

SAMPLE CALCULATIONS

Part A

$$[KSCN] = [FeSCN^{2+}]$$

$$C_1 = 0.00200 M$$

$$V_1 = 0.00100 L$$

$$C_2 = ?$$

$$V_2 = 0.0500 L$$

$$C_1 V_1 = C_2 V_2$$

$$C_2 = \frac{C_1 V_1}{V_2}$$

$$C_2 = \frac{(0.00200 M)(0.00100 L)}{0.0500 L}$$

$$C_2 = 4.00 \times 10^{-5} M$$

Part B

Slope of Calibration Curve

$$m = \frac{y_2 - y_1}{x_2 - x_1}$$

$$= \frac{0.6 - 0.5}{(1.25 \times 10^{-4}) - (1.05 \times 10^{-4})}$$

$$= 5000$$

$$\therefore \text{slope} = 5000$$

$$\text{and } y = 5000$$

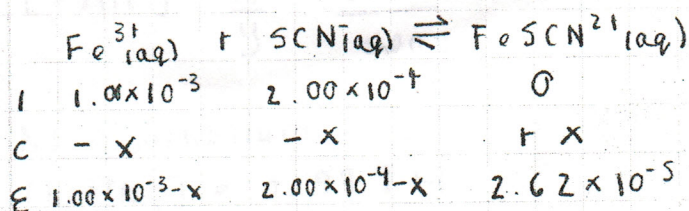
Determining the Equilibrium Concentration of $FeSCN^{2+}$

$$A = y [\text{Conc}]$$

$$[\text{Conc.}] = \frac{A}{y}$$

$$[FeSCN^{2+}] = \frac{0.131}{5000}$$

$$= 2.62 \times 10^{-5} M$$



$$\therefore x = 2.62 \times 10^{-5}$$

$$\begin{aligned} \therefore [Fe^{3+}_{(aq)}] &= 1.00 \times 10^{-3} - x \\ &= 1.00 \times 10^{-3} - (2.62 \times 10^{-5}) \\ &= 9.74 \times 10^{-4} M \end{aligned}$$

$$\begin{aligned} \therefore [SCN^{-}_{(aq)}] &= 2.00 \times 10^{-4} - x \\ &= 2.00 \times 10^{-4} - (2.62 \times 10^{-5}) \\ &= 1.74 \times 10^{-4} M \end{aligned}$$

Determining the Equilibrium Constant K_c