P. G. 2nd semester Zoology
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Topic
pH & pH meter

pH was discovered by Sorenson in 1902. It is negative logarithism of Hydrogen ion Concentration.

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

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

$$\therefore [H^+] = 10^{-pH}.$$

pH meter is a scientific instrument that measures the hydrogen ion activity in water based solutions, indicating its acidity or basicity expressed as pH.

The pH meter measures the difference in electrical potential between a pH electrode and a reference electrode. Thus pH ~~electrode~~ meter is sometimes referred to as a potentiometric pH meter'. The difference in electrical potential relates to the acidity or pH of the solution.

Parts of pH meter

A pH measurment system consists of three parts -

(a) A pH measuring electrodes
(b) A reference electrode
(c) A high ~~input impendance~~ impedance meter.

The pH electrode can be thought of as a battery with a voltage that varies with the pH of the measured solution.

Principle of pH meter

The overall working principle of pH sensor and pH meter depends upon the exchange of ions from sample solution to the inner solution (pH 7 buffer) of glass electrode through the glass membrane. The porosity of glass membrane decreases with the continuous use that decreases the performance of the probe.

How pH electrode functions

pH probes measure pH by measuring the voltage or potential difference of the solution in which it is dipped. Hence, a pH probe measures the potential difference generated by the solution by measuring the difference in hydrogen ion concentration using the Nernst equation and display the pH as output.

Function of pH meter

A pH meter is a simple and speedy device to measure the acidity and alkalinity of fluid.

— A pH meter acts as a volt meter that measures the electrical potential difference between a pH electrode and a reference electrode and displays the result in terms of the pH value of the solution in which they are immersed.

~~Types of pH meter~~