

STUDENT'S NAME		TOTAL MARKS OBTAINED
CLASS	SUBJECT	
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UNIT-V

pH, BUFFERS & ISOTONIC SOLUTIONS.

SORENSEN'S pH SCALE.

- The hydrogen ion concentration varies from 1 in 1M solution of strong acid to 1×10^{-14} in a 1M solution of strong base.
- The calculations when expressed in such a way become tedious, thus Sorensen (Danish Chemist) suggested simplified method of expressing hydrogen ion concentration.
- He established the term pH, to represent hydrogen ion potential and defined it as the common logarithm of the reciprocal of the hydrogen ion concentration.

$$pH = \log \frac{1}{[H^+]}$$

According to logarithm rules.

$$pH = \log 1 - \log [H^+]$$

$$\because \log 1 = 0$$

$$pH = 0 - \log [H^+]$$

Thus
$$pH = -\log [H^+]$$

- The pH of solution can be considered in terms of numeric scale from 0 to 14.

where,

7 to 0 - degree of acidity

7 to 14 - degree of alkalinity

7 - hydrogen & hydroxyl ion concentration is equal is referred as Neutral point.

Neutral pH at 25°C = 7

Neutral pH " 0°C = 7.47

" " " 100°C = 6.5

pH Scale & corresponding Hydrogen and Hydroxyl ion Concentration.

pH	[H ⁺] (moles/L)	[OH ⁻] (moles/L)	
0	10 ⁰ = 1	10 ⁻¹⁴	↑ ACIDIC
1	10 ⁻¹	10 ⁻¹³	
2	10 ⁻²	10 ⁻¹²	
3	10 ⁻³	10 ⁻¹¹	
4	10 ⁻⁴	10 ⁻¹⁰	
5	10 ⁻⁵	10 ⁻⁹	
6	10 ⁻⁶	10 ⁻⁸	NEUTRAL
7	10 ⁻⁷	10 ⁻⁷	
8	10 ⁻⁸	10 ⁻⁶	↓ BASIC
9	10 ⁻⁹	10 ⁻⁵	
10	10 ⁻¹⁰	10 ⁻⁴	
11	10 ⁻¹¹	10 ⁻³	
12	10 ⁻¹²	10 ⁻²	
13	10 ⁻¹³	10 ⁻¹	
14	10 ⁻¹⁴	10 ⁰ = 1	