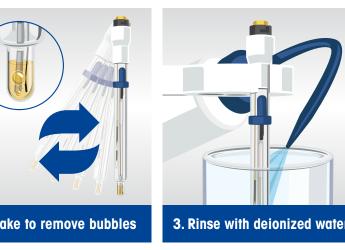


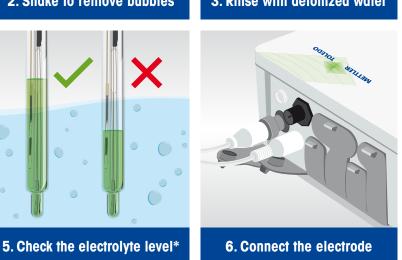
pH Electrode Maintenance Guide

Electrode Preparation

1. Remove the wetting cap 2. Shake to remove bubbles





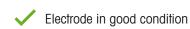


* Artificially colored green for illustration purpose

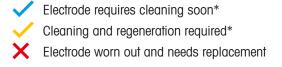
Electrode Calibration

- 1. Take a minimum of two pH buffers bracketing the sample pH.
- 2. Use a fresh amount of aliquot of non-expired pH buffer for every calibration point.
- 3. Pour enough to submerge the sensor junction.
- 4. Stir the buffers (if required).
- 5. Start the calibration and take the temperature of buffers into account.
- 6. Rinse electrode thoroughly with deionized water and blot dry with tissue.
- 7. Repeat steps 2–6 for next buffer.
- 8. Evaluate as shown in table below.

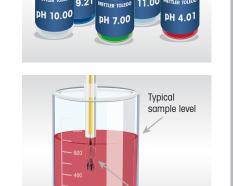
Slope/Offset	± 0-20 mV	± 20-35 mV	> 35 mV
95-105%	/	✓	✓
90-95%	✓	~	✓
85-90%	/	✓	✓
<85% or >105%	×	X	X

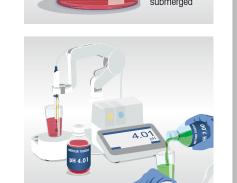












* Refer to the Electrode Troubleshooting section below

Good Measuring Practices (pH/Titration)

Sefore

Take suitable electrode according to the sample to be measured.

Rinse the electrode with deionized water and blot dry with tissue.

Ensure that the electrode junction is immersed in sample/buffer.

Ensure that the reference electrolyte level is above the sample solution level.

Calibrate the sensor before use.

4. Open SafeLock™

www.mt.com/phlab-electrodepreparation

Perform kinetic electrode test if required (for titration only).

Maintain uniform stirring and temperature conditions for calibration and sample measurement (pH/Titration).



Incidence

8 Rinse the electrode thoroughly between consecutive measurements.

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Electrode Storage Reference electrolyte solution filled within the protective tube When not in use Buffer pH 4 Dry storage In deionized water In sample (long term storage) (short term storage) (without wetting cap) In reference electrolyte solution (specific for each electrode) Short term Never store the electrode dry or in distilled water as this will affect the pH-sensitive alass membrane and thus shorten the lifetime of the electrode www.mt.com/phlab-electrodestorage

Electrode Troubleshooting

1. Symptoms, causes and regeneration procedure for pH sensitive glass membrane

Inspection
Environment
Is instrument ok?Cross-check with another instrument
Is electrode cable ok?Cross-check with another cable

Electrode						
Presence of an air	bubble					

• Refer image 2 in electrode preparation Reference electrolyte level?

• Refer image 5 in electrode preparation

Glass membrane activation? • Refer table 1 in this section Clogged junction? • Refer table 2 in this section

Troympionio, dadoo and rogeneration procedure for pir concinite glace membrane								
Cause Symptom	Ageing of glass	Scratches on membrane	Broken membrane or shaft	Gel layer destroyed or dehydrated	Dry storage of electrode	Calcium on glass membrane (whitish film)	Oil, fat or tar residues (visible?)	Deposits of unknown substances (visible?)
Reduced slope (80–90%)		•	_	_	_			
Very small slope (<80%)	•	_				_	_	_
Slow response			_					
Fluctuating reading	©		•					
Zero point shift	•	•	_	(a)		•	•	•
Reason	High temperature, age of electrode	Abrasion, solid particles, incorrect cleaning	Mechanical or temperature shock	lon deficient media, non-aqueous applications	Wrong storage	Measurement media	Measurement media	Measurement media, no cleaning
Restoration procedures	Regeneration*	Replace electrode	Replace electrode	Rehydration with electrolyte	Rehydration with electrolyte	Dip the glass in acetic acid / dilute hydrochloric acid until deposits are dissolved. Follow up with regeneration	Clean with degreasing agent, then with deionized water. Condition the electrode in pH buffer 4	Clean with degreasing agent, then with deionized water. Condition the electrode in pH buffer 4

2. Clogged junction: Causes and cleaning procedures

Possible
Probable
Highly probable
* Immerse the electrode glass membrane in regeneration solution for not more than 2 minutes

_ oroggon , amonom outdoor and oronaming procedures						
Type of contamination		Cleaning agent	Reaction time	Remarks		
Silver sulfide		Thiourea	5–60 minutes	Leave until coloration disappears		
All possible types of contamination	First recommendation for removing unknown substances	HCI 0.1 M	Approximately 12 hours	Can also be used for internal cleaning		
	Second recommendation for removing unknown substances	Chromic-sulfuric acid mixture	Approximately 30 minutes	Also cleans deposits very well. Electrode must be regenerated after this		
Proteins		Pepsin/HCl cleaning solution	>1 hour	Can also be used for internal cleaning		
		NaOH 2%	Approximately 20 minutes	Rinse the electrode with deionized water followed by conditioning in pH buffer 4		
Lipophilic substances		Ethanol, acetone	Approximately 30 minutes	Highly suitable for edible oils. Always recondition the pH electrode in buffer pH 4 or 0.1M HCl		
Calcium, scale		Acetic acid	Approximately 30 minutes	Electrode must be regenerated after this procedure		
Soaps, tensides		Hot water (80 °C)	Approximately 12 hours	Thorough washing with deionized water followed by conditioning in pH buffer 4		

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www.mt.com/pH



