

pH Meter

Standard Operating Procedure

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Section 1: Overview

Type of SOP: Process Hazardous Material Hazardous Class of Materials Equipment

Synopsis:

This protocol describes the method for the operation, four point calibration, and maintenance of the SevenCompact™ pH/Ion meter S220..

Section 2: Risk Assessment Summary (Hazards and control measures)

Materials:

Material (name, CAS #, other ID)	Hazards
pH 1.68 buffer solution ^a	Low hazard. May irritate eyes, mucous membranes and skin
pH 4.01 buffer solution ^b	Low hazard. May irritate eyes and skin
pH 7.00 buffer solution	N/A
pH 10.01 buffer solution ^c	Low hazard. May irritate eyes and skin

Relevant References for Material Hazards:

- <https://secure.nelsonjameson.com/docs/sds/5043168.pdf>
- <https://pim-resources.coleparmer.com/sds/5535042-sds-new.pdf>
- <https://pim-resources.coleparmer.com/sds/55350-68.pdf>

Equipment Hazards:

N/A

Hazardous Conditions:

- Powerful vibrations
- Direct sunlight
- Atmospheric humidity greater than 80%
- Corrosive gas atmosphere
- Temperatures below 5 °C and above 40 °C
- Powerful electric or magnetic fields

- Other hazards may arise from individual experiments.

Technique Hazards:

- Clean up spills immediately in accordance with MSDS.

Personal Protective Equipment

- Safety glasses, nitrile gloves, and a non-flammable lab coat.

Engineering Controls

N/A

Section 3: Procedures

pH Calibration

1. Clean end of probe with deionized (DI) water and dry with a lab tissue taking care not to scratch the end of the probe.
2. Place probe in first calibration solution and press appropriate button on pH meter (labeled "CAL").
3. You may now have to manually change the pH reading to that of the buffer using the "READ" keys – or meter may do this automatically
4. Keep the sample stirring during calibration but making sure that the end of the probe stays wet.
5. When pH meter has settled (this may take a minute or longer) press the appropriate button (labeled "End") and remove probe from first solution and repeat cleaning step.
6. Repeat steps 2 to 4 with new calibration solutions.

Using a pH probe and meter

1. Clean end of probe with deionized water and dry with a lab tissue.
2. Keep stirring the sample whilst taking a measurement and make sure that the end of the probe stays wet.
3. Wait until the meter settles on a value and record that value then repeat cleaning step before starting new sample.
4. In between each sample it is advisable to check the calibration of your pH probe by testing the pH of a solution of known pH.

After use

1. Always make sure probe and probe casing are clean after finishing.
2. Check the glass pH sensitive membrane for cracks, chips, or discolouration.
3. When not in use the probe should be stored upright in storage solution. *Not left dry or in DI water.*

Section 4: Waste Disposal/Cleanup

- Buffer solution (pH 6 to 10) may be flushed to the sanitary sewer (down the sink).
- Discard all remaining analyzed samples in waste container.
- All sample labware must be washed with laboratory soap inside and out followed by multiple rinses with DI water.

- Submit waste container once it is full. Fill out chemical waste form using the DRS website online.

Section 5: Emergency Response

- Take up with absorbent materials. Place in small containers and dispose according local regulations.
Render harmless: neutralize with sodium carbonate (only pH 1.68 buffer solution). Wash spill site with soap solution.

Section 6: Additional Information

Advice:

- Calibration and measurement can be performed out of hours **unless individual experimental risks do not allow.**

Checklist:

- Read (Material) Safety Data Sheets.
- Proper fire extinguisher is nearby.
- Another researcher is nearby and knows the hazards present.
- The required glassware is of the proper size to accommodate all steps of the procedure.

References:

METTLER TOLEDO, Instruction manual SevernCompact™ pH/Ion meter S220.