

pH Electrodes

Storage:

For best results, always keep the pH bulb wet, preferably in pH 4.01 buffer with 1/100 part of saturated KCl added. Other pH buffers or tap water are acceptable storage media but avoid storage in distilled water. The protective boot filled with buffer will provide an ideal storage chamber for long periods. NOTE: Electrodes should not be stored for a period longer than 6 months for best results. Electrode stock should be rotated accordingly.

Cleaning and Maintenance:

Electrodes which are mechanically intact with no broken parts can often be restored to normal performance by one of the following procedures:

- **General Cleaning**: Soak the electrode in 1:10 dilution of household laundry bleach in a 0.1-0.5% liquid detergent solution in hot water with vigorous stirring for 15 minutes. Place junction under warm, running tap water for 15 seconds. Drain/refill the reference chamber. Soak the electrode in storage solution for at least 10 minutes.
- **Salt Deposits**: Dissolve the deposit by immersing the electrode in 0.1 M HCl for five minutes, followed by immersion in 0.1M NaOH for five minutes, and thorough rinsing with distilled water.
- **Oil/Grease Films**: Wash electrode pH bulb in a little detergent and water. Rinse electrode tip with distilled water.
- **Clogged Reference Junction**: Heat a diluted KCl solution to 60-80°C. Place the reference portion of the pH electrode into the heated KCl solution for approximately 10 minutes. Allow the electrode to cool while immersed in some unheated KCl solution.
- **Protein Deposits**: Dissolve the deposit by immersing the electrode in a 1% pepsin solution with a background of 0.1M HCl for five minutes, followed by thorough rinsing with distilled water.

After any of these special cleaning procedures, remember to drain/refill the reference chamber, if refillable. Soak the electrode in storage solution for at least 10 minutes.

If these steps fail to restore normal electrode response, replace the electrode.

ORP Electrodes

Storage:

When not in use, the ORP element may be stored in air or distilled water, but water is more preferable to keep the reference junction wet. The protective boot filled with buffer will provide an ideal storage chamber for long periods. If left in air for an extended period of time, remove salt crystals on the outside of the reference junction by rinsing with distilled water and store wet. NOTE: Electrode should not be stored for a period longer than 6 months for best results. Electrode stock should be rotated accordingly.

Cleaning and Maintenance:

Electrodes which are mechanically intact with no broken parts can often be restored to normal performance by one of the following procedures:

- **General Cleaning:** Soak the electrode in 1:10 dilution of household laundry bleach in a 0.1 - 0.5% liquid detergent solution in hot water with vigorous stirring for 15 minutes. Drain/refill the reference chamber. Soak the electrode in distilled water for at least 10 minutes.
- **Salt Deposits:** Dissolve the deposit by immersing the electrode in 0.1 M HCl for five minutes, followed by immersion in 0.1M NaOH for five minutes, and thorough rinsing with distilled water.
- **Oil/Grease Films:** Wash electrode in a little detergent and hot water. Rinse electrode tip with distilled water.
- **Clogged Reference Junction:** Heat a diluted KCl solution to 60-80°C. Place the reference portion of the ORP electrode into the heated KCl solution for approximately 10 minutes. Allow the electrode to cool while immersed in some unheated KCl solution.
- **Protein Deposits:** Dissolve the deposit by immersing the electrode in a 1% pepsin solution with a background of 0.1M HCl for five minutes, followed by thorough rinsing with distilled water.

After any of these special cleaning procedures, remember to drain/refill the reference chamber, if refillable. Soak the electrode in storage solution for at least 10 minutes.

If these steps fail to restore normal electrode response, replace the electrode.

Galvanic Style Oxygen Electrodes

Storage:

These electrodes may be stored filled with solution, but make sure the electrode is disconnected from the meter during storage. Also, do not store electrode with a shorting strap connected. For long term storage you may safely store the electrode dry (drain the fill solution out).

Cleaning and Maintenance:

After the electrode has been used for a period of time the residual current may rise. To minimize the residual current, the following cleaning method is recommended. Gently unscrew the bottom membrane cap from the electrode body and rinse the inside of the membrane with DI water. Soak the lead anode in 0.1N HCl (8.3 ml concentrated HCl in 1000 ml DI water) for 15 to 20 minutes. Rinse the lead anode with DI water, blot dry with tissue paper. Refill the electrode with electrolyte and replace membrane cap as directed in the electrode user manual.

Polarographic Style Oxygen Electrodes

Storage:

These electrodes may be stored filled with solution. For short term storage, you may leave the probe connected to your meter or disconnected as you wish. However, keep in mind that the polarographic style electrodes take 1-2 hours polarization time before they can be used. For long term storage, disconnect the probe from the meter.

Cleaning and Maintenance:

After the electrode has been used for a period of time the residual current may rise. To minimize the residual current, the following cleaning method is recommended. Gently unscrew the membrane cover from the body, rinse the inside of the membrane with DI water. Flush the electrolyte chamber with DI water. Soak the silver anode and the glass tip in silver cleaning solution (commercially available as jewelry cleaning solution) for about 10 minutes. Thoroughly rinse the soaked portion with DI water, blot dry with tissue paper. Refill the electrode with electrolyte and replace membrane cap as directed in the electrode user manual.

Ion Selective Electrodes

Storage:

For Short Term Storage (less than 2 weeks), store the ISE in dilute ISE standard (appropriate to electrode).

For Long Term Storage (longer than 2 weeks), store the ISE dry.

Cleaning & Maintenance:

Polymer membrane ISE's - Treat with distilled water, followed by soaking in Standard. Polymer membrane ISE's include Ammonia, Ammonium, Calcium, Carbon dioxide, Fluoroborate, Nitrate, Nitrogen oxide, Perchlorate, Potassium, Sodium, Surfatant, and Water Hardness.

Solid State ISE's - Polish membrane with polishing strips, followed by soaking in dilute ISA solution

Solid State ISE's include Bromide, Cadmium, Chloride, Copper, Cyanide, Fluoride, Iodide, Lead, and Silver/Sulfide.