Differential Pulse Voltammetry requires a computer-controlled or programmable potentiostat. DPV provides excellent high sensitivity. However, the method uses pulse waveforms so that ASV takes longer and interference from oxygen can becomes significant. Thus, it is advisable to remove oxygen from solutions by purging them with nitrogen for a few minutes. Otherwise, the procedure is the same as already outlined above. Discuss with the laboratory instructor about how to set the operating parameters of the potentiostat for DPV.

If you use computer data acquisition, it is useful to export the ASCII data to an Excel file and computers subtract the "blank" background scan from the Pb ones. The baseline will be nearly flat after background subtraction (e.g., Figure 2) so that it is easy to determine the peak heights.

Use the standard lead solutions from Part A, under Chemical Solutions, for the ASV experiment.

![Figure 2](image.png)

Figure 2. Example Pb ASV with differential pulse voltammetry. Deposition time is 2 minutes with 30 second rest period before ASV from –1,000 mV to +200 mV with a step height of 2 mV. The cycle period is 20 ms with a pulse height of 50 mV. The Hg film is co-deposited with the Pb during the deposition step. Data were obtained with CS-1200 computer-controlled potentiostat. Data exported to Excel and plotted with the potential scale set from –200 mV to –800 mV. If you are unfamiliar with the use of Excel program, please consult the Technical Note on Excel in this eChem Manual.