

WJEC Chemistry 1 Dual Award – Foundation Tier 1.3 Mark Scheme

	Prac	2			~	N
	Maths		-	~		
vailable	Total	Ν	1	۲	~	N
Marks A	A03	En l			~	N
	A02		5	۲-		
	A01	N				2 - A
	Marking details	Intration Intration	1 13	II bathing accept 21 %	tradest A contest B softest B assume C is in the correct position if A and B are correct	 B – no credit on its own but needed for the explanations boils at (exactly) 100°C (1) produces the most froth / softest water (1)
	stion	(j)	(ii)		(i)	(ii)
	Ques	(a)			(q)	
		<i>с</i> и				

				A 1 N 1			
				INIALKS A	valiable		
Question	Marking details	A01	A02	A03	Total	Maths	Prac
(iii)	shaking the mixture / tube (1) shake a set number of times / for a specified length of time (1)	2			7		2
	award (1) only for reference to water temperature, type of soap, concentration of soap						
(iv)	CaF ₂		-		-		
	Question 3 total	4	3	3	10	2	Ŋ

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4	2	9	2	N	сл	Question 2 total			
		-			-	Ca ²⁺		(d)	
		N			N	all three of following for (2) award (1) for any one/two • wastes soap • forms a scum with soap • forms limescale when heated		(c)	
Ν		Ň	N			A (1) needed highest volume/amount of soap solution (to form permanent lather) (1) ecf possible from part (i))		
	N	N		N		18 + 19 + 17 (1) must show working 3 3 18 (1) award (1) max for 18 with no working	(i)	(d)	
N		N	2	9	N	 award (1) each for any two of following used equal volumes/amounts of each water sample shook each water sample for an equal amount of time used the same concentration of soap solution for each water sample 		a	N
Prac	Maths	Total	AO3	A02	A01	Marking details	ion	luesti	0
		in linking	Mortoo						

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							6	Q	
								uestion	
Question 6 to	0 marks No attempt made or no response worthy of credit.	1-2 marks Brief description of benefit; mentions one health side effect or ethical There is a basic line of reasoning which is not coherent, largely irrelev structure. The candidate uses limited scientific terminology and inacco	3-4 marks Good description of benefit and peoples' concerns; mentions one hea There is a line of reasoning which is partially coherent, largely relevar candidate uses mainly appropriate scientific terminology and some ac	5-6 marks Detailed description of benefit and peoples' concerns; includes at lea: There is a sustained line of reasoning which is coherent, relevant, sut appropriate scientific terminology and accurate spelling, punctuation a	 Reasons to oppose can have possible side effects on health e.g. brittle bones, infertility, kidney problems, stomach cancer, birth defects can cause fluorosis - teeth going yellow unethical - fluoride added to drinking water without public consent / mass medication fluoride is toxic in high concentrations 	Benefit - fluoride reduces tooth decay / results in less fillings in teeth	Indicative content	Marking details	
al 6		gument nt, supporte acies in spe	h side effec supported urate spellir	two health tantiated ar d grammar.	o		1	A01	
0	-	∍d by limiteo ₃lling, punct	x; mentions by some ev 1g, punctua	side effects nd logically :				A02	
0		d evidence uation and	s ethical arg ridence and tion and gra	s; describes structured.				AO3	Marks a
6		and with ve grammar.	yument I with some ₃mmar.	s ethical ar <u>(</u> The candid	თ			Total	available
0		<i>∍ry little</i>	structure.	gument late uses				Maths	
0			The					Prac	

				Marks a	vailable	_	
Question	Marking details	A01	A02	AO3	Total	Maths	Prac
5 (a)							
					د		
(b)							
				<u>د</u>	-		
(c)	potassium fluoride and calcium sulfate						
	ammonium sulfate and potassium nitrate						
	calcium fluoride and ammonium nitrate			ــ			
8	ammonium sulfate and calcium fluoride						

		0
	(d)	Ques
(ii)	(i)	tion
48.7 (2) accept if answ 38 or (1 24.4 (e	136	
t9 ∍r incorrect award (1) for either of following 9 × 2) shown in working ƴ – use of 19 instead of 38)		Marking details
		A01
N	<u>د</u>	A02
		Marks a
N	-	vailable Total
N	-	Maths
	 (ii) 48.7 (2) accept 49 if answer incorrect award (1) for either of following 38 or (19 × 2) shown in working 24.4 (ecf – use of 19 instead of 38) 2 	(d) (i) 136 1 1 1 1 (ii) 48.7 (2) accept 49 accept 49 if answer incorrect award (1) for either of following 2

	1						7	Question	
Question 7 total	0 marks No attempt made or no response worthy of credit.	1-2 marks Simple reference to one advantage and one disadvantage There is a basic line of reasoning which is not coherent, largely irrelevant, The candidate uses limited scientific terminology and inaccuracies in spel	3-4 marks Basic description of advantages and disadvantages of hard water; one ex There is a line of reasoning which is partially coherent, largely relevant, su candidate uses mainly appropriate scientific terminology and some accura	5-6 marks Detailed description of advantages and disadvantages of hard water; two disadvantages There is a sustained line of reasoning which is coherent, relevant, substant appropriate scientific terminology and accurate spelling, punctuation and (Disadvantages does not readily form lather with soap solution / forms scum more soap solution needed to produce lather for washing e.g. clothes, dishes boilers and hot water pipes become 'furred up' (due to calcium carbonate / limescale precipitating) boilers and kettles become less efficient and pipes and radiators can become completely blocked energy is wasted as a result	Advantages good for healthy bones and teeth (due to calcium ions) reduces risk of heart disease good for brewing beer better taste	Indicative content	Marking details	
6		supporte ling, punc	ample of e pported b ite spellin	examples tiated and yrammar.		J		A01	
0	-	d by limite tuation an	each with s y some ev g, punctua	of each w d logically	1			A02	
0	-	d evidence d grammar	simple dev vidence an tion and gi	ith referend structured.				A03	Marks a
6	•	and with	elopment (d with som 'ammar.	ce to const The cand		J		Total	vailable
c	•	very little si	of one poin ne structure	equences (idate uses				Maths	
-		tructure.	t 2. The	of	1			Prac	

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									2		
					(b)				(a)	Quest	
	Ĵ			(ii)	(i)	(ii)			(i)	tion	
								=	-		
Question 2 total	climate change (more) extreme weather (more) drought conditions (more) flooding forest fires snowier winters slowing of gulf stream leading to colder weather in UK/ northern Europe polar ice caps melting (at a faster rate) sea levels rising crop failure different pests affecting farmland loss of wildlife habitat	eward (1) each for up to two of following	neutral answers – methane / greenhouse gas	carbon dioxide	14.8	convection	award (1) for each correct letter – any order	ΠŒ	D	Marking details	
8	Ν					1		ω	-	A01	
0										A02	
-					ح					A03	Marks a
9	Ν					د_		ω	د	Total	available
-1										Maths	
0										Prac	
	Question 2 total 8 0 1 9 1 0	(III) climate change (more) extreme weather (more) extreme weather (more) foculitions (more) foculit	(iii) award (1) each for up to two of following (iii) award (1) each for up to two of following climate change (more) stream weather (more) drought conditions (more) flooding forest fires snowier winters snowier winters snowier winters snowier winters source caps melting to colder weather in UK/ polar ice caps melting (at a faster rate) sea levels rising crop fallure different pests affecting farmland loss of wildlife habitat Question 2 total 8 0 1 9 1 0	(iii) award (1) each for up to two of following (iii) award (1) each for up to two of following climate change climate change (more) extreme weather (more) extreme weather (more) flooding forest frees showing of gulf stream leading to colder weather in UK/ 2 solwing of gulf stream leading to colder weather in UK/ 2 solwing of gulf stream leading to colder weather rate) 2 solwing corp failure 2 different pests affecting farmland 2 loss of wildlife habitat 4 Question 2 total 8 0 1 9 1 0	(ii) carbon dioxide 1 1 1 (iii) neutral answers – methane / greenhouse gas 1 1 1 (iii) award (1) each for up to two of following 1 1 1 1 (iii) award (1) each for up to two of following 1 1 1 1 1 (iii) award (1) each for up to two of following 1	(b) (i) 14.8 (ii) carbon dioxide 1 1 1 1 (iii) carbon dioxide neutral answers – methane / greenhouse gas 1 1 1 1 1 (iii) award (1) each for up to two of following 1 <	Image: Convection (i) (i) convection 1 1 1 Image: Convection (i) (i) carbon dioxide 1 1 1 1 Image: Convection (ii) carbon dioxide anard (1) each for up to two of following 1	Image: Construct State of Construct State Sta	Image: Section 2 (1) Image: Section 2 (1) Image: Section 2 (1) Section 2 (1)	2 (a) (1) D 2 (a) (1) D 2 (a) (1) D 1 B I B 1 B I I 1 I B I I 1 I I I I I 1 I I I I I I 1 I I I III IIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIII	Vertex Marking details A01 A02 A03 Total Marking details 2 (a) (b) 1 D 1 D 1 <td< td=""></td<>

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(i)		(ii)	Ξ		on
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2 KNO $_3 \rightarrow 2$ KNO $_2$ + O $_2$	award (1) for any value in the range 34-38 ecf possible from incorrectly plotted/drawn line	award (1) for any value in the range 72-76 ecf possible from incorrectly plotted/drawn line	award (2) all points plotted correctly tolerance ±½ square award (1) for 4/5 points plotted correctly award (1) for suitable curve ecf possible from incorrect plotting	2 times 3 times 4 times 5 times	Marking details
			a construction of the second se		A01
-	-		ω		A02
					Marks a AO3
_	د		ω	د_	available Total
			ω	<u>د</u>	Maths
			ω		Prac

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					(ii)	Question	
Question 3 total	71.9	<u>6260</u> 87	3.113 4.35	if answer incorrect award (1) for any of following	72 (2)	Marking details	
0						A01	
œ			N			A02	
-			·			A03	Marks a
9			2			Total	available
8			2			Maths	
თ						Prac	

								Marks a	vailable		
	Quest	tion		Marking details		A01	A02	AO3	Total	Maths	Prac
G	(a)			London, Yorkshire and the North West all have a mean DMFT of 1.0							
				The South East has the lowest mean DMFT	1						
				East Midlands has the highest mean DMFT							
				East England, the South West and the South East have a mean DMFT of 0.7				N	N		
		,		The East Midlands has a lower mean DMFT than Yorkshire	<						
				London, the North West and South West all have a mean DMFT of 0.9							
20	(b)	(i)		All areas with fluoridated drinking water have lower mean DMFT than areas which do not fluoridate water						2	
				All areas with fluoridated drinking water have the same mean DMFT as non-fluoridated areas					<u>د</u>		
			1	All areas with fluoridated drinking water have lower mean DMFT than the North West	<						
		(ii)		It is not possible to decide whether fluoridation of drinking water lowers mean DMFT	<						
				All areas with fluoridated drinking water have higher mean DMFT than areas which do not fluoridate drinking water				ــ	۲		
	1			All areas with fluoridated drinking water have a higher mean DMFT than the South West							
					-					=	

	(0)		Question	
Question 6 total	 more people brush their teeth (with toothpaste) better dental hygiene / use mouthwash / floss natural fluoride in (drinking) water less sugar in diets neutral answers toothpaste better education wealthier area 	and (1) for any of following	Marking details	
0			A01	
0			A02	
U	<u>ل</u>		A03	Marks a
U	<u>ــــــــــــــــــــــــــــــــــــ</u>		Total	vailable
0			Maths	
0			Prac	

					Marks a	vailable		
	Question	Marking details	A01	A02	A03	Total	Maths	Prac
8/2	(a)	0.42 (2)		2		N	2	
		if answer incorrect award (1) for any of following						
		42 420000 4.2 × 10 ⁵						
	(b)	award (1) for any of followingdistillation						
		 reverse osmosis graphene membrane 						
		neutral answers desalination boiling / evaporation / condensation						
	(c)	add soap solution to both water samples and shake (1)		8				
		fair testing - equal volumes of both water samples and shake for an equal amount of time (1)						<u>h</u>
		the sample that produces more lather is the softer water / the sample that produces less lather is the harder (1)						
		alternative method	ω			ω		ω
		add 1cm ³ / small volume of soap solution and shake; if no lather add further 1cm ³ / small volume (1)						
		fair testing - equal volumes of both water samples and shake for an equal amount of time (1)						
		the sample that lathers with less soap is the softer / the sample that requires more soap is the harder (1)						

		(d)	Ques	
			stion	
		Na ₂ CO ₃		
			Marking det	
	Question 8		tails	
	/2 total			
	4		A01	
	ω	<u>حــــــــــــــــــــــــــــــــــــ</u>	A02	
	0		A03	Marks a
	7	-	Total	vailable
ъ	2		Maths	
	ω		Prac	