

# MI-420 AND MI-425 Na<sup>+</sup> ION MICROELECTRODES OPERATING INSTRUCTIONS

Carefully unwind the tape and remove the probe from the protective glass tube. Only the bulbous tip is sensitive to sodium. For best results, soak the tip of the electrode in 0.1 N NaCl solution for 24 hours prior to use.

The use of a separate Reference Electrode such as our MI-409 is required.

## Calibration

Meter requirement: Any research grade pH meter with millivolt mode capability. Set meter to millivolt mode.

The MI-420 and MI-425 are standardized using pure sodium chloride (NaCl) solutions and again in solutions containing possible interfering ions ( if appropriate). The pure NaCl solutions are used to determine probe function. In pure solutions, a 55 mv difference (approximate) will occur between each tenfold change in concentration. For example, test in 0.001 N NaCl, 0.01 N NaCl and 0.1 N NaCl.

Standardization in solutions containing possible interfering ions is done in order to simulate the actual samples to be analyzed. For example, if your samples contain a known potassium background such as 100 millimoles KCl then your calibrating standards should also have this background. These are some possible mixtures you could use: 0.001N NaCl-0.1N KCl, 0.01N NaCl-0.1N KCl, 0.1N NaCl-0.1 N KCl. The data are then plotted on semilog paper (See Sample Calibration Curve).

## Remember! For best results, do the following:

1. Always use standards that bracket the concentration range that you expect to have in your samples.
2. Always mix your standards to closely match the composition of your samples.
3. Always calibrate using the same volume of standard that you will have as a sample.  
Example: samples = 50 microliters then standards = 50 microliters.

## Handling

Always handle the electrode with the same care you would use with other glass electrodes.

## Cleaning

When using the electrodes in solutions containing protein, the MI-420 and the reference electrode should be rinsed with an enzyme cleaning solution such as Terg-a-zyme (Alconox, Inc.) or a chromic/sulfuric glass cleaning solution after each use for a couple of minutes to remove the protein from the glass and the reference junction. This will prolong the useful life of the electrodes..

## Storage

Always clean the microelectrode before storing:

**Long-term (over 2 weeks):** Return the electrode to its original container and prepare it in the same condition in which you received it. Usually this means simply moistening the sponge located in the bottom of the protective glass tube with distilled water.

**Short-term:** The electrode can be left in a 0.1 N NaCl solution