OAKTON® TECH TIPS

Use of the pH Wand with non-pH Wand Electrodes

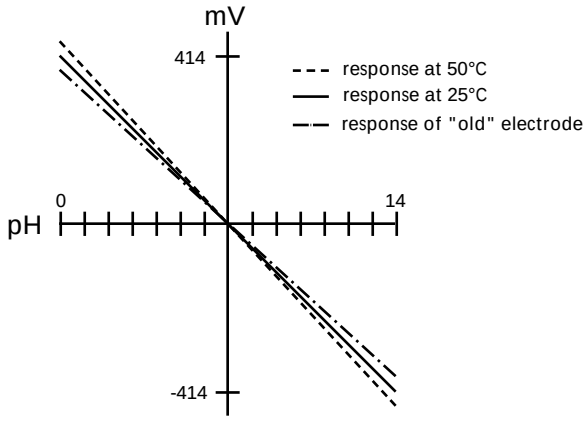
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Most pH electrodes do not have any type of built-in temperature sensor and rely on a separate temperature probe. Nearly all electrodes with a built-in temperature sensor use separate connectors for sending pH and temperature signals to the pH meter. Alternatively, pH Wand electrodes use a single, modified BNC connector to carry both signals to the pH Wand. This configuration produces some unique conditions when the pH Wand is used with a non-pH Wand electrode.

First, due to the lack of a temperature compensation element in a standard electrode, the pH Wand "sees" an open temperature compensation circuit. It interprets this open circuit to mean the measured sample is 50°C, and compensates accordingly. If no calibration or single-point calibration is performed, this may result in reading off by as much as 1-1.5 pH units in low- and high-pH samples. The error in neutral samples is less because neutral samples require a smaller degree of temperature compensation. To avoid this error when using a non-pH Wand electrode, calibration must be performed at both pH 4 and 10 before operation.

Second, the operating life of non-pH Wand electrodes may be shortened when used with the pH Wand. Because the glass properties of an electrode change with use, the electrode gradually produces a response signal with a lower slope. Through calibration, the meter is able to compensate for this change in response. However, the meter's electronics have a limited compensation ability. Eventually, an "old" electrode will produce a response with a slope too low to allow calibration. In the case of non-pH Wand electrodes, this point may happen sooner because of the additional drain on the pH Wand's compensation ability by the temperature effect described in the second paragraph.

Figure 1: Change of pH electrode slope



In summary, the end-user MUST calibrate frequently at both pH 4 and 10 when using a non-pH Wand electrode. Of secondary concern, the end-user may experience shorter electrode life.

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