

1 Which one of the following does **not** have a pair of s electrons in its highest filled electron energy sub-level?

- A H^-
- B Mg
- C P^{3+}
- D Ar

(Total 1 mark)

2 Assuming that chlorine exists as two isotopes, and that hydrogen and carbon exist as one isotope each, how many molecular ion peaks will be shown in the mass spectrum of $\text{C}_4\text{H}_6\text{Cl}_4$?

- A 2
- B 3
- C 4
- D 5

(Total 1 mark)

3 Which of these atoms has the smallest number of neutrons?

- A ^3H
- B ^4He
- C ^5He
- D ^4Li

(Total 1 mark)

4 Which one of the following statements is **not** correct?

- A The first ionisation energy of iron is greater than its second ionisation energy.
- B The magnitude of the lattice enthalpy of magnesium oxide is greater than that of barium oxide.
- C The oxidation state of iron in $[\text{Fe}(\text{CN})_6]^{3-}$ is greater than the oxidation state of copper in $[\text{CuCl}_2]^-$
- D The boiling point of C_3H_8 is lower than that of $\text{CH}_3\text{CH}_2\text{OH}$

(Total 1 mark)

5

Ions of two isotopes of iron are



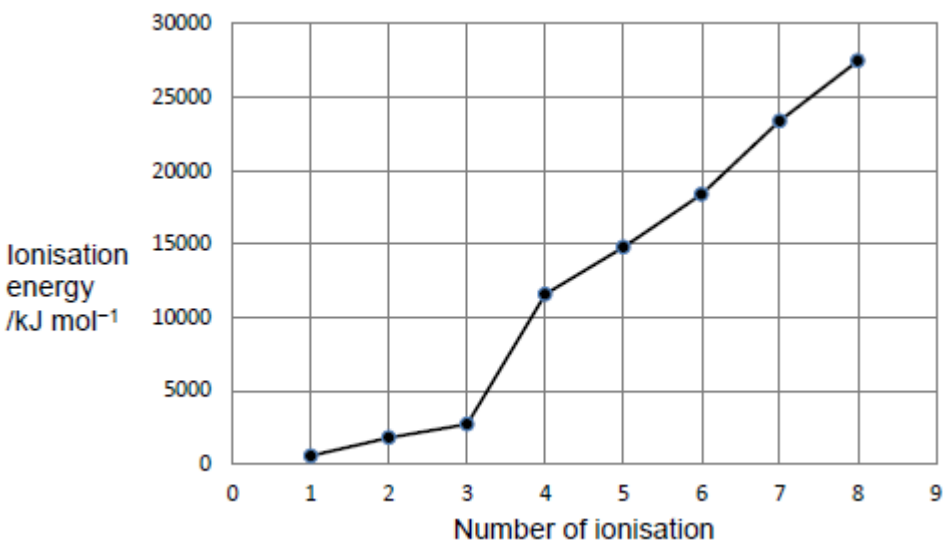
Which statement is correct?

- A The ions of both the isotopes have the electronic configuration $1s^2 2s^2 2p^6 3s^2 3p^6 4s^2 3d^6$
- B The ions of both the isotopes contains 26 neutrons
- C $^{53}\text{Fe}^{2+}$ has fewer protons than $^{56}\text{Fe}^{2+}$
- D After acceleration to the same kinetic energy $^{56}\text{Fe}^{2+}$ will move more slowly than $^{53}\text{Fe}^{2+}$

(Total 1 mark)

6

The successive ionisation energies for element X are shown in the following graph.



Which element is X?

- A Nitrogen
- B Phosphorus
- C Aluminium
- D Boron

(Total 1 mark)

7 Which change requires the largest amount of energy?

- A $\text{He}^+(\text{g}) \longrightarrow \text{He}^{2+}(\text{g}) + \text{e}^-$
- B $\text{Li}(\text{g}) \longrightarrow \text{Li}^+(\text{g}) + \text{e}^-$
- C $\text{Mg}^+(\text{g}) \longrightarrow \text{Mg}^{2+}(\text{g}) + \text{e}^-$
- D $\text{N}(\text{g}) \longrightarrow \text{N}^+(\text{g}) + \text{e}^-$

(Total 1 mark)

8 Which of these atoms has the largest atomic radius?

- A Ar
- B Cl
- C Mg
- D Na

(Total 1 mark)

9 Bromine exists as two isotopes ^{79}Br and ^{81}Br , which are found in almost equal abundance.

Which of the statements is correct?

- A The first ionisation energy of ^{79}Br is less than the first ionisation energy of ^{81}Br
- B The atomic radius of ^{79}Br is less than the atomic radius of ^{81}Br
- C The mass spectrum of $\text{C}_3\text{H}_7\text{Br}$ has two molecular ion peaks at 122 and 124
- D ^{79}Br is more reactive than ^{81}Br

(Total 1 mark)

10Which of these correctly shows the numbers of sub-atomic particles in a $^{41}\text{K}^+$ ion?

	Number of electrons	Number of protons	Number of neutrons	
A	19	19	20	<input type="radio"/>
B	18	20	21	<input type="radio"/>
C	18	19	22	<input type="radio"/>
D	19	18	23	<input type="radio"/>

(Total 1 mark)

Mark schemes

1	D	[1]
2	D	[1]
3	D	[1]
4	A	[1]
5	D	[1]
6	C	[1]
7	A	[1]
8	D	[1]
9	C	[1]
10	C	[1]