

UNIT 2: BIOCHEMISTRY

Acids, Bases, and Buffers

Ion

- ⦿ Atom that has a positive or negative charge
 - Example: Cl^- , Ca^{2+}

pH Scale

- ⦿ Measurement system that indicates the concentration of H^+ ions (hydrogen)

- ⦿ Scale goes from 0 to 14
 - 0-6 Acidic
 - 7 Neutral
 - 8-14 Basic

Acid

- ⦿ Forms H^+ ions in solutions
- ⦿ Higher $[H^+]$ than pure water
- ⦿ pH values <7

- ⦿ Strong acids have a pH of 1-3
 - HCl – Hydrochloric acid produced by the stomach

Base

- ⦿ Forms hydroxide (OH^-) in solution
- ⦿ Lower $[\text{H}^+]$ than pure water
- ⦿ pH values >7

- ⦿ Strong bases have a pH of 11-14
 - Bleach

Buffer

- ⦿ Weak acids or bases (can be neutral) that react to prevent sharp, sudden changes in pH
- ⦿ Example: pH of most cells in human body must be between 6.5-7.5
 - If it is lower or higher, essential chemical reactions won't occur
 - The body uses buffers to maintain homeostasis

Buffers in the Body

- <https://www.youtube.com/watch?v=r6UAEbhRXNI>

Inorganic vs. Organic Compounds

⦿ Inorganic

- Does NOT contain carbon – hydrogen (C-H) bond
- Salts, metals

E.g. NaCl (salt),
carbon dioxide (CO₂),
water (H₂O)

⦿ Organic

- Contains carbon-hydrogen (C-H) bond
- Molecules associated with living organisms

E.g. carbohydrates,
lipids, proteins, nucleic
acids