

CHEMISTRY STUDY MATERIALS FOR CLASS 10

(NCERT Based notes of Chapter -02)

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ACIDS, BASES AND SALTS

pH – MEASUREMENT OF STRENGTH OF ACID AND BASE

pH stands for the power of hydrogen ion concentration in a solution. pH values decide whether a solution is acidic or basic or neutral. pH scale was introduced by S.P.L. Sorenson. It is mathematically expressed as

$$\text{pH} = -\log_{10}[\text{H}^+]$$

For neutral solution $[\text{H}^+] = 10^{-7}\text{M}$; $\text{pH} = 7$

For acidic solution $[\text{H}^+] > 10^{-7}\text{M}$; $\text{pH} < 7$

For basic solution $[\text{H}^+] < 10^{-7}\text{M}$; $\text{pH} > 7$

When OH^- ions are taken into account the pH expression is replaced by pOH

$$\text{pOH} = -\log_{10}[\text{OH}^-]$$

The strength of acid or base depends upon the hydrogen ion concentration.

If the concentration of hydrogen ion is greater than hydroxide ion, the solution is called acidic.

If the concentration of hydrogen ion is smaller than the hydroxide ion, the solution is called basic. If the concentration of hydrogen ion is equal to the concentration of hydroxide ion, the solution is called neutral solution.

pH is a scale which quantifies the concentration of hydrogen ion in a solution.

The range of pH scale is between 0 to 14.

The pH value decreases with increase in hydrogen ion concentration.

If the value of pH is 0, this shows maximum hydrogen ion concentration.

pH value equal to 14 shows lowest hydrogen ion concentration.

pH value equal to 7 shows the hydrogen ion concentration is equal to hydroxide ion concentration neutral solution,

Such as distilled water has value of hydrogen ion concentration equal to 7 on pH scale.

The acidic solution has value of hydrogen ion concentration less than 7 on pH scale.

The basic solution has value of hydrogen ion concentration greater than 7 on pH scale.

In pH scale 'p' stands for 'potenz'. Potenz is a German word which means 'power' or 'potential'. Here; 'H' stands for hydrogen ion. Thus, pH means the potential of hydrogen or power of hydrogen.


