Tech Support NOTE

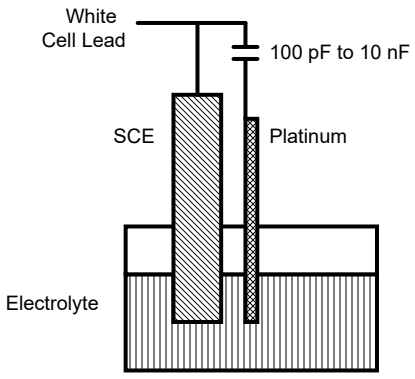
Improving Potentiostat Stability

Often times, a high impedance reference electrode can lead to your potentiostat oscillation. More information on why can be found in our potentiostat hardware manuals. In today's tech tip though, we're going to highlight three methods to dealing with a high impedance reference electrode.

The first method sounds almost silly but is simply lowering the reference electrode impedance. Change out the frit, unclog the reference junction, try to avoid small diameter Luggin capillaries and use a conductive electrolyte.

The second method involves adding a capacitively-coupled low-impedance reference element in parallel with your existing reference electrode. The classic fast combination reference electrode is a platinum wire and a junction-isolated SCE. The capacitor insures that DC potential comes from the SCE, and AC potential from the platinum wire. The capacitor value is generally determined by trial and error.

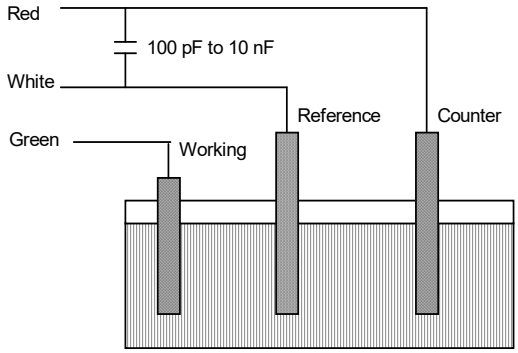
Fast Combination Reference Electrode



The third method involves providing a high-frequency shunt around the cell. A small capacitor between the red and white cell leads allows high-frequency feedback to bypass the cell. The capacitor's value is generally determined by trial and error. Ten nF (10 000 pF) is a good starting point.

In a sense, this is another form of an AC-coupled low-impedance reference electrode. The counter electrode is the low-impedance electrode, eliminating the need for an additional electrode in the solution.

High Frequency Shunt



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