

Name of the Student: _____

Max. Marks : 20 Marks

Time : 20 Minutes

Mark Schemes

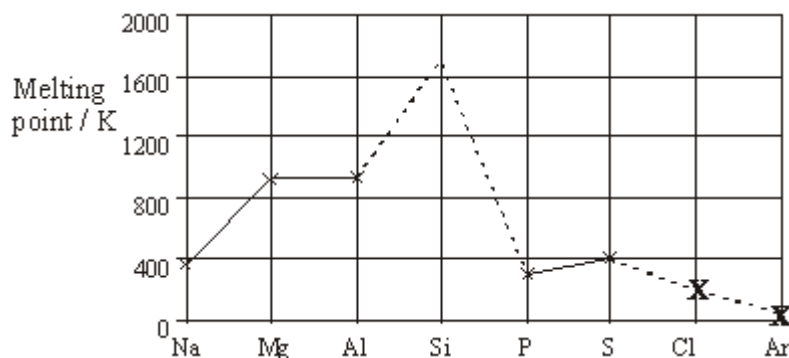
Q1.

- | | | |
|-----|---|---|
| (a) | Outer electrons are in p orbitals | 1 |
| (b) | decreases | 1 |
| | Number of protons increases | 1 |
| | Attracting outer electrons in the same shell (or similar shielding) | 1 |
| (c) | Sulfur molecules (S_8) are larger than phosphorus (P_4) | 1 |
| | Therefore van der Waals' forces between molecules are stronger | 1 |
| | Therefore more energy needed to loosen forces between molecules | 1 |
| (d) | Argon particles are single atoms with electrons closer to nucleus | 1 |
| | Cannot easily be polarised (or electron cloud not easily distorted) | 1 |

[9]

Q2.

(a) (i)



M1 Si: cross ≥ 1200

1

M2 Cl: cross below S

1

M3 Ar: cross below Cl

[allow, even if M2 wrong]

[If Cl cross missing and Ar below S, allow M3]

1

(ii) Si is macromolecular/giant molecular/giant covalent/ giant atomic

1

Covalent bonds need to be broken/accept 'overcome'

[Not loosened/weakened]

1

Covalent bonds are strong / many covalent bonds involved/
requires much energy/hard to break

[Tied to 'break' or near miss in M2] [Not 'structure' is broken]

[Must mention 'covalent' somewhere in part (a)(ii) to earn M2/M3]

[If van der Waals'/IMF mentioned M2/M3 = CE = 0.]

[If ions mentioned M1/M2/M3 = CE = 0]

1

(iii) Intermolecular force = van der Waals'/induced
dipole–dipole/dispersion forces

1

QoL Sulphur has greater M_r / size / surface area/more electrons/more
atoms **so** stronger intermolecular forces (comparison)

[Mark separately] [Not 'more shells']

1

(b) Trend: Decreases

[If trend wrong = CE = 0]

1

Increase in size of ion/atom / more shells / decrease in charge density /
decrease in charge size ratio

1

Weaker attraction for delocalised/free/sea of electrons / weaker metallic bonding

[Ignore shielding]

[van der Waals' etc. = CE = 0 for M2 and M3]

1

[11]