Rewarding Learning

General Certificate of Secondary Education
2012

Science: Double Award (Modular)

Paper 2
Foundation Tier

[G8202]

TUESDAY 12 JUNE, MORNING

MARK SCHEME

					AVAILABLE MARKS
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)	$H_2O(g)$	[1]	20

					AVAILABLE MARKS
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]	20

AVAILABLE MARKS

3 **(a)** chlorine: reactive **and** green or yellow-green [1]
nitrogen: colourless **and** no (poisonous) [1]
helium: lighter **and** unreactive [1] [3]

(b) *Appearance:* Grey/yellow [1] solid (mixture) [1] or grey solid (iron) [1] yellow powder (sulphur) [1]
Safety precaution: Wear safety goggles/carry out in fume cupboard [1]
Description: 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]
Product: 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) $Cl_2 + \mathbf{2}KI \rightarrow I_2 + \mathbf{2}KCl$ [1]

(iv) bromine [1]

20

AVAILABLE MARKS

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] 20

Total **80**