

Common questions

Question Number		Sub-section		Mark	Answer	Accept	Neutral answer	Do not accept
FT	HT							
8	1	(a)		3	<p>two possible approaches</p> <p>either</p> <ul style="list-style-type: none"> below 54°C, NaCl more soluble (1) at 54°C, solubilities the same (1) above 54°C, CuSO₄ more soluble (1) <p>or</p> <ul style="list-style-type: none"> below 54°C, CuSO₄ increases a lot with temperature, NaCl does not (1) above 54°C, trend continues but CuSO₄ is more soluble than NaCl (1) at 54°C, solubilities the same (1) 	converse		
		(b)		2	<p>$56 - 29 = 27$ (1) no tolerance</p> <p>$27/2 = 13.5$ (1) ecf possible</p> <p>award (2) for cao</p>			

Question Number		Sub-section		Mark	Answer	Accept	Neutral answer	Do not accept
FT	HT							
		(c)		2	<p>water freezes at 0°C / is ice at 0°C / is solid at 0°C / 0°C is the freezing point of water (1)</p> <p>water boils at 100°C / is steam at 100°C / is a gas at 100°C / 100°C is the boiling point of water (1)</p>	<p>these are the freezing point and boiling point of water (2)</p> <p>these are the fixed points of water (2)</p> <p>water is only liquid between these two temperatures (2)</p> <p>water is liquid between these temperatures (1)</p>	melting point	

Higher Tier only questions

Question Number		Sub-section		Mark	Answer	Accept	Neutral answer	Do not accept
FT	HT							
	4	(a)		5	<p>step 1 – use of soap solution to identify distilled water, needs fair testing element for both marks</p> <ul style="list-style-type: none"> • add 1cm³ soap (solution) to 5 cm³ of each water sample (1) • shake for 1 minute/shake for the same time (1) • distilled water most froth (1) <p>step 2</p> <ul style="list-style-type: none"> • boil unidentified samples and repeat step 1 (1) • temporary hard water lathers after boiling; permanent hard water still does not lather after boiling (1) <p>credit alternative methods – up to (3) for method/fair test and up to (2) for conclusions</p>	add soap to each water sample and shake (1)		washing up liquid
		(b)		1	<p>reference to appliance needed</p> <p>furs up kettles/ kettles less efficient / boilers fur up / boilers less efficient / pipes fur up / pipes less efficient</p>		reference to soap 'wastes energy' 'decreases efficiency' 'blocks pipes'	

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FT	HT								
	5	(a)			3	<p>two discrete diagrams needed</p> <ul style="list-style-type: none"> - diagram 1 showing transfer of electrons - diagram 2 showing ions <p>diagram 1 two potassium atoms lose 1 electron each (1) one sulfur atom gains 2 electrons (1)</p> <p>diagram 2 two K^+ ions and one S^{2-} ion formed (1) <i>octet of electrons around S^{2-} not needed</i></p>	if transferred electrons on both potassium and sulfur award (1)		
		(b)			2	<p>two shared pairs of electrons (S—F) (1)</p> <p>octet of electrons around S and both F atoms (1)</p>			

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	6	(a)		1	A steepest line / steepest graph / finishes in the shortest time both needed	greatest gradient / highest gradient / quickest reaction	precipitate	
		(b)		2	time = 22 (1) 0.045 / 0.0455 / 0.04545 (1) award (2) for cao	21 0.048 / 0.0476		0.05
		(c)		3	higher the temperature, faster the rate (1) particles have more energy / move faster at higher temperature (1) must be correct to award third mark therefore greater chance of (successful) collisions / more (successful) collisions per second (1)	more particles have required activation energy	more collisions	

Question Number		Sub-section			Mark	Answer	Accept	Neutral answer	Do not accept
FT	HT								
	7	(a)			3	A iron(III) chloride / FeCl ₃ (1) B sodium chloride / NaCl (1) C bromine / Br ₂ (1)		iron chloride gas	iron(II) chloride Br
		(b)	(i)		2	Ag ⁺ + Cl ⁻ (1) AgCl (1) ignore state symbols			
			(ii)		3	2AgNO ₃ + MgBr ₂ → 2AgBr + Mg(NO ₃) ₂ award (1) each for both products balancing (1) only award balancing mark if both products are correct			

Question Number		Sub-section		Mark	Answer	Accept	Neutral answer	Do not accept
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	8	(a)		3	mass carbon and hydrogen divided by respective A_r values e.g. carbon 9/12 and hydrogen 2/1 (1) ratio of 3:8 (1) C_3H_8 (1) ecf possible if formula given is an alkane award (1) mark only for correct answer with no working			
		(b)		2	$M_r(C_4H_{10}) = 58$ (1) $(48/58) \times 100 = 82.76$ (1) consequential marking	82.8 / 83		

Question Number		Mark	Answer
FT	HT		
	9	6 QWC	<p>Indicative content</p> <ul style="list-style-type: none"> • ethene (monomer) contains a C=C bond/ ethene (monomer) is unsaturated • double bonds in ethene molecules ‘open’ • ethene molecules join together • long chain molecule formed/ polymer formed/ single molecule formed • balanced symbol equation, showing repeating unit • monomer & repeating unit, for example, for polypropene from propene/ PVC from chloroethene / polytetrafluoroethene from tetrafluoroethene <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>