Mark schemes

Q1.

(a) percentage of nitrogen increases

1

until 2.3 billion years

allow a value in the range 2.1 to 2.4 billion years
allow until 80%

1

then remains constant

1

(b) the percentage of carbon dioxide decreased

1

(c) light

1

(d) algae

1

plants

1

(e) cellulose

1

starch

1

(f) 1.4×10^{11}

1

(g) 70 000 000 000

1

(h) helix

1

(i) 4

1

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Q2.

(a) colourless

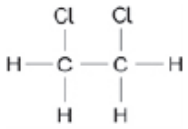
ignore clear

1

(b) damp litmus paper

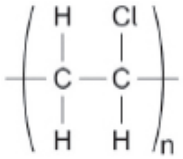
1

(c)



1

(d)



1

(e) 1.5 × 10 0.9 × 10

1

(ratio =) 15 : 9

1

= 5 : 3

allow correct determination of the simplest whole number ratio from an attempt at a density ratio

1

alternative approach

(ratio =)

$\frac{1.5}{0.9}$ $\frac{0.9}{0.9}$ (1)

1.666 : 1 (1)

= 5 **:** 3 (1)

allow correct determination of the simplest whole number ratio from an attempt at a density ratio

(f) the pipes will melt

or

the polymers will melt

allow the melting point of both polymers is below 300°C

1

(g) oil is non-renewable

or

paper is obtained from a renewable source

allow oil is finite

1

[9]

Q3.

(a) (the poly(propene) beaker will begin to) melt

allow poly(propene) has a low melting point

1

(the poly(propene) beaker will) burn / ignite

allow poly(propene) is flammable

1

(b) (poly(propene) beakers are) less easily broken

allow (poly(propene) beakers are) less likely to shatter

allow (poly(propene) beakers are) tougher

allow (poly(propene) beakers have a) higher resistance to impact

1

(c) boron trioxide

1

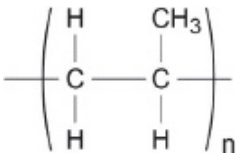
(d)

Symbol for element	Name of element	Number of atoms of element in one molecule of propene
C	carbon	3
H	hydrogen	6

*if no other mark awarded allow **1** mark for a correct column*

2

(e)



1

(f) (**Stage 1** is) fractional distillation

1

(**Stage 2** is) cracking

1

(**Stage 3** is) polymerisation

1

(g) alkene

1

monomer

1

[12]