How To Guide

Princeton Applied Research

Vycor Frit Handling and Replacement in Reference Electrode Bridge Tubes

All PAR reference electrode bridge tubes incorporate an unfired Vycor tip designed specifically to provide ultra low leakage rates with minimum IR drop through the tip. This arrangement eliminates complications arising from poisoning of test solutions by reference electrode filling solutions or by unwanted species produced at the counter electrode, and allows high sensitivity operation of potentiostats and polarographic analyzers. The Vycor tip is deliberately seated to the tube in a dry state. ONCE THE TIP IS WETTED, IT MUST BE MAINTAINED IN A WET STATE. What this means practically is that, when the tube is not in use, in must be stored in a solution - ideally a solution that closely approximates the solutions employed in the electrochemical experiment. If the tip is allowed to remain dry *for more than a few minutes* once it has been wetted, it will crack. A cracked tip must be replaced before the tube can be used again. Also, the tip may crack if it is exposed to drastically different environments, e.g.:

1. The bridge tube is immersed in an aqueous environment but filled with an organic solvent (or vice versa).

2. The bridge tube is removed from an aqueous environment and placed directly in an organic solvent (or vice versa).

If it should be necessary to use the bridge tube in different environments, i.e., organic solvents and aqueous solutions, it may be possible to prevent the tip from cracking by equilibrating the tip (inside and out) with a mixture (or mixtures) of the two environments. Alternatively, two bridge tubes should be used, one for each environment.

The following procedure is recommended for replacing a Vycor tip.

1. Slice off the old Teflon sleeve with a razor blade. Then discard the sleeve and the old tip.

2. Wash and dry the bridge tube.

3. Slide a new length of heat-shrink Teflon tubing onto the bridge tube.

4. Stand the bridge tube on the new Vycor tip. DO NOT WET THE TIP AND AVOID FINGER CONTACT WITH IT.

5. Heat the Teflon tubing on all sides with a hot-air stream from a heat gun. (A direct flame should not be used because it will char the Teflon.) Allow the tubing to shrink over the disk. BE SURE TO ALLOW THE TUBING TIME TO COOL TO ROOM TEMPERATURE BEFORE LIFTING THE ASSEMBLY.

Extra tips and Teflon sleeves can be purchased from Princeton Applied Research.

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