



# Department of biology



## Department of biology

2025-2026

**((Plant Physiology))**

**Stage (3)**

**(( LAB - (2) - ))**

**Acidity & Alkalinity & Buffers**

**By**

**Asst. Lec. Zainab Nadhum Aziz**



### Acidity & Alkalinity & Buffers

90% water Plant cell or tissue of 10% chemical compounds carbohydrate, enzymes, salts, proteins.

All biochemical reaction occur within the plant cell uses the water present in the cell. Pure water is the standard by which all solution are compared because water is an ionic neutral solution.

Acids are molecules that release hydrogen ions ( $H^+$ ) when dissolved in water. Acids increase the concentration of  $H^+$  in a solution.

Base are molecules that remove  $H^+$  from solution, Bases decrease the concentration of  $H^+$  in a solution when the proportionately less.

By general agreement, the scale (pH stands for the potential of hydrogen ions).

**Buffers :-** they are chemicals that absorb excess  $H^+$  as the pH decreases (more acidity) or release  $H^+$  as the pH increases (more Alkaline). Buffers minimize changes in pH.

- In most organisms, the pH is kept relatively constant by Buffers.
- Most biological fluids (e.g. milk, blood) contain buffers.
- ✓ And in plant cell there are buffer fluid like: **Citric acid, oxalic acid, Ammonium hydroxide, carbonic acid.**

Maximum Buffer capacity :- is the quantity of strong acid or bases that must be added to change the pH of 1 liter solution by one pH unit.

Note :- buffer solution only can maintain the pH stable in some range (called buffer capacity) and the buffer capacity is affected by:-

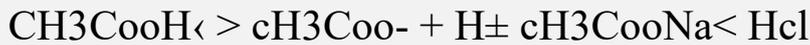


**1- The concentration of the buffer component.**

**2- The quality of the buffer component.**

❖ Mechanism of How buffer working: -

a) With strong acid



b) With strong base



Methods used to measure the pH:-

1. Litmus paper.
2. pH - meter

**Q:- three solution , three pH were 9, 5, 4. After adding a chemical compound to them the pH changing as show in**

A	B	C	
9	5	4	
7	8	4.1	after adding

- which of three solution is a buffer ?

- what the nature of the chemical compound that added ?