Biology 190

Chapter 2 class notes
The Chemical Context of Life

Refer to Class Handout for Chapter 2: Part I and Part II (A-C)

Question 2.1

Question 2.2

II. Atomic Structure

D. Electrons occupy specific regions in space.

- **Electron Shell =**

E. Valence electrons influence chemical properties

- **Valence electrons =**

2. Octet rule =

- **Conclusion: Valence electrons are responsible for the atom's chemical bonding capacity.**

Question 2.3

III. Atoms combine to form molecules

A. Covalent bond =

B. Nonpolar vs. Polar Covalent Bonds

1. Electronegativity =

2. Electronegativity Scale

- **0 = 3.5**
- **N = 3.0**
- **S and C = 2.5**
- **P and H = 2.1**

3.

4. It is the *difference* in the electronegativity values between atoms that helps us determine polarity.

• Nonpolar (covalent) bonds =	Polar (covalent) bonds =

Question 2.4

C. Ionic Bonds

Ionic bond = Bond formed by complete transfer of electron(s) from a donor atom to an acceptor atom.

- **Cation = (+) charged ion. (Na+)**
- **Anion = (-) charged ion. (Cl-)**

Figure 2.13
Fig 2.14 and 3.6

D. Weak chemical bonds play important roles in the chemistry of life.

- **Biologically important weak bonds include...**
  1. **Hydrogen bonds.**
  2. Ionic bonds in aqueous solutions.
  3. Other weak forces included Van der Waals forces.
  4. **Hydrophobic interactions.**

E. Hydrogen Bonds

- **Hydrogen bond =**

Question 2.5

F. Hydrophobic Interactions

- **Hydrophobic =**
- **Hydrophobic interaction =**