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Mark Scheme (Results)
November 2009

IGCSE

IGCSE Science (Double Award) (4437) Paper 2F

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S E C T I O N A

Question			Mark	Acceptable answers	Notes	Total
1	**a**		M1	S		**1**
	b		M1	O		**1**
	c		M1	1	Accept Alkali metals	**1**
	d		M1	2		**1**
	e		M1	Al / aluminium		**1**
					TOTAL	**5**

Question			Mark	Acceptable answers	Notes	Total
2	**a**		M1	hydrocarbons		**1**
			M2	heated		**1**
			M3	distillation		**1**
			M4	top		**1**
			M5	condenses		**1**
					TOTAL	**5**

Question			Mark	Acceptable answers	Notes	Total
3	**a**	**i**	M1	copper		**1**
		ii	M1	sodium / copper		**1**
		iii	M1	iron		**1**
		iv	M1	copper		**1**
3	**b**		M1	cross in box 2		**1**
			M2	cross in box 3		**1**
					TOTAL	**6**

Question			Mark	Acceptable answers	Notes	Total
4	**a**		M1	white		**1**
			M2	colourless		**1**
			M3	decomposition		**1**
	b		M1	ammonium chloride		**1**
	c	**i**	M1	white precipitate / solid / suspension	ignore powder / crystals	**1**
		ii	M1	ammonia / NH_3		**1**
					TOTAL	**6**

Question			Mark	Acceptable answers	Notes	Total
5	**a**		M1 M2	(dilute) sulphuric acid water + carbon dioxide (gas) + → + (solid) zinc carbonate zinc sulphate	M1 zinc sulphate M2 complete equation	**1**
	b		M1	limewater		**1**
			M2	turns milky		**1**
	c		M1	heat / increase the temperature	Any two for 1 each	**1**
			M2	use powdered/smaller pieces(of zinc carbonate)		**1**
			M3	use more concentrated (sulphuric) acid		**1**
	d	**i**	M1	carbonic (acid)		**1**
		ii	M1	cross in box 2		**1**
		iii	M1	orange / yellow		**1**
					TOTAL	**9**

Question			Mark	Acceptable answers	Notes	Total
6	**a**		M1	limestone / calcium carbonate	Either way round	**1**
			M2	coke / carbon		**1**
			M3	(hot) air		**1**
			M4	slag / calcium silicate	Award 1 mark for D and E in reverse order	**1**
			M5	iron		**1**
	b	**i**	M1	$C + O_2 \rightarrow CO_2$		**1**
		ii	M1	carbon + carbon dioxide → carbon monoxide		**1**
		iii	M1	loss of oxygen	Accept gain of electrons	
					TOTAL	**8**

Question			Mark	Acceptable answers	Notes	Total
7	**a**		M1	black		**1**
			M2	blue	Reject green	**1**
	b	**i**	M1	to neutralise/use up/react with all the acid		**1**
		ii	M1	to remove the solid / copper oxide		**1**
		iii	M1	to remove/evaporate (some of) the water	Accept "so crystals form"	**1**
		iv	M1	to dry the crystals / absorb water		**1**
					TOTAL	**6**

SECTION A TOTAL: 45 MARKS

S E C T I O N B

Question			Mark	Acceptable answers	Notes	Total
8	**a**		M1	(electron) 1/1836 / negligible	Accept value in range 1/2000 to 1/1800 and 0.0005 to 0.00056 Ignore zero	**1**
			M2	(neutron) 0		**1**
			M3	(proton) 1		**1**
			M4	(proton) +1		**1**
	b	**i**	M1	(number of) protons and neutrons		**1**
			M2	35		**1**
		ii	M1	18		**1**
	c	**i**	M1	5		**1**
		ii	M1	isotopes		**1**
					TOTAL	**9**

Question			Mark	Acceptable answers	Notes	Total
9	**a**	**i**	M1	different boiling points / boiling point of propanone lower than that of water		**1**
		ii	M1	heat / boil		**1**
			M2	propanone boils/collects (first)		**1**
			M3	stop collecting liquid above 56 °C	Accept wording that indicates that water collected separately or not at all	**1**
	b		M1	cross in column 1 box 4		**1**
			M2	cross in column 2 box 2		**1**
					TOTAL	**6**

Question			Mark	Acceptable answers	Notes	Total
10	**a**		M1	(bromine) liquid		**1**
			M2	grey / black		**1**
	b	**i**	M1	any indication of chlorine in left hand tube		**1**
		ii	M1	hydrogen / H_2		**1**
		iii	M1	brine / sodium chloride solution / NaCl(aq)	Accept concentrated/saturated NaCl Ignore sea water	**1**
	c		M1 M2	chlorine + sodium bromide → bromine + sodium chloride	M1 reagents M2 products	**2**
					TOTAL	**7**

Question			Mark	Acceptable answers	Notes	Total
11	**a**		M1	double bond / C=C / not all bonds are single		**1**
	b		M1	contains bromine / another element/atom does not contain only carbon and hydrogen		**1**
	c		M1	B and E		**1**
	d		M1	A and B / A and E / C and F		**1**
	e		M1	alkane(s)		**1**
			M2	C_nH_{2n+2}	Accept other symbols such as x	**1**
	f		M1	yellow / orange / brown		**1**
			M2	colourless / decolorised	Ignore clear	**1**
					If only colourless stated, assume it is final colour	
					TOTAL	**8**

SECTION B TOTAL: 30 MARKS

PAPER TOTAL: 75 MARKS

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