



# COVALENT & IONIC SUBSTANCES

- 1) Which of the following substances could be simple molecular, giant covalent, ionic or are do they have another type of structure?

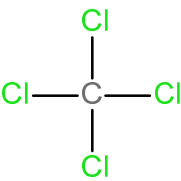
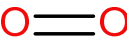
	C	C <sub>60</sub>	SiO <sub>2</sub>	N <sub>2</sub> H <sub>4</sub>	KNO <sub>3</sub>	S <sub>8</sub>	He	Mg	Fe <sub>2</sub> S <sub>3</sub>
ionic									
simple molecular									
giant covalent									
neither									

- 2) Look at the properties of the following substances.

Substance	Melting point (°C)	Boiling point (°C)	Electrical conductivity as	
			solid	liquid
M	673	926	does not conduct	conducts
N	3520	4658	does not conduct	does not conduct
O	-87	25	does not conduct	does not conduct
P	98	345	conducts	conducts
Q	1537	2318	does not conduct	conducts
R	835	1280	conducts	conducts

- a) Which of these compounds could have an ionic structure? .....
- b) Which of these compounds could have a simple molecular structure? .....
- c) Which of these compounds could have a giant covalent structure? .....

- 3) Complete the table to show stick and/or dot-cross diagrams for these molecules.

Molecule	Stick diagram	Dot-cross diagram
CCl <sub>4</sub>		
O <sub>2</sub>		
NF <sub>3</sub>		

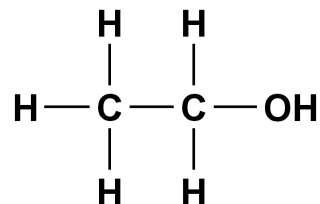
4) Write the formula of the following **ionic** compounds.

- |                             |                               |
|-----------------------------|-------------------------------|
| a) potassium oxide .....    | d) iron (III) hydroxide ..... |
| b) aluminium chloride ..... | e) magnesium nitrate .....    |
| c) sodium carbonate .....   | f) ammonium iodide .....      |

5) Diamond and graphite both have giant covalent structures. Explain each of the following.

- a) Diamond and graphite both have very high melting points. ....  
 .....  
 .....
- b) Graphite conducts electricity but diamond does not. ....  
 .....  
 .....
- c) Graphite is soft but diamond is hard. ....  
 .....  
 .....

6) Ethanol (alcohol) is made of molecules with the formula C<sub>2</sub>H<sub>5</sub>OH. A diagram of an ethanol molecule is shown. Explain why ethanol has a low boiling point.



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7) Magnesium sulfate is an ionic compound with the formula MgSO<sub>4</sub>.

- a) Explain why magnesium sulfate has a high melting point. ....  
 .....  
 .....
- b) Explain why magnesium sulfate conducts electricity as a liquid but not as solid. . ....  
 .....  
 .....