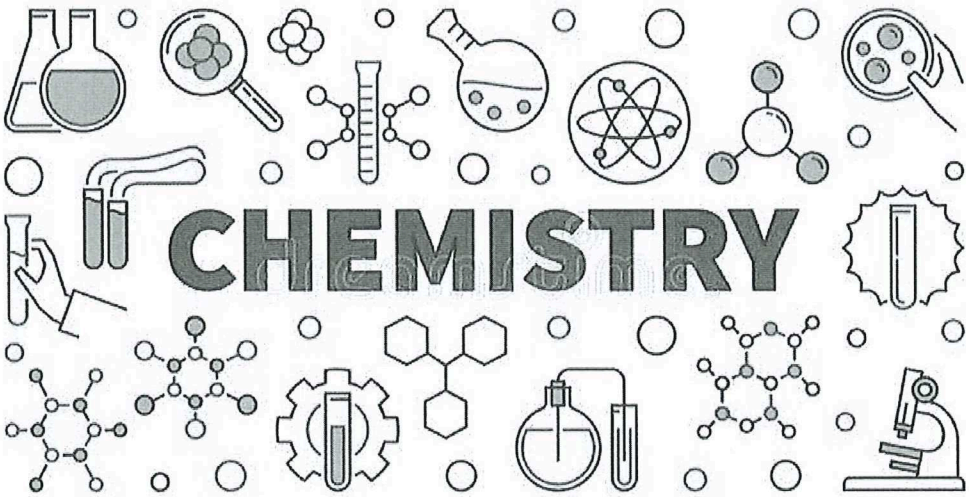


WJEC Chemistry 2

Dual Award – Foundation Tier

2.5 Mark Scheme

Question				Marking details	Marks available					
					AO1	AO2	AO3	Total	Maths	Prac
4	(a)	(i)		(remains) **marine** life / animals / plants (1) over millions of years / because of pressure / decompose in absence of oxygen (1)	2			2		
		(ii)		will run out / won't last forever / finite / cannot be replaced cannot be used again – neutral	1			1		
	(b)	(i)		distillation (1) accept any of following for (1) • boiling point • boiling temperature • sized molecules / chain length • different forces between molecules different temperature / different molecules / different melting point – neutral	2			2		
		(ii)		**mixture** **element** **compound**	1			1		
	(c)			84 / 83.7 / 83.72 (2) award (1) for 83 award (1) for M_r 86 allow ecf from incorrect M_r		2		2	2	

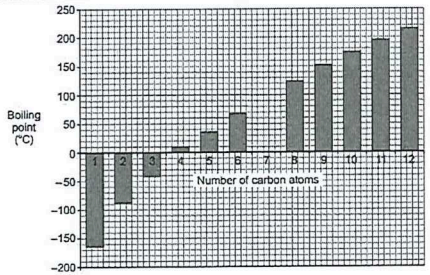
Question				Marking details	Marks available					
					AO1	AO2	AO3	Total	Maths	Prac
	(d)	(i)		**B**		1				
		(ii)		**A C D** – all **three** needed (1) **B E** – **both** needed (1) award (1) for one correct structure given in **both** parts		2		2	1	
	(e)			linked method **and** problem required burning / incineration – releases poisonous gases / toxic fumes / CO_2 which causes global warming (1) send to landfill / bury – space running out / does not decompose / non-biodegradable (1) award (1) for two correct methods if insufficient descriptions of the problems	2			2		
				Question 4 total	**8**	**5**	**0**	**13**	**3**	**0**

Question				Marking details	Marks available					
					AO1	AO2	AO3	Total	Maths	Prac
5	(a)			any of following • they all burn the same • they all burn very easily • there is no difference between them			1	1		
	(b)			A B C ☐ A C B ☐ B A C ☐ B C A ✓ C A B ☐ C B A ☐			1	1		
	(c)			All of the fuels contribute to acid rain and global warming when they burn ☐ Fuels A and C contribute to acid rain and global warming when they burn ☐ Only fuel C contributes to acid rain and global warming when it burns ✓ (1) None of the fuels contribute to acid rain and global warming when they burn ☐ sulfur dioxide **and** carbon dioxide released when it burns accept '**C** is the **only** one that produces SO_2' (1)	1		1	2		

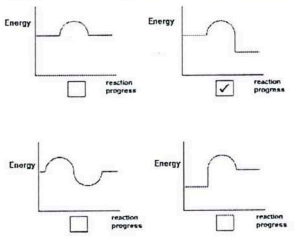
<table>
<tr><th colspan="4">Question</th><th>Marking details</th><th colspan="6">Marks available</th></tr>
<tr><th></th><th></th><th></th><th></th><th></th><th>AO1</th><th>AO2</th><th>AO3</th><th>Total</th><th>Maths</th><th>Prac</th></tr>
<tr><td></td><td>(d)</td><td></td><td></td><td>245 (2)

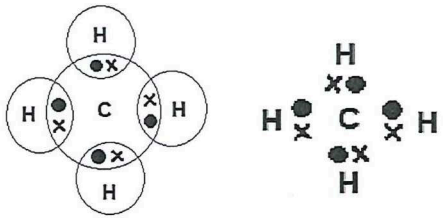
if incorrect award (1) for $\frac{44.1}{0.18}$</td><td>1</td><td>1</td><td></td><td>2</td><td>2</td><td></td></tr>
<tr><td></td><td>(e)</td><td></td><td></td><td>(✓)
<table><tr><td>Fuel C will run out after fuels A and B</td><td></td></tr><tr><td>Fuel C is easier to store than fuel A</td><td></td></tr><tr><td>Fuel A burns more easily than fuel C</td><td></td></tr><tr><td>Fuel B is the cleanest fuel</td><td>✓</td></tr><tr><td>Fuel B is easier to store than fuel C</td><td></td></tr><tr><td>Fuel B will never run out</td><td>✓</td></tr><tr><td>Fuel A is less harmful to the environment than fuel C</td><td>✓</td></tr><tr><td>Fuel A is less cost effective than fuel B</td><td>✓</td></tr></table>
award (2) for all four correct
award (1) for any two correct

if more than four ticks, each additional one cancels out a correct tick e.g.
five ticks – credit max three ticks i.e. 1 mark
six ticks – credit max two ticks i.e. 1 mark</td><td></td><td></td><td>2</td><td>2</td><td></td><td></td></tr>
<tr><td></td><td></td><td></td><td></td><td>Question 5 total</td><td>2</td><td>1</td><td>5</td><td>8</td><td>2</td><td>0</td></tr>
</table>

Question				Marking details	Marks available					
					AO1	AO2	AO3	Total	Maths	Prac
6/1	*(a)*			the <u>larger the molecules / (as the size/fraction) gets bigger</u> • the <u>smokier</u> the <u>flame</u> (1) • the <u>more difficult</u> it becomes to <u>burn</u> (1) accept the converse argument correct identification of both properties, without reference to increasing size (1)			2	2		
	(b)	(i)		 all 5 bars correctly plotted with ±½ small square tolerance (2) 3 or 4 correct plots (1) accept charts where bars are touching – correct height of each bar to be credited		2		2	2	

Question				Marking details	Marks available					
					AO1	AO2	AO3	Total	Maths	Prac
		(ii)		appropriate **straight** trend line drawn with ruler, spans across at least 6 bars (1) correct boiling point taken from the trend line (1) award no credit for a curved trend line (but allow ECF for a correct value read from an incorrect trend line) if no trend line drawn, award (1) for a value in the range 85-105			2	2	2	
	(c)	(i)		sand / foam / CO_2 / fire blanket because it removes oxygen **both** method and explanation needed		1		1		
		(ii)		$5CO_2 + 6H_2O$ correct products (1) correctly balanced (1) – only if correct products given		2		2	1	
		(iii)		does not produce carbon dioxide / sulfur dioxide / **only** produces water (1) does not contribute to global warming / climate change / acid rain (1)	1	1		2		

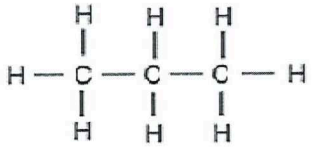
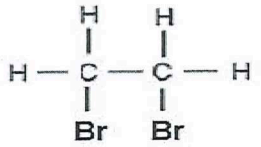
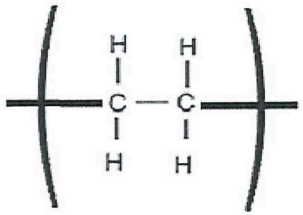
Question				Marking details	Marks available					
					AO1	AO2	AO3	Total	Maths	Prac
	(d)	(i)		temperature (of water) **before and after** burning (1) mass of fuel and burner **before and after** burning (1) initial ≡ before ≡ at start final ≡ after ≡ at end temperature rise and change in mass – neutral answers award (1) only for reference to measuring both temperature throughout and mass throughout award (1) for answers that refer to measuring **both** the temperature and mass **either** before **or** after burning only			2	2		2
		(ii)		distance between burner and flame / material or thickness or size of beaker / same size wick / same beaker reference to mass of fuel and mass of water – neutral	1			1		1
		(iii)				1		1	1	
				Question 6/1 total	**2**	**7**	**6**	**15**	**6**	**3**

Question				Marking details	Marks available					
					AO1	AO2	AO3	Total	Maths	Prac
3	(a)	(i)		oxygen / O_2 accept O	1			1		
		(ii)		water / H_2O (1) carbon dioxide / CO_2 (1) do not accept carbon monoxide	2			2		2
		(iii)		alkenes ☐ monomers ☐ polymers ☐ alkanes ✓	1			1		
	(b)	(i)		award (2) for correct diagram  accept any representation of electrons e.g. all crosses or all dots if incorrect award (1) for any representation of 4 hydrogen atoms bonded to central carbon atom		2		2		

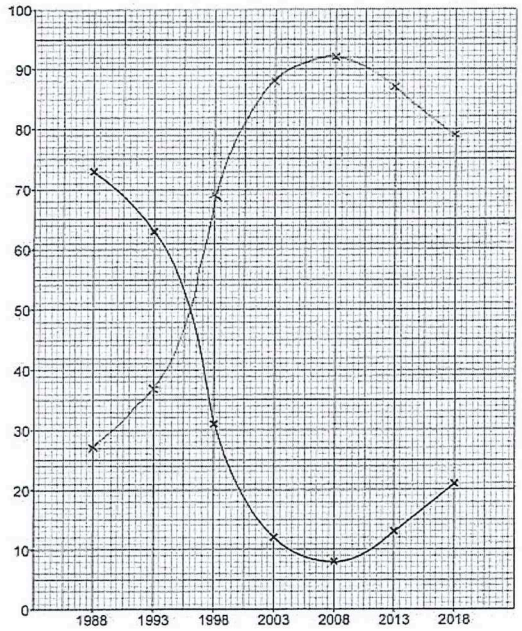
Question				Marking details	Marks available					
					AO1	AO2	AO3	Total	Maths	Prac
		(ii)		covalent	1			1		
	(c)			award (1) for each error **and** correction 	Fire	Description of fire	Fire fighting method	How method works
---	---	---	---
1	chip pan fire	tea towel	removes the heat
2	bonfire	fire blanket	removes the heat	 fire 1 - tea towel removes the oxygen (not heat) fire 2 - use a hose pipe / water (not fire blanket) accept error implied in the correction for both award (1) where both errors are identified but no corrections given incorrect 'error' cannot gain credit for correction			2	2		2
				Question 3 total	**5**	**2**	**2**	**9**	**0**	**4**

Question				Marking details	Marks available					
					AO1	AO2	AO3	Total	Maths	Prac
4	(a)	(i)		<table><tr><th>Statement</th><th>True</th><th>False</th></tr><tr><td>The number of plastic bags used in Wales and England has reduced since charging for them</td><td>✓</td><td></td></tr><tr><td>Retailers donate all the money generated from the sale of plastic bags to good causes</td><td></td><td>✓</td></tr><tr><td>Plastic bags are no longer used</td><td></td><td>✓</td></tr><tr><td>The charge for plastic bags has totally stopped their use in Wales</td><td></td><td>✓</td></tr><tr><td>The use of plastic bags leads to environmental problems</td><td>✓</td><td></td></tr><tr><td>The charge for plastic bags is beneficial to good causes</td><td>✓</td><td></td></tr></table> award (3) for all 6 correct award (2) for any 4 or 5 correct award (1) for any 2 or 3 correct			3	3		
		(ii)		575 (2) if incorrect award (1) for any of following 115 140 – 25 reference to both 700 and 125		2		2	2	
	(b)			81% (2) if incorrect award (1) for either of following 100 – 19 6 + 14 + 38 + 23			2	2	2	
	(c)			non-biodegradable / doesn't break down / doesn't rot accept takes a long time to decompose	1			1		
				Question 4 total	**1**	**2**	**5**	**8**	**4**	**0**

COMMON QUESTIONS

Question				Marking details	Marks available					
					AO1	AO2	AO3	Total	Maths	Prac
7/1	(a)	(i)		**D** and **E** **both** needed, either order		1		1		
		(ii)		propene	1			1		
		(iii)			1			1		
	(b)	(i)		 (1)  (1)		2		2		
		(ii)		decolourises / goes colourless neutral answers – goes clear / changes colour	1			1		1

Question				Marking details	Marks available					
					AO1	AO2	AO3	Total	Maths	Prac
		(iii)		(addition) polymerisation	1			1		
	(c)	(i)		0.15 (2) if answer incorrect award (1) for any of following $\frac{12}{100} \times 1.25$ 0.0125×12 15 / 150000		2		2	2	

Question				Marking details	Marks available					
					AO1	AO2	AO3	Total	Maths	Prac
		(ii)		 award (2) for **all** points plotted correctly – tolerance ±1 square award (1) for any **four** correct points award (1) for curved line do not accept - point to point line		3		3	3	

Question				Marking details	Marks available					
					AO1	AO2	AO3	Total	Maths	Prac
		(iii)	I	1996 accept 1995 / 1997 accept range 1995-1996 / 1996-1997		1		1		1
			II	2 : 8 (1 : 4) 4 : 1 8 : 2 20 : 80			1	1	1	
		(iv)		award (1) for any of following actions people **use** bag for life / alternative bags people **reuse** bags supermarkets **charge** for bags / **stop giving** free plastic bags government **introduced** a charge people have **become more aware** of issues to do with plastic waste people **want to reduce** amount of plastic going to landfill / incineration people **want to reduce** the amount of plastic pollution / microsplastics			1	1		
				Question 7/1 total	**4**	**9**	**2**	**15**	**6**	**2**