Fisher Scientific
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accumet®

electrochemistry 101
with Dr. Seymour Blue

How to check your pH electrode slope

1) Select the millivolt (mV) mode of your pH meter
2) Using a pH electrode, obtain mV readings of two fresh calibration buffers (i.e., pH 4.0 and pH 7.0 are best)
3) Determine the net mV change
4) Determine the net mV change per pH unit change and compare using the chart at right

Slope	at 20°C		at 25°C		Status
	1pH unit	3pH units	1pH unit	3pH units	
>102	>59.3	>178.0	>60.3	>181.0	Poor
102%	59.3	178.0	60.3	181.0	OK
101%	58.8	176.3	59.8	179.3	Very Good
100%	58.2	174.5	59.2	177.5	Ideal
99%	57.6	172.8	58.6	175.7	Very Good
98%	57.0	171.0	58.0	173.9	Very Good
97%	56.4	169.3	57.4	172.2	Very Good
96%	55.8	167.5	56.8	170.4	Very Good
95%	55.3	165.8	56.2	168.6	Very Good
94%	57.0	171.0	58.0	173.9	OK
93%	54.1	162.3	55.0	165.1	OK
92%	53.5	160.5	54.4	163.3	OK
<92	<53.5	<160.5	<54.4	<163.3	Poor

For example, at 25°C: pH 4 = 170.5mV, pH 7 = -3.4mV: Net change = 170.5mV - (-3.4mV) = 173.9mV. Since pH 4 and pH 7 are 3 pH units apart, using the chart, 98% = Very Good

Care and Maintenance of Electrodes

- Calibrate regularly with fresh buffers
- Rinse electrode tip well between readings
- On refillable electrodes be sure to check your fill level and open the fill hole before calibration or measurement
- Never rub the bulb to dry it; a static charge can develop!
- Store your electrode with fill-hole closed in electrode storage solution *(Never store in deionized water!)*
- Special electrode cleaning solutions (13-642-583) help with tough samples that coat your electrode bulb—proteins, bacteria, oils, and more
- Record temperature along with your pH value

Did you know?
Buffers should be at the same temperature as your sample.

Cleaning Probes

Cleaning a dirty, clogged or coated electrode can restore proper electrode performance and prolong the useful life of the electrode. Here are some cleaning suggestions:

- **Organic Oil/Grease Films**—liquid dish soap and warm water are best. Isopropyl alcohol can be used on most electrodes if additional cleaning is needed. ***NOTE:*** Solvents such as acetone will damage plastic body electrodes!
- **Inorganic Salt Deposits**—soak probe in 0.1M HCl as needed
- **Proteins**—Use a protein-cleaning solution (13-642-584)

If you have a refillable probe, drain the chamber and refill with correct reference filling solution. Rinse the probe tip with distilled or deionized water and condition the probe in storage solution before using again.

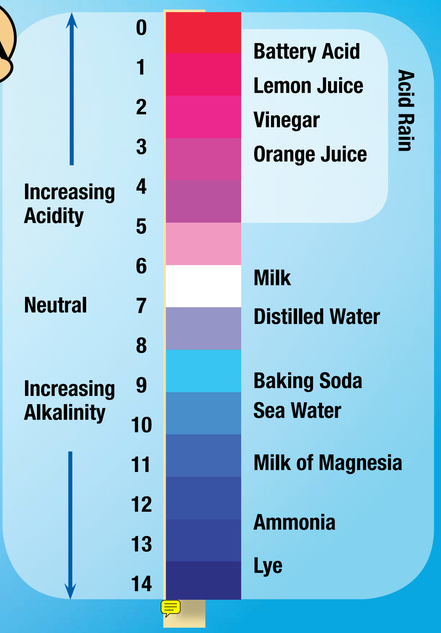
Need Help? Call
888-358-4706
for your accumet specialist!

(per NIST) Standardized Buffers

pH Values of Buffers at Various Temperatures

0°C	1.67	4.00	6.98	7.11	9.46	10.32	12.79
5°C	1.67	4.00	6.95	7.08	9.40	10.25	12.73
10°C	1.67	4.00	6.92	7.06	9.33	10.18	12.67
20°C	1.67	4.00	6.87	7.01	9.23	10.06	12.52
25°C	1.68	4.01	6.86	7.00	9.18	10.01	12.46
30°C	1.68	4.02	6.85	6.98	9.14	9.97	12.36
40°C	1.69	4.04	6.84	6.97	9.07	9.89	12.17
50°C	1.71	4.06	6.83	6.97	9.01	9.83	11.96
60°C	1.72	4.09	6.84	6.97	8.96	9.79	11.73
70°C	1.74	4.13	6.85	6.99	8.92	9.78	11.47
80°C	1.77	4.16	6.86	7.03	8.89	9.78	11.19
90°C	1.79	4.21	6.88	7.08	8.85	9.80	10.89

pH Scale



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