

CONCEPT: ACIDS, BASES, AND BUFFERS

● **Acids** and **bases** are molecules found in cellular aqueous solutions

□ Acids are substances that release positively charged _____ ions into solution

- The hydrogen gives up its electron, leaving a positively charged proton in the solution

- The hydrogen ions form with water to create H_3O^+ (*hydronium ions*)

- Weak acids do not completely disassociate in solution

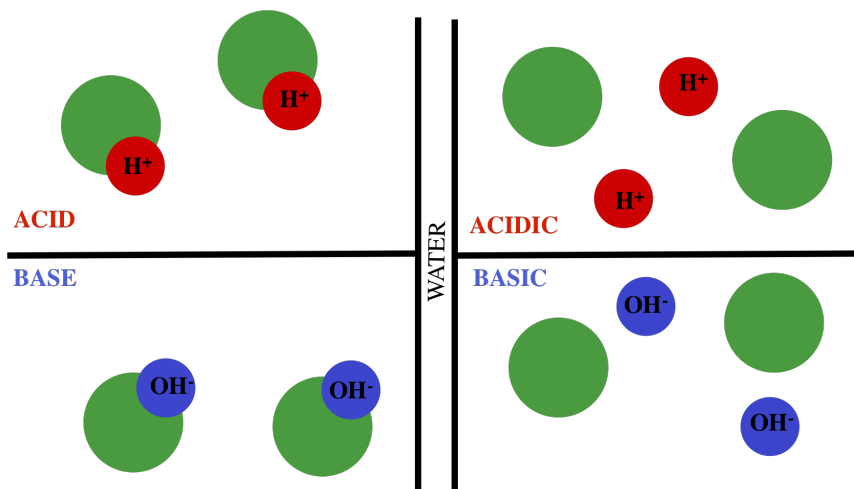
□ Bases are substances that _____ positively charged hydrogen ions

- Combine directly with hydrogen ions to form OH^- (*hydroxide*) or water

- Weak bases only partially associate in solution

□ Water can act as an acid or base

EXAMPLE: Acids and Bases dissolve in water

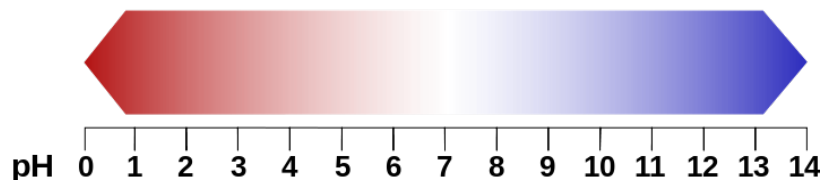


● The **pH scale** measures the concentration of Hydrogen ions (H^+)/Hydronium ions (H_3O^+) on a logarithmic scale

EXAMPLE: pH scale:

Red=acidic;

Blue = basic



□ Aqueous solutions in cells have H^+ and OH^- molecules in different concentrations

Cytosol = 7.2 _____; Lysosome = 4.5 _____

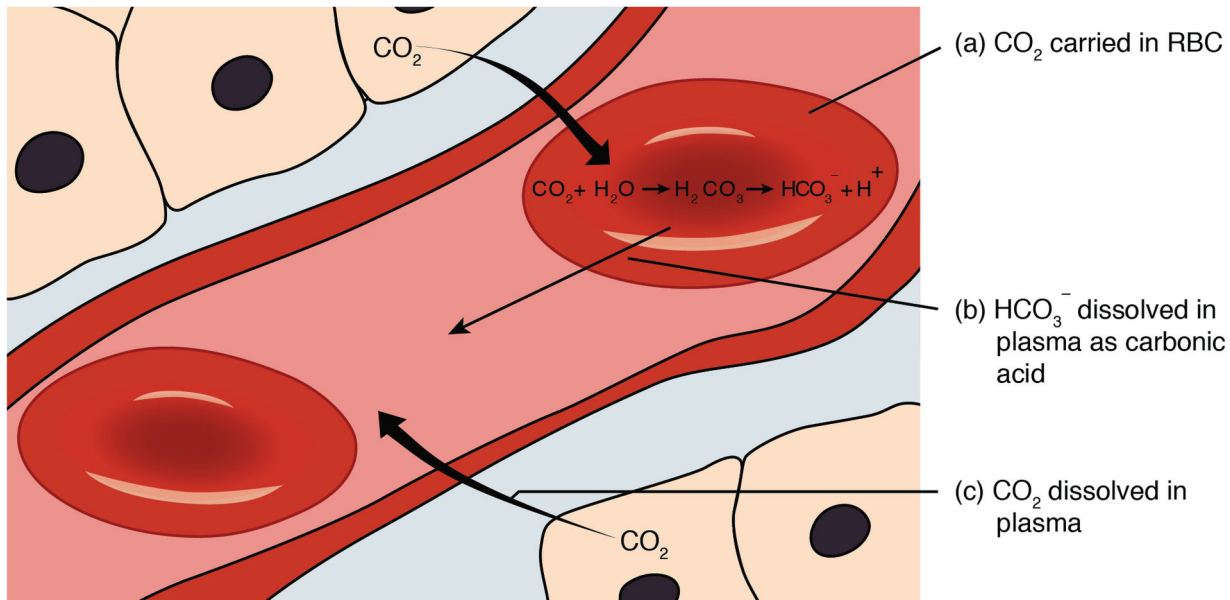
● **Buffers** are solutions that limit _____ in pH of a solution

□ Composed of both weak acids and bases

- These adjust the pH of the solution by releasing or accepting protons

□ Buffers are crucial in cell biology to keep cellular compartments at a specific pH

EXAMPLE: Blood pH is balanced by the weak carbonic acid (H_2CO_3) and the weak conjugate base (HCO_3^-)



PRACTICE:

1. Choose which of the following is false.
 - a. Acids are proton acceptors
 - b. Buffers work to neutralize the pH of a solution
 - c. The pH scale is a measure of the acidity of a solution
 - d. Bases are proton acceptors

2. A substance with a pH of 3 is considered what?
 - a. Acidic
 - b. Basic
 - c. Neutral

3. True or False: Bases release positively charged ions into a solution?
- a. True
 - b. False