

Energy Transfer

Question Paper 1

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

Time Allowed: 29 minutes

Score: /24

Percentage: /100

Grade Boundaries:

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

- 1 Substance X requires oxygen in order to produce energy.

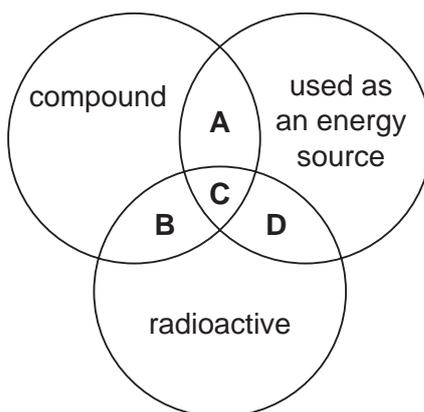
It does **not** form carbon dioxide as a result of this energy production.

What is substance X?

- A hydrogen
- B natural gas
- C petrol
- D ^{235}U

- 2 The diagram shows some properties that substances may have.

To which labelled part of the diagram does ^{235}U belong?



- 3 Three processes are listed.

burning methane in air

radioactive decay of ^{235}U

reacting hydrogen with oxygen.

Which statements about these processes are correct?

- 1 Hydrogen and methane are being used as fuels.
- 2 All the processes involve oxidation.
- 3 All the processes are used to produce energy.

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

4 Butane, ethanol and hydrogen are fuels.

Which substances produce **both** carbon dioxide and water when used as a fuel?

	butane	ethanol	hydrogen
A	✓	✓	✓
B	✓	✓	x
C	✓	x	✓
D	x	✓	x

5 Which substance does **not** produce carbon dioxide when it burns in oxygen?

- A butane
- B ethanol
- C ethene
- D hydrogen

6 Which fuel does **not** produce carbon dioxide when it burns?

- A coal
- B hydrogen
- C methane
- D petrol

7 Which substance could **not** be used as a fuel to heat water in a boiler?

- A ethanol
- B hydrogen
- C methane
- D oxygen

8 Which substance is not a fossil fuel?

- A coal
- B kerosene
- C gasoline
- D wood

9 Which substance does **not** require oxygen in order to produce energy?

- A coal
- B hydrogen
- C natural gas
- D ^{235}U

10 Statement 1 Hydrogen is used as a fuel.

Statement 2 When hydrogen burns in the air to form water, heat energy is produced.

Which is correct?

- A Both statements are correct and statement 2 explains statement 1.
- B Both statements are correct but statement 2 does not explain statement 1.
- C Statement 1 is correct but statement 2 is incorrect.
- D Statement 2 is correct but statement 1 is incorrect.

11 A power station was designed to burn gaseous fuels only.

Which two substances could be used?

- A carbon dioxide and hydrogen
- B carbon dioxide and ^{235}U
- C hydrogen and methane
- D methane and ^{235}U

12 Which fuel does **not** produce air pollution when it burns?

- A coal
- B diesel oil
- C hydrogen
- D gasoline (petrol)

13 Power stations produce electrical energy from different fuels.

Which fuel causes least pollution to the atmosphere?

- A coal
- B fuel oil
- C natural gas
- D radioactive isotopes

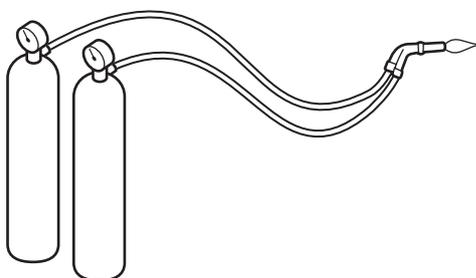
14 Hydrogen can be used as a fuel.

Which properties of hydrogen would be advantages and which would be disadvantages?

- 1 Hydrogen is expensive to produce.
- 2 Hydrogen reacts exothermically with oxygen.
- 3 When hydrogen burns, a greenhouse gas is not formed.

	advantages	disadvantages
A	1	2 and 3
B	1 and 2	3
C	1 and 3	2
D	2 and 3	1

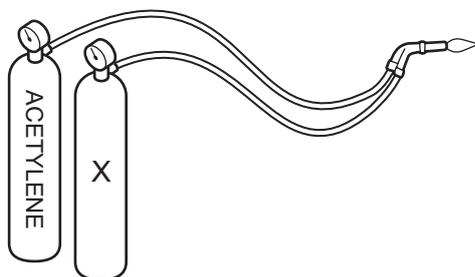
15 Metals are welded by using the heat produced by burning a gas in oxygen.



Which gas could **not** be used for this purpose?

- A ethene
- B hydrogen
- C helium
- D methane

- 16 The diagram shows the flame produced from burning a hydrocarbon, acetylene, in a welding torch.



Which gas is X?

- A hydrogen
- B methane
- C nitrogen
- D oxygen

- 17 The elements hydrogen and uranium are used as fuels.

The compound ethanol is also used as a fuel.

Which fuels require oxygen in order to produce heat energy?

	hydrogen	uranium	ethanol
A	✓	✓	✓
B	✓	✓	x
C	✓	x	✓
D	x	✓	✓

- 18 Which substance does **not** use oxygen to produce energy?

- A coal
- B hydrogen
- C natural gas
- D uranium

19 Which substance could **not** be used as a fuel to heat water in a boiler?

- A ethanol
- B hydrogen
- C methane
- D oxygen

20 Some properties of four fuels are shown in the table.

Which fuel is a gas at room temperature and makes two products when it burns in a plentiful supply of air?

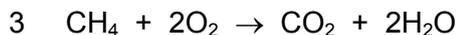
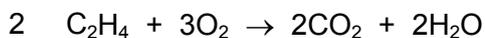
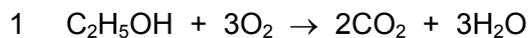
	fuel	formula	melting point /°C	boiling point /°C
A	hydrogen	H ₂	-259	-253
B	methane	CH ₄	-182	-164
C	octane	C ₈ H ₁₈	-57	126
D	wax	C ₃₁ H ₆₄	60	400

21 Which statement about fuels is correct?

- A Heat energy can only be produced by burning fuels.
- B Hydrogen is used as a fuel although it is difficult to store.
- C Methane is a good fuel because it produces only water when burned.
- D Uranium is burned in air to produce energy.

22 Heat energy is produced when hydrocarbons burn in air.

Which equations represent this statement?

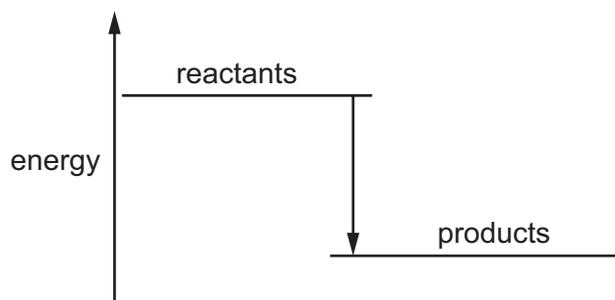


- A** 1, 2 and 3 **B** 1 and 2 only **C** 1 and 3 only **D** 2 and 3 only

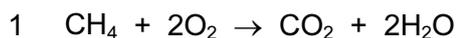
23 Which fuel needs oxygen in order to produce heat energy and which type of reaction produces the energy?

	fuel	type of reaction
A	a radioactive isotope	endothermic
B	a radioactive isotope	exothermic
C	hydrogen	endothermic
D	hydrogen	exothermic

24 A diagram for the energy change during an exothermic reaction is shown.



For which reactions would this be an appropriate diagram?



- A** none of them
B 1 and 2 only
C 2 and 3 only
D all of them