

C2 Topic 3 Covalent bonding and properties

Covalent bonding	
1. What is a compound?	A substance made of two or more element that are chemically bonded together
2. What kind of bonding involves sharing electrons?	Covalent
3. Why do atoms share electrons?	To gain full outer shells of electrons
4. Describe covalent bonds	They are strong
5. Give three examples of simple molecules that have covalent bonds	Any three from: H ₂ , Cl ₂ , O ₂ , HCl, H ₂ O, NH ₃ and CH ₄
6. What are diamond and silicone dioxide examples of?	Giant covalent structures
Simple molecules	
7. Describe the melting and boiling points of simple molecules	Very low – most exist as gases and liquids at room temperature
8. Describe the forces between simple molecules	Very weak forces – easily overcome
9. Why don't simple covalent molecules conduct electricity?	The molecules have no overall electric charge
Giant covalent – diamond structure	
10. Name two examples of giant covalent structures:	Diamond and graphite
11. How are the atoms in a giant covalent structure joined together?	By strong covalent bonds
12. Describe the properties of giant covalent compounds	They have very high melting points
13. How many bonds does each carbon in diamond make?	4 bonds per atom
14. Describe the properties of diamond	It has a very high melting point / it is incredibly strong
Giant covalent – graphite structure	
15. How many bonds does each carbon in graphite make?	3 bonds per atom
16. How are the atoms in graphite arranged?	In layers
17. What are the layers in graphite able to?	Slide over each other
18. Why can the layers slide over each?	There are no covalent bonds between layers (only weak intermolecular forces)
19. Describe the properties of graphite	Soft and slippery (used as a lubricant in machinery).

20. HT - How is graphite able to conduct heat and electricity?	Due to having one delocalised electron per carbon atom that is able to move throughout the structure
Fullerenes and nanoscience	
21. What is a fullerene?	A different form of carbon based on hexagonal rings
22. What are fullerenes used for?	For drug delivery, in lubricants, as catalysts, and in nanotubes
23. What size are nanostructures?	1-100 nm, a few hundred atoms
24. What new technology is nanoscience being used to develop?	New computers, new catalysts, new coatings, highly selective sensors, stronger and lighter construction materials, and new cosmetics
Polymers	
25. What are the two types of polyethene?	LD – low density, and HD – high density
26. How are the reactions to produce polyethene different?	They use different catalysts and reaction condition
27. Describe thermosoftening polymers	They consist of individual, tangled polymer chains
28. Describe thermosetting polymers	They consist of polymer chains with cross-links
29. Which type of polymer, thermosoftening or thermosetting, melts easier?	Thermosoftening
30. Why do thermosoftening melt easier?	They do not contain cross-links