

# Mark Scheme (Results)

January 2013

International GCSE  
Chemistry (4CH0) Paper 2C

Edexcel Level 1/Level 2 Certificate  
Chemistry (KCH0) Paper 2C

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Question number	Expected Answer	Accept	Reject	Marks
1 (a)	bar drawn at height of 32 bar drawn at height of 8 bar drawn at height of 62-64	2 marks for all 3 1 mark for any 2  horizontal lines at correct heights vertical lines ending at correct heights		2
(b)	M1 - capric <u>AND</u> palmitic solid	S	any other state symbols	1
	M2 - formic liquid	l		1
			Total	4

Question number	Answer	Accept	Reject	Marks
2 (a) (i)	D	d		1
(ii)	A	a		1
(b)	M1 - B M2 - the spots do not line up (with any of the blue, red or yellow spots) M2 dependant on M1	b the colours do not match (with any one of blue, red or yellow) the spots are not the same (as those for blue, red or yellow)	contains other colours	1 1
			Total	4

Question number	Answer	Accept	Reject	Marks
3 (a) (i)	M1 - at least two layers of circles drawn with the majority touching one another			1
	M2 - no regular pattern overall			1
(ii)	(particles/they are) <u>more</u> closely packed or (particles they are) <u>closer</u> together or <u>more</u> (particles of them) in a given volume/in the tank	<u>less</u> space between particles, etc  molecules or atoms for particles  reverse arguments	oxygen in place of particles	1
(b) (i)	M1 - bright/brilliant/blinding/white flame	light for flame	any other colour glow for flame	1
	M2 - <u>white</u> powder / solid / smoke / ash			1
(ii)	MgO	correct formula as part of an equation		1
(c) (i)	base/alkali	basic/alkaline (it) forms hydroxide ions (in water)	contains hydroxide ions	1
	(ii) OH <sup>-</sup> / hydroxide			1
			Total	8

Question number	Answer	Accept	Reject	Marks
4 (a)	M1 - bubbles (of gas) / fizzing / effervescence	gas/carbon dioxide given off		1
	M2 - <u>lump/calcium carbonate/solid</u> disappears/gets smaller	dissolves forms a colourless solution		1
(b)	M1 - (bubble through) limewater/calcium hydroxide solution	white precipitate/ suspension/solid (formed)		1
	M2 - (goes) milky/cloudy/chalky			1
	M2 dependent on M1 or near miss, e.g. $\text{Ca(OH)}_2(\text{s})$ IGNORE references to lighted spill goes out			
(c)	time increases, mass decreases  IGNORE references to mass eventually stops decreasing	reverse statement mass decreases with time (they have a) negative correlation	mass goes down with no reference to time	1
(d) (i)	3.3 to 3.5	3 min 18s to 3 min 30s		1
(d) (ii)	lump/calcium carbonate/solid <u>completely</u> reacted	used up/has gone	has dissolved (both) reactants used up	1

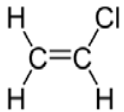
Question Number	Answer	Accept	Reject	Marks
4 (e) (i)	calcium chloride AND hydrochloric acid	hydrogen chloride for hydrochloric acid correct formulae		1
(ii)	IGNORE carbon dioxide / carbonic acid / calcium carbonate calcium chloride AND hydrochloric acid IGNORE carbon dioxide / carbonic acid	hydrogen chloride for hydrochloric acid correct formula	calcium carbonate	1
(f)	M1 - steeper curve to left of original starting at, or close to (100,0) M2 - levels at 98.4 g		curves that 'dip' below 98.4 by more than ½ small square	1 1
			Total	11





Question Number	Answer	Accept	Reject	Marks
5 (c)	M1 - dissolve both (lead(II) nitrate and sodium chloride) in water	dissolve one in water		1
	penalise M1 is any other reagents added			
	M2 - mix/add (the two solutions)	react		1
	M3 - filter	decant		1
	M4 - wash <u>residue/solid/lead ((II)) chloride</u> (with deionised/distilled water)			1
M5 - dry on filter paper/in a (warm) oven/leave to dry /heat	other sensible methods of drying	strong heating	1	
			Total	12

Question number	Answer	Accept	Reject	Marks
6 (a)	$C_{12}H_{22}O_{11} + H_2O \rightarrow 2C_6H_{12}O_6$ Ignore yeast		lower case symbols and numbers not given as subscripts	1
(b) (i)	no more bubbles/fizzing/effervescence IGNORE when no more ethanol is formed/all the glucose has reacted/all the yeast has reacted/references to mass/references to temperature	no more gas/carbon dioxide given off		1
(ii)	filtration/filtering IGNORE sieving	decant	evaporation/distillation	1
(c) (i)	(the elements of) water removed	H <sub>2</sub> O removed 2 hydrogen (atoms) and 1 oxygen (atom) are removed		1
(ii)	aluminium oxide/Al <sub>2</sub> O <sub>3</sub>	(concentrated) sulfuric acid (concentrated) phosphoric acid	dilute acid phosphorus/phosphorous	1
(iii)	chlorine (gas) / Cl <sub>2</sub> If both name and formula given, both must be correct	correct name or formula as part of an equation	chloride / Cl <sup>-</sup>	1
(iv)	CH <sub>2</sub> ClCH <sub>2</sub> Cl → CH <sub>2</sub> (=)CHCl + HCl	C <sub>2</sub> H <sub>4</sub> Cl <sub>2</sub> for CH <sub>2</sub> ClCH <sub>2</sub> Cl and C <sub>2</sub> H <sub>3</sub> Cl for CH <sub>2</sub> =CHCl		1

Question Number	Answer	Accept	Reject	Marks
(d) (i)	 <p>IGNORE bond angles and positions of H and Cl relative to each other</p>			1
(ii)	Any three from: M1 - (one bond in the) double bond breaks M2 - small molecules/monomers/chloroethene molecules join together M3 - to form a (long) chain/macromolecule M4 - product/polymer contains only single bonds			3
			Total	11

Question number	Answer	Accept	Reject	Marks
7 (a) (i)	M1 - $\frac{144}{24\,000}$	One mark for $(144 \div 24) = 6$		1
	M2 - 0.006			1
(ii)	0.006			1
(iii)	M1 - $\frac{0.888}{0.006}$			1
	M2 - 148 ( <u>MUST</u> be a whole number)			1
(iv)	M1 - $(\text{CO}_3) = 60$			1
	M2 - 88			1
	M3 - Sr / strontium			1
	Mark csq throughout part (a)			answer csq on correctly calculated value of M2 (i.e. metal closest to calculated $A_r$ ), but <u>must</u> be a Group 2 metal

Question Number	Answer	Accept	Reject	Marks
7 (b)	Any two from:  M1 - gas was lost between adding acid and replacing bung  M2 - bung does not fit/there are leaks in the apparatus  M3 - some gas dissolved/reacted in the water  M4 - the carbonate was impure  M5 - the temperature (of the gas) was <u>lower</u> than room temperature/25°C			2
			Total	10

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