AQA GCSE CHEMISTRY (HIGHER) · 8462

CHEMISTRY



MARK SCHEME

4.7.2 REACTIONS OF ALKENES AND ALCOHOLS (PACK 2)

SCORE	PERCENTAGE
/36	%

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Q1.

(a) (i) by (fractional) distillation

*accept a description of the distillation process (heat and how separation works) eg heat **and** condense*
accept boil / vapourise etc for heat

or

fractionation

1

(ii) CO_2

note the order of these products must be correct

1

H_2O

*wrong way round = **1** mark*

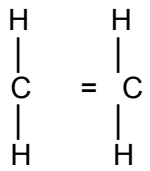
1

(b) (i) (hexane) has been broken down (into smaller hydrocarbons / molecules)

1

accept (thermal) decomposition / cracked / split / broken up owtte

(ii)



accept $CH_2 = CH_2$

1

(iii) water / hydrogen oxide / steam

accept H_2O

1

(c) candidates must include both sugar cane and crude oil in their evaluation **and** both an advantage and a disadvantage to gain full marks.
if they do not then the maximum mark is three

any **four** from:

<u>advantages of using sugar</u>

- country has no wealth to buy (large quantities of) crude oil

  not 'expensive' alone

- country has limited technological development

  or

  underdeveloped / third world country

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- able / suitable climate to grow sugar cane
- enough land to grow sugar cane / land cannot be used to grow food / deforestation
- sugar is a renewable source

  or

  crude oil is a non-renewable resource / finite resource / limited resources
- CO_2 / carbon neutral

<u>advantages of using alkanes:</u>

- economic costs are low
- continuous process
- country has large oil resources
- country has oil refineries / cracking plants
- very pure product
- faster process

4

[10]

Q2.

(a) not broken down by microorganisms **or** not bio-degradable

accept alternative answers such as:
do not rot / corrode / fade / react with atmosphere etc
any answers which imply the inertness or non-biodegradability of this plastic
accept they don't react, they are 'inert'
ignore rusting

*do **not** accept weathering*

1

(b) (i) (have a) double bond **or** do not have maximum number of (hydrogen) atoms attached

accept can add / react with hydrogen
accept can take part addition reactions

*do **not** accept it is a double bond*
*do **not** accept additional reactions*

*do **not** accept has 'spare' / 'free' bond*
*do **not** accept alkene alone*

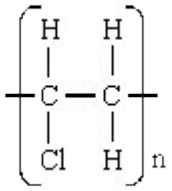
1

(ii) single bond between carbon atoms

1

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all atoms correct + 2 'linking' bonds
(linking bonds need not go through bracket)



1

n moved to bottom right of bracket i.e. is below $\frac{1}{2}$ way on the right

first 2 marks are possible for chain structures

accept $[– CHCl–CH_2–]_n$

1

(iii) many molecules **or** many monomers

1

joined / bonded / linked **or** form long chain molecules / large molecules **or** to form a long chain polymer

*accept many alkenes **or** many (ethene) molecules*

*do **not** accept many ethene alone etc.*

to form a long polymer is not enough for 2nd mark

1

(iv) no other substances formed
(A + B → C)

allow because double bond breaks so other atoms can add
allow one product only

*do **not** accept saturation occurs*

1

[8]

Q3.

(a) (i) by heating

pressure is neutral

using a catalyst/pot/ceramic/porcelain/aluminium oxide

1

(ii) use bromine water/(alkaline) permanganate

accept bromine

1

alkene makes bromine go colourless or lose its colour

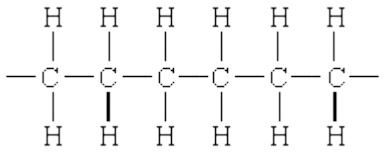
accept alkane does not change the red/orange colour of bromine

***not** change colour/goes clear*

1

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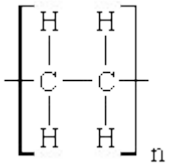
(b) (i)



either of these must show bonds at end

1

or



***not** H on ends*

*allow 3 instead of n **not** any other number*

(ii) poly(ethene) – brackets not essential

accept polythene

1

(iii) **large amount** of waste polymer/poly(ethene)/polythene/litter

*accept large amount of crude oil **or** finite resource used*

1

it is not biodegradable

accept it does not

decompose/decay/break down

it causes pollution/it creates toxic

fumes when burnt are neutral

***not** it is not recyclable*

2

[8]

Q4.

air/gases
oxygen O_2
chemical change/reaction
gases
carbon dioxide/CO_2
water [vapour] H_2O
(heat or heat energy or energy)

for 1 mark each

[7]

Q5.

(a) fuels
heat – allow light

for 1 mark each

2

(b) gases

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for 1 mark

1

[3]

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