Beer's Law Calibration Curve

Because crystal violet is a colored species, a device that measures light absorbance may be used to determine concentration. The absorbance is related to concentration according to the Beer-Lambert law:

$$A = \varepsilon l c$$

where $\boldsymbol{A}$ is the absorbance, $\boldsymbol{\varepsilon}$ is the "molar absorptivity" coefficient (a constant unique to the solute at a particular wavelength) for the substance of interest, $\boldsymbol{l}$ is the length of the light path, and $\boldsymbol{c}$ is the concentration of the absorbing species. A plot of absorbance vs. concentration for a set of solutions will yield a straight line for which the slope is $\boldsymbol{\varepsilon l}$. The cells are 1 cm wide, so the l-term is ignored. This plot can then be used to find concentration given absorbencies.

To prepare a Beer's law calibration curve, you should first determine the wavelength of light to use for maximum absorption. Then determine the absorbencies for a set of at least seven different concentrations of crystal violet prepared by serially diluting the stock solution – 5.00 mL CV^+ solution with 5.00 mL water for a total volume of 10.00 mL.

Graph your results to determine the linear range between concentration and absorbance.

Wavelength: _____ **Molarity stock:** _____

Solution Number	Concentration (M) of Crystal Violet	Absorbance
1		
2		
3		
4		
5		
6		
7		
8		

Linear regression equation for absorbance vs. concentration:

Correlation coefficient and reason for discarding data: