

# Carbonates

## Question Paper 1

Level	IGCSE
Subject	Chemistry (0620/0971)
Exam Board	Cambridge International Examinations (CIE)
Topic	Carbonates
Sub-Topic	
Booklet	Question Paper 1

**Time Allowed:** 30 minutes

**Score:** /25

**Percentage:** /100

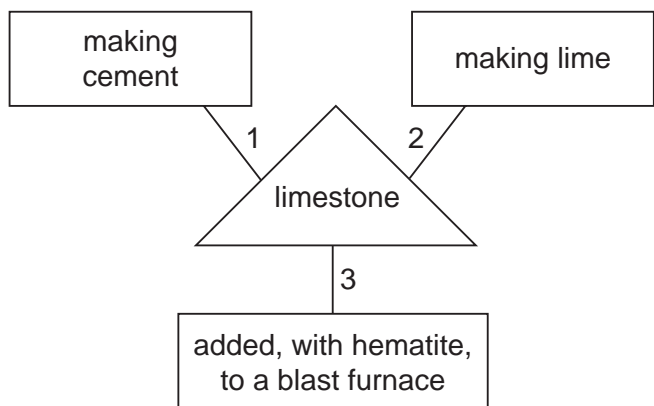
**Grade Boundaries:**

9	8	7	6	5	4	3	2	1
>85%	75%	68%	60%	53%	48%	40%	33%	<25%

1. Carbon dioxide is produced when dilute hydrochloric acid reacts with

- A calcium sulfate.
- B carbon.
- C copper(II) carbonate.
- D limewater.

2. A student is asked to draw a diagram showing the uses of limestone.



Which numbered lines show a correct use of limestone?

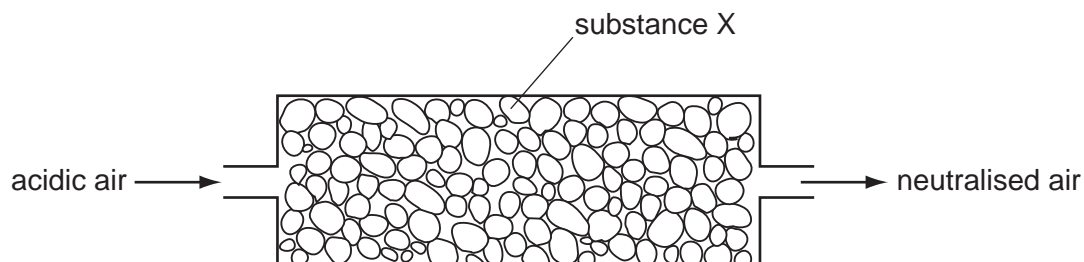
- A 1 and 2 only
- B 1 and 3 only
- C 2 and 3 only
- D 1, 2 and 3

3. Two industrial processes that involve heating are
- extracting iron from its ore using a blast furnace,
  - making lime.

In which of these processes is calcium carbonate used?

	extracting iron	making lime
<b>A</b>	✓	✓
<b>B</b>	✓	x
<b>C</b>	x	✓
<b>D</b>	x	x

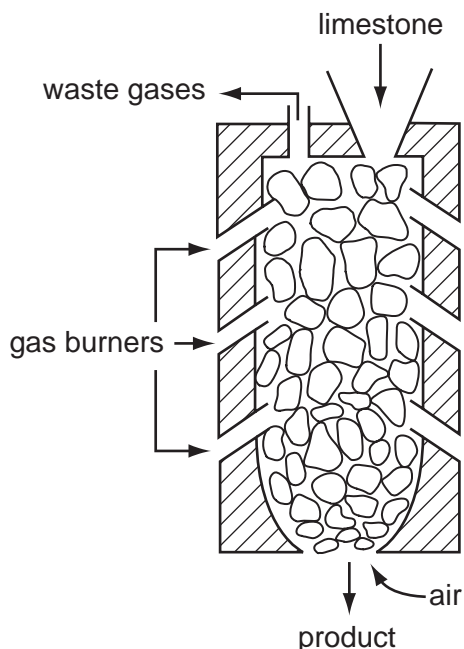
4. Air containing an acidic impurity was neutralised by passing it through a column containing substance X.



What is substance X?

- A** calcium oxide
- B** sand
- C** sodium chloride
- D** concentrated sulfuric acid

5. The diagram shows a kiln used to heat limestone.



What is the product and what waste gas is formed?

	product	waste gas
<b>A</b>	lime, CaO	carbon monoxide
<b>B</b>	lime, CaO	carbon dioxide
<b>C</b>	slaked lime, Ca(OH) <sub>2</sub>	carbon monoxide
<b>D</b>	slaked lime, Ca(OH) <sub>2</sub>	carbon dioxide

6. Which process does **not** produce carbon dioxide?

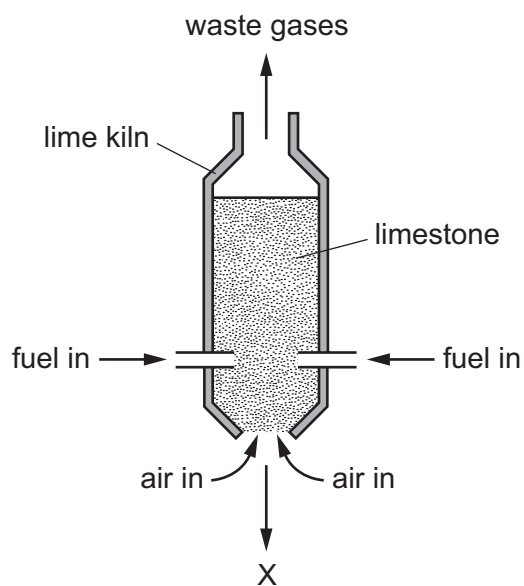
- A** fermentation
- B** respiration
- C** the production of lime from limestone
- D** the treatment of acidic soil with lime

7. When compound X is heated, it changes colour from green to black. Compound Y is formed and a gas is given off which turns limewater milky.

What are X and Y?

	X	Y
<b>A</b>	calcium carbonate	calcium oxide
<b>B</b>	copper carbonate	carbon
<b>C</b>	copper carbonate	copper oxide
<b>D</b>	copper sulfate	copper oxide

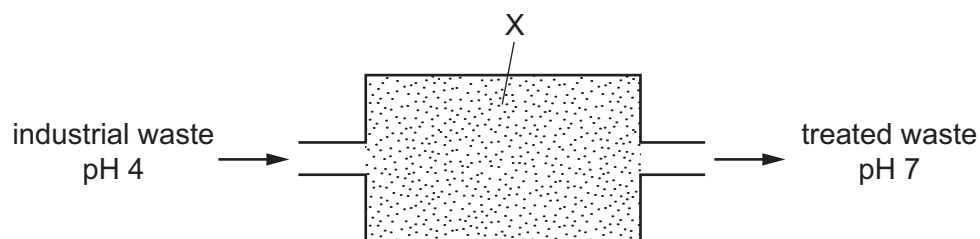
8. The diagram represents a lime kiln.



What leaves the furnace at X?

- A** calcium carbonate
- B** calcium hydroxide
- C** calcium oxide
- D** calcium sulfate

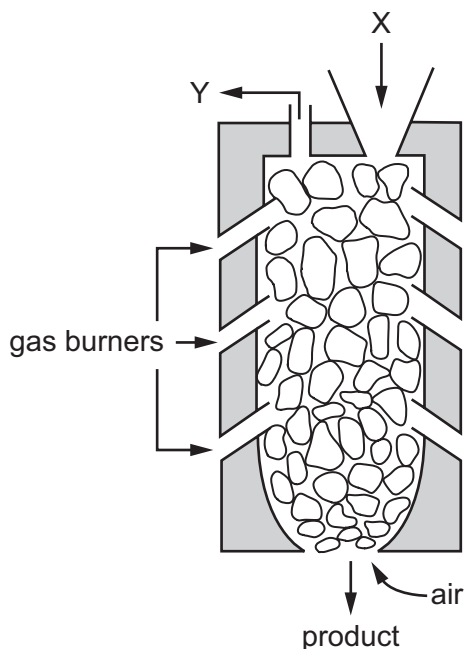
9. Substance X is used to treat industrial waste.



What is X and which type of reaction occurs during the treatment?

	X	type of reaction
<b>A</b>	calcium oxide (lime)	neutralisation
<b>B</b>	calcium oxide (lime)	redox
<b>C</b>	carbon	neutralisation
<b>D</b>	carbon	redox

10. The diagram shows a kiln used to manufacture lime.



Which row identifies X and Y?

	X	Y
<b>A</b>	lime	carbon dioxide
<b>B</b>	lime	steam
<b>C</b>	limestone	carbon dioxide
<b>D</b>	limestone	steam

11. The diagram shows the soil pH range over which a vegetable grows well.

The pH of the soil to be used is 5.5.



Why is lime added to the soil before planting the vegetable?

- A** The lime acts as a catalyst.
- B** The lime changes the soil acidity.
- C** The lime is an indicator.
- D** The lime supplies nitrogen.

12. When limestone is heated it forms lime (calcium oxide) and carbon dioxide.



Which statement is **not** correct?

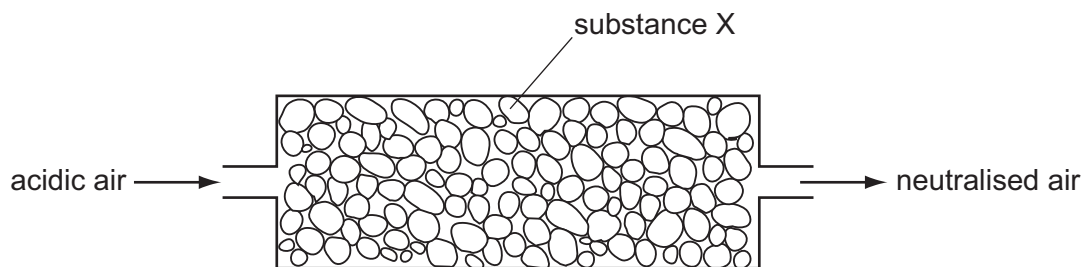
- A Carbon dioxide is a greenhouse gas which may contribute to climate change.
  - B Slaked lime is used to neutralise industrial waste.
  - C The lime can be used to treat alkaline soil.
  - D This reaction is an example of thermal decomposition.
13. Lime (calcium oxide) is used to treat waste water from a factory.

Which substance is removed by the lime?

- A ammonia
  - B sodium chloride
  - C sodium hydroxide
  - D sulfuric acid
14. Which process is used to make lime (calcium oxide) from limestone (calcium carbonate)?
- A chromatography
  - B electrolysis
  - C fractional distillation
  - D thermal decomposition
15. Why does a farmer put lime (calcium oxide) on the soil?
- A to act as a fertiliser
  - B to kill pests
  - C to make the soil less acidic
  - D to make the soil less alkaline



- 16 Air containing an acidic impurity was neutralised by passing it through a column containing substance X.



What is substance X?

- A calcium oxide
  - B sand
  - C sodium chloride
  - D concentrated sulfuric acid
- 17 Some marble chips (calcium carbonate) are heated strongly and substances X and Y are formed.

Substance X is a white solid that reacts with water, giving out heat. Substance Y is a colourless gas.

What are substances X and Y?

	X	Y
<b>A</b>	calcium chloride	oxygen
<b>B</b>	calcium hydroxide	carbon dioxide
<b>C</b>	calcium oxide	carbon dioxide
<b>D</b>	calcium sulfate	oxygen

18 Which statement is **not** correct?

- A Converting limestone into lime is a thermal decomposition reaction.
- B Flue gas desulfurisation is a neutralisation reaction.
- C In the extraction of iron, calcium carbonate is converted into calcium oxide.
- D Slaked lime is added to soil as a fertiliser.

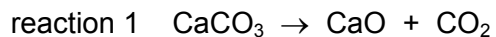
19 Statements about methods of manufacture and uses of calcium oxide are shown.

- 1 It is manufactured by reacting acids with calcium carbonate.
- 2 It is manufactured by heating calcium carbonate.
- 3 It is used to desulfurise flue gases.
- 4 It is used to treat alkaline soil.

Which statements are correct?

- A 1 and 2      B 1 and 4      C 2 and 3      D 3 and 4

20 Two equations are shown.



Which terms describe reactions 1 and 2?

	reaction 1	reaction 2
<b>A</b>	reduction	hydration
<b>B</b>	reduction	hydrolysis
<b>C</b>	thermal decomposition	hydration
<b>D</b>	thermal decomposition	hydrolysis

21 A student carried out two experiments.

experiment 1 The student heated a sample of limestone very strongly. A white powder formed.

experiment 2 The white powder from experiment 1 was cooled. The student then added a small quantity of cold water to the powder. Large quantities of steam were produced.

Which statement is **not** correct?

- A An endothermic reaction occurred in experiment 1.
- B An exothermic reaction occurred in experiment 2.
- C Thermal decomposition occurred in experiment 1.
- D Thermal decomposition occurred in experiment 2.

22 A gas is produced when calcium carbonate is heated.

Which type of change is this?

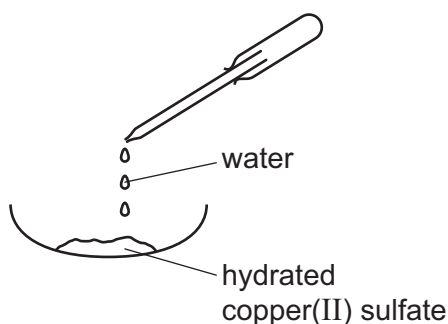
- A chemical
- B exothermic
- C physical
- D separation

23 Farmers spread slaked lime (calcium hydroxide) on their fields to neutralise soils that are too acidic for crops to grow well.

Which ion in slaked lime neutralises the acid in the soil?

- A  $\text{Ca}^{2+}$                       B  $\text{H}^+$                       C  $\text{O}^{2-}$                       D  $\text{OH}^-$

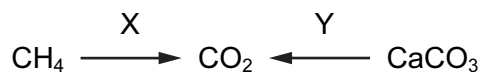
24 Water is added to hydrated copper(II) sulfate.



Which colour change takes place?

- A blue to pink  
 B blue to white  
 C no change  
 D white to blue

25 Two reactions, X and Y, produce carbon dioxide.



Which types of reaction are X and Y?

	X	Y
<b>A</b>	combustion	combustion
<b>B</b>	combustion	thermal decomposition
<b>C</b>	thermal decomposition	combustion
<b>D</b>	thermal decomposition	thermal decomposition