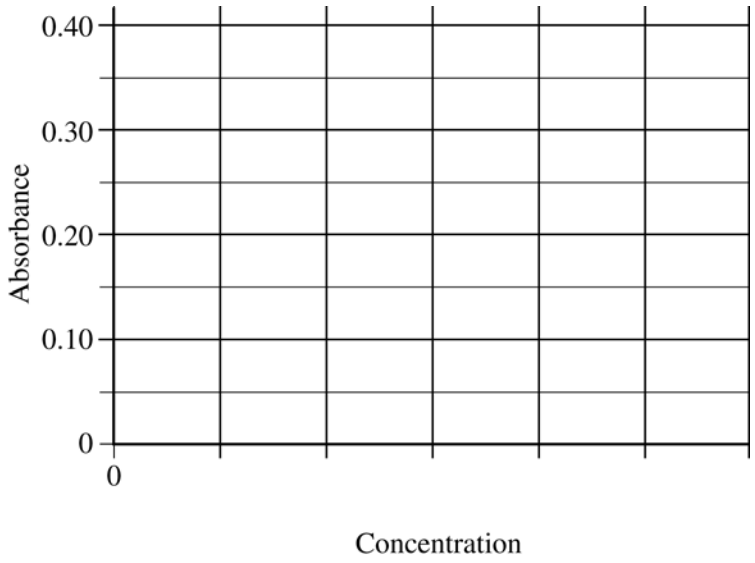
(i) Draw a Beer's law calibration plot of all the data on the grid below. Indicate the scale on the horizontal axis by labeling it with appropriate values.




(ii) An $FeSCN^{2+}(aq)$ solution of unknown concentration has an absorbance of 0.300. Use the plot you drew in part (i) to determine the concentration, in moles per liter, of this solution.

(c) The purpose of the experiment is to determine the equilibrium constant for the reaction represented below.

$$Fe^{3+}(aq) + SCN^{-}(aq) \rightleftarrows FeSCN^{2+}(aq)$$

(i) Write the equilibrium-constant expression for $K_c$.

(ii) The student combines solutions of $Fe(NO_3)_3$ and KSCN to produce a solution in which the initial concentrations of $Fe^{3+}(aq)$ and $SCN^{-}(aq)$ are both $6.0 \times 10^{-3}\ M$. The absorbance of this solution is measured, and the equilibrium $FeSCN^{2+}(aq)$ concentration is found to be $1.0 \times 10^{-3}\ M$. Determine the value of $K_c$.

(d) If the student's equilibrium $FeSCN^{2+}(aq)$ solution of unknown concentration fades to a lighter color before the student measures its absorbance, will the calculated value of $K_c$ be too high, too low, or unaffected? Justify your answer.