

Ch2 Bio Notes

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8:12 PM

Atoms, Ions Molecule: Building blocks of chem. Evo.

- Four types: hydrogen, carbon, nitrogen, and oxygen make 96% of org.
- **Two Q's** : What is the physical structure of these four elements? What is the structure of these simple molecules?

Basic Atomic Structure

- Periodic Table:
 - Atomic Number= protons
 - Mass Number = protons + neutrons
- Atomic # doesn't vary if it changes then there is a new element present
- Diff. # of neutrons creates an isotope - means different masses
- Atomic weight: avg. of all masses
- Not all isotopes are stable- ^{14}C as it decays turns one of its neutrons into a protons making it radioactive
- **Dalton**: used to measure protons neutrons electrons ($1 = 1 \text{ dalton}$) not an electron
- **Orbitals** (up to 2 electrons) : specific regions electrons move around nuclei in
- Grouped to levels- **electron shells**
- Fill innermost before outer
- **Valence Shell**- outermost shell: electrons in here are valence electrons
- # of unpaired electrons is called the valence
- **Chemical Bonds**- fills outermost shells - strong attraction between 2 or more is a covalent bond

How Does Covalent Bonding Hold Molecules Together?

- Molecular substances held together by covalent bonds
- Opposites attract

Polar and nonpolar Bonds

- Electrons not always shared due to **electronegativity**
- Due to # of protons in nucleus and distance from nucleus to valence shell
- Non polar- when electrons are shared
- Asymmetric sharing of electrons means a polar covalent bond

Polar bonds produce Partial Charges on Atoms

Why is water such an efficient solvent?

- Life is based upon water
- Covalent bonds within are polar
- Greater electronegativity than hydrogen
 - Oxygen has partial neg. charge
 - Hydrogen has partial pos. charge

Hydrogen Bonds

- Weak electrical attractions partially neg. oxygen of one water molecule
- Partially positive hydrogen