

- A common synthesis in body is called dehydration synthesis (water product).

11. Contrast endothermic and exothermic reactions.

- Endothermic = reaction requires a net **input** energy
- Exothermic = reaction **releases** a net output energy

12. Give an example of a decomposition reaction that involves breaking the bonds of a water molecule.

- A large compound (breaks covalent bond) → 2 smaller molecules (Exothermic)
- A common decomposition in body is called hydrolysis (water added to product).

13. Compare exchange reactions (aka transfer reactions) to synthesis and decomposition reactions.

- Involve both features = breaking and forming bonds (involve both endo- and exothermic)

14. Describe five qualities of water that make it vital to life.

- **Cohesion:** molecules stick through hydrogen bonding
 - **Surface tension**, thin layer on the surface of cells. This aqueous layer is necessary for the transport of dissolved materials into and out of a cell.
- **Excellent solvent:** dissolves salts and other electrically charged molecules
- **Remains a liquid** across a wider range of temperatures.
- **Absorb significant amounts of heat energy** without itself changing temperature.
- **Participate in many chemical reactions.**

15. Contrast acids, bases, and salts, and explain the role of buffers.

- Acids: Proton donor
- Bases: Proton acceptor
- Salts: compound dissociates in water (other than H^+ and OH^- (form acid and base))
- Buffers: usually proteins (weak acid/base), that resist changes in pH

16. What is the pH scale? What is the relationship between acidity and pH value?

- pH scale = The negative logarithmic concentration of H^+ in solution
- **1 (Low pH) Acidic = High conc. Of H^+ ← (7) → Low conc. Of H^+ = Basic (High pH) 14**

17. Define functional groups as it relates to organic chemistry.

- Atoms that appear in common arrangements.

18. For the four classes of macromolecules, know their component monomers and type of bond that links them together.

- **Lipids** = Glycerol molecule (back bone) and fatty acids with ester bonds.
- **Carbohydrates** = Monosaccharides or simple sugars linked with glycosidic linkages.
- **Proteins** = amino acids linked with peptide bonds
- **Nucleic Acid** = nucleotides linked via covalent bonds

19. Describe the structure of a triglyceride molecule, and compare it to that of a phospholipid.

- A triglyceride molecule contains 3 carbon tails.
- Phospholipids contain 2 tails. The 3rd C on glycerol backbone attached to phosphate.