How to Calculate a pH Probe Slope Percentage

Calculating a pH slope percentage will allow you to verify that your pH probe is functioning properly.

Often, you will obtain a straight calibration curve on a pH probe and obtain consistent readings, but these readings are erroneous.

This is because the Offset of the curve is outside of the range of acceptable values.

Generally a slope between 90 and 105% is acceptable.

Outside of this range, you may need to replace your pH probe.

To calculate the Slope Percentage of your pH Probe:

1) Read the mV potential generated by the electrode in two separate calibration buffers.

2) Calculate the difference in mV's between the higher buffer value and the lower buffer value.

3) Divide the difference in mV potential by the difference in pH unit
(**EXAMPLE**: the difference in pH unit between 7.01 buffer and 4.01 buffer is 7.01 – 4.01 = 3).

4) Divide this number by the theoretical maximum (59.16 mV/pH unit @ 25 ºC) and multiply by 100 to get a percentage value.

Sample Calculation:

pH electrode generated –15 mV in pH 7.01 buffer and +160 mV in pH 4.01 buffer.

160 mV – (-15 mV) = 175 mV

175mv / 3 = 58.33 mV/pH unit

(58.33 / 59.16) x 100 = 98.6% slope. ***This is your pH slope percentage.***