

# BAS E2 Cyclic Voltammetry

Updated November 14, 2017

Instrument instructions can be found at:

<http://academic.bowdoin.edu/chemistry/resources/instructions.shtml>

If you have any problems with the instrument or would like to get trained, please contact

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- 1. There are three electrodes that need to be prepared and connected before the instrument is turned on.**
  - Auxiliary – this is a platinum wire that plugs into the red wire on the instrument. It is not stored in anything and is cleaned by dipping it in 6M nitric acid every couple of years.
  - Reference – this electrode plugs into the white wire on the instrument. It contains an AgCl solution and is stored in 3M NaCl. Rinse with DI water before using.
  - Working – this electrode plugs into the black wire on the instrument. For the  $K_3[Fe(CN)_6]$  we use 9 glassy carbon probe. Other solutions require different probes. Before using you need to polish this electrode. There is a pad that has Alumina on it. Put a little water on it and gently rub the electrode in figure eight patterns rotating the probe 45 degrees every few seconds. It is very important to keep the electrode perpendicular to the pad.
- 2. Bring up a nitrogen tank and put a regulator on it. The regulator should be at a very low pressure. (5 psi MAX!!)**
- 3. Plug in the electrodes. (Cell stand and Epsilon modules turned OFF)**
- 4. Turn on the instrument (cell stand and controller) and then turn on the computer.**
- 5. Open up Epsilon EC.**
- 6. Place stir bar in container.**
- 7. Pour sample into container.**
- 8. Hold container so electrodes are immersed. Swivel base to the left to support container.**
- 9. Turn on stirrer and purge.** The purge will remove oxygen from the sample. This will take about 10 minutes.
- 10. Set up instrument parameters** (Experiment > New > Cyclic Voltammetry)
  - # of Segments
  - Initial Potential (mV)
  - Switch Potential (mV)
  - Final Potential (mV)
  - Scan Rate (mV/s)
  - Quiet Time (seconds)
  - Full Scale (uA)
- 11. Turn off stir and purge.** There will now be a blanket purge.
- 12. Hit run.**
- 13. Rescale.**
- 14. Save file.**
- 15. Click on Graph-Display and then select “Colors and Fonts”—Select Colors For: and click “All Black” then click “Apply”. Then go to File>Print.**

16. **To configure a network printer and set it as default.**
  - a. Make sure you are connected to the Bowdoin network.
  - b. Left click Start, click “Printers and Faxes”.
  - c. Under Printer Tasks click “Add Printer”. When wizard window pops up, click “Next”.
  - d. Select “A network printer...” then click “Next”.
  - e. Select “Connect to this printer...” and type in <\\bradbury\dahlia> then click “Next”.
  - f. Select “Yes” if you want it as your default printer, then click “Next”, then “Finish”.
17. **Turn off instrument** (cell stand and controller).
18. **Turn off computer.**
19. **Remove electrodes and rinse. Ag/AgCl ref. back in NaCl solution.**
20. **Store electrodes properly.**
21. **Dispose of any chemicals and waste properly.**
22. **Turn off N<sub>2</sub> tank.**
23. **Aqueous samples—between runs, rinse electrodes (still connected) with DI water, then methanol and gently blot dry.**