Assembly and Use of the LowVolume Cell Series Cap Kit

This brief product information document will describe how to assemble the LowVolume Cell Series Cap Kit. The LowVolume Cell Series Cap Kit enables users to perform electrochemical experiments in a sealed cell. In many cases, this may allow air sensitive electrochemistry to be performed on the benchtop instead of in a glove box.

1. LowVolume Cell Series Cap Kit

The LowVolume Cell cap kit is designed to tightly seal around all probes (electrodes, sparge tubes, purge tubes). Once assembled, the cap kit seals into the joint in the LowVolume cell.

The cap kit consists of four 7 mm holes and one 3.5 mm hole. The kit includes appropriately sized O-rings for use with matching probe diameters. Pine Research offers working and counter electrodes to fit the 7 mm hole and reference electrodes to fit the 3.5 mm hole. To take advantage of the sealing aspect of the lid, select the appropriately-sized plug and matching O-ring to use in any hole that does not contain a probe (see: Figure 1-1).

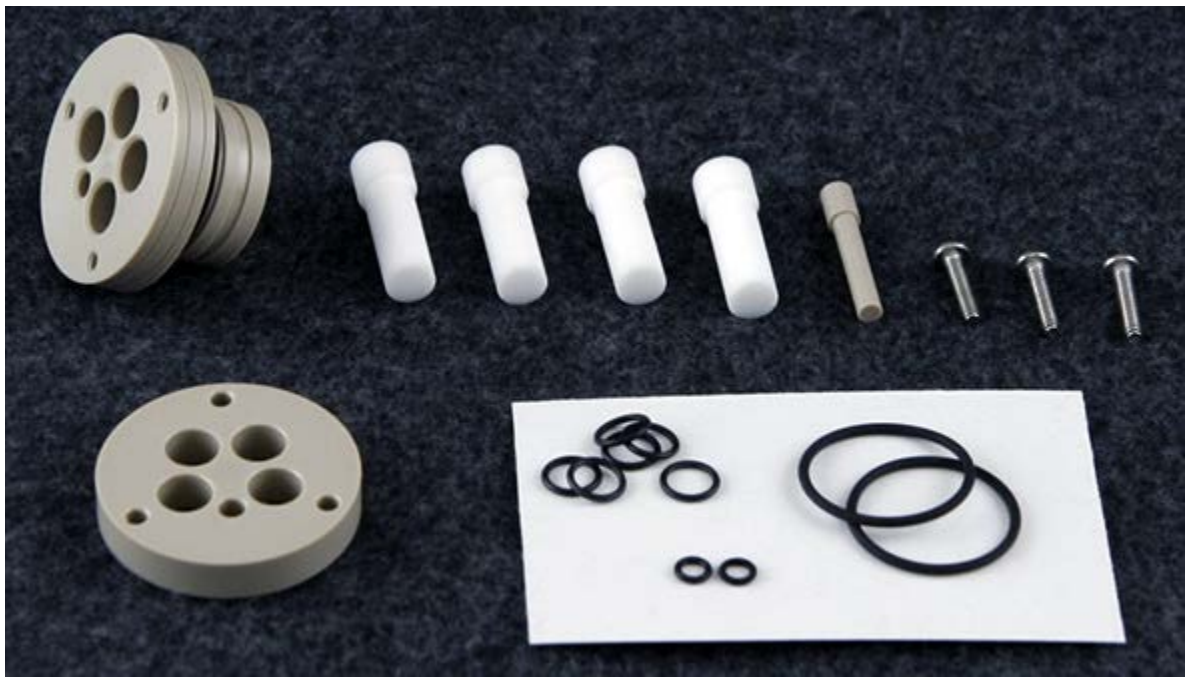

Figure 1-1. Components of the LowVolume Cell Series Cap Kit.

The basic principle of the cap kit is to seal all probes (i.e. electrodes) into the cap by wedging a soft O-ring between the upper and lower halves of the cap and clamping the halves together to seal any gaps. Then, the assembled cap kit seals directly into the cells. The following images will walk through the steps to position and seal the electrodes in the cap, then the cap in the cell.

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2. Cap and Probe Assembly Instructions

2.1 Select Electrodes, Tubes, and Ports

Use of this cell requires a plan prior to experimentation. Electrodes and probes are sealed in the cap, which then seals into the 24/12 or 24/25 cell port on the LowVolume cells. It can be challenging to add and remove electrodes or probes during an experiment, so plan electrodes in advance of experimentation. Pine Research offers working, counter, and reference electrodes designed for the LowVolume Cells (see: Figure 2-1).

Figure 2-1. LowProfile Working (Left), Counter (Middle), and Reference (Right) Electrodes.

Additionally, each LowVolume Cell Kit includes a glass tube for venting and blanketing and a fritted glass tube for sparging (see: Figure 2-2).

Figure 2-2. LowProfile Glass Venting/Blanketing Tube (Top) and Frited Glass Sparge Tube (Bottom).

2.2 Insert Electrodes/Probes into Thin Cap

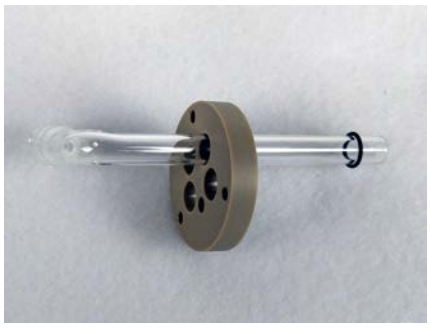

Figure 2-3. Probe/Electrode/Plug Insertion into the Thin Cap Piece.

Insert each electrode, probe, and/or plug through the thin cap piece and add an appropriately sized O-ring onto the end that was inserted. This is the O-ring that will seal when the lower cap is connected to the thin cap piece

(see: Figure 2-3). Be mindful of the insertion depth of the LowVolume Cell. In some cases (with the H-Cell and Membrane Cell, for example), the immersion depth may less than half the overall length of the probe. Once fully assembled, it is not possible to adjust the heights easily.

Insert all electrodes, probes, and/or plugs that you anticipate using and attach the O-ring, setting the height by O-ring position. It will take several assemblies and uses of the LowVolume Cell before you are intuitively aware of the appropriate heights.

With all O-rings in place, hold the cap in an inverted fashion and verify the O-ring positions (see: Figure 2-4).

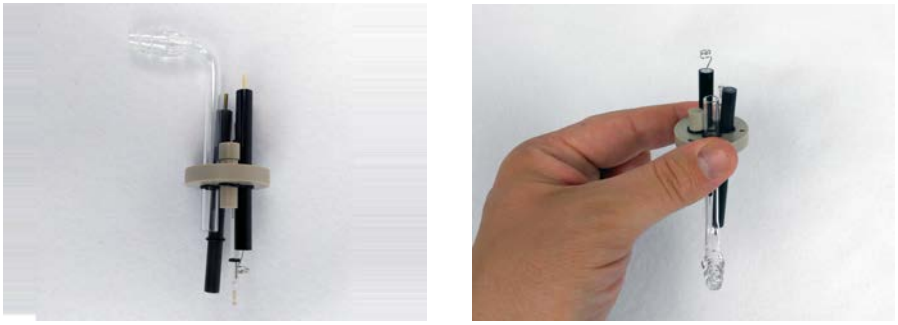

Figure 2-4. Insertion of All Desired Electrodes, Probes, and/or Plugs into the Thin Cap.

2.3 Attach Lower Cap and Seal Against Thin Cap

Slide the lower cap onto the probes. Note, there is a directionality and the cap will only fit on in one orientation. After the lower cap is fitted onto the electrodes, probes, and/or plugs, invert the assembly and hold onto the lower cap so it does not slide off (see: Figure 2-5).

Figure 2-5. Attachment of the Lower Cap onto Thin Cap/Electrode Assembly.

While holding the assembly, install three screws. Loosely tighten the screws to hold the cap halves together. Tighten each screw slowly, alternating between each of three screws (see: Figure 2-6). Occasionally view the cap assembly from the side to ensure the cap halves are tightened evenly.

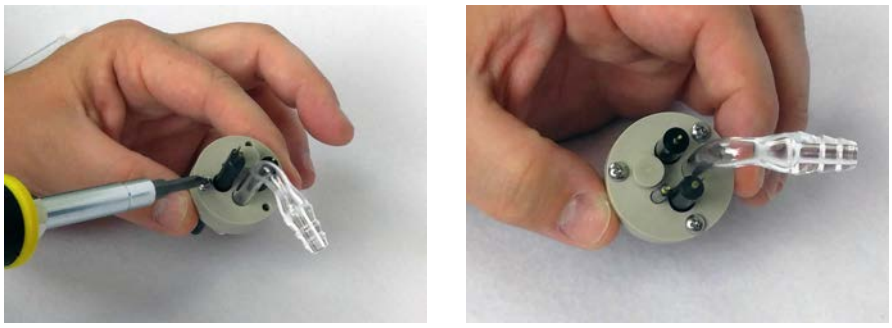

Figure 2-6. Installation of Cap Screws.

Continue gradual tightening until each screw is tight and the inserted electrodes, probes, and plugs are secured in placed and fairly immobile, up and down as well as by twisting.

2.4 Install Assembled Cap into Cell

After assembling the cap, slowly lower into the LowVolume Cell.

Figure 2-7. Install Cap into LowVolume Cell.

3. Disassembly

Simply perform the steps outlined in this guide in reverse order. Ensure each electrode is properly cleaned, rinsed, and stored for future use. Discard any cracked or damaged O-rings, which can happen when the assembled cap is used for prolong periods with non-aqueous solvents.

4. Contact Us

If you have any questions or would like to inquire about the LowVolume Cell Series Cap Kit described in this document, please contact us via the means provided below:

4.1 Email

Reach us by emailing the entire sales department: pinewire@pineresearch.com.

4.2 Website

There is a contact us form on our website.

There may also be additional resources (such as YouTube videos) for some of the products mentioned here: http://www.pineresearch.com