

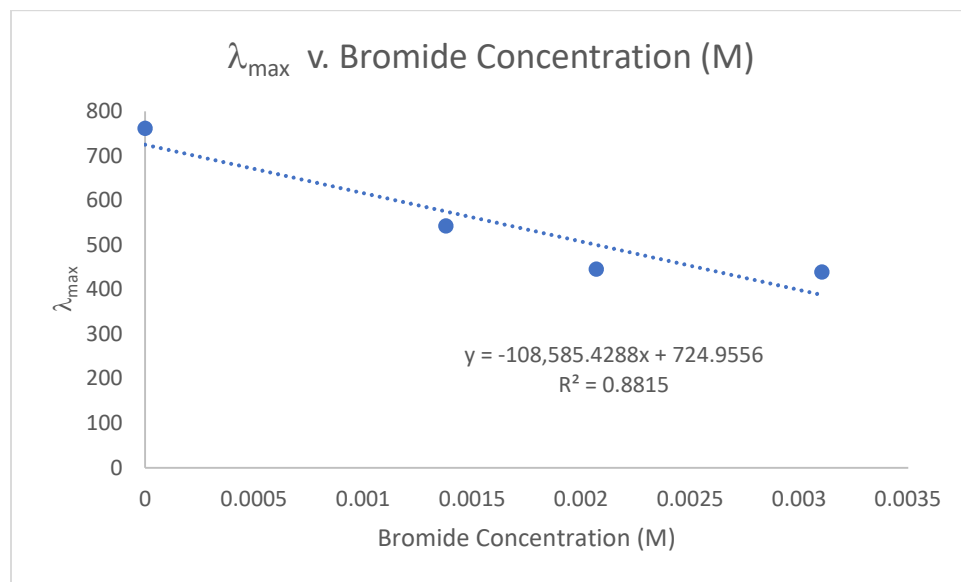
## Nanoparticles Discussion Questions

These questions will help you complete your Smart Worksheet, but you may want to complete the Smart Worksheet first. Please include your properly formatted tables and graphs (see Data and Graphics activity for formatting requirements), and please write your answers to the following questions in paragraph form as needed. Submit this file as a PDF to Gradescope.

1. Make a table of your bromide concentration and  $\lambda_{\max}$  data below. (1 pt)

Concentration of bromide (M)	$\lambda_{\max}$ (nm)
0.00000000	761.5
0.00137931	542.4
0.00206897	445.3
0.00310345	439.2

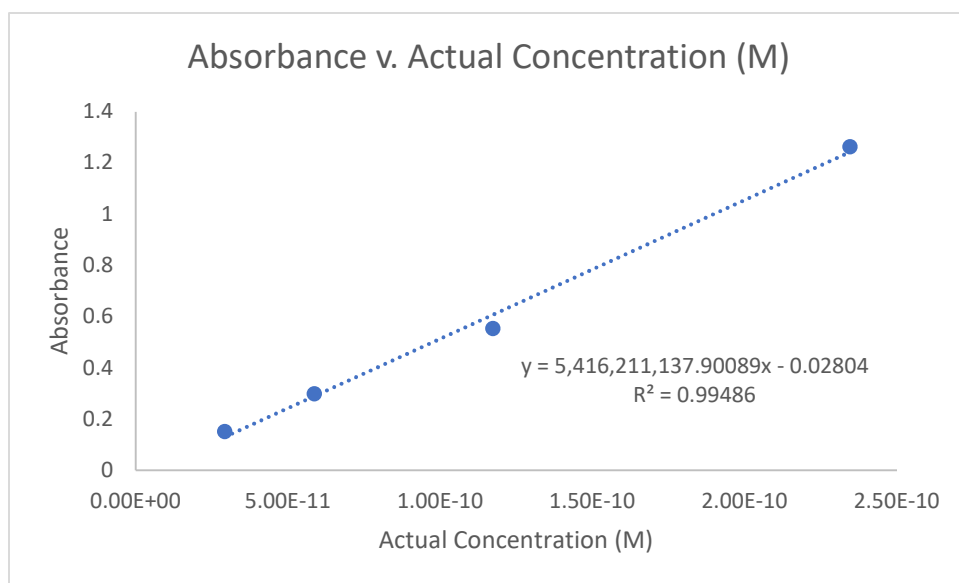
2. Using that table, plot the data in Excel ( $\lambda_{\max}$  vs. bromide concentration) and paste that graph here, adding a figure caption. (3 pts)



3. Make a table of your calibration curve data (the concentration and absorbance data points for your 4 blue dilutions) using the **actual concentrations**. See Smart Worksheet for calculation of actual concentrations. (1 pt)

Actual Concentration (M)	Absorbance
2.35E-10	1.264
1.17E-10	0.555
5.87E-11	0.3
2.93E-11	0.152

4. Using that table, plot your calibration curve in Excel (absorbance vs. concentration) and paste that graph here, adding a figure caption. (3 pts)



5. Do the silver nanoprisms from vial 1 obey Beer's law? Why or why not? (2 pts)

Yes, the silver nanoprisms adhere to Beer's law because their absorbance is directly proportional to their concentration.

6. We've been referring to the nanoparticles as a solution, but in actuality, they are a suspension. What is the difference? (2 pts)

A solution is a homogenous mixture where molecules all mix together, while in a suspension there are particles (the silver nanoprisms in this case) that are too big and don't dissolve into the mixture.

7. Centrifuges are used to separate solids from liquids. If we were to put a sample of a nanoparticle suspension in a centrifuge then put the sample in the spectrophotometer, predict how it may affect the absorbance of the suspension. Explain your answer. (3 pts)

The absorbance of the suspension would increase if put in a centrifuge. The liquid of the suspension dilutes the concentration of the nanoprisms, so removing it would leave only the nanoprisms, increasing the concentration to be almost if not entirely pure.

**This is the end of your assignment. You should now save this as a PDF and submit it to Gradescope. Remember to tag pages while submitting to Gradescope.**