



## The Care and Use of Microelectrode Holder Half-Cells

### Microelectrode Holders

WPI microelectrode holders are designed to provide an electrical coupling between fluid-filled glass pipettes and high input impedance microelectrode amplifiers. The 2-mm diameter gold-plated pin or receptacle connects directly to the probe input connector of WPI microelectrode amplifiers. An Ag/AgCl half-cell or silver wire, molded into the holder, provides the interface to the microelectrode electrolyte.

### Use of the Holders

After the glass capillary micropipette is pulled (for example, with a WPI micropipette puller) it is usually filled with 3 M KCl. Insert a syringe needle (e.g. 30-gauge) completely into the shank of the micropipette and inject with chloride-containing electrolyte. Care must be taken to eliminate air bubbles by tapping the pipette with the tip pointed downwards. Fill the holder with the same chloride solution. The stem of the micropipette is then carefully pushed into the half-cell through the small hole in the holder gasket. At this point there must be no air bubbles or gaps throughout the micropipette and holder. The outside of the holder should be carefully dried with a tissue and the tip plug is then inserted into the tip jack of the probe. The electrode is now ready for use.

### Chloridization

Holders with silver wires should be chloridized before use. This may be done easily by immersing the wire in 1 M hydrochloric acid and applying +1.5 V to the holder vs. a return electrode, such as a large platinum wire. If, before chloridizing, the wire is tarnished (yellow to dark red) it may be cleaned by passing it quickly over a flame, being careful to avoid melting the acrylic body, or washing in urea solution.

### Cleaning and Storage

If the holder is not to be used for a period of time (more than a day) it should be rinsed with distilled water and carefully

dried. The holders should not be stored in solution, especially salt solutions, because the stainless steel tip will cause rust to deposit on the Ag/AgCl pellet. Do not use organic solvents such as alcohol or acetone for cleaning.

Noise or potential drift may be an indication that the Ag/AgCl pellet or wire has been poisoned (complexed with protein, iron or other material). Often the poisoned portion is limited to only the surface and can be removed. A pellet can be rejuvenated with a suitably small drill bit or reamer. A wire may be lightly sanded.

A spare gasket for the holder is provided since the gasket can become damaged after repeated insertions of the glass tubing. For the MEH1 series the gasket may be glued using silicone adhesive (WPI No. 1571). Use a small length of the glass tubing to center the gasket and allow for overnight curing of the adhesive.

### Double Junction Electrode

To avoid contaminating a sample with potassium or chloride ion, a double-junction electrode may be constructed using any of the microelectrode holders. The inside of the holder is filled with 3 M KCl, while the glass capillary is filled with another electrolyte, such as ammonium nitrate.

### Reference Cell (Indifferent Electrode) Model RC1

The reference cell is a Ag/AgCl pellet molded into the end of a 4-ft length of flexible wire. It is designed to be used as the ground leg (return path) from a preparation. We recommend the use of a wick or a salt-saturated gel between the reference electrode and the surrounding fluid medium. This is done to prevent contamination of the Ag/AgCl by protein, which may adversely affect the electrode behavior.

*Electrodes, batteries and other consumable parts are warranted for 30 days from the date on which the customer receives them.*

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