

GR. 12 UNIVERSITY PREP. BIOLOGY REVIEW

Unit 1 – Biochemistry

Chapter 1 - Chemical Basis of Life

1. Identify subatomic particles, isotopes, radioisotopes and valence electrons.
2. Give 3 examples of practical applications or specific radioisotopes (atomic mass).
3. Identify the importance of electronegativity in identifying the type of **intramolecular bond** that forms (ionic, polar and polar covalent).
4. Use VESPR theory to determine whether a **molecule** is polar or non-polar.
5. Identify the types of **intermolecular** bonds and how they contribute the physical and chemical properties of the molecules involved
6. Identify and explain the special properties of water and how they influence life.
7. Identify pH as a relative scale of H^+ ion concentration.
8. Describe how acid-base buffers operate.
9. Identify the following functional groups: hydroxyl, carboxyl, carbonyl, amino, sulfhydryl and phosphate.
10. Identify the name, structure, chemical properties and biological significance of carbohydrates, fats, proteins and nucleic acids.
11. Define the term isomer and describe the relationship between chemical structure and chemical properties (function).
12. Differentiate between condensation and hydrolysis reactions.
13. Differentiate between spontaneous and non-spontaneous reactions and the importance of biochemical coupling. Know the Gibb's free energy equation.
14. State the first and second law of thermodynamics and give a real life example of each.
15. What is activation energy and how do enzymes operate to decrease the activation energy of a reaction?
16. Enzymes are said to be specific in their function. What is it about enzymes, which leads to this specificity?
17. Describe the "induction-fit" and "lock and key" models.
18. Describe the affect of the following variables on enzyme activity:
enzyme concentration substrate concentration temperature pH