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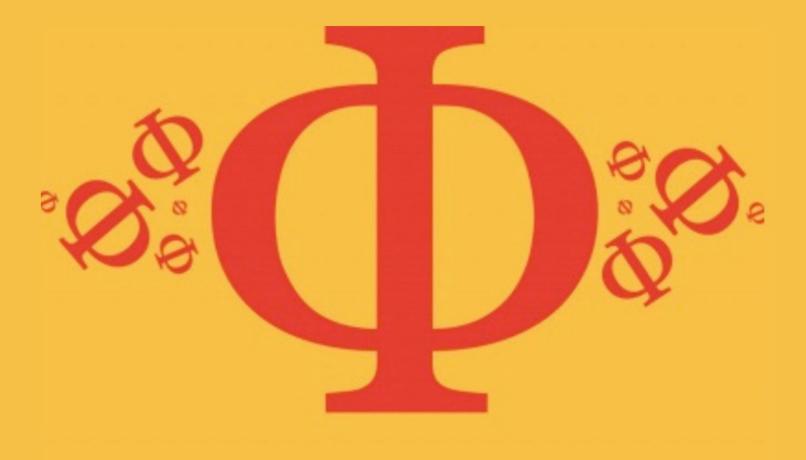
Detailed mark scheme

Suitable for all boards

Designed to test your ability and thoroughly prepare you

IB Chemistry: SL

2.1 Atomic & Electronic Structure



CHEMISTRY

SL



2.1 Atomic & Electronic Structure Question Paper

Course	DP IB Chemistry
Section	1. Stoichiometric Relationships
Торіс	2.1 Atomic & Electronic Structure
Difficulty	Hard

EXAM PAPERS PRACTICE

Time allowed: 20

Score: /10

Percentage: /100



Which species produces a half-filled set of p orbitals on losing an electron?

- A. Li+
- B. F
- C. N
- D. N-

[1 mark]

Question 2

Which statement explains why electrons pair up in orbitals before occupying an orbital of a higher energy level?

- A. the energy from repulsion is greater than the jump to a higher orbital
- B. electrons occupy higher energy orbitals before lower energy orbitals
- C. electrons in lower orbitals have higher energies
- D. the energy from repulsion is less than the jump to a higher orbital

[1 mark]

EXAM PAPERS PRACTICE

Question 3

An element consists of two isotopes ⁶⁹X and ⁷¹X, whose abundances are 60% and 40% respectively. What is the relative atomic mass of element X?

- A. 69.2
- B. 69.8
- C. 70.0
- D. 70.2



Element X is in period 2 and has the first seven ionisation energies in kJ mol⁻¹ as shown.

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What is the electronic configuration of element X?

- A. 1s 2 s 2 p 4
- B. 1s 2s2p2
- C. $1s^2s^2p^3$
- D. 1s ²s ²p⁶

[1 mark]

Question 5

For the successive ionisation energies of oxygen, where would the highest jump be expected to occur?

- A. second ionisation energy
- B. first ionisation energy
- C. seventh ionisation energy
- D. sixth ionisation energy

[1 mark]

EXAM PAPERS PRACTICE

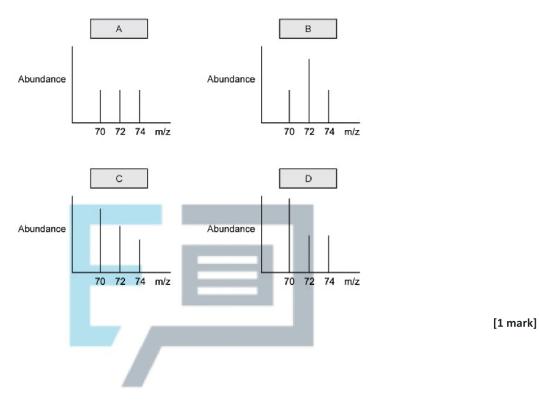
Question 6

Which statement explains the similarity in chemical behaviour for isotopes of the same element?

- A. they may have the same electronic configuration, depending on the reaction
- B. they have the same electronic configuration
- C. their mass numbers are different
- D. they have different numbers of neutrons



Chlorine has two naturally occurring isotopes, Cl³⁵ and Cl³⁷, whose abundance is 75% and 25% respectively. The mass spectrum of chlorine gas would be



Question 8 PAPERS PRACTICE

Which equation is correct for the third ionization energy for the element nitrogen?

A. N+(g) \rightarrow N⁴⁺(g) + 3e⁻

B. $N^{2+}(g) \rightarrow N^{3+}(g) + e^{-}$

C. $N(g) \rightarrow N^{3+}(g) + 3e^{-}$

D. $N^{3+}(g) \rightarrow N^{4+}(g) + e^{-}$



Aline emission spectrum occurs when

- A. electrons release energy as they move from high to low energy levels
- B. electrons release energy as they move from low to high energy levels
- C. electrons absorb energy as they move from high to low energy levels
- D. electrons absorb energy as they move from low to high energy levels

[1 mark]



CAM PAPERS PRACTICE

Question 10

A spectral line that would be found in the visible spectrum of the hydrogen emission spectrum would be

 $A.\ n_1 \rightarrow n_2$

 $B. n_2 \rightarrow n_2$

C n \ n

D. n $_3 \rightarrow$ n ∞