



Portable and Bench-Top pH Meters Calibration, Use and Maintenance

Calibration:

The pH meter/electrode (glass/epoxy type) must be calibrated before use with suitable buffers. You should try to calibrate in the same pH range as the sample you are going to measure. It is best to calibrate with 2 buffers that would bracket the pH range of your sample. Why a range? Because pH measurement is not completely linear across the spectrum of 1-14. If you are measuring an acidic sample (pH<7.0) you should calibrate with pH 4.0 and pH 7.0 buffers. If you are measuring a basic (alkaline) sample you should calibrate with pH 7.0 and pH 10.0 buffers. Standard color-coded buffers are available:

pH 4.0 (red label)
pH 7.0 (yellow label)
pH 10.0 (blue label)

Electrode Conditioning:

Before you calibrate the typical glass/epoxy electrode you must condition the electrode by storing it in a pH buffer (4.0) for at least an hour. Overnight conditioning is preferred. During this time a layer of ions (sometimes called a gel layer) develops at the junction point (the glass bulb) of the electrode. Once you have conditioned an electrode it should be kept moist by storing in either an electrode storage solution or a pH buffer solution. Distilled water is not recommended. If the electrode is kept dry for an extended period of time it will have to be cleaned and re-conditioned.

Use: The pH of a solution is affected by temperature. Unless you are always going to measure at 25° C (~ 75 F°) you need compensate for any other temperatures. pH meters can come with either 2 probes (one for temperature and one for measuring the pH) while other meters have a single combination electrode that provides automatic temperature compensation (ATC).

Maintenance:

Some electrodes are very low maintenance, after use you clean them with a stream of water, wipe gently (Kim-wipe or similar) and then store them in a small amount of pH buffer or an electrode storage solution. These are called sealed electrodes. Other electrodes have a port for re-filling the fluid inside. Some non-glass electrodes can be stored dry and do not need to be conditioned.