

Experiment Name: Determination of pH in given water sample as per Indian Standards

Objective:

To determine the pH of water samples using standard procedures as per the guidelines outlined in **IS 3025 (Part 11): 1983**.

Apparatus and Materials

1. **pH Meter:** A calibrated electronic pH meter with a sensitivity of 0.1 pH units.
2. **Electrode:** Combination glass electrode or equivalent suitable for aqueous samples.
3. **Beakers:** 100 mL or 250 mL capacity.
4. **Distilled Water:** For rinsing electrodes.
5. **Buffer Solutions:**
 - pH 4.0
 - pH 7.0
 - pH 9.2 (or pH 10.0, depending on expected sample pH range).
6. **Sample Containers:** Clean, non-reactive, and leak-proof containers for collecting wastewater.
7. **Thermometer:** To measure the sample temperature (optional, depending on pH meter capabilities).
8. **Filter Paper:** If the sample contains significant suspended solids.

Procedure

A. Calibration of pH Meter

1. **Setup:** Turn on the pH meter and allow it to stabilize.
2. **Buffer Calibration:**
 - Rinse the electrode with distilled water and blot it dry with a clean tissue.
 - Immerse the electrode in pH 7.0 buffer solution and adjust the meter to read 7.0.
 - Repeat calibration with pH 4.0 and pH 9.2 (or 10.0) buffer solutions to ensure accuracy across the range.
3. **Stabilization:** Ensure the readings stabilize before recording.

B. Sample Preparation

1. **Collection:**
 - Collect water samples in clean containers.
 - If immediate measurement is not possible, store samples at 4°C and test within 24 hours.
2. **Filtration** (if necessary):
 - If the sample contains suspended solids, filter it using clean filter paper.

C. Measurement of pH

1. **Prepare the Electrode:**
 - Rinse the electrode with distilled water and blot dry.
2. **Sample Testing:**
 - Pour the wastewater sample into a clean beaker.
 - Insert the electrode into the sample, ensuring it is fully submerged and not touching the sides or bottom of the beaker.
3. **Stabilize Reading:**
 - Allow the pH reading to stabilize and record the value.
4. **Repeat for Accuracy:**
 - Perform at least two measurements and take the average if necessary.

Observation Table

S.No.	Sample	pH Value	Avg. pH	Acid/base on pH Scale	Temperature	Avg. Temp.

Result

The pH of the water sample is determined and recorded to the nearest 0.1 pH unit.

Reporting/Conclusion

1. Report the measured pH of the water sample.
2. Mention any unusual observations or deviations from standard conditions.

Precautions

1. Ensure the pH meter is properly calibrated before use.
2. Do not touch the glass bulb of the electrode; it is delicate and may break.
3. Avoid cross-contamination by rinsing the electrode with distilled water between samples.
4. Maintain a consistent sample temperature during testing.
5. Handle wastewater samples with care; wear gloves and protective equipment if required.

References

- **IS 3025 (Part 11): 1983** – Methods of Sampling and Test (Physical and Chemical) for Water and Wastewater, Part 11: Determination of pH.
- Relevant environmental regulations by the **Central Pollution Control Board (CPCB), India.**