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SCIE1106 LECTURE NOTES:

Macromolecules 1:

Molecules-Formation:

- Molecules
 - ⇒ made up of elements
 - ⇒ elements - “cannot be broken down or converted into other substances by chemical means”
 - ⇒ chemical element consists of one type of atom
- Atoms
 - ⇒ “smallest particle of an element that still retains the elements distinctive chemical properties”
 - ⇒ Protons – positive charge
 - Atomic number - number of protons
 - ⇒ Electrons - negative charge
 - determine atom’s chemical behavior
 - orbit the nucleus of an atom on different energy levels (electron shells)
 - ⇒ # of electrons = # of protons
 - ⇒ Neutrons – neutral

Molecules-Bond Formation between atoms:

- Electrons fill electron shells from the innermost to the outer shell
- Most atoms have unfilled outermost electron shells
 - ⇒ reactive
- able to donate, accept, or share electrons with each other
 - ⇒ complete outer shell
 - ⇒ stabilized
- chemical=covalent bond formed

Covalent Bonds between Atoms:

- Example H₂O:
 - ⇒ Hydrogen: one electron in outer shell
 - ⇒ Oxygen: six electrons in outer shell
 - ⇒ Sharing the electrons of two hydrogen atoms with electrons of one oxygen results in 2 electrons in outer shells for the two hydrogen atoms and 8 electrons in the outer shell for oxygen
 - Stable molecular bond

Single and Double Covalent Bonds:

- equal sharing of electrons, e.g. between hydrogen and oxygen or between carbon atoms joins atoms into clusters called molecules
- Ethane molecules, tetrahedral
 - ⇒ 2 electrons shared=single bond