

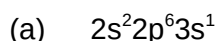
Name of the Student: _____

Max. Marks : 13 Marks

Time : 13 Minutes

Mark Schemes

Q1.

*1s² can be rewritten**Allow $2s^2 2p_x^2 2p_y^2 2p_z^2 3s^1$* *Allow subscripts and capitals*

1

- (b) (i) Energy/enthalpy (needed) to remove one mole of electrons from one mole of atoms/compounds/molecules/elements

1

OR

Energy to form one mole of positive ions from one mole of atoms

OR

Energy/enthalpy to remove one electron from one atom

In the gaseous state (to form 1 mol of gaseous ions)

*Energy given out loses M1**M2 is dependent on a reasonable attempt at M1**Energy needed for this change* *$X(g) \rightarrow X^+(g) + e^{(-)} = 2 \text{ marks}$* *This equation alone scores one mark*

1

- (ii) $Mg^+(g) \rightarrow Mg^{2+}(g) + e^{(-)}$
 $Mg^+(g) + e^{(-)} \rightarrow Mg^{2+}(g) + 2e^{(-)}$
 $Mg^+(g) - e^{(-)} \rightarrow Mg^{2+}(g)$

*Do not penalise MG**Not equation with X*

1

- (iii) Electron being removed from a positive ion (therefore need more energy)/electron being removed is closer to the nucleus/ Mg^+ smaller (than Mg)/ Mg^+ more positive than Mg

*Allow from a + particle/species**Not electron from a higher energy level/or higher sub-level**More protons = 0*

1

- (iv) Range from 5000 to 9000 kJ mol^{-1}

1

- (c) Increase
If decrease CE = 0/3
If blank mark on
 1
- Bigger nuclear charge (from Na to Cl)/more protons
 QWC
 1
- electron (taken) from same (sub)shell/similar or same shielding/
 electron closer to the nucleus/smaller atomic radius
If no shielding = 0
Smaller ionic radius = 0
 1
- (d) Lower
If not lower CE = 0/3
If blank mark on
Allow does not increase
 1
- Two/pair of electrons in (3)p orbital or implied
 Not 2p
 1
- repel (each other)
M3 dependent upon a reasonable attempt at M2
 1
- (e) Boron/B or oxygen/O/O₂
 1

[13]