Mark schemes

Q1.

(a) 6

1

(b) 7

1

(c) 6

1

(d) C_2F_6

1

(e) only intermolecular forces are weak

1

(f) spherical

1

(g) 3

1

(h) giant structure

allow lattice

1

(of atoms joined by) covalent bonds

1

each carbon / atom forms four bonds

1

[10]

Q2.

(a) **C**

1

(b) **D**

1

(c) 4 / four

1

(d) very hard

1

(e) C_2H_6

1

(f) H^+

1

(g) (M_r =) (1 × 2) + 12 + (16 × 3)

allow (M_r) = 2 + 12 + 48

= 62

2

[8]

Q3.

(a) **D**

1

(b) **B**

1

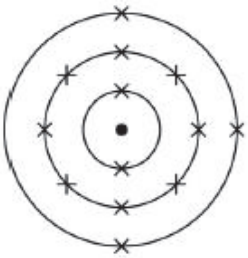
(c) any **two** from:
(Group 1 elements)
- have lower melting / boiling points
- have lower densities
- are less strong
- are softer

allow (Group 1 elements are) more malleable / ductile
allow (Group 1 elements) are not useful as catalysts
ignore transition elements form coloured compounds
ignore transition elements form ions with different charges
ignore references to chemical properties

2

allow converse statements for transition elements

(d)



allow any combination of x, •, o, $e^{(-)}$ for electrons

1

(e) delocalised electrons
allow free electrons

1

(the electrons) carry (electrical) charge
ignore current / electricity for charge

1

(the electrons move) through the metal / aluminium / structure
ignore throughout for through

1

(f) ionic

1

(g) magnesium (atom) loses electrons

1

oxygen (atom) gains electrons

1

two electrons (are transferred)

1

magnesium ions **and** oxide ions are formed

*allow Mg^{2+} (ions) **and** O^{2-} (ions) are formed*

allow magnesium forms positive ions and oxygen forms negative ions

allow (both) form a complete outer shell

1

[13]