

Name of the Student: _____

Max. Marks : 24 Marks

Time : 24 Minutes

Q1.

This question is about the periodicity of the Period 3 elements.

- (a) State and explain the general trend in first ionisation energy across Period 3.

(4)

- (b) Give one example of an element which deviates from the general trend in first ionisation energy across Period 3.

Explain why this deviation occurs.

(3)

- (c) The table shows successive ionisation energies of an element **Y** in Period 3.

Ionisation number	1	2	3	4	5	6	7	8
Ionisation energy / kJ mol^{-1}	1000	2260	3390	4540	6990	8490	27 100	31 700

Identify element Y.

Explain your answer using data from the table.

(2)

(d) Identify the Period 3 element that has the highest melting point.

Explain your answer by reference to structure and bonding.

(4)

(Total 13 marks)

Q2.

This question is about the elements in Period 3 of the Periodic Table.

- (a) State the element in Period 3 that has the highest melting point.
Explain your answer.

Element _____

Explanation _____

(3)

- (b) State the element in Period 3 that has the highest first ionisation energy.
Explain your answer.

Element _____

Explanation _____

(3)

- (c) Suggest the element in Period 3 that has the highest electronegativity value.

(1)

- (d) Chlorine is a Period 3 element.
Chlorine forms the molecules ClF_3 and CCl_2

- (i) Use your understanding of electron pair repulsion to draw the shape of ClF_3 and the shape of CCl_2
Include any lone pairs of electrons that influence the shape.

Shape of ClF_3

Shape of CCl_2

(2)

(ii) Name the shape of CCl_2

(1)

(iii) Write an equation to show the formation of one mole of ClF_3 from its elements.

(1)

(Total 11 marks)