AQA GCSE Combined Science - Trilogy | 8464

SPECIFICATION POINT 5.6.2.2

# Energy changes and reversible reactions

## Past-paper questions

| | |
|---|---|
| Tier | **Foundation** |
| Question groups | **2** |
| Available paper years | **2019–2022** |

## Using this booklet

1. Answer the questions in order and show your working.
2. Original question numbers and marks are retained.
3. Print at actual size (100%) for measuring questions.
4. Use the companion answer booklet to check your work.

**Name:** _____ **Date:** _____

Whole questions are retained for context, so some parts assess other specification points. Current and legacy sources are labelled. Continue on extra paper if needed.

### 5.6.2.2 Energy changes and reversible reactions

**Question 01**

June 2019 | 8464/C/2F | Original Q1

**0 1 . 1** This question is about gases.

Draw **one** line from each substance to the description of the substance.

**[3 marks]**

| Substance | Description of substance |
|---|---|
| | Compound |
| Air | Element |
| Carbon dioxide | Hydrocarbon |
| Oxygen | Metal |
| | Mixture |

5.6.2.2 Energy changes and reversible reactions

Question 01 · continued



**0 1 . 2** What is used to test for each of the gases?

Draw **one** line from each gas to the test for the gas.

**[2 marks]**

| Gas | Test |
|---|---|
| Carbon dioxide | A glowing splint |
| | A lighted splint |
| Oxygen | Limewater |
| | Litmus paper |

**0 1 . 3** Give **two** reasons why the percentage of carbon dioxide in the air has decreased in the last 2.7 billion years.

**[2 marks]**

Tick (✓) **two** boxes.

- Combustion ☐
- Dissolved in oceans ☐
- Intense volcanic activity ☐
- Photosynthesis ☐
- Respiration ☐

**5.6.2.2 Energy changes and reversible reactions**

**Question 01 · continued** June 2019 | 8464/C/2F | Original Q1

Oxygen reacts with sulfur dioxide.

The reaction is reversible.

**0 1 . 4** What is the symbol for a reversible reaction?

**[1 mark]**

_____

**0 1 . 5** Complete the sentence.

**[1 mark]**

In a reversible reaction the forward reaction is exothermic, so the

reverse reaction is _____ .

**0 1 . 6** A reversible reaction happens in apparatus which stops the escape of reactants and products.

Complete the sentence.

**[1 mark]**

Equilibrium is reached when the forward and reverse reactions happen at

exactly the same _____ .

**10**

**5.6.2.2 Energy changes and reversible reactions**

**Question 02**



**0 3** This question is about ammonia and its compounds.

A student heated a sample of ammonium chloride.

The equation for the reaction is:

$$\underset{\text{ammonium chloride}}{NH_4Cl} \rightleftharpoons \underset{\text{ammonia}}{NH_3} + HCl$$

**0 3 . 1** One product is ammonia.

What is the name of the product with the formula HCl?

**[1 mark]**

_____

**0 3 . 2** Ammonia is a gas.

What is the state symbol for ammonia?

**[1 mark]**

Tick (✓) **one** box.

(aq) ☐ (g) ☐ (l) ☐ (s) ☐

**0 3 . 3** How does the equation show that the reaction is reversible?

**[1 mark]**

_____

_____

**0 3 . 4** Complete the sentence.

**[1 mark]**

The forward reaction is endothermic,

so the reverse reaction is _____ .

5.6.2.2 Energy changes and reversible reactions

Question 02 · continued



**0 3 . 5** Complete the sentence.

Choose the answer from the box.

**[1 mark]**

| | | |
|---|---|---|
| **concentration** | **rate** | **temperature** |

Equilibrium is reached when the forward and reverse reactions happen at exactly the same _____ .

**Question 3 continues on the next page**

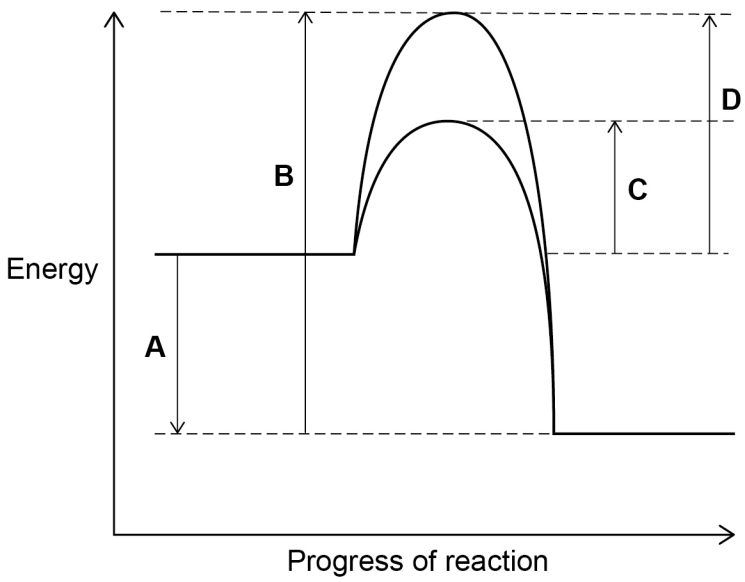
Question 02 · continued



The industrial process to produce ammonia uses a catalyst.

**0 3 . 6** **Figure 5** shows the reaction profile for the reaction with and without a catalyst.

**Figure 5**




Which letter represents the activation energy for the reaction with a catalyst?

**[1 mark]**

Tick (✓) **one** box.

**A** ☐ **B** ☐ **C** ☐ **D** ☐

5.6.2.2 Energy changes and reversible reactions

Question 02 · continued



**0 3 . 7** Give **one** reason why using a catalyst reduces costs.

Do **not** answer in terms of activation energy.

**[1 mark]**

**0 3 . 8** Ammonia is in a mixture that is used as a household cleaner.

What is a mixture that has been designed as a useful product called?

**[1 mark]**

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**Turn over for the next question**