

Carbon dioxide and methane

Question Paper 1

Level	IGCSE
Subject	Chemistry (0620/0971)
Exam Board	Cambridge International Examinations (CIE)
Topic	Air and Water
Sub-Topic	Carbon dioxide and methane
Booklet	Question Paper 1

Time Allowed: 36 minutes

Score: /30

Percentage: /100

Grade Boundaries:

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

1. A newspaper article claims that carbon dioxide is formed as follows.

- 1 during respiration
- 2 when calcium carbonate reacts with hydrochloric acid
- 3 when methane burns in air

Which statements are correct?

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

2. Which information about carbon dioxide and methane is correct?

		carbon dioxide	methane
A	formed when vegetation decomposes	✓	✗
B	greenhouse gas	✓	✓
C	present in unpolluted air	✗	✗
D	produced during respiration	✗	✓

3. Which statement about methane is **not** correct?

- A** It is a liquid produced by distilling petroleum.
- B** It is produced as vegetation decomposes.
- C** It is produced by animals such as cows.
- D** It is used as a fuel.

4. Which pollutant gas is produced by the decomposition of vegetation?

- A** carbon monoxide
- B** methane
- C** nitrogen oxide
- D** sulfur dioxide

5. The table gives the composition of the atmosphere of four newly discovered planets.

planet	composition of atmosphere
W	argon, carbon dioxide and oxygen
X	argon, nitrogen and oxygen
Y	argon, carbon dioxide and methane
Z	methane, nitrogen and oxygen

On which planets is the greenhouse effect likely to occur?

- A** W only
- B** W, X and Z
- C** W and Y only
- D** W, Y and Z

6. Greenhouse gases may contribute to climate change.

Two of these gases are emitted into the atmosphere as a result of processes within animals.

Gas1..... is produced by process3..... .

Gas2..... is produced by process4..... .

Which words correctly complete gaps 1, 2, 3 and 4?

	1	2	3	4
A	CO	C ₂ H ₆	digestion	respiration
B	CO	C ₂ H ₆	respiration	digestion
C	CO ₂	CH ₄	digestion	respiration
D	CO ₂	CH ₄	respiration	digestion

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

- A combustion of petrol
- B reaction between an acid and a metal hydroxide
- C reaction between an acid and a carbonate
- D respiration

8. Gas X is a waste gas from digestion in animals.

Gas Y is formed when gas X is burnt with a small amount of oxygen.

Gas Z is formed when gas X is burnt with an excess of oxygen.

What are X, Y and Z?

	X	Y	Z
A	carbon dioxide	methane	carbon monoxide
B	carbon monoxide	methane	carbon dioxide
C	methane	carbon dioxide	carbon monoxide
D	methane	carbon monoxide	carbon dioxide

9. Carbon dioxide and methane are 'greenhouse gases' which contribute to global warming.

Which process does **not** increase global warming?

- A burning fossil fuels
- B decay of organic waste
- C farming cattle for beef
- D growing crops such as sugar cane

10. In which process is carbon dioxide **not** formed?

- A** burning of natural gas
- B** fermentation
- C** heating lime
- D** respiration

11. Which information about carbon dioxide and methane is correct?

		carbon dioxide	methane
A	formed when vegetation decomposes	✓	✗
B	greenhouse gas	✓	✓
C	present in unpolluted air	✗	✗
D	produced during respiration	✗	✓

key
✓ = true
✗ = false

12. The list shows four methods that were suggested for the formation of carbon dioxide.

- 1 action of an alkali on a carbonate
- 2 action of heat on a carbonate
- 3 complete combustion of methane
- 4 reaction of a carbonate with oxygen

Which methods would result in the production of carbon dioxide?

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

13. Which statement about methane is **not** correct?

- A It is a liquid produced by distilling petroleum.
- B It is produced as vegetation decomposes.
- C It is produced by animals, such as cows.
- D It is used as a fuel.

14. Carbon dioxide and methane both contribute to climate change.

Which process produces both gases?

- A complete combustion of natural gas
- B farming cattle
- C heating calcium carbonate
- D respiration

15. In which reaction is carbon dioxide **not** produced?

- A complete combustion of petrol
- B hydrochloric acid reacting with magnesium
- C respiration
- D thermal decomposition of limestone

16. Unwanted vegetation is sometimes placed in a bin where it decays to form compost. This compost can be used to fertilise soils.

Which gas is likely to be present in a higher percentage inside the bin than in the air outside the bin?

- A carbon monoxide
- B methane
- C oxygen
- D sulfur dioxide

17. These statements are about a gas.

- 1 It is produced by thermal decomposition of a carbonate.
- 2 It is produced by the fermentation of glucose.
- 3 It makes up 1% of unpolluted air.
- 4 It is produced during the production of steel from iron.

Which statements are correct for carbon dioxide?

- A** 1 and 2 only **B** 1, 2 and 3 **C** 1, 2 and 4 **D** 1, 3 and 4

18. Four reactions produce carbon dioxide.

- 1 respiration
- 2 fermentation
- 3 combustion of methane
- 4 manufacture of lime

Which reactions do **not** use oxygen from the air?

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

19. The list gives four experiments carried out with calcium carbonate.

- 1 acid added
- 2 alkali added
- 3 heated strongly
- 4 water added

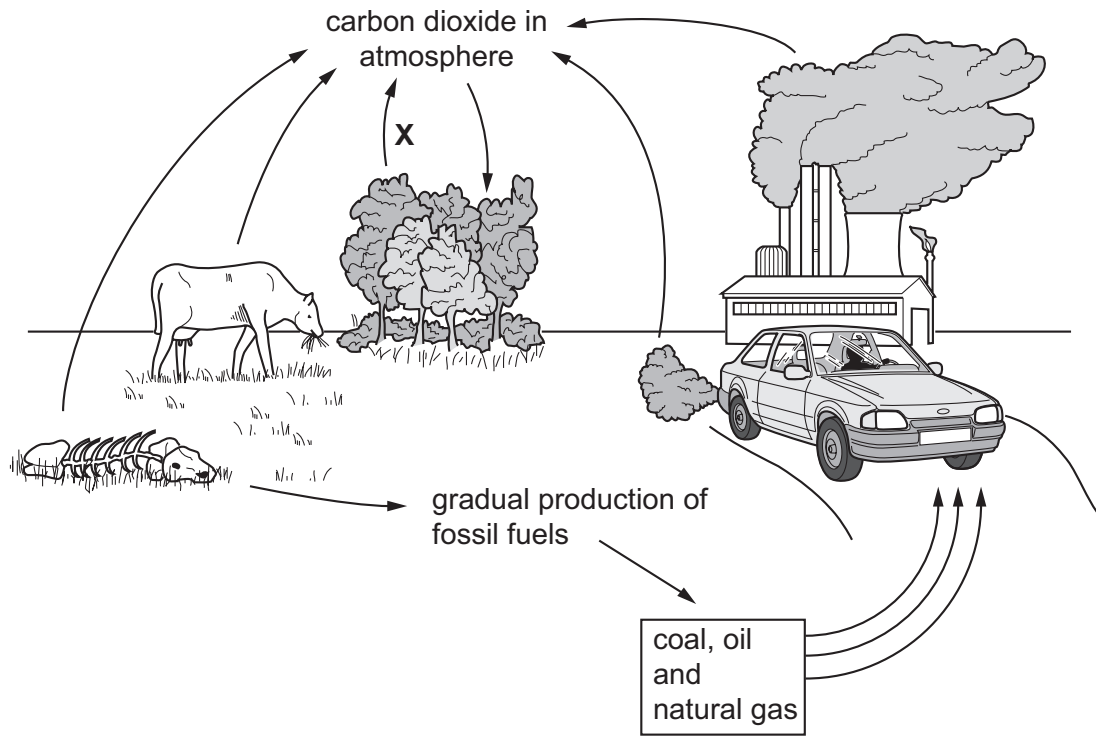
Which experiments produce carbon dioxide?

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

20. Which statement about methane is **not** correct?

- A It is a greenhouse gas.
- B It is an alkene.
- C It is formed by decomposition of vegetation.
- D It is used as a fuel.

21. The diagram shows the carbon cycle.



Which process is shown by the arrow marked X?

- A combustion
- B photosynthesis
- C respiration
- D transpiration

22. Greenhouse gases may contribute to climate change.

Two of these gases are emitted into the atmosphere as a result of processes within animals.

Gas1..... is produced by process3..... .

Gas2..... is produced by process4..... .

Which row correctly complete gaps 1, 2, 3 and 4?

	1	2	3	4
A	CO	C ₂ H ₆	digestion	respiration
B	CO	C ₂ H ₆	respiration	digestion
C	CO ₂	CH ₄	digestion	respiration
D	CO ₂	CH ₄	respiration	digestion

23 Which process does **not** produce carbon dioxide?

- A combustion of alkanes
- B photosynthesis
- C respiration
- D thermal decomposition of limestone

24 Which process removes carbon dioxide from the atmosphere?

- A combustion of fossil fuels
- B decomposition of carbonates
- C photosynthesis
- D respiration

25 In which process is carbon dioxide **not** formed?

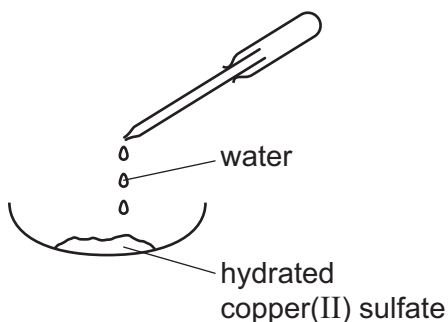
- A burning of natural gas
- B fermentation
- C heating lime
- D respiration

26 Photosynthesis and respiration are important natural processes.

Which statement is correct?

- A Carbon dioxide is formed by the reaction of glucose with water during photosynthesis.
- B Carbon dioxide is removed from the air by respiration.
- C Glucose reacts with water to form oxygen during respiration.
- D Photosynthesis produces glucose and oxygen.

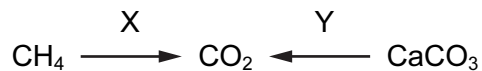
27 Water is added to hydrated copper(II) sulfate.



Which colour change takes place?

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

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



Which types of reaction are X and Y?

	X	Y
A	combustion	combustion
B	combustion	thermal decomposition
C	thermal decomposition	combustion
D	thermal decomposition	thermal decomposition

29 Which row is correct for both carbon dioxide and methane?

	causes climate change	produced by burning fuels	produced by living organisms
A	✓	✓	✓
B	✓	✓	x
C	✓	x	✓
D	x	✓	✓

30 The carbon cycle includes the processes combustion, photosynthesis and respiration.

Which row shows how each process changes the amount of carbon dioxide in the atmosphere?

	combustion	photosynthesis	respiration
A	decreases	decreases	increases
B	decreases	increases	decreases
C	increases	decreases	increases
D	increases	increases	decreases