Materials and Equipment

Materials	Equipment
Prepared $FeNCS^{2+}$ Solutions	3 - 50mL Pipette
2.00×10^{-5}M $FeNCS^{2+}$	8 - 3mL Cuvettes
4.00×10^{-5}M $FeNCS^{2+}$	Lint-free tissue paper
6.00×10^{-5}M $FeNCS^{2+}$	Colorimeter
8.00×10^{-5}M $FeNCS^{2+}$	6 15mL Test Tubes
1.00×10^{-4}M $FeNCS^{2+}$	
1.20×10^{-4}M $FeNCS^{2+}$	
1.40×10^{-4}M $FeNCS^{2+}$	
2.00×10^{-3}M Fe^{3+}	
2.00×10^{-3}M NCS^-	
1.00×10^{-1}M HNO_3	
Deionized Water	

Method

The first step in determining the formation constant for the reaction

$$Fe^{3+}_{(aq)} + NCS^-_{(aq)} \leftrightarrow FeNCS^{2+}_{(aq)}$$

was to establish a relationship between concentration and absorbance for solutions of $FeSCN^{2+}$. This was accomplished by establishing a Beer-Lambert calibration curve. First, a 3mL cuvette was filled with 1.40×10^{-4}M $FeSCN^{2+}$ and placed into the colorimeter, cycling through the wavelength settings to determine which showed the strongest absorbance reading in response to FeSCN solutions. This wavelength was determined to be 470nm, as can be seen in Table 1. After the appropriate wavelength was chosen, establishing a calibration curve was a matter of filling 3mL cuvettes with the solutions specified in Table 2 and loading them into the colorimeter one at a time. The absorbance values noted in Table 2 were collected in this manner.