

# MARK SCHEME

# GCSE

## CHEMISTRY

## AQA - TRIPLE SCIENCE

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C7 - TEST 2

ORGANIC CHEMISTRY

Beginner

## Mark schemes

- 1.** (a) Propanol 1
- (b) Butanol has the highest boiling point 1
- (c) 
$$\begin{array}{c} \text{H} \\ | \\ \text{H} - \text{C} - \text{O} - \text{H} \\ | \\ \text{H} \end{array}$$
 1
- (d) ethene + water ( $\rightarrow$  ethanol)  
*allow answers in either order*  
*allow steam for water* 1
- (e) goes back to reactor  
*allow is recycled* 1
- (f) air contains oxygen 1
- which oxidises ethanol  
*allow ethanol reacted with oxygen* 1
- to produce ethanoic acid 1
- [8]**
- 2.** (a) (i) hydrocarbons 1
- (ii) ethane has the smallest molecules 1
- heptadecane has the highest boiling point 1
- (iii) evaporating 1
- condense 1
- (b) (i) **W** 1
- Y** 1

(ii) floats

*if no answer written on line, allow correct answer indicated in the box*

1

(iii) open the tap

*allow let the water out  
ignore remove water*

1

stop the flow of liquid when the water has run out

*allow until oil is left behind  
ignore filter*

1

[10]

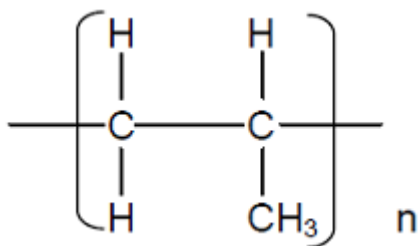
3.

(a) (i) ethene

*allow C<sub>2</sub>H<sub>4</sub>*

1

(ii)



*accept line drawn from word 'Monomer' or from the monomer box to the correct 'Polymer'*

*allow the correct 'Polymer' indicated by a tick, circled etc.*

1

(b) (i) nickel

*accept Ni*

1

(ii) 75(%)

1

(iii) (stainless steel) is hard /strong / durable

*it = stainless steel*

*accept (pure) iron is soft*

1

(stainless steel) resistant to corrosion **or** unreactive

*accept (pure) iron rusts / corrodes / reacts*

*do **not** allow corrosive*

1

- (c) **Advantage** : Conserves resources of crude oil and ores  
*do not allow more than one tick in the advantage column*

1

**Disadvantage** : High cost of separating materials  
*do not allow more than one tick in the disadvantage column*

1

[8]

4.

- (a) (i) hydrogen / H and carbon / C  
*answers can be in either order*  
*if letters given, must be capital H*

1

- (ii)  $C_nH_{2n+2}$

1

- (b) (most) crude oil vaporises / evaporates **or** crude oil enters as a vapour

1

(vapour) cools as it rises up the tower / column **or** tower / column cooler at the top **or**  
negative temperature gradient

1

the fractions have different boiling / condensation points / ranges  
*accept the larger the molecules, the higher the boiling point /  
condensation point*

1

so they will condense at different levels in the tower  
*allow will collect at different levels if condensation mentioned*  
*allow will condense to give different fractions*  
*if no other mark is gained allow 1 mark for mention of heating*

1

- (c) (i)  $C_8H_{18}$   
*if one answer is given  $C_8H_{18}$  is the only acceptable answer*  
*credit any correct combination of alkanes and alkenes, eg  $C_5H_{12}$   
and  $C_3H_6$*

1

- (ii) hot / high temperature  
*accept any temperature in the range 300 – 900 °C*  
*'heat' is insufficient*

1

catalyst

*accept a named catalyst – alumina **or** zeolites **or** aluminosilicates  
**or** broken pot*

*ignore other named catalysts*

*allow (mixing with) steam as an alternative to second marking point*

*ignore pressure*

1

[9]

5.

(a) oxygen

*must be name*

*do **not** accept oxide or dioxide*

1

(b) (i) 2 x C–C

and

5 x C–H

*all single (line) bonds*

1

(ii) C<sub>3</sub>H<sub>8</sub>

*must be formula*

*do **not** accept lower case h*

1

(iii) water

1

(c) ethane and butane boil at temperatures less than 20°C

1

ethene and hexene each have a carbon-carbon double bond

1

[6]

6.

(a) Methane has the lowest melting point and icosane has the highest boiling point

1

Decane and icosane are liquid at 100°C

1

(b) water / H<sub>2</sub>O

*either order*

1

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

*allow hydrogen oxide*

1

(c) (i) fermentation

1

(ii) any **two** from:

- sugar cane / plants absorb carbon dioxide  
*ignore oxygen released*
- growing sugar cane / plants reduces global warming  
*allow ethanol from plants is carbon neutral*
- renewable resource / sustainable  
*accept conserves fossil fuels / petrol*

2

(iii) any **two** from:

- destruction of habitats / forests (to grow sugar cane/crops)
- fermentation releases carbon dioxide
- production plants cause visual pollution
- pollution from the transportation of sugar cane / Ethanol
- growing sugar cane / plants uses a lot of land

2

[9]

7.

(a) hydrocarbons **or** hydrocarbon

1

(b) (i) distillation

1

(ii) evaporation

1

(iii) condensation

1

(c) (i) bond

1

(ii)  $(C_6H)_{14}$

1

(iii) cracking

1

(d) (i) poly(butene)

*allow with or without brackets*

1

(ii) Advantage = energy is released

*do **not** accept more than one tick in the advantage column*

1

Disadvantage = carbon dioxide is produced

do **not** accept more than one tick in the disadvantage column

1

[10]

8.

(a) (i)  $C_2H_4$

1

(ii) poly(ethene)

1

(b) (i) is not biodegradable

1

(ii) not enough landfill sites / space

*accept landfill sites are filling up or plastics remain for years or plastics not broken down*

*ignore cost / waste of resources / not biodegradable / wildlife*

1

(iii) recycle / burn

*accept reduce the amount of packaging used*

*ignore reused*

1

[5]

9.

(a) (i) wood

1

(ii) 30 (kJ)

1

(iii) 3 / three (g)

1

(b) carbon / C

or hydrogen / H

or sulfur / S

*allow oxygen / O*

1

(c) releases most energy

*accept releases a lot of energy / burns rapidly*

*ignore references to cost*

1

no harmful gases / no or less pollution formed / no global warming / no climate change / no greenhouse gas

*accept produces water (only) / steam*

*accept does not produce sulfur dioxide / carbon dioxide / carbon monoxide / particles / smoke*

1

[6]