Working up Electrochemistry

Start with Best CV including all peaks + Ferrocene

1. Find $E_{1/2}$ of Ferrocene in CV with complex

   $F_{c} \max \approx 0.334 \Rightarrow 0.336 \text{V}$  \[ E_{1/2}^{F} = 0.332 \text{V} \]
   $F_{c} \min \approx 0.404 \Rightarrow 0.408 \text{V}$

2. Find correction to get Ferrocene $E_{1/2}$ to $+0.400 \text{V}$

   $0.332 + 0.078 \text{V} \Rightarrow +0.400$  
   
   Correction.

3. Find $E_{1/2}$ of Complex

   $\text{Complex max} \approx 0.034 \Rightarrow 0.038 \text{V}$  \[ E_{1/2}^{\text{Complex}} = 0.077 \text{V} \]
   $\text{Complex min} \approx 0.115 \Rightarrow 0.115 \text{V}$  \[ \Delta E = 77 \text{mV} \]

4. Add correction amount to find true $E_{1/2}$ Complex: $E_{1/2}^{\text{Complex corrected}} = +0.105 \text{V}$

5. Go to Complex-only CV. Find $E_{1/2}$ Complex

   $\text{Complex max} \approx 0.025 \Rightarrow 0.029 \text{V}$  \[ E_{1/2} = 0.076 \text{V} \]
   $\text{Complex min} \approx 0.120 \Rightarrow 0.122 \text{V}$  \[ \Delta E = 93 \text{mV} \]

6. Determine correction needed to make complex

   $E_{1/2}$ the true value: $0.076 \text{V} \overset{+0.029}{\rightarrow} +0.105 \text{V}$

7. Add correction $+0.029$ to all data points and plot final, corrected figure.

   $Fe^{2+/3+} = E_{1/2} = +0.105 \text{V}$  \[ \Delta E = 93 \text{mV} \]