Mark scheme

The Periodic Table

Chemistry 0620 · Questions from Paper 1, Paper 2, Paper 3 and Paper 4

Total marks

40

MARKS FOR EACH QUESTION

1	2	3	4	5	6	7	8	9	10	Total
1	1	1	1	1	1	8	8	6	12	**40**

Question 1 [1]

Answer A

Question 2 [1]

Answer D

Question 3 [1]

Answer A

Question 4 [1]

Answer D

Question 5 [1]

Answer B

Question 6 [1]

Answer B

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Question 7 [8]

7(a)	B	1
7(b)	F	1
7(c)	D	1
7(d)	A **AND** E	1
7(e)	G	1
7(f)	C	1
7(g)	B	1
7(h)	F	1

Question 8 [8]

8(a)	**M1** solid (1) **M2** black (1)	2
8(b)(i)	**M1** colourless (1) **M2** to brown / orange / yellow (1)	2
8(b)(ii)	$Cl_2 + 2KBr \rightarrow 2KCl + Br_2$ **OR** $Cl_2 + 2Br^- \rightarrow 2Cl^- + Br_2$ **M1** all formulae (1) **M2** equation balanced correctly (1)	2
8(c)	**M1** two ticks for Cl_2 / KI, Br_2 / KI (1) **M2** three crosses for Br_2 / KCl, I_2 / KCl and I_2 / KBr (1)	2

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Question 9 **[6]**

9 In **(a)**, **(b)** and **(c)**, descriptions of chemical properties need not be detailed. If more than one answer is given in each section, mark the **first** one and ignore anything subsequent unless it contradicts what they have already written. No marks for reversing physical and chemical properties.

(a) properties should focus on a group 1 metal and not just metals in general

PHYSICAL soft / can be cut (with a knife) / low density / light / low melting point / (good) conductor (heat or electricity) / shiny (when freshly cut) / malleable / ductile / tarnishes [1]

CHEMICAL react with water (**not** steam) / (very) reactive / forms salts with halogens / react vigorously with acids (**ignore** concentration) / forms an alkaline or basic oxide / fixed oxidation state or oxidation number or valency of +1 / has one valency or outer shell electron **not** forms ionic compounds on its own. [1]

(b) properties should focus on a transition metal

PHYSICAL hard / high density / dense / high mp or bp / (good) conductor (heat or electricity) / strong / malleable / ductile / silver or grey or lustrous or shiny solid [1]

CHEMICAL more than one oxidation state or valency (**accept** many oxides) / forms coloured compounds or ions (**not** coloured on its own) / forms complex ions / behave as a catalyst / less reactive than group 1 [1]

(c) PHYSICAL colourless gas / yellow gas [1]
not diatomic molecules

CHEMICAL most reactive halogen / **very** reactive / forms **ionic** fluorides / bonds with metals / form **covalent** fluorides / bonds with non-metals / powerful oxidant / gains one electron (to be stable) / fixed oxidation state or valency of –1
allow decolourised when reacts with alkene) / forms F^- ions / forms acidic oxides / forms an acid when reacted with hydrogen / hydride is acidic [1]
not bleaching agent

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Question 10 **[12]**

10 **(a)** **(i)** Any **four** suitable differences e.g.: [4]

- no noble gases / only 7 (standard) Groups ORA;
- hydrogen / H in same column as Li ORA;
- some elements missing / named element missing / empty spaces ORA
- groups are horizontal rather than vertical / reference to groups or periods being different ORA
- not ordered according to atomic number / no proton numbers
- Zn put in same group as Be and Mg ORA

(ii) any **two** from: [1]
fluorine, chlorine, bromine, oxygen , nitrogen , hydrogen

(b) any **three** from: [3]

- melting points / boiling points;
- density;
- catalytic activity;
- strength
- hardness
- electrical conductivity / heat conductivity
- malleability / ductility

(c) 2 (Cl_2); [1]
CO_2 (on right); [1]

(d) to prevent sodium reacting with air / to stop the Ti reacting with the air / to exclude air / to stop the hydrolysis of the titanium oxide / to exclude water (vapour); [1]

because argon is inert / unreactive / inactive / does not react; [1]

[Total: 12]

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