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Mark Scheme (Results)

November 2012

GCSE Chemistry
5CH2F/01

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GCSE Chemistry 5CH2F/01 Mark Scheme – November 2012

Question Number	Answer	Acceptable answers	Mark
1(a)	exothermic	exthermic exothermal	**(1)**

Question Number	Answer	Acceptable answers	Mark
1(b)	(iron +) oxygen (1) → iron oxide (1)	accept ironoxide (one word) ignore heat ignore (III) and (II)	**(2)**

Question Number	Answer	Acceptable answers	Mark
1(c)	B a catalyst		**(1)**

Question Number	Answer	Acceptable answers	Mark
1(d)	A description including any two of temperature (1) falls /decreases / lowers (1) crystals disappear (1) solution (formed) (1)	 reading on thermometer water becomes colder ignore dissolves ignore fizzing and any other incorrect observations	**(2)**

Question Number	Answer	Acceptable answers	Mark
1(e)	crystals: crushed / powdered / use smaller crystals (1) water: heat / stir faster (1)	break down (crystals) increase surface area larger surface area ignore reference to change in mass increase its temperature boil ignore reference to change in volume	**(2)**

Question Number	Answer	Acceptable answers	Mark
2(a)(i)	B calcium nitrate		**(1)**

Question Number	Answer	Acceptable answers	Mark
2(a)(ii)1	A suggestion to include two from: the reaction was incomplete (1) unwanted reaction(s) / side reactions took place (1) some was lost (in transfer) / left in the beaker (1) some of the solid remained on the filter paper (1)	 ignore some of reactant solutions lost spillage washed away lost in filtering	**(2)**

Question Number	Answer	Acceptable answers	Mark
2(a)(ii)2	3.0/4.0 (1) (any fraction) X 100 (1) (= 75 %)	3/4 75(%) only scores 2 marks	**(2)**

Question Number	Answer	Acceptable answers	Mark
2(b)(i)	108 + 35.5 (1) (= 143.5)	143.5 with no working scores the mark	**(1)**

Question Number	Answer	Acceptable answers	Mark
2(b)(ii)	108/answer to (b)(i) (1) (any fraction) X 100 (1) (= 75.261 %) x 100 (1)	If no working allow 2 marks for 75 or 75.3 or 75.2 or 75.26 or 75.261 (%)	**(2)**

Question Number	Answer	Acceptable answers	Mark
3(a)	B group 1		**(1)**

Question Number	Answer	Acceptable answers	Mark
3(b)	Rb / Cs / Fr	ONLY reject RB, CS, FR reject rb, cs, fr	**(1)**

Question Number	Answer	Acceptable answers	Mark
3(c)	**one** line from alkali metals to soft and low melting points (1) **one** line from transition metals to strong and high melting points (1)	if more than one line from alkali metals box then 0 mark if more than one line from transition metals box then 0 mark	**(2)**

Question Number	Answer	Acceptable answers	Mark
3(d)(i)	Any one of the following points use small piece of potassium (1) use (safety) screen /shield (1) make sure students safe distance away (1)	 drop at arm's length description of screen teacher steps away (after dropping potassium) wear gloves ignore tongs ignore fume cupboard	**(1)**

Question Number	Answer	Acceptable answers	Mark
3(d)(ii)	(potassium hydroxide) aq (1) (hydrogen) g (1)	capital letters	**(2)**

Question Number	Answer	Acceptable answers	Mark
3(d)(iii)	A description including any two of effervescence / fizzing / bubbles (1) potassium floats / on surface (1) moves (1) potassium forms ball / sphere (1) potassium disappears / becomes smaller(1) flame (seen) (1)	 ignore cloudy/white trail ignore reacts ignore dissolve catches fire ignore smoke ignore references to use of / result of adding indicator (to the water)	**(2)**

Question Number	Answer	Acceptable answers	Mark
3(d)(iv)	2 (1) 2 (1)	reject multiples of equation	**(2)**

Question Number	Answer	Acceptable answers	Mark
4(a)	A description to include neutrons in nucleus (1) protons in nucleus (1) electrons in shells / orbits (1)	all marks can be scored from **labelled** diagram description of position of particles without use of "nucleus" or "shell /orbit" BUT if description or labels on diagram do not mention "nucleus" **or** "shell /orbit" at least once then max 2 marks ignore charges / masses / numbers of particles	**(3)**

Question Number	Answer	Acceptable answers	Mark
4(b)	D 2.8.7		**(1)**

Question Number	Answer	Acceptable answers	Mark
4(c)(i)	an explanation linking outer {shell / orbit} (electrons) (1) 7 / same number (of electrons) (1)	 one / same number of electrons short (of next noble gas)	**(2)**

Question Number	Answer	Acceptable answers	Mark
4(c)(ii)	a description to include (dark) red (1) liquid (1)	 red-brown / brown-red ignore any references to vapour	**(2)**

Question Number	Answer	Acceptable answers	Mark
4(d)	An explanation linking any two of nucleus very small (by comparison with atom) / atom very large compared to nucleus / most of atom consists of empty space (1) most particles {miss nucleus / go straight through (atom)} / only a few particles (1 in 20 000) {pass close to / hit} nucleus (1) (gold) nuclei positive / both (nucleus and particles) {positively charged / have same charge} (1)		**(2)**

Question Number	Answer	Acceptable answers	Mark
5(a)(i)	covalent		**(1)**

Question Number	Answer	Acceptable answers	Mark
5(a)(ii)	HCl	ClH ignore subscript 1 after either or both atoms ignore any working	**(1)**

Question Number	Answer	Acceptable answers	Mark
5(a)(iii)	C has a low boiling point		**(1)**

Question Number	Answer	Acceptable answers	Mark
5(b)	$H_2 + F_2 \rightarrow 2\ HF$ correct formulae on correct sides of equation (1) balancing correct formulae (1)	accept = for → multiples reject f for F and h for H BUT allow mark for balancing completely correct equation but reversed scores 1 mark	**(2)**

Question Number		Indicative Content	Mark
QWC	***5(c)**	A description including some of the following points **molecules** simple / small molecule separate / discrete molecules covalent bonds (between atoms in molecule) displayed structure for CH_4 weak forces between molecules **properties** to boil need to separate molecules little energy needed (as weak forces between molecules) therefore low boiling point to be able to conduct must have charged particles which must be free to move no charged particles present no delocalised /free electrons / no ions present all electrons are in covalent bonds therefore does not conduct electricity / cannot carry current	**(6)**
Level	**0**	No rewardable content	
1	**1 - 2**	a limited description e.g. methane is a simple / small molecule e.g. weak forces between molecules the answer communicates ideas using simple language and uses limited scientific terminology spelling, punctuation and grammar are used with limited accuracy	
2	**3 - 4**	a simple description e.g. methane is a simple / small molecule with weak forces between molecules (so low boiling point) e.g. {it is covalent / there are no charged particles (ions or free electrons)} to move and carry the current the answer communicates ideas showing some evidence of clarity and organisation and uses scientific terminology appropriately spelling, punctuation and grammar are used with some accuracy	
3	**5 - 6**	a detailed description e.g. methane is a simple / small molecule with weak forces between molecules (so low boiling point) AND any mention of lack of charged particles e.g. does not conduct electricity because {it is covalent /there are no charged particles (ions or free electrons)} to move and carry the current AND any mention of separate molecules or weak forces between them the answer communicates ideas clearly and coherently uses a range of scientific terminology accurately spelling, punctuation and grammar are used with few errors	

Question Number	Answer	Acceptable answers	Mark
6(a)	An explanation linking the following two elements / magnesium and oxygen (1) combined / bonded/(chemically) joined together (1)	 ignore mixture ignore reacted together ignore type of bond	**(2)**

Question Number	Answer	Acceptable answers	Mark
6(b)(i)	two electrons in first shell and eight in outer shell	dots or crosses or combination of both	**(1)**

Question Number	Answer	Acceptable answers	Mark
6(b)(ii)	An explanation including two of the following points idea of electron(s) transfer in correct direction (1) two (electrons transferred) (1)	 marks can be scored in a diagram any indication of covalent bonding / electron sharing scores 0	**(2)**

Question Number	Answer	Acceptable answers	Mark
6(b)(iii)	A has a high melting point		**(1)**

Question Number		Indicative Content	Mark
QWC	***6(c)**	A description to include some of the following points **flame test** use a wire / splint concentrated hydrochloric acid / water dip in solid put in flame gives a colour (to flame) yellow (flame) **NB Only ONE of salts needs to be identified** **test for chloride** dissolve salt in water add dilute nitric acid add silver nitrate solution white precipitate formed **test for carbonate** add dilute acid (to solid) effervesces / fizzes /bubbles (pass) gas (given off) (into) limewater turns milky / cloudy / white (so) carbon dioxide (formed)	**(6)**

Level	**0**	No rewardable content
1	**1 - 2**	a limited description e.g. put salt in flame e.g. add acid to (suspected) carbonate the answer communicates ideas using simple language and uses limited scientific terminology spelling, punctuation and grammar are used with limited accuracy
2	**3 - 4**	a simple description e.g. put salt in flame and gives correct colour e.g. add acid to the carbonate and it fizzes e.g. add silver nitrate (solution) and white ppt (forms) e.g. put salt in flame (to show sodium present) and add silver nitrate (solution) to show chloride present the answer communicates ideas showing some evidence of clarity and organisation and uses scientific terminology appropriately spelling, punctuation and grammar are used with some accuracy
3	**5 - 6**	a detailed description e.g. salt put in flame produces yellow (flame) and when silver nitrate solution added a white precipitate forms with the chloride e.g. silver nitrate solution to solution of solid gives white ppt showing chloride and sodium salts give yellow flame e.g. solid on wire / splint put into flame gives yellow colour AND silver nitrate (solution) added shows chloride the answer communicates ideas clearly and coherently uses a range of scientific terminology accurately spelling, punctuation and grammar are used with few errors

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