

pH Accuracy Test / Calibration

Equipment List

- Orion 210A pH meter with temperature and pH probes
- pH 7 and 10 buffers
- pHisa ionic strength buffer
- 1 mL syringe
- distilled water squirt bottle
- spare containers for pH buffers
- sample container
- filling solution
- 9 V battery



Considerations:

Please **do not** set down probe, it is very fragile. Only place in solution or its storage container. Please do your best to **conserve** buffer!

When to do an Accuracy Test/ Calibration:

- In the morning before someone uses the pH meter - to make sure it's accurate.
- In the evening after someone uses the pH meter - to make sure it was accurate all day. (The meter is more likely to fall out of calibration over night, if you don't do an accuracy check until the morning after someone uses it, you will not know if it fell out of calibration overnight or during the day while they were using it).

Accuracy Check:

- 1) Ensure that there is no crystal build-up on the inside of the pH probe and that the filling solution is within one inch of the vent.
- 2) Remove the probe from it's storage solution bottle.

Expose the vent by removing the plastic cover or plug.

Expose the temperature probe by removing the black plastic cap.



Rinse the pH and Temperature probes with the distilled water



- 3) Then rinse probes with a tiny bit of pH 7 buffer from bottle labeled RINSE. Place probes into the container of pH 7 buffer labeled DIP. Turn on the display; the screen should automatically say "measure."

- 4) Swirl the probes for several seconds without hitting the walls of the container. When the meter beeps and displays “ready” record the temperature and the reading in the log book.

Is the reading more than 0.2 S.U. off of the theoretical value for that buffer and temperature?

If NO

Continue to pH 10 buffer: Rinse probes with distilled water, rinse with 10 buffer out of RINSE bottle. Place probes in DIP bottle of 10 buffer. Swirl, when meter says “ready” record in log book.

- Is the 10 buffer reading more than 0.2 S.U. off of the theoretical value for that buffer and temperature?
 - o If NO – congrats! You are finished with the accuracy check! Put it all away.
 - o If YES, move on to CALIBRATION step.

If YES

Move on to the CALIBRATION step

<u>THEORETICAL VALUES FOR pH</u>			
pH 7.00 Buffer		pH 10.00 Buffer	
<u>°C</u>	<u>pH</u>	<u>°C</u>	<u>pH</u>
0	7.12	0	10.31
10	7.06	5	10.23
20	7.02	10	10.17
25	7.00	15	10.11
30	6.99	20	10.05
35	6.98	25	10.00
40	6.97	30	9.95
60	6.98	35	9.91
80	7.04	40	9.87
90	7.09	45	9.84
		50	9.81

CALIBRATION:

- 5) Press the **mode** button until the screen reads “calibrate 7-4”. Press the **no** button, the screen will then read “calibrate 7-10.” Press the **yes** button.
The screen will display “P1 ATC” and a reading.

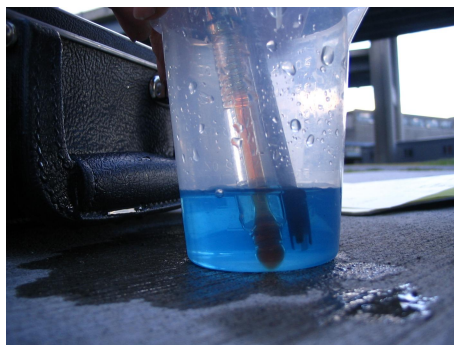


- 6) If the probes are not already in the DIP bottle of 7 buffer solution – rinse them with distilled water and 7 buffer solution out of the RINSE bottle and place them in the DIP bottle of 7 buffer solution.
- 7) Swirl the probes for several seconds without hitting the walls of the container. When the meter beeps and displays “ready” **record** the pH reading and press **yes**.
The screen will display “P2 ATC”.



- 8) Rinse the probe with distilled water followed by pH 10 buffer from the RINSE bottle. Place both probes in the DIP container of pH 10 buffer and swirl. When the meter reads “ready,” **record** the pH reading and press **yes**.

***Note:** the slope will appear briefly on the display, be prepared to record.



- 9) **Record** the slope value that is *briefly* displayed. The meter will automatically go to the measure function. At this point you can **record** the temperature of the pH 10 buffer.



- 10) Make sure to **record both theoretical value and the tested value**. Theoretical value can be found on the back of this page. Match up the resulting temperature as best as you can and record the corresponding pH value in the log book. Do this for both pH 7 and pH 10.

	buffer	temp	theo	rdg	slp	sl
2/20/06	7	20	7.02	7.01	97.8	OK
	10	20	10.05	10.07		
2/24/06	7		7.02			
PH	10	20	10.05	10.06	98.1	
2/26/06	7	19	7.02	7.02	97.6	OK
PH	10		10.06	10.07		
2/26/06	7	19	7.02	7.02	97.5	OK
ES	10		10.06	10.07		
3/15/06	7	18	7.02			
PH	10		10.07			



NOTE: If you want, you can re-run the accuracy test to make sure it took. Start with the ph 10 this time, as the probes should still be in that bottle.