

TOPIC 3 SUMMARY NOTES

Summary

- Covalent bonding:
 - covalent bonds form between non-metal atoms;
 - a covalent bond forms when two positive nuclei are held together by their common attraction for a shared pair of electrons;
 - diagrams can be drawn to show how outer electrons are shared to form the covalent bond(s) in a molecule;
 - seven elements exist as diatomic molecules through the formation of covalent bonds: H_2 , N_2 , O_2 , F_2 , Cl_2 , Br_2 , I_2 ;
 - the shape of simple covalent molecules depends on the number of bonds and the orientation of these bonds around the central atom. These molecules can be described as linear, angular, trigonal pyramidal or tetrahedral;
 - more than one bond can be formed between atoms leading to double and triple covalent bonds;
 - covalent substances can form either discrete molecular or giant network structures.
- Covalent molecular substances:
 - have strong covalent bonds within the molecules and only weak attractions between the molecules;
 - have low melting and boiling points as only weak forces of attraction between the molecules are broken when a substance changes state;
 - do not conduct electricity because they do not have charged particles which are free to move;
 - covalent molecular substances which are insoluble in water may dissolve in other solvents.
- Covalent network structures:
 - have a network of strong covalent bonds within one giant structure;
 - have very high melting and boiling points because the network of strong covalent bonds is not easily broken;
 - do not dissolve;
 - in general, covalent network substances do not conduct electricity. This is because they do not have charged particles which are free to move.