2.29 Climate Change and Atmospheric Pollutants: 10-minute Pack

AQA 8464 · Calculator allowed · about 10 minutes

Total Marks

Name: _____ Date: ____ / ____ / _____

Answer ALL questions. Show all your working.

1 This question is about greenhouse gases.

(a) Which of these gases is NOT considered a greenhouse gas linked to human-caused climate change? **(1)**

- ☐ A) Carbon dioxide
- ☐ B) Methane
- ☐ C) Nitrogen
- ☐ D) Nitrous oxide

(Total for Question 1 is 1 mark)

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2 Methane (CH_4) is the main component of natural gas.

(a) Balance the equation for the complete combustion of methane: $CH_4 + O_2 \rightarrow CO_2 + H_2O$ **(1)**

(b) 16 g of methane undergoes complete combustion. Using the balanced equation and the relative formula masses (Mr: CH_4 = 16, CO_2 = 44), calculate the mass of carbon dioxide produced. **(3)**

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(c) State and explain which type of combustion (complete or incomplete) produces carbon monoxide instead of carbon dioxide. **(2)**

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(Total for Question 2 is 6 marks)

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3 Scientists use several types of evidence, besides direct atmospheric measurements, to link global climate change to human activity.

(a) State two pieces of evidence that scientists use to link global climate change to human activity. **(2)**

(Total for Question 3 is 2 marks)

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Mark scheme · 2.29 Climate Change and Atmospheric Pollutants: 10-minute Pack

Question 1

(a) C (Nitrogen) **B1**

(a) Answer: C (Nitrogen makes up about 78% of the atmosphere but is not classed as a greenhouse gas linked to human-caused climate change)

Question 2

(a) $CH_4 + 2O_2 \rightarrow CO_2 + 2H_2O$ cao **B1**

(a) Answer: $CH_4 + 2O_2 \rightarrow CO_2 + 2H_2O$

(b) moles of $CH_4 = 16 / 16 = 1$ (mol) oe **M1**

(b) mole ratio of $CH_4 : CO_2$ is 1 : 1, so moles of $CO_2 = 1$ (mol) oe **M1**

(b) mass of $CO_2 = 1 \times 44 = 44$ g cao **A1**

(b) Answer: 44 g

(c) incomplete combustion cao **B1**

(c) because there is not enough oxygen available for all the carbon to be fully oxidised to carbon dioxide oe **B1**

(c) Answer: Incomplete combustion, because there is not enough oxygen for all the carbon to be fully oxidised to carbon dioxide

Question 3

(a) any one from: ice core data showing historical CO_2 and temperature levels; global temperature records rising alongside industrialisation; melting glaciers and polar ice caps; rising sea levels oe **B1**

(a) any second, different point from the list above oe **B1**

(a) Answer: Any two of: ice core data; rising global temperature records; melting glaciers/ice caps; rising sea levels

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