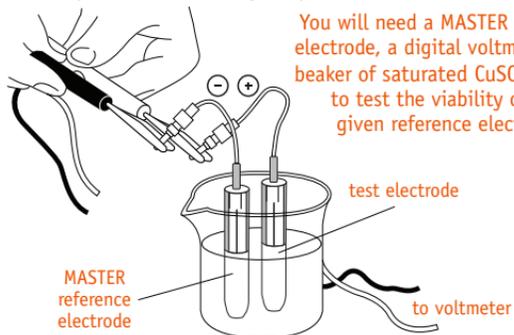


> TESTING THE VIABILITY OF Cu/CuSO_4 REFERENCE ELECTRODES

If you are concerned about the viability of a particular Cu/CuSO_4 reference electrode, it can be tested using a voltmeter, a MASTER reference electrode (RE that is solely stored and used for this purpose), and a saturated CuSO_4 solution (see below). Read the potential difference between the MASTER reference electrode and electrode under question using the voltmeter. If 2 RE's are of the same type (e.g. Cu/CuSO_4 vs Cu/CuSO_4), then the voltmeter should read 0 +/- 20 mV. If a reading is significantly different, then another electrode of the same type should be used to help distinguish which of the two needs replaced. Make sure to also regenerate and/or calibrate your MASTER RE regularly.



You will need a MASTER reference electrode, a digital voltmeter and a beaker of saturated CuSO_4 solution to test the viability of any given reference electrode.

> REGENERATING THE Cu/CuSO_4 REFERENCE ELECTRODES

If the frit or filling solution becomes contaminated and potential drift is observed, then the CoralPor® frit can be removed and replaced with (MF-2064) and the glass body refilled with a new saturated CuSO_4 solution.



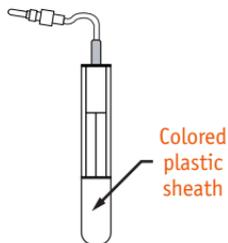
> Cu/CuSO_4 REFERENCE ELECTRODE MF-2063



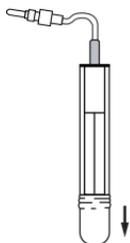
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> REMOVING THE SHEATH

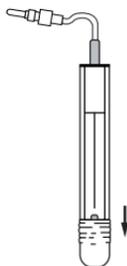
Every Cu/CuSO_4 reference electrode is shipped with a yellow plastic sheath that covers the porous CoralPor® frit and slows drying. **Immediately remove the sheath upon receipt.** Roll the sheath off the electrode without pulling the sheath and without holding the electrode by the pin. A small cut at the upper edge of the sheath will help initiate rolling the sheath off the electrode.



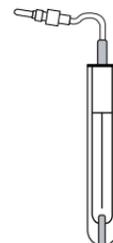
Reference electrode as shipped.



Starting at top of sheath, pull gently and start to roll the edge down.



Continue rolling sheath.



Reference electrode is now ready for immediate use. Store in a saturated CuSO_4 solution

> DISLODGING BUBBLES

Bubbles lodged in the tip may prevent electrical contact with the electrolyte and may damage the working electrode. Bubbles can be dislodged by holding the top of the electrode with one hand and tapping the electrode near the CoralPor® tip until the bubbles rise to the top.

> STORING Cu/CuSO_4 REFERENCE ELECTRODES

After the sheath is removed, store the electrode tip in a saturated CuSO_4 solution. The Cu/CuSO_4 reference electrodes are easily ruined by drying. Prevent the tips from drying out by placing in a storage vial (MR-5275) containing a saturated CuSO_4 solution when not in use. Only the tip needs to be immersed in the storage solution; the connecting pin needs to be kept dry to minimize corrosion. Reference electrodes will naturally change with use due to the ion and solvent transport across the porous CoralPor® frit. The rate of change is a function of the difference in composition between the sample solution and the filling solution (saturated CuSO_4). Storing the reference electrode in a saturated CuSO_4 solution between experiments will extend its lifetime, but **reference electrodes are expendable items, so be certain to have spares available.**