Chemistry 2 - Common questions
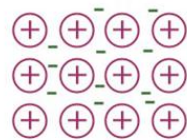
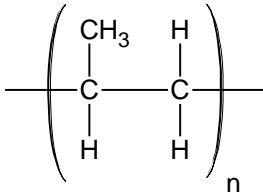| Question Number									
FT	HT	Sub-section			Mark	Answer	Accept	Neutral answer	Do not accept
8	1	(a)			1	solubility of sodium carbonate increases (until 40-43°C) and then decreases			
		(b)			3	plotting 7 correct points (2) plotting 6 correct points (1) suitable line – must be curve (1)			
		(c)			1	sodium carbonate sodium bromate sodium chloride – correct order			
		(d)			3	recognise that sodium chloride is soluble and silver chloride is not (1) add (enough/excess) water (to remove/dissolve all the sodium chloride) (1) filter (1)			

Question Number		Sub-section			Mark	Answer	Accept	Neutral answer	Do not accept
FT	HT								
9	2	(a)	(i)		2	436 + 242 (1) = 678 (1) – correct answer only (cao) (2)			
			(ii)		2	2 × 431 (1) = 862 (1) – cao (2)			
		(b)			1	exothermic since energy given out (as bonds made) > energy needed (to break the bonds) energy given by reaction is negative / −184 credit 'endothermic' with correct reason if calculation error followed through (ft)			

Question Number								
FT	HT	Sub-section			Mark	Answer	Accept	Neutral answer	Do not accept
10	3	(a)	(i)		1	A – requires the most soap – both needed			
			(ii)		2	D (1) some hardness removed by boiling but not all / temporary hardness removed by boiling but permanent hardness remained (1) Alternative answer accepted for all candidates due to very common mis-interpretation of question on Welsh-medium papers A contains permanent hardness and C contains temporary hardness (1) A loses none of its hardness through boiling and C loses all of its hardness (through boiling) (1)			
		(b)			2	same trend / A still the hardest / B still the softest / D still contains both permanent and temporary hard water (1) different amount of water used / different concentration of soap solution / shaken for a different amount of time / different amount of lather formed (1)			

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Question Number			
FT	HT	Mark	Guidance
11	4	6	Indicative content: This method of separation is called fractional distillation. Crude oil is a mixture of hydrocarbons. The crude oil is heated and vaporised before entering the column. Smaller/lower boiling hydrocarbons will rise in the column and condense higher up the column. Hydrocarbons with similar boiling points condense at the same level in the column. (Boiling point depends on the size of the molecule – larger molecules have higher boiling points.) 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. 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. 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. 0 marks: The candidate does not make any attempt or give a relevant answer worthy of credit.

Chemistry 2 - Higher Tier only questions

Question Number		Sub-section		Mark	Answer	Accept	Neutral answer	Do not accept
FT	HT							
	5	(a)		1	2,8,1			
		(b)		2	positive ions fixed positions electrons mobile / sea – all four points (2) – two/three points (1)			
		(c)	(i)	1	floats moves fizzes / bubbles goes into a round shape / melts – any two		vigorous reaction dissolves	
			(ii)	1	sodium hydroxide and hydrogen – both needed	$NaOH + H_2$	H	
		(d)		1	potassium burns / lilac flame		potassium moves faster	yellow / orange / red / green flame
		(e)		2	atoms get bigger / greater distance between the (positive) nucleus and the (outer) electron (1) outer electron more weakly held (1)			

Question Number						Answer	Accept	Neutral answer	Do not accept
FT	HT	Sub-section			Mark				
	6	(a)	(i)		1	polytetrafluoroethene / PTFE		Teflon	
			(ii)	I	1				
				II	1	addition			additional
		(b)			2	both have long or large molecules / long chains of carbon atoms / polymer chains (1)

(only) thermosets have crosslinking / strong bonds between chains   (1) | | | reference to layers |

Question Number		Sub-section			Mark	Answer	Accept	Neutral answer	Do not accept
FT	HT								
	7	(a)			1	lithium / Li^+	Li Ca Sr		
		(b)	(i)		1	cream precipitate	off white ppt		pale yellow ppt
			(ii)		2	$Ag^+ + Br^-$ (1) AgBr (1)			
		(c)	(i)		1	chlorine / fluorine	Cl_2 / F_2	Cl / F	
			(ii)		1	displacement	redox		

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Question Number								
FT	HT	Sub-section			Mark	Answer	Accept	Neutral answer	Do not accept
	8	(a)			1	any one from: some copper had not reacted reaction had not been completed heated to constant mass			
		(b)			3	mass of copper = 37.7 -25.0 = 12.7 mass of oxygen = 40.9 – 37.7 = 3.2 (1) n(Cu) = 12.7/63.5 n(O) = 3.2/16 (1) ratio 0.2/0.2 : 0.2/0.2 ie 1:1 formula CuO (1)			

Question Number									
FT	HT	Sub-section			Mark	Answer	Accept	Neutral answer	Do not accept
	9	(a)			3	*two discrete diagrams needed:* - *diagram 1 showing transfer of electrons* - *diagram 2 showing ions* diagram 1 two lithium atoms losing 1 electron each (1) one sulfur atom gaining 2 electrons (1) diagram 2 $2 \times Li^+$ and S^{2-} formed (1)			
		(b)			2	magnesium and/or oxide ions have a greater charge than sodium and/or chloride ions (1) this gives a greater attraction between the ions / stronger ionic bonds / more energy is needed to break bonds (1)			
		(c)			2	shared electron pair between H atoms and adjacent O atoms and between the two O atoms (1) 8 electrons in outer shell of both O atoms (1)			

Question Number			Guidance
FT	HT	Mark	
	10	6	Indicative content: For a chemical reaction to take place the reactant particles must collide. Increasing the concentration increases the number of particles in the same volume which gives a greater chance of the particles colliding, giving an increase in the rate of the reaction. As the temperature increases the reactant particles are moving faster, increasing the chance of a collision. At higher temperature the particles also have higher energy which increases the possibility of having sufficient energy during collision to overcome the activation energy and become a 'successful collision'. Therefore increasing the temperature also increases the speed of a reaction. 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. 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. 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. 0 marks: The candidate does not make any attempt or give a relevant answer worthy of credit.