How to polish the electrodes' surface ?

I. Introduction

The purpose of polishing electrodes is to remove redox reaction products accumulated on the electrode surface.

With repeated electrochemical redox reaction experiments, the adhesion of experimental products onto the electrode surface, and the electron transfer rate is attenuated gradually.

- If the electron transfer speed becomes slow, the difference between peak potentials for oxidation and reduction will broaden.
- Refreshing the electrode surface by polishing, the electron transfer rate will increase again. Consequently, the peak potential difference becomes narrow and returns to an ideal CV.

BioLogic provides a polishing kit called PK-3 electrode polishing kit, A-011975 (Fig. 1)

Figure 1 : PK-3 electrode polishing kit

II. PK-3 polishing kit

The kit is composed of a glass plate, polishing pads and polishing liquids.

The diamond pads and polishing liquid are dedicated to intermediate polishing while the alumina pads and polishing liquid are dedicated to final polishing to obtain a miror surface. Tab. I presents the composition of the PK-3 electrode polishing kit.

Table I PK-3 kit composition (A-011975)

	Purpose
1 µm polishing diamond (10 mL)	For intermediate polishing
Diamond polishing pad (10 pieces)	For intermediate polishing
0.05 µm polishing alumina (20 mL)	For final polishing
Alumina polishing pad (10 pieces)	For final polishing
Glass plate (1 piece)	-

It is also possible to buy some of these items independantly as spare parts.

III. How to polish electrodes ?

In most cases, for a general polishing of the electrodes, polishing with alumina pads and liquid (step 3 and 4) are recommended.

If this regeneration of the electrode surface still does not improve the measurements, try the diamond polishing first.

Note: to ensure that alumina particles adhered to the electrode surface are removed, use a new alumina polishing pad, slightly polish the washed electrode, and then rinse the electrode surface with distilled water and dry.

Step 1: Prepare the glass plate, and put a few drops of polishing diamond on a wetted diamond polishing pad (Fig. 2).

Figure 2 : Step 1

Step 2: Hold the CV electrode at right angle to the pad, and polish in a circular motion (Fig. 3).

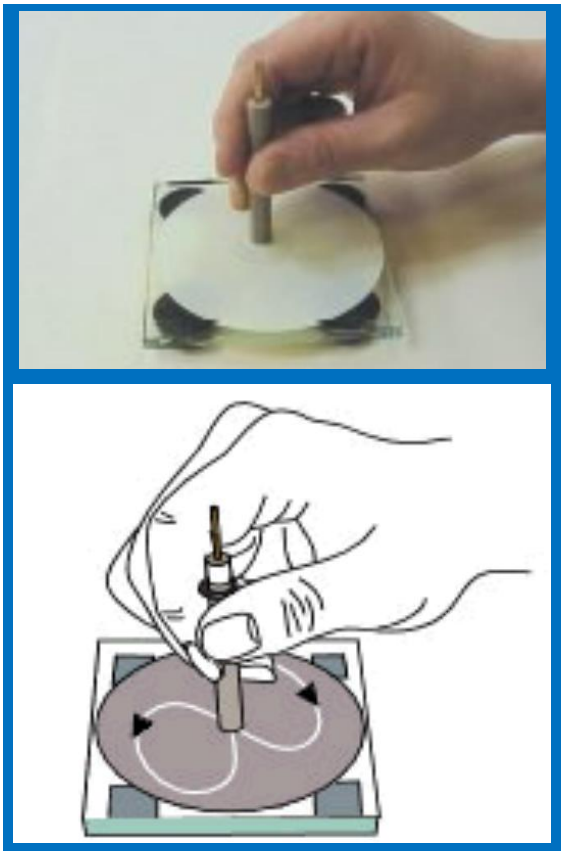

Figure 3 : Step 2

Step 3: Replace the diamond pad to an alumina polishing pad, put a few drops of polishing alumina, and polish the electrode to be mirror surface. Rinse the electrode surface with distilled water, and finish by air drying (Fig. 4).

Figure 4 : Step 3

Step 4: Using a new alumina polishing pad, polish few times the electrode (for removing the alumina particles remaining on the electrode surface). Rinse the electrode surface with distilled water, and finish by air drying.

Scientific articles are regularly added to BioLogic's Learning Center:
https://www.biologic.net/topics/

To access all BioLogic's application notes, technical notes and white papers click on Documentation:
https://www.biologic.net/documents/