

Assembly of dual immersion corrosion cell electrode mount

1. The electrodes are comprised of four main parts: the PEEK piece, glass rod, bolt and stainless steel rod.



Figure 1. From left: PEEK piece, glass rod (with o-rings), bolt and stainless steel rod

2. The glass rod is slightly ground at one end with two o-rings attached.



Figure 2. Glass rod with o-rings attached at ground end.

3. The PEEK piece has an internal counterbore, which can be seen in Figure 3A. The ground end of the glass rod is carefully placed into the counterbore. This should be a tight fit and the counterbore will hold the glass rod in place (Figure 3B).

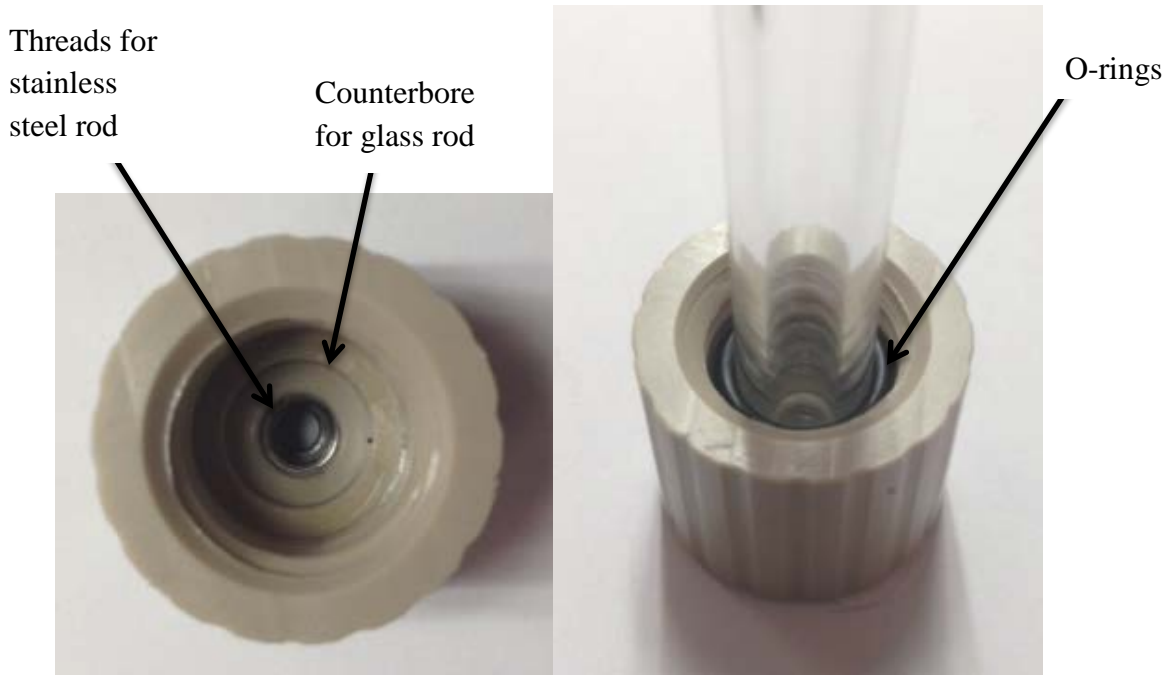


Figure 3. A) PEEK piece with counterbore and threads B) Glass rod placed into counterbore

4. The bolt slides down onto the glass rod from the top and gets placed into the PEEK piece. The bolt is then threaded into the PEEK piece. The bolt only needs to be hand-tightened into the seal piece, though it needs to be a very tight fit (until you cannot hand tighten any more). This will compress the o-rings around the glass rod and form a seal. **NOTE:** At this point, an o-ring can be placed over the glass rod (above the bolt) to hold the electrode mounts in place in the electrochemical cell top.



Figure 4. Assembly of bolt into seal piece

5. The stainless steel rod is placed through the glass rod.



Figure 5. Placement of stainless steel rod into glass rod

6. Using the handle at the end of the stainless steel rod, push the rod all the way down to the PEEK piece and rotate. The bottom end of the stainless steel rod will start to turn into the threads inside the bottom of the PEEK piece, seen in Figure 3A. Continue until the stainless steel rod cannot rotate any further. After this step, the assembly should look like Figure 6. Figure 7 shows the protrusion of the stainless steel rod through the bottom of the PEEK piece.



Figure 6. Placement of stainless steel rod into seal piece



Figure 7. Protrusion of stainless steel rod through bottom of PEEK piece

7. The o-ring at the top of the glass rod sits flush against the glass rod and is then compressed slightly by rotating the nut so that it pushes the o-ring into the glass rod. Do not over-tighten. Only a slight compression is needed.

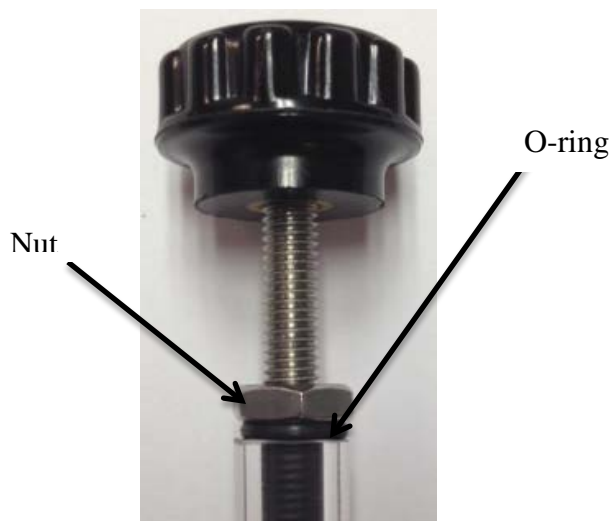


Figure 8. Compression of o-ring into the glass rod

8. The final assembly is shown in Figure 9.



Figure 9. Fully assembled electrode mount.

Attachment of electrode mount to coupon

9. The stainless steel rod protrusion at the bottom of the PEEK piece is placed into the threaded hole in the coupon.



Figure 10. Placement of electrode into coupon

10. While holding the coupon, use the handle at the top of the electrode mount to rotate the mount into the coupon.



Figure 11. Initial attachment of electrode mount into coupon

11. Once the electrode mount is firmly in place, rotate the bolt/PEEK piece clockwise (if looking down the length of the electrode at the coupon). The bolt/PEEK piece will rotate off the stainless steel rod and towards the coupon. Hand-tighten until rotation stops. The o-ring at the bottom of the PEEK piece will compress into the coupon to make the seal.



Figure 12. Forming the o-ring seal with the coupon

12. The final electrode mount/coupon assembly is shown in Figure 13.



Figure 13. Electrode mount attached to coupon

Use of electrode

13. All steps of the electrode mount assembly must be complete in order to ensure proper functionality. However, the order in which the assembly is done may change due to the design of the electrochemical cell. For example, the glass rod may need to be placed through an electrochemical cell top before assembly can proceed.
14. The electrode mounts (coupon, PEEK piece, and entire bolt) are designed to be fully submerged in solution provided that all pieces are tightly fit together. However, it is recommended that only the coupon and PEEK piece be submerged unless required by the electrochemical cell and experimental design.
15. Additional o-rings are provided to hold the electrode mounts in place in the electrochemical cell top.