

Standard Operating Procedure (SOP) for a pH Meter

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Standard Operating Procedure (SOP) for a pH Meter



1. Purpose

To describe the procedure for accurate measurement of pH using a pH meter.

2. Scope

Applicable to all laboratory personnel performing pH measurement of solutions.

3. Responsibilities

- **Analyst/Technician** : Perform calibration and measurement.
- **Lab Supervisor** : Ensure proper maintenance and compliance.
- **Students** : Adherence to instructions and safety guidelines

4. Apparatus & Materials

- pH meter
- Calibrating Buffer solutions (pH 4.0, 7.0, 9.2 or 10.0)
- Distilled or deionized water
- Beakers
- Tissue paper or lint-free wipes
- pH electrode storage solution (KCl storage solution)



Figure 1 Apparatus and Supplies (Source: <https://share.google/YRA69mwNTEqH6sgrh>)

5. Procedure

5.1 Preparation

- Switch on the pH meter and allow it to stabilize (15–30 minutes).
- Ensure electrode is clean and properly filled (if applicable).
- Rinse electrode with distilled water and blot dry.

5.2 Calibration

- Calibrate daily before use.
- Use at least **two or three buffer solutions**.

Steps:

1. Clean electrode.
2. Calibrate in pH 7.
3. Second point -use pH 4 or pH 10.
4. Optional three point calibration.
5. Store properly.

How to Calibrate a pH Meter

1. Clean Electrode

- Rinse with distilled water
- Blot with tissue paper



2. Calibrate in pH 7.00

- Immerse electrode
- Wait for stable reading
- Confirm / Calibrate



3. Second Point

- Use pH 4.00 or pH 10.00
- Rinse between buffers



4. Optional 3-Point Calibration



5. Store Properly

- Store in KCl solution
- Do not store in distilled water



Figure 2 How to Calibrate a pH meter (Source: <https://share.google/MnX9zIwiY7N6QJNQ2>)

5.3 Measurement

1. Rinse electrode with distilled water and blot dry.
2. Dip electrode into the sample solution.
3. Stir gently and wait for stable reading.
4. Record the pH value.
5. Rinse electrode after each measurement.

5.4 After Use



Figure 3 How to clean a pH electrode (Source: <https://www.labmanager.com/best-practices-for-cleaning-and-maintaining-lab-ph-meters-35072>)

- Rinse electrode with distilled water.
- Store electrode in pH electrode storage solution (KCl storage solution) (not dry).
- Switch off the instrument.

6. Precautions



Figure 3 How to wipe a pH electrode (Source: <https://www.wikihow.com/Clean-a-pH-Meter-Probe>)

- Do not wipe electrode aggressively (can create static charge).
- Always use fresh buffer solutions.
- Avoid touching electrode bulb.
- Ensure temperature compensation if applicable.
- Do not allow electrode to dry out.

7. Maintenance

- Clean electrode regularly.
- Replace electrode if response is slow or unstable.
- Check and refill electrolyte (for refillable electrodes).

8. Documentation

- Record calibration data.
- Maintain logbook for pH measurements and maintenance.

9. References

<https://youtu.be/CRMcY--5KQs?si=QQVn5YucHA74nISF>

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