



Rewarding Learning

General Certificate of Secondary Education

2012

Science: Double Award (Modular)

Paper 2
Foundation Tier

[G8202]

TUESDAY 12 JUNE, MORNING

**MARK
SCHEME**

1	(a) (i) hazard	[1]
	(ii) Any two : warn of danger/eye-catching/internationally understood (2 × [1])	[2]
	(iii) D	[1]
	(iv) A	[1]
	(v) corrosive or equivalent not irritant not harmful	[1]
(b)	(i) boils [1] taken in [1]	[2]
	(ii) sublimation	[1]
	(iii) compressible	[1]
	(iv) increases	[1]
(c)	(i) (excellent) conductor of electricity	[1]
	(ii) cheaper or stronger	[1]
	(iii) Any two of: idea that aluminium/has low density/(very) good conductor of electricity/idea of not reacting not idea of not rusting ignore reference to cost	[2]
(d)	(i) Na	[1]
	(ii) nitrogen monoxide	[1]
	(iii) sodium hydrogencarbonate	[1]
	(iv) CuCl ₂	[1]
	(v) H ₂ O(g)	[1]

AVAILABLE MARKS
20

2	(a) (i)	1. combustion accept oxidation	[1]
		2. photosynthesis	[1]
		3. neutralisation	[1]
		4. reduction	[1]
	(ii)	2	[1]
	(b) (i)	water/steam	[1]
	(ii)	blue [1] to white [1]	[2]
	(c) (i)	lower temperature/slows down	[1]
		higher HCl concentration/speeds up	[1]
		using magnesium powder/speeds up	[1]
		addition of catalyst/speeds up	[1] [4]
	(ii)	gas syringe/appropriate graduated apparatus	[1]
	(iii)	idea of bubbles stopping or magnesium used up/magnesium has disappeared	[1]
	(d) (i)	C	[1]
	(ii)	A	[1]
	(iii)	A	[1]
	(iv)	idea of a fair test	[1]
	(e)	Any two of: good for teeth and bones/good for brewing/nice taste/ tanning leather/prevent heart disease (2 × [1]) do not accept just health or contains calcium irons	[2]

AVAILABLE MARKS
20

3	(a)	chlorine: reactive and green or yellow-green	[1]	
		nitrogen: colourless and no (poisonous)	[1]	
		helium: lighter and unreactive	[1]	[3]
	(b)	<i>Appearance:</i> Grey/yellow [1] solid (mixture) [1] or grey solid (iron) [1] yellow powder (sulphur) [1]		
		<i>Safety precaution:</i> Wear safety goggles/carry out in fume cupboard [1]		
		<i>Description:</i> Mixture glows when heated [1]		
		Pungent smell [1] bad/choking/rotten eggs not strong smell		
		Continues to glow when removed from heat [1]		
		Allow burns with blue flame [1]		
		Grey/black solid forms [1]		
		<i>Product:</i> Iron sulphide/iron(II) sulphide [1] FeS [1] allow idea of sulphur melts [1]		
		(7 × [1]) allow up to 6 for the appearance, safety and description marks at least one product mark needed for 7		[7]
		Quality of written communication		[1]
	(c)	(i) toxic/poisonous gas/stops oxygen getting to body	[1]	
		odourless/colourless	[1]	[2]
		(ii) idea of needing good supply air/oxygen/for complete combustion or other correct prevents, e.g. leaks of carbon monoxide/poisonous gas or to prevent incomplete combustion		[1]
		not idea of formation of carbon monoxide		
		(iii) idea of global warming/greenhouse effect		[1]
	(d)	(i) chlorine is poisonous		[1]
		(ii) colourless [1] to brown /yellow-brown/orange-brown/red-brown		[2]
		(iii) $\text{Cl}_2 + 2\text{KI} \rightarrow \text{I}_2 + 2\text{KCl}$		[1]
		(iv) bromine		[1]

- 4 (a) (i) Any **three** of:
 he left spaces
 elements arranged in order of atomic mass **not** mass or mass number
 idea that it had a relatively small number of elements
 elements were arranged in Groups
 elements were arranged in Periods
 metals were separated from non-metals
or other correct i.e. hydrogen in Group I
 Maximum (3 × [1]) [3]

- (ii) Any **three** of:
 elements arranged in order of increasing atomic number
 more elements/more periods
 no spaces
 idea of some elements having their position changed
 (as long as incorrect answer is not given)
 noble gases included
Accept idea of actinides **Accept** lanthanides
 transition metals between Group II and Group III **or** in a block
or other correct e.g. hydrogen not in Group I
 Maximum (3 × [1]) [3]

(b)

Element	Group	Period	Electronic structure
potassium	I [1]	4	2,8,8,1 [1]
magnesium	II	3 [1]	2,8,2 [1]
sulphur [1]	VI [1]	3	2,8,6

[6]

- (c) (i) all have same number of electrons in their outer shells/all have one electron in their outer shell [1]
- (ii) reactivity increases [1]
- (iii) iodine [1]
- (iv) decreases [1] then increases [1] then decreases for argon [1] [3]
 Allow [1] for decreases but **not** for increase alone
- (d) (i) magnesium hydroxide **or** magnesium oxide **or** magnesium carbonate [1]
- (ii) sulphuric acid [1]

Total

20

80