

General rules and tips

- When using refillable electrodes, open the fill hole during calibration and measurement (and close it afterwards!)
- Level of electrolyte in the outer cavity of refillable electrodes should be kept above the level of the solution being measured. This prevents reverse electrolyte flow
- To obtain accurate readings, immerse the electrode to cover both the glass pH sensing bulb and reference junction
- Electrodes perform best when they are hydrated. Recondition a dried out electrode by soaking in electrode solution (helps re-establish the thin hydration layer on the sensing bulb critical to pH measurements)
- Rinsing electrode with deionised or distilled water between samples is fine but do not use for storage (robs critical ions from the sensing bulb)
- To help maintain the hydration layer on the sensing bulb avoid wiping or touching it
- Avoid moving or touching the electrode cable as this may result in unstable readings
- Since temperature changes pH, the sample temperature should always be noted with pH readings. Use an automatic temperature compensation (ATC) probe for best accuracy
- Always use fresh pH buffers. Excessive air exposure and sunlight can alter the buffer's value

pH measurement procedure

- 1 Verify that the pH electrode has been prepared and calibrated correctly. If the electrode is refillable, make sure that the fill hole is uncovered and the filling solution level is at least one inch above the sample solution level
- 2 Rinse the electrode with distilled water and blot it dry with a lint-free tissue
- 3 Place the electrode into the sample. Use a magnetic stir plate and clean stir bar or the accumet™ benchtop stirring probe to stir the sample at a moderate, uniform rate
- 4 When the measurement is stable, record the pH value and temperature of the sample

How to check the slope of a pH electrode

- 1 Select the millivolts (mV) mode on your pH meter
- 2 Place the electrode in a fresh pH 7 solution and note the value in mV (ideally 0 to ±20mV)
- 3 Place the electrode in a fresh pH 4 solution and note the value in mV
- 4 Calculate the difference between these two values, the difference should be between 160 and 180mV

How to maintain a pH electrode

- 1 Check the level of electrolyte within the electrode, top it up if necessary
- 2 Check the appearance of the reference junction, which is normally white. Clean it if necessary
- 3 Store the correct electrode in the correct storage solution; avoid distilled water
- 4 Clean the electrode regularly with a suitable cleaning solution
- 5 For refillable electrodes: change the electrolyte regularly
- 6 Rehydrate for two to three hours, preferably in a storage solution, or in a pH 7 solution, then calibrate
- 7 Rinse the electrode well between two measurements



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ELECTROCHEMISTRY Focus on pH

pH Electrode Selection Guide

Use the selection guide below to help you choose the right Fisherbrand electrode for your particular application.

| Sample/Application Type | Recommended Electrode Type | Cat. No |
|--|---|-----------------------------------|
| General purpose for many common sample types, e.g. aqueous samples, drinking water etc | Glass bodied | 11749798 Connector: BNC |
| | Plastic bodied | 11706358 Connector: BNC |
| Food and drink e.g. juices, baby food, cheese | Tuff-Tip | 11755638 Connector: BNC |
| | Spear tip | 11736209 Connector: S7 |
| Environmental samples e.g. wastewater, soils, sea water | Tuff-Tip | 11755638 Connector: BNC |
| | Sleeve junction | 11726358 Connector: S7 |
| Low ionic strength e.g. treated effluent, deionised water, distilled water | Sleeve junction | 11726358 Connector: S7 |
| | Non-aqueous e.g. solvents, alcohols | Sleeve junction |
| Life science samples Tris-containing reagents, proteins etc | Tuff-Tip | 11755638 Connector: BNC |
| Small samples e.g. samples stored in test tubes, small flasks and beakers | Thin stem Semi micro | 11769798 Connector: BNC |
| High-viscosity samples e.g. slurries, suspended solids | Sleeve junction | 11726358 Connector: BNC |

For further information on the above pH electrodes refer to the Focus on pH and Electrochemistry brochure

did you know?...

Next to temperature and mass, pH is the third most common laboratory measurement



Standard buffer solutions for pH calibration

Fisher Chemical have all the standard buffers you need. Manufactured to exacting standards and packaged for convenience, you'll find a buffer to meet virtually every laboratory or field application.



| Cat. No | Description | pack size |
|----------|---|-----------|
| 10457711 | Buffer, pH 4.00 (phthalate) red, traceable to NIST | 500mL |
| 10427260 | Buffer, pH 4.00 (phthalate) red, traceable to NIST | 1,000mL |
| 10000642 | Buffer, pH 7.00 (phosphate) yellow, traceable to NIST | 500mL |
| 10477830 | Buffer, pH 7.00 (phosphate) yellow, traceable to NIST | 1,000mL |
| 10774074 | Buffer, pH 10.00 (borate) blue, traceable to NIST | 500mL |
| 10284240 | Buffer, pH 10.00 (borate) blue, traceable to NIST | 1,000mL |

pH Indicator paper

- pH-Fix non-bleeding test strips
- Just dip... and read!
- Rapid and reliable pH testing

| Cat. No | pH range | pack size |
|----------|-------------|------------|
| 10642751 | 0.0 to 14.0 | 100 sticks |
| 10018080 | 0.0 to 6.0 | 100 sticks |
| 10017950 | 1.7 to 3.8 | 100 sticks |
| 10353641 | 3.8 to 6.1 | 100 sticks |
| 10333501 | 4.5 to 10.0 | 100 sticks |
| 11386454 | 6.0 to 7.7 | 100 sticks |
| 10271751 | 7.0 to 14.0 | 100 sticks |



Featuring:

- Benchtop meters
- Portable meters
- pH electrodes
- Fisher Chemicals
- Standard buffer solutions for pH calibration
- pH accessories e.g. wash bottles, indicator sticks and reels
- Technical resources e.g. troubleshooting guide and FAQ's

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