

# MARK SCHEME

# GCSE

## CHEMISTRY

## AQA - COMBINED SCIENCE

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C9 - TEST 1

CHEMISTRY OF THE ATMOSPHERE

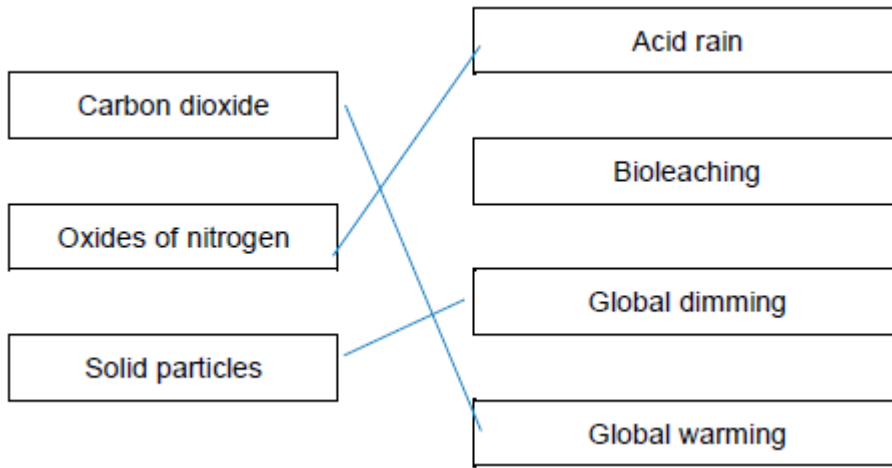
Beginner

## Mark schemes

1. (a) combustion

1

(b) **Substance** **Environmental effect**



*extra lines from substance negates mark*

3

[4]

2. (a) carbon dioxide

1

water

*each extra box ticked cancels one mark*

1

(b) sulfur dioxide

1

acid rain

1

particles

1

*must be in correct order*

*accept phonetic spelling – see marking guidance 3.6*

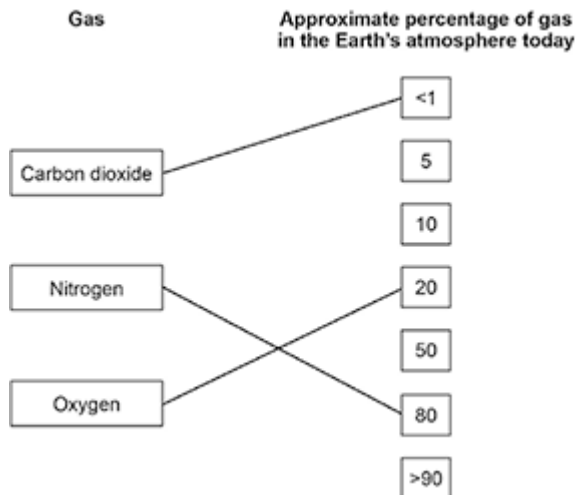
dimming

1

[6]

<b>3.</b>	<p>(a) any <b>two</b> from:</p> <p>(Earth has)</p> <p style="padding-left: 40px;"><i>ignore figures unless qualified</i></p> <p style="padding-left: 40px;"><i>allow converse responses</i></p> <ul style="list-style-type: none"> <li>• smaller percentage carbon dioxide <i>allow less</i></li> <li>• larger percentage nitrogen <i>allow more</i></li> <li>• larger percentage oxygen <i>allow more</i></li> </ul>	2
	<p>(b) (Mars) temperature below freezing point of water <i>allow too cold (for liquid water to form)</i> <i>allow water will freeze or ice will form</i></p>	1
	<p>(Venus) temperature above boiling point of water <i>allow too hot (for liquid water to form)</i> <i>allow water would boil or would be steam / gas</i> <i>if no other mark awarded allow one mark for not enough water vapour</i></p>	1
		<b>[4]</b>
<b>4.</b>	<p>(a) dissolved <i>in this order</i></p> <p style="padding-left: 40px;">carbonates</p>	1
	<p>(b) Photosynthesis</p>	1
	<p>(c) water <i>In this order</i></p> <p style="padding-left: 40px;">oxygen <i>both needed for the mark</i></p>	1

(d)



*Extra lines from Gas negate the mark*

3

(e) increases global temperatures

1

(f) use renewable energy supplies

1

(g) correct reason, eg:

- renewable technology underdeveloped
- disagreement between countries

1

**[10]**

**5.**

(a) Colourless liquid / condensation / water

1

(b) incomplete combustion of the fuel

1

because not enough oxygen

1

(c) Sulfur dioxide

1

**[4]**

**6.**

(a) carbon dioxide (decreased) **one** from:

*1 mark for one reason for each gas*

- photosynthesis
- formation of (sedimentary) rocks
- formation of fossil fuels
- dissolved in oceans

*ignore respiration*

1

nitrogen (increased) **one** from:

- volcanoes / volcanic activity
- ammonia reacted with oxygen

1

oxygen (increase):

- photosynthesis

1

(b) 1960

1

because the rise became much steeper

1

(c)  $362 - 320 = 42$  (ppm)

*both readings from graph*

1

$$42 \div 320 \times 100$$

1

$$= 13(\%)$$

1

(d) **Level 2 (3–4 marks):**

A detailed and coherent explanation of how the rise in carbon dioxide levels affect the environment.

**Level 1 (1–2 marks):**

Simple relevant statements are made about the effects of rise in carbon dioxide levels on the environment. The account is incomplete or inaccurate and lacks coherence.

**0 marks:**

No relevant content.

**Indicative content**

consequences of rise in carbon dioxide levels

- carbon dioxide is a greenhouse gas
- it stops infrared radiation escaping from the Earth
- warming up the atmosphere
- rise in level warms atmosphere up more
- so leads to global warming
- leading to climate change

effects on environment:

- extreme weather fluctuations
- rise in sea levels
- effects on human habitats
- effects on animal habitats
- decrease in biodiversity
- effects on food producing capacity.

4

[12]

7.

(a) bar drawn correctly 78 – 80 (%)

1

(b) (i) (Mars has) no (green / living) plants / trees

1

(ii) (argon) is unreactive / inert

*accept argon is a noble gas*

*ignore it is in Group 0*

1

(c) (the amount of carbon dioxide has decreased because it has been) absorbed / used by (green / living) plants / trees **or** used for photosynthesis

*accept dissolved / absorbed by oceans or locked up in fossil fuels / carbonate rocks*

1

(d) the eruption of volcanoes

1

[5]

<b>8.</b>	(a) crust	<i>ignore Earth's</i>	1
	core	<i>ignore inner and/or outer</i>	1
	(b) bar chart		1
	all heights are correct	<i>accept correctly plotted points</i>	1
	all labels are correct for nitrogen, oxygen and other / argon		1
	(c) (i) decomposed		1
	(ii) global warming		1
			<b>[7]</b>
<b>9.</b>	(a) (i) nitrogen / N <sub>2</sub>		1
	(ii) carbon dioxide / CO <sub>2</sub>		1
	(b) (i) humans / scientists had not evolved	<i>accept it was billions / millions of years ago</i> <i>allow too long ago</i>	1
	(ii) temperature is above 100°C <b>or</b> any water would evaporate / boil	<i>accept Venus is too hot</i>	1

(c) any **three** from:

- used by plants
- used for photosynthesis  
*accept plants take in carbon dioxide and give out oxygen for the first two bullet points ie 2 marks*
- dissolves in oceans / seas  
*allow absorbs into oceans / seas*
- used to form the shells / skeletons of marine organisms
- locked up as limestone / carbonates
- locked up as fossil fuels / oil / coal

3

[7]

10.

(a) curve of best fit drawn through

**or** close to all of the points

1

(b) (i) 313

1

(ii) 1989 +/- 1

1

(c) concentration / amount of carbon dioxide has increased

1

recently the rate of increase is increasing

1

[5]

11.

(a) (i) 78 %

1

(ii) A – nitrogen

*allow  $N_2$*

*N must be uppercase and 2 must be subscript*

*ignore N*

1

B – oxygen

*allow  $O_2$*

*O must be uppercase and 2 must be subscript*

*ignore O*

1



(b) (i) any **two** from:

- level *up* to 1900 (allow 1890 to 1910)
- increasing from 1900 to today ( *allow 1890 to 1910*)  
*allow increased by 90 (ppm), allow answers in the range 88 – 92*
- increased more rapidly in last 50 years  
*if no other marks gained allow 1 mark for it has increased*

2

(ii) (fossil) fuels

*accept coal / oil / (natural) gas / peat*  
*allow petrol / diesel / methane*

1

**[6]**