

A Level Chemistry A
H432/03 Unified chemistry

Question Set 6

1 This question refers to the elements in the first three periods (H–Ar) of the Periodic Table.

(a) Select an element from the first three periods that fits each of the following descriptions.

(i) The element that forms a 1– ion with the same electron configuration as helium. [1]

(ii) The element with the highest first ionisation energy. [1]

(iii) The element in Period 3 which has the successive ionisation energies shown below.

Ionisation number	1st	2nd	3rd	4th
Ionisation energy/kJ mol ⁻¹	738	1451	7733	10541

[1]

(iv) The element which forms a compound with fluorine that has octahedral molecules. [1]

(v) An element which reacts with water to form an acidic solution. [1]

(vi) The element X, which forms a compound with hydrogen, XH₃, with a molar mass of 34.0 g mol⁻¹. [1]

(vii) An element which forms a compound with hydrogen in which the element has an oxidation number of –4. [1]

(viii) The element which has a density of 1.33 × 10⁻³ g cm⁻³ at room temperature and pressure. [1]

(b) Table 1.1 shows some properties of Period 3 chlorides.

Group		1	2	14 (4)	15 (5)	16 (6)
Chloride		NaCl	MgCl ₂	SiCl ₄	PCl ₃	SCl ₂
Electrical conductivity	Solid	poor	poor	poor	poor	poor
	Liquid	good	good	poor	poor	poor
Melting point		high	high	low	low	low

Table 1.1

Explain the properties shown in Table 1.1 in terms of bonding and structure. [5]

Total Marks for Question Set 6: 13

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