

June 2003

INTERNATIONAL GCSE

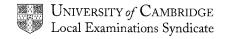
MARKING SCHEME

MAXIMUM MARK: 80

SYLLABUS/COMPONENT: 0620/02

CHEMISTRY

(Core Paper 2)



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	IGCSE EXAMINATIONS – June 2003	0620	2

1	(a)	(i) (ii) (iii) (iv) (v) (vi)	Fe/Cu ALLOW Zn C/N/S/F/C1/Br O/S C Li/Na/K ALLOW F CU/Zn/Br/Kr	[1] [1] [1] [1] [1]
	(b)		argon - light bulbs; chlorine - kills bacteria; carbon - as lubricant; helium - in balloons	[4]
	(c)	(i) (ii) (iii)	covalent BrF ₅ ALLOW F ₅ Br ions/charged particles; NOT: particles not free to move in solid/free to move in molten/liquid state	[1] [1]
2	(a)		drop small tube in acid/loosen string/idea of mixing zinc and acid/let go of cotton ALLOW: cut the string NOT: heat (the acid) NOT: pull the string	[1]
	(b)	(i) (ii) (iii)	correct plotting including 0-0 point (_1 per omission or error) best curve drawn and to go through origin no more gas produced/reaction finished; all zinc reacted/used up	[2] [1] [2]
	(c)		graph drawn with faster initial rate and starting at 0-0; ALLOW: straight line as initial rate ends up at 55 cm ³	[2]
	(d)	(i) (ii) (iii)	2 (HC <i>I</i>) zinc chloride 136 IGNORE units	[1] [1] [1]
	(e)		substance containing only one type of atom/substance which cannot be broken down to any other substance by <u>chemical means</u> NOT 'can't be split' alone NOT is a pure substance	[1]
3	(a)	(i) (ii)	evaporation/vaporisation/boiling freezing/solidification	[1] [1]
		(iii)	NOT: fusion condensing/condensation/liquefaction	[1]
	(b)		2 nd box ticked	[1]
	(c)		A; energy needed to overcome forces between molecules/idea of energy input/taking in heat	[2]
	(d)	(i) (ii) (iii)	chlorine bromine sodium chloride	[1] [1] [1]

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	(e)	(i)	diffusion NOT: Brownian motion	[1]
		(ii)	ammonium chloride NOT: ammonia chloride	[1]
		(iii)	ammonia diffuses or moves faster/HC l diffuses or moves slower/ammonia has lower mass/HC l higher mass/molecules of HC l and ammonia move at different speeds NOT: ammonia evaporates faster/HC l evaporates more slowly	[1]
	(f)		neutralisation/acid base NOT: exothermic NOT: addition	[1]
	(g)	 (g) (i) thermometer (ii) reference to the solid or melting point of the solid is needed for the boiling point of water too low to get solid to melt/boiling water cannot 155°C NOT: boiling point of water is only 100°C/boiling point of water too low. NOT: water boils off first 		[1]
				[1]
		(iii)	so that the liquid is the same temperature throughout/no hot or cold spots/so the tube is the same temperature as the thermometer/so heat can circulate in all places ALLOW: so that temperature of liquid is balanced NOT: to keep temperature constant	[1]
4	(a)	(i) (ii)	breaking down of molecules substances using heat substance which speeds up a reaction NOT: alters/changes rate of reaction NOT: speeds up and slows down rate	[1] [1]
	(b)		ethene/ethylene NOT: formula	[1]
	(c)	(i) (ii)	paraffin 4000g/4kg	[1] [1]
		(iii)	(correct unit needed) C_2H_4 ; H_2	[2]
	(d)	(i)	two units polymerised with continuation bonds at either end and hydrogen atoms drawn ALLOW: $-CH_2CH_2CH_2-$ ALLOW: $-[-CH_2CH_2-]_{-n}$ ALLOW: $-[-CH_2-]_{-n}$	[1]
		(ii)	addition (polymerisation)	[1]
5	(a)		(sodium) hydroxide/ammonia; → green/grey green; silver nitrate; → yellow; ALLOW: lead nitrate NOT: cream	[2] [2]
			ALLOW: bubble chlorine → grey/black (precipitate) silver nitrate; → white: barium chloride/nitrate; → white; ALLOW: lead acetate	[2] [2]

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	(b)		filtration/filtering or diagram of correct apparatus for filtration (filter paper must be present on diagram) NOT: decanting sodium chloride through filter paper/shown on diagram; NOT: filtrate through filter paper	
			evaporate off water from sodium chloride/suitable diagram ALLOW: distilling off <u>water</u>	[3]
	(c)		different atoms/elements (chemically) joined/bonded/combined (both points needed) (reference to mixtures = 0 unless qualified enough in time frame e.g. a mixture of elements which are then chemically combined)	[1]
	(d)	(i) (ii)	chlorine/C l_2 sodium/Na	[1] [1]
6	(a)		potassium/magnesium/aluminium	[1]
	(b)		they did not have electricity/did not know about electrolysis/did not know the metal existed NOT: did not have the right technology	[1]
	(c)	(i)	indication that bubbles produced rapidly or quickly/slower than magnesium but faster than zinc	
			OR number of bubbles produced intermediate between magnesium and zinc; uranium dissolved slower than magnesium but faster than zinc/dissolves at	[1]
		/::\	medium rate etc.	[1]
		(ii)	atoms of same element with different mass number/different number of neutrons/different nucleon number	[1]
		NOT: compounds/molecules with different mass number indication of use for energy – nuclear power stations/nuclear energy ALLOW: atomic/nuclear bombs NOT: curing cancer/medical uses NOT: 'for fuel'		[1]
	(d)		magnesium oxide	
	()		ALLOW: MgO	[1]
	(e)	(i) (ii)	idea of mixture of (different) metals alloys harder/stronger/decreased malleability/increased toughness/increased	[1]
		(11)	corrosion resistance/heat or electrical resistance increased NOT: increase in melting point NOT: cheaper NOT: improving properties	[1]
	(f)		removes oxygen from zinc oxide ALLOW: definition of reduction involving oxidation numbers/electron transfer	[1]
	(g)	(i)	reversible reaction	[1]
		(ii)	ALLOW: equilibrium 76-80%	[1]
	(h)	(i) (ii)	correct electronic structure of Mg (2.8.2) on diagram loses two electrons/loses its valence electrons = 2 forms Mg ²⁺ ion = 1	[1]
			loses electron(s) = 1 forms Mg ²⁺ ion by losing electrons = 2	[2]