

pH meter and its Calibration

pH Meter - Use and Calibration

1. What is a pH Meter?
2. An instrument that measures the H^+ ion concentration (pH) of a solution using an ion sensitive electrode which will ideally respond to one specific ion, in this case H^+ . The pH of a solution is the negative logarithm of the H^+ ion concentration. A typical modern pH meter has a glass and reference electrode in one tube
3. How Does a pH Meter Measure H^+ Concentration?
4. The pH meter has two electrodes in one tube, glass and reference electrode. **A saturated KCL and HCL solution is contained in a tube** which is inside of an outer tube that will have contact with the solution to be measured. This outer tube has a double glass bulb with Na^+ which makes an ion specific electrode. When measuring the pH of a solution, a salt bridge forms. The Na^+ ion, not H^+ , crosses the glass membrane of the pH electrode and allows for a change in free energy which is measured by the pH meter as the concentration of H^+ .

CALIBRATION OF PH METER

1. Calibrating a pH Meter•

Make sure the meter is in pH mode• For a 3 point calibration, use high pH (--), pH 7.0 and low (-.0) solution•

Before calibration, rinse probe thoroughly with de-ionized water or a rinse solution• Immerse the end of the probe completely in the calibration solution•

Stir the probe gently to create a homogenous sample

Measuring the pH of a Solution•

1. Always rinse electrodes with **de-ionized water** prior to placing in a solution for pH measurement•
2. Allow meter to stabilize for 30 seconds or a minute, then read• Remove electrodes and rinse with de-ionized solution• The pH bulb should always be stored wet preferably in pH 4.0 buffer with 1/100 KCl•
3. Other buffers or tap water can be used for storage.

Maintenance of pH Meter• Wipe off exterior of pH meter with a damp cloth after use• The outside of the meter is made of polyester and is not affected by most solvents but is affected by some organic solvents•
pH the “power of hydrogen”

pH scale and measurement

1. **A Quick Method for Determining pH Litmus Paper**
2. 8. Litmus Paper• Litmus paper is useful to determine the pH of a solution when you do not have a pH meter available• Proper storage of the litmus paper is essential to maintain quality control
3. 9. The pH Scale•
4. The pH measures the concentration of H^+ in a solution• The lower the number, the more acidic the solution• The higher the number, the more basic the solution