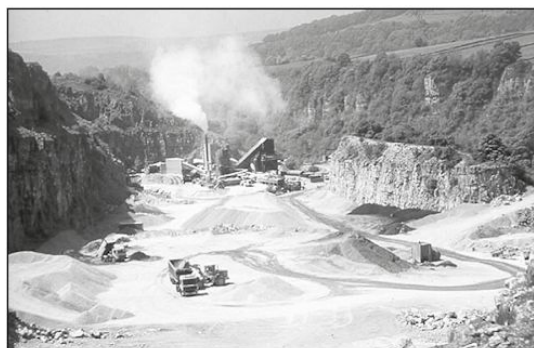
(a) The pie chart below shows some uses of limestone in the construction industry.



Calculate the percentage of limestone used for making iron and steel. [2]

Percentage used for making iron and steel =%

(b) The photograph below shows a limestone quarry.



Give **two** environmental problems relating to limestone quarrying. [2]

Problem 1

Problem 2

- (c) Limestone, CaCO_3 , is the raw material for the production of slaked lime, Ca(OH)_2 . The flow diagram below shows the steps involved.



- (i) Using the **chemical names** write a word equation for the production of slaked lime from quicklime. [1]

..... + \longrightarrow

- (ii) The addition of water to quicklime is a very exothermic reaction. Describe what you observe during this reaction. [2]

.....
.....

Image: www.ebc-indevelopment.co.uk

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4.

- (a) The table below shows information about three substances. Complete the table. [3]

Common name	Chemical name	Chemical formula
.....	calcium carbonate	CaCO_3
quicklime	calcium oxide
slaked lime	Ca(OH)_2

- (b) A group of pupils investigated the composition of egg shells. They suspected that egg shells contain calcium carbonate. They carried out the following tests.

- (i) Flame test

Choose from the box below the colour you would expect to see if egg shells contain calcium ions. [1]

brick-red	lilac	yellow	green	white
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Colour

- (ii) Test for carbonate ions by adding dilute hydrochloric acid

Name the gas formed if egg shells contain carbonate ions. Describe the test you would carry out to identify this gas. Include the result for your test. [2]

Gas

Test and result

- (iii) The pupils were told that 2.0g of egg shells contain 1.9g of calcium carbonate. Calculate the percentage of calcium carbonate in these egg shells. [2]

Percentage = %

- (c) The box below shows some of the concerns a local conservation group have about the opening of a new limestone quarry in their area.

<p style="text-align: center;">Concerns</p> <p style="text-align: center;">Noise pollution from blasting</p> <p style="text-align: center;">Unsightly quarry pits</p> <p style="text-align: center;">Dust pollution from rock blasting</p> <p style="text-align: center;">Noise and dust pollution from lorries</p> <p style="text-align: center;">Habitat destruction</p>

The quarry owner suggests that planting trees around the quarry will reduce the impact of noise pollution. Suggest two other things the quarry owner could do to reduce the impact of the quarry on the local environment. [2]

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.....

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- (d) Suggest two advantages of limestone quarrying. [2]

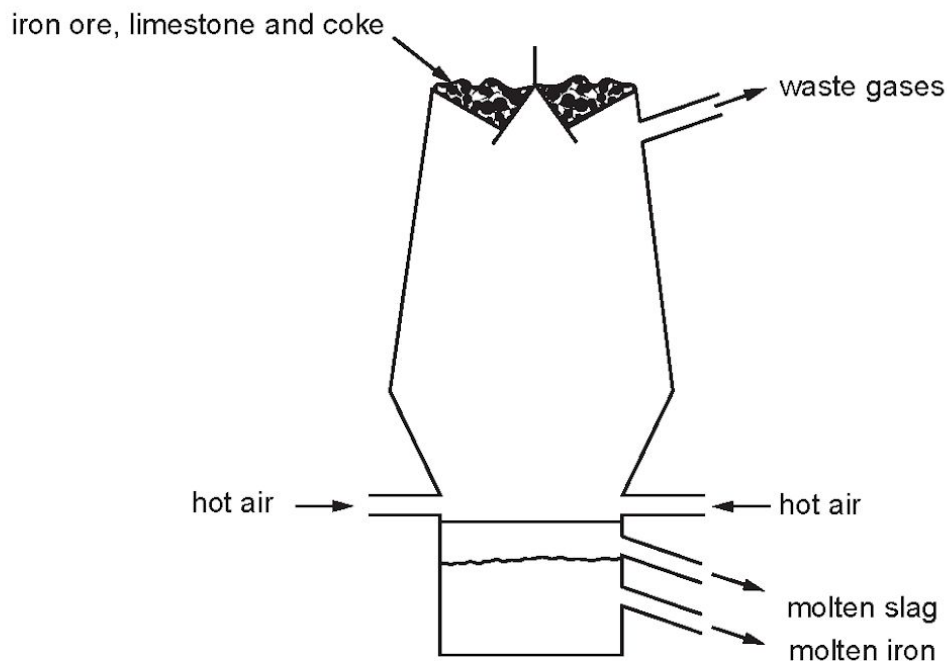
Advantage 1

Advantage 2

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5.

Iron is extracted from iron ore in a blast furnace.



(a) Draw a line to link the raw material to its use in the blast furnace.

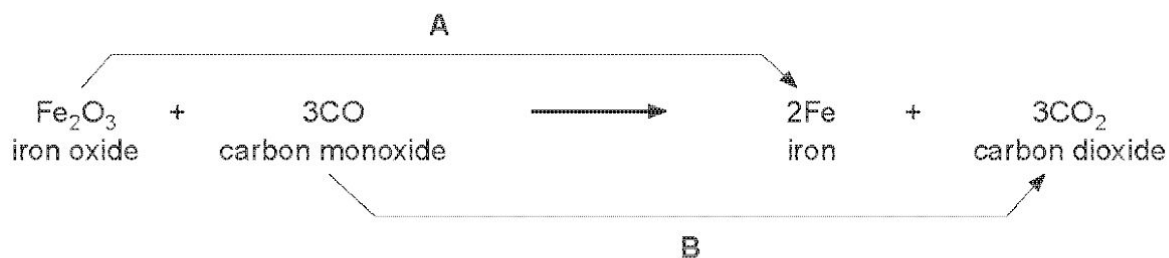
[2]

Raw material	Use
iron ore	source of iron
limestone	acts as a fuel
coke	removes impurities

(b) Coke contains the element carbon. Carbon reacts with oxygen in the air forming carbon dioxide. Write a word equation for this reaction. [1]



(c) The equation below shows the formation of iron in the blast furnace.



Give the letter of the arrow which shows reduction taking place. Give a reason for your choice. [2]

(d) Iron is used to make steel. Steel is an example of an alloy.

compound	element	mixture
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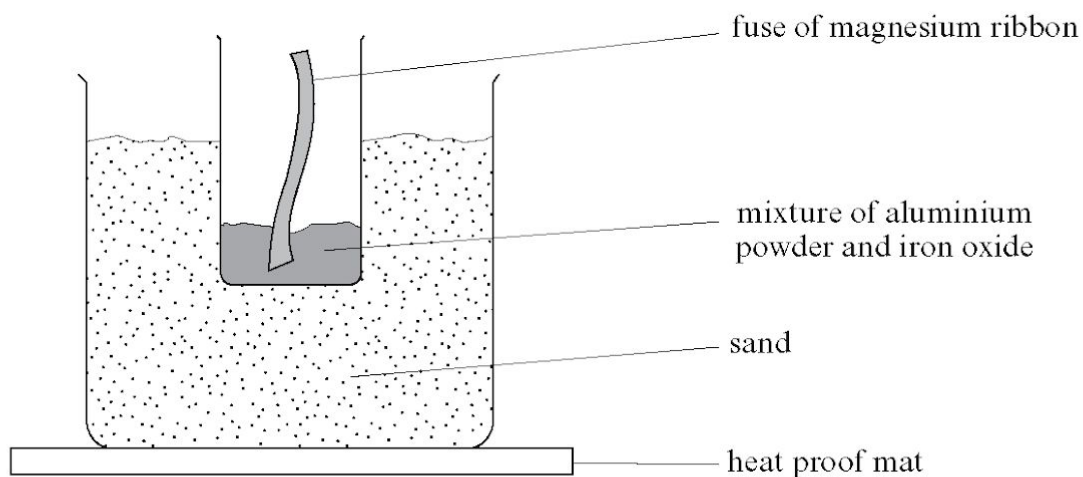
Choose from the box above the term used to describe an alloy.

[1]

6

6.

The Thermit reaction is a reaction between aluminium powder and iron oxide. It can be demonstrated in a chemistry laboratory using the apparatus shown in the diagram below.



(a) State why the magnesium ribbon fuse is able to start the reaction. [1]

(b) (i) Complete the word equation for the reaction that takes place between aluminium and iron oxide. [1]

aluminium + iron oxide \longrightarrow +

(ii) State which reactant is reduced and give a reason for your answer. [1]

(c) Titanium is extracted from titanium chloride by reacting it with sodium at 1000°C in a reactor. The only other substance in the reactor is argon gas.

(i) Balance the symbol equation for the reaction that takes place in the reactor. [1]



(ii) What does this reaction tell you about the reactivity of titanium? [1]

.....
.....

(iii) Suggest a reason why the reactor contains argon and not air. [1]

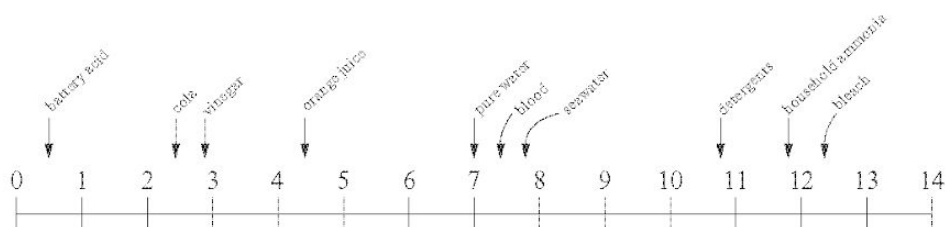
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(iv) Suggest a reason why extracting titanium from titanium chloride is an expensive process. [1]

.....
.....

7

7. The following diagram shows the pH scale and the pH values of some common substances.



(a) From the substances above, name

(i) the strongest acid, [1]

(ii) the weakest alkali, [1]

(iii) a neutral substance, [1]

(b) John was studying the reactions of acids with three different substances, A, B and C. He recorded his observations and temperature changes in the table shown below.

Substance added to acid	Observations	Temperature change (°C)
A	bubbles of gas produced, gas collected turns limewater milky, substance reacts to produce blue solution	+4
B	no gas produced, substance reacts to produce a blue solution	0
C	no visible change	+8

Identify A, B and C from the substances in the box below.

[3]

copper carbonate copper oxide magnesium
 sodium chloride sodium hydroxide

A

B

C

6

8. The following table shows the pH of some common substances.

Substance	pH
limewater	10.5
saliva	6.4
lemon juice	2.2
orange juice	2.6
milk of magnesia	10.0

(a) Use only information from the table to answer parts (i) and (ii).

(i) Name the strongest acid. [1]

.....

(ii) Name the substance closest to being neutral. [1]

.....

(b) Milk of magnesia is used to treat indigestion. It contains magnesium hydroxide which reacts with excess hydrochloric acid in the stomach.

(i) Complete the following word equation to show the products formed. [2]

magnesium hydroxide + hydrochloric acid \longrightarrow +

(ii) Another indigestion remedy contains calcium carbonate. Name the gas produced when calcium carbonate reacts with hydrochloric acid and state how this gas can be identified. [2]

Gas produced

How this gas can be identified

.....