

**MI-4142, MI-4144 AND MI-4146  
NEEDLE MICRO-COMBINATION pH MICROELECTRODES  
OPERATING INSTRUCTIONS**

The microelectrode is ready to use. Carefully unwind the tape and remove the probe from the protective glass tube. The white translucent sleeve, which covers the hole, should be moved down the glass barrel slightly to ventilate the reference chamber and replaced after each use.

*The use of a separate Reference Electrode is not required.*

### **Calibration**

The electrode can be held by hand when measuring pH. It has been standardized in two (2) pH buffers. Follow the procedure recommended by the manufacturer of your pH meter for calibration.

**Optimum Response Time:** Optimum response time will be obtained after the probe has been exercised in two (2) buffer solutions. Fill one beaker with a pH 4.01 buffer or equivalent and a second beaker with a pH 6.86 buffer or equivalent. Hold the microelectrode and touch the pH 4.01 buffer surface allowing 5 seconds for equilibration, and then touch the pH 6.86 buffer surface in the same manner. Do this several times. It is not necessary to rinse the probe with distilled water because the carry-over is negligible.

### **Handling**

The outer reference chamber of the microelectrode can be refilled when necessary with the 3 M KCl solution, using the bulb pipette. Hold the electrode at a 60 degree angle (approx.) and slowly insert the tip into the fill hole of the electrode.

*Be careful not to apply pressure against the inner glass capillary tube.*

Slowly fill the reference chamber. If filling is done too quickly, air may be trapped in the chamber causing reference solution to squirt out of the fill hole instead of entering and filling the reference chamber.

### **Cleaning**

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

### **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 pH 4 buffer.

**Short-term:** The probe can be left in an acid pH buffer solution (pH 4.01).

### **MICROELECTRODES, INC**

40 Harvey Road  
Bedford, New Hampshire 03110  
United States of America  
Tel. 603.668.0692 Fax 603.668.7926