

# MARK SCHEME

# GCSE

## CHEMISTRY

## AQA - TRIPLE SCIENCE

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C9 - TEST 3  
ATMOSPHERE  
Intermediate

## Mark schemes

1.

(a) any **three** from:

*accept reverse answers if unambiguous  
do **not** accept just different throughout*

3

less / little / not much carbon dioxide **or** give a %age < 1%

more / a lot of nitrogen **or** give 78-80%

(more) / (some) oxygen or give a %age 20-21%

*do **not** accept more "other gases"*

references to pollutant gases in general **or** named examples

*e.g. CO, SO<sub>2</sub>, NO, NOX etc.*

more / some water (vapour)

some / 1% argon

*ignore other noble gases*

ozone (layer) on earth

(b) any **two** from:

removed carbon dioxide

*ignore reference to respiration /  
photosynthesis unless qualified*

released oxygen

caused carbon from carbon dioxide to  
become locked in sedimentary rocks

the oxygen they produced reacted with  
methane and ammonia

produced nitrogen (must be linked to fourth point)

*accept correct word / symbol equation for photosynthesis for **2**  
marks*

*converted / changed CO<sub>2</sub> to oxygen for **2** marks*

2

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2.

(a) (i) *it = water vapour*

condensed

*accept temperature went below 100°C / boiling point of water*

*allow cooled to form liquid / water / rain*

*do **not** accept evaporated*

1

formed the oceans / seas

*ignore rain*

*accept (water vapour) cooled and formed the ocean / sea for 2 marks*

1

(ii) any **two** from:

*ignore oxygen / nitrogen increased*

*ignore reference to volcanoes / respiration*

- used by (green) plants / algae  
*accept photosynthesis / plants give out oxygen*
- changed into oxygen
- dissolved in oceans / seas  
*accept (locked up) in shells / skeletons (of animals)*
- (locked up) in carbonates / sedimentary rocks
- (locked up) in fossil fuels / named fossil fuel

2

(b) (i) cannot get to / reach / drill to / see the core

*accept the core is (too) far down (into the Earth) / do not know what happens under the crust / Earth's surface*

*accept it is (too) hot / radioactive*

*ignore lack of evidence unqualified*

1

(ii) any **three** from:

- heat / energy released
- from radioactive decay / processes  
*accept radioactivity / nuclear reactions*
- (causing) convection currents
- in the mantle

3

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3.

(a) carbon dioxide decreased (by plants / trees)

*allow plants / trees absorbed carbon dioxide*

1

oxygen increased (by plants / trees)

*allow plants / trees released oxygen*

*if neither of these marks awarded*

*allow plants / trees*

*photosynthesise for 1 mark*

1

because coal 'locks up' / traps / stores carbon dioxide / carbon

*allow trees 'locked up' carbon dioxide / carbon*

1

(b) carbon / C

hydrogen / H

sulfur / S

*all 3 correct 2 marks*

*1 or 2 correct 1 mark*

*allow H<sub>2</sub>*

*ignore oxygen*

2

(c) (i) 2 2

*balancing must be correct*

*do **not** accept changed formulae*

1

(ii) increases atmospheric pollution

carbon dioxide / CO<sub>2</sub> released

1

from the (thermal) decomposition of calcium carbonate **or**

*accept causes global warming **or** CO<sub>2</sub> is a greenhouse gas*

description of this decomposition **or** equation

*ignore sulfur dioxide and effects in this part*

1

decreases atmospheric pollution

sulfur dioxide / SO<sub>2</sub> is removed

*accept less acid rain produced*

1

by reaction with calcium oxide **or** calcium carbonate

*accept neutralisation **or** forms calcium sulfate*

1

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4.

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

- used by plants  
*allow specific plants and algae*
- used for photosynthesis  
*ignore oxygen released / respiration*
- absorbed / dissolved in oceans  
*ignore oceans formed*
- locked up in fossil fuels / limestone / sedimentary rocks

2

(ii) calcium carbonate /  $\text{CaCO}_3$

1

decomposed / thermal decomposition

*do not allow reaction with oxygen*

*accept quicklime / calcium oxide produced*

$\text{CaCO}_3 \rightarrow \text{CaO} + \text{CO}_2$  gains **2** marks

1

(b) increasing ( $\text{CO}_2$  or global warming)

1

more rapid increase recently

1

carbon dioxide causes global warming

*accept greenhouse gas or*

*climate change / sea level rising*

*or ice caps melting*

*do not accept ozone layer or acid rain or global dimming*

1

(c) (i) any **one** from:

- Wegener had no evidence / proof  
*accept movement too slow to measure*
- other scientists had different ideas / views  
*accept continents / plates fixed or land bridge*
- did not respect Wegener as a scientist / geologist

1

(ii) any **three** from:

- plates (move)  
*ignore continents*
- heat energy / radioactivity (causes)
- convection currents
- in mantle

3

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5.

(a) gives out heat / energy

*allow release / loses*

*allow the products have less energy*

**or**

energy / heat transferred to the surroundings

*ignore temperature rises*

*allow more energy given out in forming bonds than taken in to break bonds*

1

(b) (i) speed up the reaction (owtte)

*accept changes the rate*

*accept lowers activation energy*

*accept increases successful collisions*

*accept allows reaction to take place at a lower temperature*

1

(ii) nitrogen (N<sub>2</sub>) / oxygen (O<sub>2</sub>) / products are safe **or** not harmful / pollutant / toxic / dangerous / damaging

*ignore releases nitrogen / oxygen unless qualified*

**or**

(harmful) nitrogen monoxide / NO is not released into the air.

*accept prevents / less acid rain*

*ignore greenhouse gas / ozone layer*

1

(iii) 2 and 2

*accept correct multiples or fractions*

1

- (iv) idea of catalyst not being used up  
*allow not changed by reaction*  
*ignore catalyst does not take part*  
*ignore catalyst not used in the reaction* 1
- (v) idea of different reactions (require different catalysts)  
*accept catalysts work for specific reactions*  
*allow different gases* 1
- (c) • smaller / very small / or any indication of very small / 1–100 nanometres /  
a few (hundred) atoms  
*ignore just small*  
*ignore size of the converter* 1
- big(ger) surface area 1
- less (catalyst) needed / small amount of catalyst needed 1

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