Solution prep + visual spectroscopy

Part A: Beer-Lambert law for aqueous Co^{2+} ions

$\lambda_{max} = 808.5$ nm

Sol #	Co^{2+} molarity	Absorbance
1	0.000 M	.002
2	0.020 M	.247
3	0.040 M	.517
4	0.060 M	.754
5	0.080 M	1.023
6	0.100 M	1.281

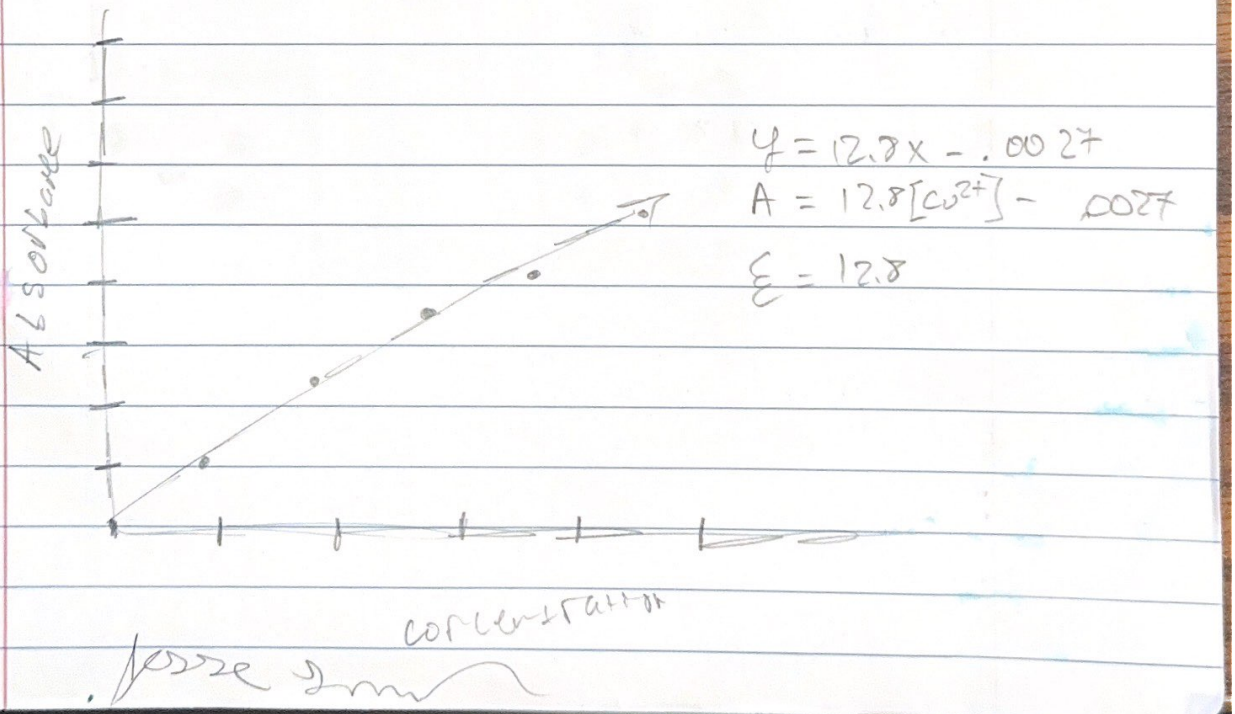
Graph of Absorbance vs molarity

$A = \varepsilon l [Co^{2+}] + \delta$

$y = M x + b$

$M_1 V_1 = M_2 V_2$

$\therefore V_1 = \frac{.08(10)}{1} = 8$ ml



$y = 12.8x - .0027$

$A = 12.8[Co^{2+}] - .0027$

$\varepsilon = 12.8$

Jesse

Part B: Reaction of copper metal w/ HNO_3

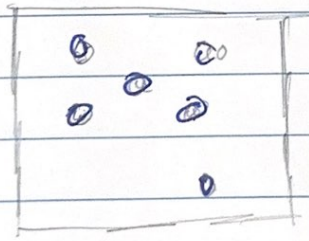
time (min)	Absorbance
0	0.006
1	0.043
2	0.292
3	0.516
4	1.115
5	1.756
10	2.130

Use previous equation $A = \varepsilon l[Cu^{2+}] + b$ to find concentration @ each time points.

$A = 12.8[Cu^{2+}] - .0027$

Absorbance of HNO_3 @ $\lambda = 709 = .006$

1 minute



5 mins

Molarity Calculations

$$\frac{A + .0027}{12.8} = [Cu^{2+}]$$

Based On The linear Regression of The Molarity of Copper as a function of time, The Rate of Rxn is .0188 $\frac{\text{Molarity}}{\text{Min}}$ for The Rxn of HNO_3 and Copper metal. Through Part A of The lab, we were able to determine The Molar absorption Constant (ε) which is 12.8. As such, using The linear relationship $A = 12.8[Cu^{2+}] - .0027$, we were able to determine The Concentration of The Cu^{2+} Solution @ each time interval in Part B. Through a linear Regression of Molarity vs time, we determined .0188 $\frac{\text{Molarity}}{\text{Min}}$ as The Rate @ which Cu^{2+} Reacts w/ HNO_3.