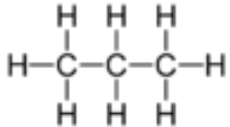
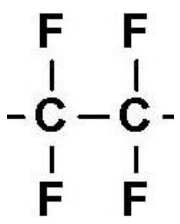


## GCSE Mark Scheme – Chemistry 2

Question Number		Sub-section		Mark	Answer	Accept	Neutral answer	Do not accept
FT	HT							
1		(a)		2	<p>metallic → malleable and ductile / high melting point</p> <p>simple molecular → gas or liquid at room temperature</p> <p>giant covalent → high melting point</p> <p>all 3 for (2) any 1 for (1)</p>			
		(b)		3	<p>thermochromic pigment (1)</p> <p>shape memory polymer (1)</p> <p>hydrogel (1)</p>			


Question Number		Sub-section		Mark	Answer	Accept	Neutral answer	Do not accept
2		(a)		1	electron		e	
		(b)		2	proton (1) neutron (1)		p n	
		(c)	(i)	1	14			
			(ii)	1	2,8,4			

Question Number		Sub-section		Mark	Answer	Accept	Neutral answer	Do not accept
FT	HT							
3		(a)	(i)	1	the higher the temperature the shorter the reaction time	higher temp, faster reaction		
			(ii)	2	<p>surface area (1)</p> <p>the greater the surface area the shorter the reaction time / faster reaction (1)</p> <p>or</p> <p>particle size (1)</p> <p>the smaller the particle size the shorter the reaction time / faster reaction (1)</p> <p>both marks could be credited for one statement e.g. smaller particles react faster</p>	<p>'form' of calcium carbonate</p> <p>'powder takes less time than chips'</p>		molecules become smaller
			(iii)	2	<p>volume of acid (1)</p> <p>concentration of acid (1)</p> <p>mass/weight of calcium carbonate (1)</p> <p>max (2)</p>	'amount of' once only	pH type of acid	
		(b)		2	<p>mass decreases (1)</p> <p>gas / carbon dioxide lost from container / released (1)</p>	gets lighter	gas produced	incorrect gas named

Question Number		Sub-section		Mark	Answer	Accept	Neutral answer	Do not accept
4		(a)		3	 (1)  $C_6H_{14}$ (1) methane (1)			
		(b)	(i)	1	ethene	$C_2H_4$		polyethene
			(ii)	1	monomers		unsaturated	
		(c)	(i)	1	polytetrafluoroethene	PTFE		
			(ii)	1			ignore brackets	

Question Number		Sub-section		Mark	Answer	Accept	Neutral answer	Do not accept
FT	HT							
5		(a)		3	all points plotted correctly (2) 4 points plotted correctly (1)  smooth <b>curve</b> through points (1)	$\frac{1}{2}$ square tolerance		
		(b)		1	the higher the temperature the higher the solubility	it increases with more heat	faster	higher solubility, higher temperature
		(c)		3	crystals form (1)  any reference to crystals/solid/powder allows access to second mark even though first mark may not have been awarded  as solubility is lower at lower temperature (1)  both marks may be awarded based on a quantitative response	solid forms		it solidifies / potassium chlorate forms

Question Number		Sub-section		Mark	Answer	Accept	Neutral answer	Do not accept
FT	HT							
6		(a)		2	3 molecules of CO <sub>2</sub> (1) must get first mark to be awarded second 5 molecules of O <sub>2</sub> (1)			
		(b)	(i)	2	identification of all bonds made e.g. 4 x O–H (1) 1852 (1) award (2) for correct answer only (cao)	max (1) if subtraction done		
			(ii)	2	485 kJ calculated (1) allow error carried forward (ecf) from (i) more energy given out than taken in (1)		negative value	

Question Number		Sub-section			Mark	Answer	Accept	Neutral answer	Do not accept
FT	HT								
7	1	(a)	(i)		2	<b>E</b> (1) two shells occupied / containing electrons (1)	Ne		
			(ii)		2	<b>B</b> and <b>E</b> (1) both have <b>full outer</b> shells of electrons (1)	Ar and Ne 8 electrons in outer shell		
			(iii)		1		2		
		(b)			2	electronic structure is 2,8,7 therefore 17 electrons / atomic number is 17 (1)  number of electrons is equal to number of protons (1)  both marks may be credited for one statement e.g. <b>total</b> number of electrons is equal to number of protons / contains 17 electrons therefore nucleus contains 17 protons (2)		any reference to adding number of electrons in each shell	

Question Number		Sub-section			Mark	Answer	Accept	Neutral answer	Do not accept
FT	HT								
8	2	(a)			2	pH6 – should be pH 11-12 (or alkaline) (1)  burns with an orange flame – should be lilac flame (1)	8-14 / above 7  lithium with implication that reaction should be more rapid (but less rapid than reaction of sodium)		7 or above
		(b)			4	flame test (1) yellow flame (1)  (add) silver nitrate (solution) (1) white precipitate (1)  must have correct test for observation mark to be awarded	orange flame		



Question Number									
FT	HT	Sub-section			Mark	Answer	Accept	Neutral answer	Do not accept
9	3	(a)			2	AlCl <sub>3</sub> (1) formula must be correct to get balancing mark  2,3,2 (1)			
		(b)	(i)		2	102 (2)  if incorrect allow (1) for (27 x 2) + (16 x 3)  no ecf within part (i)			
			(ii)		1	47  ecf possible from part (i)	47.1		

Question Number		Mark	Answer
FT	HT		
10	4	6	<p><b>Indicative content:</b>  how it is carried out – spot of each ink on pencil line and dip end of paper in water, leave for water to rise up paper  what happens – water dissolves ink and carries the components different distances according to their solubilities, appear as spots/streaks on paper / as chromatogram  results – if inks contain the same pigments, the pattern of spots would be identical; different pattern if inks contain different pigments</p> <p><b>5-6 marks:</b> 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><b>3-4 marks:</b> 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><b>1-2 marks:</b> 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><b>0 marks:</b> The candidate does not make any attempt or give a relevant answer worthy of credit.</p>