2 This question is about covalent compounds.

(a) State what is meant by a covalent bond.

.....

..... [2]

(b) Chlorine(I) oxide, Cl_2O, is a simple molecule with covalent bonds.

(i) State what is meant by (I) in the name chlorine(I) oxide.

..... [2]

(ii) Complete the dot-and-cross diagram in Fig. 2.1 of a molecule of chlorine(I) oxide.

Show outer electrons only.

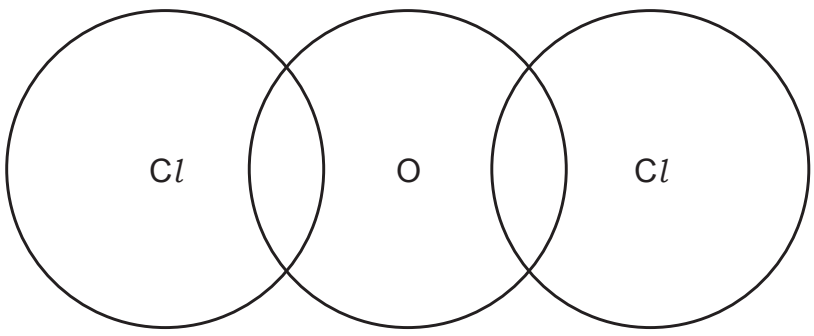

Fig. 2.1

[3]

(iii) Explain, in terms of structure and bonding, why Cl_2O boils at a low temperature and does **not** thermally decompose into its constituent elements, Cl_2 and O_2.

.....

.....

.....

..... [3]

(iv) Give **two** reasons why liquid Cl_2O is a poor conductor of electricity.

1 .....

2 ..... [2]

(c) Carbon and silicon(IV) oxide both exist as giant covalent structures.

(i) Name a giant covalent structure of carbon which conducts electricity.

..... [1]

(ii) Identify the particles responsible for the conduction of electricity in this covalent structure of carbon.

..... [1]

(iii) Silicon(IV) oxide contains silicon atoms, Si, and oxygen atoms, O.

Fig. 2.2 shows part of the giant covalent structure of silicon(IV) oxide.

Complete the diagram in Fig. 2.2 by adding the symbol for each of the 9 atoms shown.

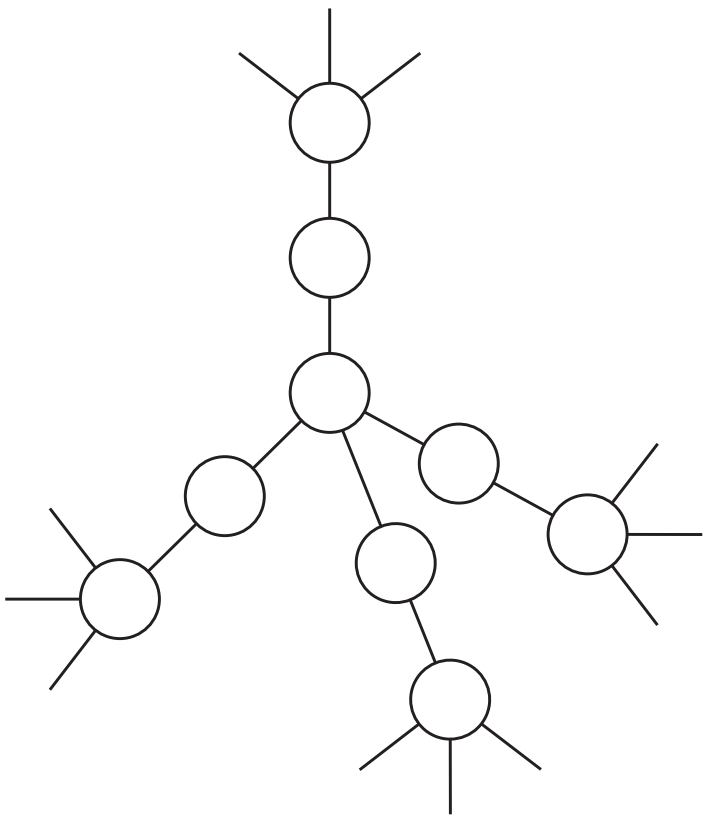

Fig. 2.2

[2]

[Total: 16]