

Calibration Curve for FeSCN^{2+} Lab

(For use with Slowinski et al. **Chemical Principles in the Laboratory** lab #23)

Prepare the following solutions:

Standard Solution #	mL of 0.002 M KSCN	mL of 0.2 M $\text{Fe}(\text{NO}_3)_3$ in 1 M HNO_3	mL of 1M HNO_3	$[\text{FeSCN}]^{2+}$	Absorbance
1 (blank)	0	12.5	Dilute to 50 mL	0	0
2	1	12.5	Dilute to 50 mL		
3	2	12.5	Dilute to 50 mL		
4	3	12.5	Dilute to 50 mL		
5	4	12.5	Dilute to 50 mL		

- Set the wavelength to 447 nm. Measure the absorbance of the standard solutions (all 5).
 - Remember you are going to “zero” the instrument with the blank (Standard Solution 1) therefore the absorbance should be zero.
- Construct a calibration curve (using Excel) by plotting the absorbance (y axis) vs. the corresponding concentration of the standard solution (x axis). Make sure to plot all 5 points.
- Using Excel, find the best fit curve to your data. Based upon Beer’s Law the slope of the best fit line is equal to the molar absorptivity (ϵ).
 - Using ϵ , you can now determine the concentration of an unknown $[\text{FeSCN}]^{2+}$ solution by just knowing the absorbance of that solution.
 - $A = \epsilon bc$
 - A = absorbance
 - ϵ = molar absorptivity (usually in $\text{M}^{-1} \cdot \text{cm}^{-1}$)
 - b = path length (usually 1 cm)
 - c = concentration (usually in M)

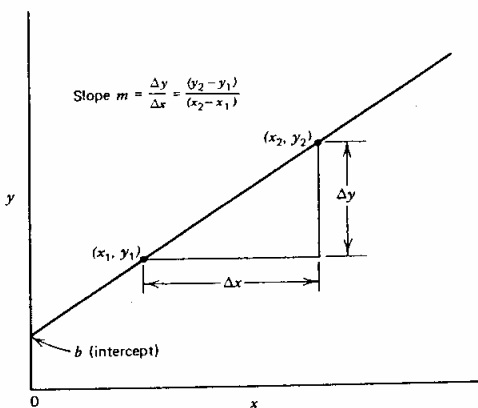


FIGURE C.3 The slope and intercept for a straight line, $y = mx + b$

