

MARK SCHEME

GCSE

CHEMISTRY

AQA - COMBINED SCIENCE

C7 - TEST 1

ORGANIC CHEMISTRY

Beginner

Mark schemes

1.	(i) C_8H_{18} <i>for one mark</i>	1	[7]
	(ii) mixture <i>for one mark</i>	1	
	(iii) fractions molecules atoms evaporated condensed <i>in this order for 1 mark each</i>	5	
2.	(a) fuels	1	[7]
	alkanes	1	
	polymers	1	
	monomers	1	
	(b) catalyst	1	
	octane <i>accept C_8H_{18}</i>	1	
	ethene <i>accept C_2H_4</i>	1	
3.	(a) carbon	1	[7]
	hydrogen <i>any order</i>	1	

- (b) fractional 1
- distillation
- accept description*
- *heat **or** evaporate / boil (1 mark)*
 - *separated when they condense **or** by boiling points (1 mark)*
- 1
- (c) alkenes 1
- accept names **or** unsaturated hydrocarbons*

[5]

4.

- (a) (i) (conical) flask 1
- (ii) measuring cylinder / pipette / burette 1
- (b) (i) any **two** from:
- so anomalous results could be identified / ignored
 - so a mean / average could be taken
 - (to improve) accuracy
- 2
- (ii) 19 1
- (iii) increases / gets longer / gets bigger 1
- (iv) anomalous / does not agree with other times for $C_{10}H_{22}$ 1
- (v) any **one** from:
- shorter hydrocarbon used
 - volume of hydrocarbon too small
 - started timing late
 - stopped timing too early / when liquid left in funnel
- must suggest why the result is **lower** than the others.*
- allow the temperature was higher **or** the students used a wider funnel.*
- 1

(c) (i) flammable

1

(ii) suitable safety precaution

1

reason that links the safety precaution to the hazard symbols

eg:

- *wear gloves*
- *(because) it is hazardous to health / harmful / toxic / irritant*

or

- *do not pour down sink or dispose of properly*
- *(because) it is harmful to the environment / kills fish*

or

- *wear a mask or do it in the fume cupboard or a well-ventilated area*
- *respiratory irritant*

1

- (d) (i) points plotted correctly (within half small square)
all six points correct scores 2
3, 4 or 5 points correct scores 1 2
- smooth curve of best fit 1
- (ii) point at 46 °C circled
allow point furthest from the line as drawn 1
- (iii) working shown on graph 1
- value read from graph line drawn (within half small square) 1
- (iv) the higher the temperature the lower the viscosity
allow the higher the temperature the lower / shorter the time taken for 1 mark 2
- non-linear **or** change gets smaller as temperature gets higher
answer relating temperature to time taken can score a maximum of 2 marks. 1
- (v) identifying source of the error 1
- method of avoiding the error
- eg:
- *the temperature will drop*
 - *insulate the funnel*
- or**
- *runs out before all added*
 - *put a tap on the funnel*
- 1

[22]

5.

- (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]

6.

(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]

7.

(a) (i) a mixture

1

(ii) distillation

1

(b) increases / gets higher

ignore figures

ignore gets hotter

1

increases / gets higher

ignore figures

ignore gets hotter

1

(c) (i) 125(°C)

accept any value in the range 80–135°C

1

(ii) C₈H₁₈

allow correct displayed formula

1

[6]

8.

(a) hydrogen

allow H₂

H must be uppercase and number a subscript

1

- (b) (i) carbon dioxide
allow CO₂
letters must be uppercase and number a subscript 1
- (ii) water
allow H₂O
letters must be uppercase and number a subscript ignore steam 1
- (c) (i) petrol
allow petroleum / refinery gases 1
- (ii) fuel (oil)
allow bitumen 1
- (iii) fuels 1
- (d) A → E → C → B → D
2 if in correct order
any of following gains 1 mark if overall order is incorrect E before C
or
C before B 2

[8]