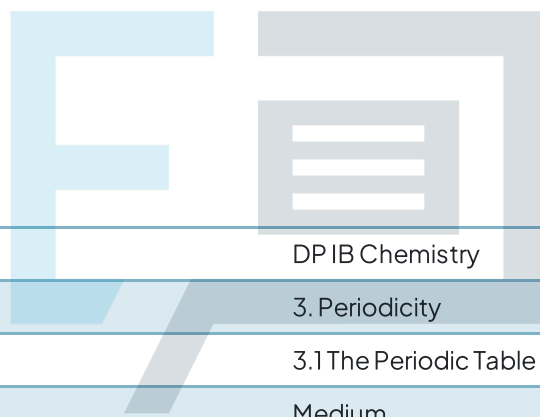




3.1 The Periodic Table & Periodic Trends

Question Paper



Course	DP IB Chemistry
Section	3. Periodicity
Topic	3.1 The Periodic Table & Periodic Trends
Difficulty	Medium

Exam Papers Practice

To be used by all students preparing for DP IB Chemistry HL
Students of other boards may also find this useful

Question 1

Electron configurations for atoms of different elements are shown below.

Which electron configuration represents the element with the largest first ionisation energy?

- A. $1s^2 2s^2 2p^6 3s^2$
- B. $1s^2 2s^2 2p^6 3s^2 3p^4$
- C. $1s^2 2s^2 2p^6 3s^2 3p^6$
- D. $1s^2 2s^2 2p^6 3s^2 3p^6 4s^2$

[1 mark]

Question 2

The second ionisation energy of magnesium is 1451 kJ mol^{-1} .

Which equation correctly represents this statement?

- A. $\text{Mg}^+(\text{g}) \rightarrow \text{Mg}^{2+}(\text{g}) + \text{e}^- \quad \Delta H^\ominus = -1451 \text{ kJ mol}^{-1}$
- B. $\text{Mg}^+(\text{g}) \rightarrow \text{Mg}^{2+}(\text{g}) + \text{e}^- \quad \Delta H^\ominus = +1451 \text{ kJ mol}^{-1}$
- C. $\text{Mg}(\text{g}) \rightarrow \text{Mg}^{2+}(\text{g}) + 2\text{e}^- \quad \Delta H^\ominus = +1451 \text{ kJ mol}^{-1}$
- D. $\text{Mg}(\text{g}) \rightarrow \text{Mg}^+(\text{g}) + \text{e}^- \quad \Delta H^\ominus = -1451 \text{ kJ mol}^{-1}$

[1 mark]

Question 3

A periodic table is needed for this question

X, **Y** and **Z** are consecutive elements in the third Period of the Periodic Table. Element **Y** has the highest first ionisation energy and also the lowest melting point of these three elements.

What could be the identities of **X**, **Y** and **Z**?

- A. silicon, phosphorus, sulfur
- B. sodium, magnesium, aluminium
- C. aluminium, silicon, phosphorus
- D. magnesium, aluminium, silicon

[1 mark]

Question 4

An element in the d block of the periodic table forms a +4 ion and has the electron configuration of $[\text{Ar}] 3d^1$.

What is the identity of the element?

- A. Chromium
- B. Copper
- C. Vanadium
- D. Silicon

[1 mark]

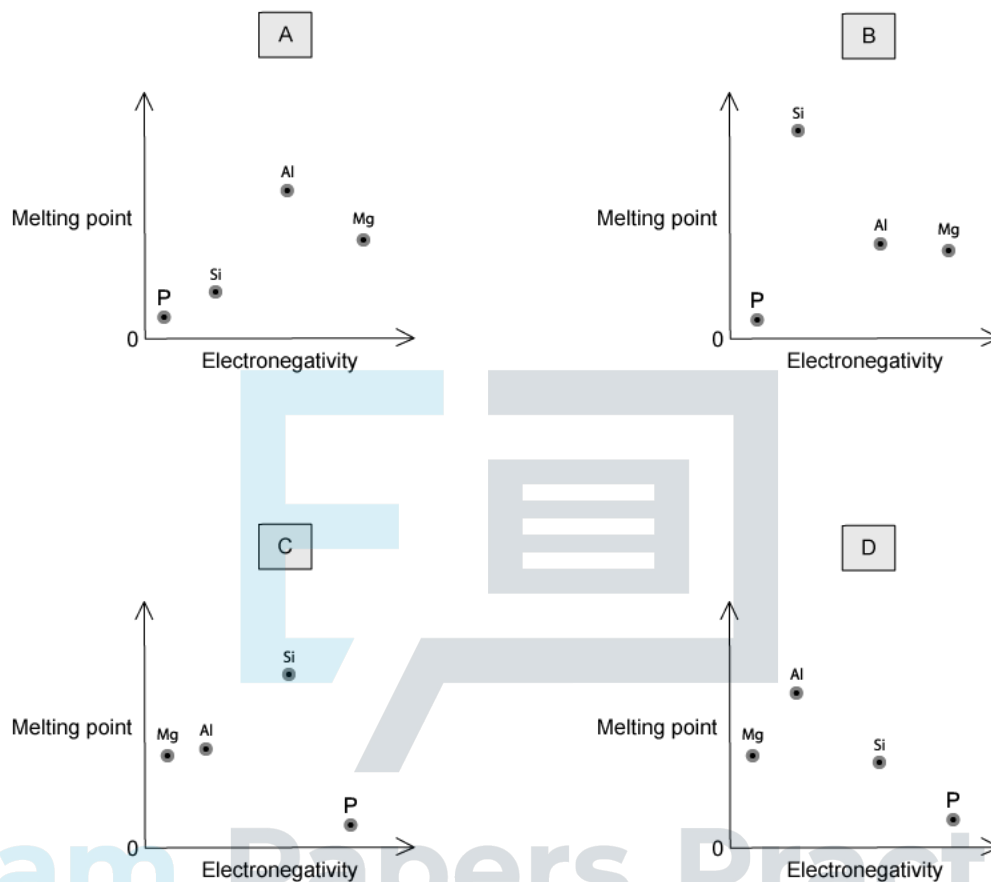


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Question 5

A periodic table is needed to answer this question

Which graph correctly shows the relative melting points of period 3 elements plotted against their relative electronegativities?



[1 mark]

Question 6

For the following pairs, which has the greatest difference in size?

- A. Li and Cl
- B. Na and Br
- C. Li^+ and Br^-
- D. Na^+ and Cl^-

[1 mark]

Question 7

A periodic table is needed for this question.

Elements **X** and **Y** are Period 3 elements that react together to form compound **Z**. Element **X** has the second smallest atomic radius in Period 3. Apart from argon, there is only one element in Period 3 which has a lower melting point than element **Y**.

Which compound could be **Z**?

- A. Na_2S
- B. MgS
- C. MgCl_2
- D. PCl_3

[1 mark]

Question 8

Which of these elements would form the largest ion with a noble gas electron configuration?

- A. Gallium
- B. Bromine
- C. Arsenic
- D. Rubidium

[1 mark]

Question 9

Use a periodic table to deduce the correct information about the element tin, Sn ($Z = 50$)

	Number of occupied main energy levels	Number of electrons in the highest main energy level
A	4	4
B	4	14
C	5	4
D	5	14

[1 mark]

Question 10

The order of the elements in the periodic table is

- A. according to relative atomic mass
- B. by nuclear charge
- C. by reactivity
- D. in order of electronegativity

[1 mark]



Exam Papers Practice