
Technical Procedure for the pH Meter

- 1.0 Purpose** - This procedure specifies the required elements for the calibration and use of the pH meter.
- 2.0 Scope** – This procedure applies to the pH meter used in the Toxicology Units of the State Crime Laboratory.
- 3.0 Definitions**
- **Performance verification** – The initial confirmation of the reliability of a previously or externally validated method or instrument.
 - **Quality control (QC) check** – Periodic confirmation of the reliability of equipment, instrumentation, and/or reagents.
- 4.0 Equipment, Materials and Reagents**
- 4.1 Equipment**
- pH Meter with Electrode - pH combination, double junction, Ag/AgCl reference and thermometer
- 4.2 Materials**
- Eye protection
 - Beakers
 - Wash bottle
- 4.3 Commercial Reagents**
- Buffer solutions, pH 4.00 and pH 7.00, and other buffer solution strengths as needed
 - 4 M Potassium Chloride saturated solution
- 5.0 Procedure**
- 5.1 Standards and Controls** – N/A
- 5.2 Calibrations**
- 5.2.1** Perform daily when in use.
- 5.2.2** Set the function selector to the pH position.
- 5.2.3** Obtain two buffer solutions with values that bracket the desired measuring range (i.e., pH 4.00 and pH 7.00 for samples that fall between pH 4 and 7).
- 5.2.4** Open the fill hole on the electrode.
- 5.2.5** Place a beaker containing the buffer nearest in value to pH 7 in position and immerse the electrode and thermometer into the solution.
- 5.2.6** Standardize the pH meter to the buffer.

- 5.2.7 Remove the electrode and thermometer from the buffer solution.
- 5.2.8 Rinse the electrode and thermometer with deionized water.
- 5.2.9 Place a beaker containing the second buffer in position, and immerse the electrode and thermometer into the solution.
- 5.2.10 Standardize the pH meter to the buffer.
- 5.2.11 Remove the electrode and thermometer from the buffer and rinse with distilled water.
- 5.2.12 Close the fill hole on the electrode.
- 5.2.13 The slope (electrode efficiency) must be greater than 95 %. The calibration may be repeated if necessary to meet the requirement.
- 5.2.14 Notify the Key Operator or designee if a slope greater than 95 % cannot be obtained.
- 5.2.15 The Key Operator or designee shall evaluate the instrument and replace the electrode if necessary.
- 5.2.16 If the problem cannot be corrected by replacing the electrode, the Key Operator or designee shall obtain service or replacement. The instrument shall be placed out of service until a slope greater than 95 % is obtained.
- 5.2.17 Record all calibrations in the instrument logbook.
 - 5.2.17.1 Record the date, operator initials, lot number, expiration date and pH of buffers used and the slope obtained.

5.3 Maintenance

- 5.3.1 Fill the electrode with 4 M potassium chloride saturated solution as needed.
- 5.3.2 Record all maintenance in the instrument logbook.
 - 5.3.2.1 Record the date, initials and description of maintenance performed.

5.4 Sampling

- 5.4.1 Ensure that the liquid to be measured is well mixed using shaking and/or vortexing prior to measuring.

5.5 Application of Procedure on Evidence

- 5.5.1 Set the function selector to pH and open the fill hole on the electrode.
- 5.5.2 Immerse the electrode and thermometer into the sample solution.
- 5.5.3 Read the pH of the sample from the display and record value.

5.5.4 Remove the electrode and thermometer from the solution.

5.5.5 Rinse the electrode and thermometer with deionized water before proceeding with the next measurement.

5.5.6 Close the fill hole on the electrode.

5.5.7 Record the date, initials and liquid measured in the logbook.

5.6 **Calculations** – N/A

5.7 **Uncertainty of Measurement** – N/A

6.0 **Limitations**

6.1 Do not touch or move the electrode during measurement.

7.0 **Safety**

7.1 Refer to the [Laboratory Safety Manual](#).

8.0 **References**

pH Meter Operating Instructions. Fisher Scientific.

Combination pH Electrodes with Silver/Silver Chloride Reference. Part No. 69486/Accumet, published November, 1993.

9.0 **Records**

- Instrument logbook

10.0 **Attachments** – N/A

Revision History		
Effective Date	Version Number	Reason
09/17/2012	1	J-09 Conversion to ISO format
02/15/2013	2	2.0 - modified to merge procedure with Triad Laboratory
11/15/2013	3	Added issuing authority to header