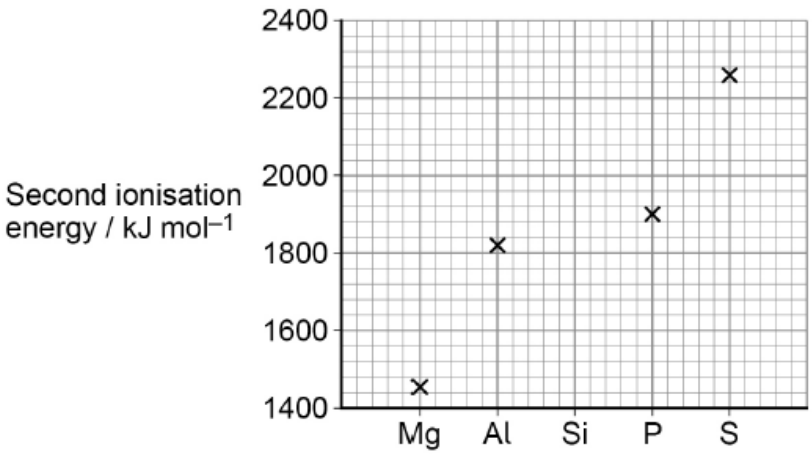
AQA – Bonding – A2 Chemistry P1

1. June/ 2020/Paper_1/No.3

0 3 This question is about Period 3 elements.

Figure 2 shows the **second** ionisation energies of some elements in Period 3.

Figure 2



0 3 . 1 Draw a cross (x) on **Figure 2** to show the **second** ionisation energy of silicon.

[1 mark]

0 3 . 2 Identify the element in Period 3, from sodium to argon, that has the highest **second** ionisation energy.

Give an equation, including state symbols, to show the process that occurs when the **second** ionisation energy of this element is measured.

If you were unable to identify the element you may use the symbol **Q** in your equation.

[2 marks]

Element _____

Equation

_____

0 3 . 3 Explain why the atomic radius decreases across Period 3, from sodium to chlorine.

[2 marks]

_____

_____

_____

_____

0 3 . 4 Identify the element in Period 3, from sodium to chlorine, that has the highest electronegativity.

[1 mark]

_____

0 3 . 5 Phosphorus burns in air to form phosphorus(V) oxide.
Give an equation for this reaction.

[1 mark]

_____

2. June/ 2020/Paper_1/No.7

0 7 The melting point of XeF_4 is higher than the melting point of PF_3

Explain why the melting points of these two compounds are different.

In your answer you should give the shape of each molecule, explain why each molecule has that shape and how the shape influences the forces that affect the melting point.

[6 marks]

3. June/ 2019/Paper_1/No.8

0 8 This question is about structure and bonding.

0 8 . 1 Draw a diagram to show the strongest type of interaction between two molecules of ethanol (C_2H_5OH) in the liquid phase.

Include all lone pairs and partial charges in your diagram.

[3 marks]

0 8 . 2 Methoxymethane (CH_3OCH_3) is an isomer of ethanol.

Table 5 shows the boiling points of ethanol and methoxymethane.

Table 5

Compound	Boiling point / °C
ethanol	78
methoxymethane	–24

In terms of the intermolecular forces involved, explain the difference in boiling points.

[3 marks]

Extra space

0 8 . 3 Draw the shape of the $POCl_3$ molecule and the shape of the ClF_4^- ion.
Include any lone pairs of electrons that influence the shapes.

In a $POCl_3$ molecule the oxygen atom is attached to the phosphorus atom by a double bond that uses two electrons from phosphorus.

Name each shape.

Suggest a value for the bond angle in ClF_4^-

Shape of $POCl_3$ Shape of ClF_4^-

[5 marks]

Name of shape of $POCl_3$

Name of shape of ClF_4^-

Bond angle in ClF_4^-