

Care of Porous Glass Frits

Introduction

Porous glass frit is often used at the end of a reference electrode or a bridge tube to allow electrical, ionic conductivity between the bulk of the solution and the internal filling solution, while preventing large scale convective mixing of the solutions. This kind of glass, informally known as “thirsty glass,” is a porous glass with a fairly low leak-rate.

The frits, however, are not immortal!

To preserve their useful lifetime, keep them wet. If you let them dry out, solid crystals can clog the narrow pores and increase the electrical resistance. In extreme cases, the frit can crack upon drying out.

When not in use, store the reference electrode or bridge tube with the glass frit immersed in distilled water. Diffusion through the frit is fairly slow, and the internal filling solution will not get diluted, even upon a few weeks of storage.

An alternative is to replace the small plastic cap that was in place when the reference electrode was shipped.

Replacing a Glass Frit

Replace a glass frit if it has dried out, is cracked or chipped, or become discolored. The procedure is quite simple. A frit cannot be reused.

- 1) Remove the old frit by cutting the heat-shrink PTFE holding it in place. A sharp knife or razor blade is ideal.
- 2) Place a single glass frit inside the piece of heat-shrink PTFE tubing supplied. Five 1/8” (3.2 mm) glass frits and five pieces of suitable heat-shrink PTFE are available as a kit from Gamry Instruments as part number 955-00003. Contact Gamry Instruments or your local representative for pricing.



- 3) Slide the PTFE over the end of the reference electrode and be sure that the glass frit touches the end of the glass tube. Warm the PTFE with an electric “heat gun” until the PTFE shrinks tightly around the frit and the end of the reference electrode. **Do not hold the heat gun too close or the PTFE will melt.** Rotate the reference electrode to evenly heat all sides of the PTFE. You can buy a suitable heat gun from your local laboratory supply house. You can also use a common “paint stripper” heat gun.



- 4) Finally, trim the excess PTFE so that it is even with the end of the glass frit. If you do not, the excess PTFE tube can trap a gas bubble and isolate your reference electrode from the solution. That will make your potentiostat very unhappy!



- 5) Promise to take better care of your reference electrode frit in the future.

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