

Chemistry 2 – Foundation Tier only questions

Question Number		Sub-section			Mark	Answer	Accept	Neutral answer	Do not accept
FT	HT								
1		(a)	(i)		1	2,8,7			
			(ii)		1	D and E (both needed)			
			(iii)		1	A and D (both needed)			
			(iv)		1	5			
		(b)			2	1 (1) +1 (1)		1	

Question Number		Sub-section		Mark	Answer	Accept	Neutral answer	Do not accept
2		(a)		1	potassium	K		
		(b)		1	potassium + oxygen → potassium oxide follow through (ft) error from (a) only if Group 1 metal given	K + O ₂ → K ₂ O (ignore balancing) consequential possible	gas	
		(c)		1	lithium / sodium ft only if Group 1 metal given is less reactive than that named in (a)	Li / Na		
		(d)	(i)	1	silver nitrate	AgNO ₃		
			(ii)	1	dissolved (in water)	diluted / solution	liquid / molten	
			(iii)	1	white independent of (i)		milky	creamy

Question Number		Sub-section		Mark	Answer	Accept	Neutral answer	Do not accept
3		(a)		1	horse C			
		(b)		1	no, none have a spot corresponding to caffeine	no samples match caffeine		
		(c)		2	3 (1) R _f value = 0.3 (1) correct answer only (cao) – 2 marks ft incorrect 'distance moved' only if value given divided by 10 i.e. correct distance moved by solvent – 1 mark			

Question Number		Sub-section		Mark	Answer	Accept	Neutral answer	Do not accept
4		(a)		1	sodium chloride	NaCl		
		(b)		1	62			
		(c)		2	140 – 80 (1) 60 (1) cao – 2 marks			
		(d)		2	increases (to maximum) then falls / up and down (1) maximum at 30 °C / maximum of 70 ± 2 g per 100 g water (1) rises more steeply than it falls – 2 marks			

Question Number		Sub-section		Mark	Answer	Accept	Neutral answer	Do not accept
5		(a)		4	<p>Name propene (1)</p> <p>Molecular formula CH₄(1)</p> <p>Structural formula</p> $ \begin{array}{ccccccc} & \text{H} & \text{H} & \text{H} & \text{H} & & \\ & & & & & & \\ \text{H} & -\text{C} & -\text{C} & -\text{C} & -\text{C} & -\text{H} & \\ & & & & & & \\ & \text{H} & \text{H} & \text{H} & \text{H} & & \end{array} $ <p>(1)</p> <p>Family of hydrocarbons – both needed (1)</p> <p>alkane</p> <p>alkene</p>			
		(b)		2	<p>double bond breaks / changes to single bond (1)</p> <p>many ethene molecules join together / form long chain or polymer (1)</p>			
		(c)		1	$ \begin{array}{cc} \text{F} & \text{F} \\ & \\ \text{C} & = & \text{C} \\ & & \\ \text{F} & & \text{F} \end{array} $ <p>ignore 'n' and any brackets used</p>			

Question Number		Sub-section			Mark	Answer	Accept	Neutral answer	Do not accept
6		(a)	(i)		3	all points plotted correctly (2) 4 correct (1) smooth curve through points (1)			line drawn using ruler
			(ii)		1	the higher the temperature, the shorter the time / faster the reaction / higher the rate	'faster the rate'		'faster / quicker the time '
		(iii)		1	curve must be below original curve and steeper – ignore end point				
		(b)		2	light intensity decreases (1) continuous readings / graph plotted automatically / more precise end point (1)	light blocked more reliable than eyesight / more repeatable / no judgement required	reference to 'reliability' or 'accuracy' or to 'human error' needs qualification	'no chance of human error'	

Chemistry 2 – Common questions

Question Number		Sub-section		Mark	Answer	Accept	Neutral answer	Do not accept
7	1	(a)		3	<i>mass number</i> 7 (1) <i>atomic number</i> 6 (1) <i>number of neutrons</i> 12 (1)			
		(b)	(i)	1	2,8			
			(ii)	2	two shells (containing electrons) outer shell is full / can't accept any more electrons		8 in outer shell	
		(c)		2	B and C (1) same number of protons but different numbers of neutrons / same atomic number but different mass number (1) [marks linked i.e. second mark cannot be awarded if first is not given]		reference to electrons	

Question Number		Sub-section		Mark	Answer	Accept	Neutral answer	Do not accept
8	2	(a)		2	graphite and nanotube (1) both have free moving / delocalised electrons (1)	mark independently		
		(b)		2	graphite (1) weak bonds between layers / layers able to slide over each other (1) [marks linked i.e. second mark cannot be awarded if first is not given]			

Question Number		Sub-section		Mark	Answer	Accept	Neutral answer	Do not accept
9	3	(a)		1	chlorine gas is toxic / poisonous		harmful / dangerous / kills any reference to FeCl ₃	
		(b)		2	Fe + Cl ₂ (1) balancing 2,3,2 (1) [balancing mark only awarded if correct formulae included]			
		(c)		3	M _r (FeCl ₃) = 162.5 [or 3 × A _r (Cl) = 106.5] (1) 106.5 / 162.5 × 100 (1) 65.5% (1) cao – 3 marks	allow 66		

Question Number		Mark	Answer
FT	HT		
10	4	6 QWC	<p>Indicative content Materials that change their properties reversibly according to conditions; thermochromic pigments change colour according to temperature; photochromic pigments change colour according to light intensity; shape memory alloys can regain shape by heating / spring back in to shape (NITINOL)</p> <p>Uses: thermochromic pigments – forehead thermometers, baby spoons etc. photochromic pigments – lenses for sunglasses; UV marker pens etc. shape memory alloys – spectacle frames; stents in veins etc.</p> <p>5–6 marks The candidate constructs an articulate, integrated account correctly linking relevant points, such as those in the indicative content, which shows sequential reasoning. The answer fully addresses the question with no irrelevant inclusions or significant omissions. The candidate uses appropriate scientific terminology and accurate spelling, punctuation and grammar.</p> <p>3–4 marks The candidate constructs an account correctly linking some relevant points, such as those in the indicative content, showing some reasoning. The answer addresses the question with some omissions. The candidate uses mainly appropriate scientific terminology and some accurate spelling, punctuation and grammar.</p> <p>1–2 marks The candidate makes some relevant points, such as those in the indicative content, showing limited reasoning. The answer addresses the question with significant omissions. The candidate uses limited scientific terminology and inaccuracies in spelling, punctuation and grammar.</p> <p>0 marks The candidate does not make any attempt or give a relevant answer worthy of credit.</p>