

A stylized graphic of a pH electrode is shown, consisting of a rounded rectangular frame. Inside the frame, the text "Instructions for the Use of pH Electrodes" is centered. The electrode itself is depicted as a horizontal line with a small square connector on the left and a larger rectangular body with a small circle at the end on the right. A curved line extends from the top right of the frame, ending in a small square connector.

Instructions for the Use of pH Electrodes

This pH electrode is a hand crafted, precision analytical device. Carefully follow the directions in this instruction sheet to obtain the best performance and electrode life.

Required Equipment and Solutions

- pH meter (a temperature compensator is recommended for increased pH measurement accuracy)
- pH Buffer 4.01
- pH Buffer 7.00
- Reference filling solution (see list for particular pH electrode type)
- Wash bottle filled with distilled or de-ionized water
- Laboratory magnetic stirrer and magnetic stir bars
- Lab wipes
- Clean beakers

Preparation of the Electrode for Initial Use

1. Remove the protective bottle or cover from the electrode and thoroughly rinse the electrode with distilled water. Wipe carefully with a clean lab wipe.
2. During shipment, air bubbles may have migrated into the electrode sensing bulb. Hold the electrode up to the light and inspect the sensing bulb for air bubbles. If air is seen, carefully shake the electrode downward (like a thermometer) to dispel the air bubble from the sensing bulb at the tip of the electrode.
3. For refillable models, uncover the filling port to expose the electrode reference chamber fill hole (for sealed, gel filled electrodes, disregard this operation). Fill the reference chamber with the appropriate pH reference filling solution. Electrodes that have been filled with the incorrect filling solution are not covered under warranty.

Reference Filling Solution Selection

- For pH combination electrodes with Calomel and Double Junction Ag/AgCl reference half cells, use 4 M KCl reference filling solution.
- For pH combination electrodes with Single Junction Ag/AgCl reference half cells, use 4 M KCl saturated with AgCl reference filling solution.

Standardizing the Electrode

1. Connect your pH electrode to the input connector on the pH meter. Ensure that the electrode connection is secure.
2. Place the electrode into a beaker containing pH 7.00 buffer and a stir bar. Stir at a moderate speed.
3. When the reading is stable, adjust the meter to read the value of the pH 7.00 buffer at the temperature in the laboratory (see the meter manufacturer's instructions for details regarding temperature compensation)
4. Remove the electrode from the buffer. Rinse with distilled water and blot with a lab wipe.

5. Place the electrode in a beaker containing pH 4.01 buffer and a stir bar. Stir as before. When the reading is stable, adjust the meter to read the value of the 4.01 buffer at the temperature in the laboratory.

Reading a Sample with the Electrode

1. Rinse the electrode with distilled water and blot with a lab wipe. Place the electrode in a beaker containing the sample and a stir bar. The sample should be at the same temperature as the buffers used to standardize the electrode. Stir as before. Record the pH when the reading is stable.
2. Remove the electrode from the sample, rinse the electrode with distilled water over the "waste" beaker. Blot the electrode dry with a lab wipe. The electrode is now ready to read the pH of other samples.

Storing the Electrode

Short Term

Between measurements, store the pH electrode in a beaker containing pH 4.01 buffer.

Long Term

When storing for longer periods, store the pH electrode in the storage bottle or the protective boot which came with the electrode. Ensure that the foam in the storage bottle or the cotton ball in the protective boot is totally wetted with DI water to keep a moist environment around the pH bulb and junction.

Maintain the moist environment in the storage bottle or in the protective boot during storage.

If the pH electrode is equipped with a fill hole cover, slip the cover over the fill hole.

Electrode Cleaning

Do not use strong solvents (e.g. acetone, carbon tetrachloride, etc.) to clean the pH electrode. Be sure to recalibrate the electrode after cleaning.

1. If the electrode has become coated with oil or grease, carefully wash the electrode under warm tap water using dish-washing detergent. Rinse thoroughly with fresh tap water followed by a rinse with distilled water. Soak the electrode in pH electrode storage solution for 30 minutes after this cleaning procedure. Recalibrate the electrode before use.
2. If the electrode has been exposed to protein or similar materials, soak in acidic pepsin, The part number CS 0003 for 5 minutes. Rinse thoroughly with distilled water. Recalibrate before use.
3. If the previous cleaning procedures fail to restore response, soak the electrode in 0.1 N HCl for 30 minutes. Rinse thoroughly with distilled water. Recalibrate before use.
4. If electrode response is not restored still, replace the electrode.