

HYDROCARBONS 9

MARK SCHEME

Q1.

Question	Answer	Extra information	Marks
(a)	Methane has the lowest melting point and icosane has the highest boiling point Decane and icosane are liquid at 100°C		1
			1
(b)	water / H ₂ O carbon dioxide / CO ₂	either order allow hydrogen oxide	1
			1
Total marks			4

Q2.

Question	Answer	Extra information	Marks
(i)	crude oil		1
(ii)	hydrocarbons		1
			1
(iii)	oxygen		
Total marks			3

Q3.

Question	Answer	Extra information	Marks
(i)	bar labelled 9 bar drawn to correct height		1
			1
(ii)	(boiling point) increases		1
(iii)	heat / evaporate (the crude oil)	accept separate by boiling point accept smaller molecules go to top / larger molecules stay at bottom accept fractional distillation for two marks or distillation / fractionation for one mark	1
	cool / condense (hydrocarbons at different temperatures)		1
Total marks			5

Q4.

Question	Answer	Extra information	Marks
(i)	the greater the number (of carbon atoms), the higher its boiling point	do not accept hydrocarbons for carbon atoms allow converse allow melting point	1
(ii)	accept answers in the range 344 to 350		1
(iii)	216		1
Total marks			3

Q5.

Question	Answer	Extra information	Marks
(i)	burning / combustion	allow oxidation / redox	1
(ii)	any two from: <ul style="list-style-type: none"> • cracking / (thermal) decomposition • heat / vaporise • catalyst / aluminium oxide 	reaction with hydrogen gains max of 1 mark only allow porous pot ignore names of other catalysts	2
Total marks			3

Q6.

Question	Answer	Extra information	Marks
(a)	hydrogen	ignore formulae	1
(b)	any two from: <ul style="list-style-type: none"> • different sized molecules / more or less (carbon) atoms (in molecules) • fuels have different boiling points • fuels condense at different temperatures 	ignore different densities	2
(c)		all three correct = 3 marks two correct = 2 marks one correct = 1 mark	3
Total marks			6

Q7.

Question	Answer	Extra information	Marks
(i)	add bromine (water) to the oil one drop at a time / dropwise or count / record number of drops until the bromine (water) no longer decolourises or until bromine water remains orange	it = bromine water allow shake / mix / stir ignore clear	1 1 1
(ii)	A 2 anomalous result or explanation	both need to be correct allow A 17 ignore does not fit pattern/trend independent marking points	1 1
(iii)	any one from: temperature concentration of bromine water (same) dropper / pipette	ignore references to time allow same bromine water allow (same) drop size	1
(b)	any three from: A's oil has more unsaturated fat (than Vegio) or has the most unsaturated fat B's oil has more unsaturated fat (than Vegio) C's oil has less unsaturated fat (than Vegio) or has the least unsaturated fat D's oil has less unsaturated fat (than Vegio) Vegio is in 3rd position	comparison must be to Vegio allow healthier or better (for you) for more unsaturated fat ignore references to bromine water allow only A and B have more unsaturated fat than Vegio or only C and D have less unsaturated fat than Vegio for 3 marks	3
Total marks			9

Q8.

Question	Answer	Extra information	Marks
	decane has the largest molecules		1
	methane and butane are gases at 20°C		1
Total marks			2