

10/10/2017

Tasklist:

- This class began investigation of other ways to form NPs.
- Today, we prepared 4mM AgNO₃, 20mM ZnCl₂, 35mM Histidine stock, and 35mM Cysteine stock
- The stock solutions were then used to make nanoparticles

➤ Stock Solution Preparation

4mM AgNO₃

- Step 1: 0.0067948g of AgNO₃ was added to a 10mL volumetric flask
- Step 2: DI water was used to bring the solution up to 10mL and a final concentration of 4mM

20mM ZnCl₂

- Step 1: 0.036696g of ZnCl₂ was added into a 10mL volumetric flask
- Step 2: DI water was used to bring the solution up to 10mL and a final concentration of 20mM

35mM Histidine Stock

- Step 1: 0.13576g of histidine was added into a 25mL volumetric flask
- Step 2: DI water was used to bring the solution up to 10mL and a final concentration of 35mM

35mM Cysteine Stock

- Step 1: 0.106015g of cysteine was added into a 25mL volumetric flask
- Step 2: DI water was used to bring the solution up to 10mL and a final concentration of 35mM

➤ NP Preparation

- Step 1: Solutions were mixed according to table 1 to form the samples
- Step 2: The samples were placed in the oven for heating.

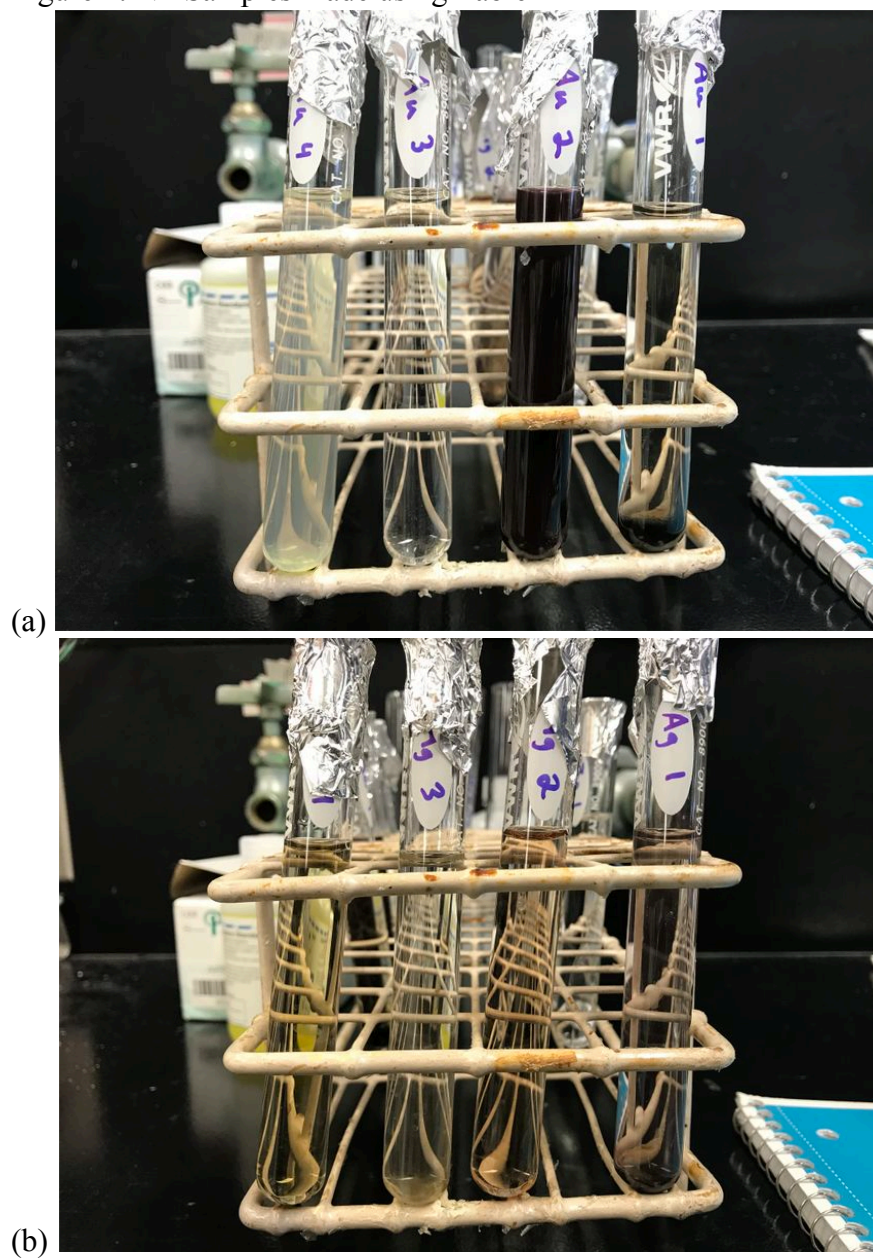
Table 1: Preparation of Samples

Samples	Metal	His (mL)	Cys (mL)	NaOH (mL)	NH ₄ OH (mL)	Water (mL)
1	1	1	0	1	0	7
2	1	1	0	0	1	7
3	1	0	1	1	0	7
4	1	0	1	0	1	7

Table 1 lists the amount of each substance added into the samples. The metal used was Ag and Zn stock solutions, respectively. Thus, 8 solutions were made total with some form of

metal. 4 samples were also made without any metal and just the gold stock. 12 solutions were made total.

Figure 1: NP Samples made using Table 1





(c)

Figure 1 shows the twelve samples made using table 1. (a) shows the samples made without any metal. Sample 2 formed colloids as it was a very dark purple color. 4 also changed to indicate it also formed colloids. (b) shows the samples made using silver nitrate stock solution. Since all four samples turned colors, all four formed gold nanoparticles. (c) shows the samples made using zinc acetate. No nanoparticles formed as none changed color.

Figure 2: UV/Vis for the Zinc Samples

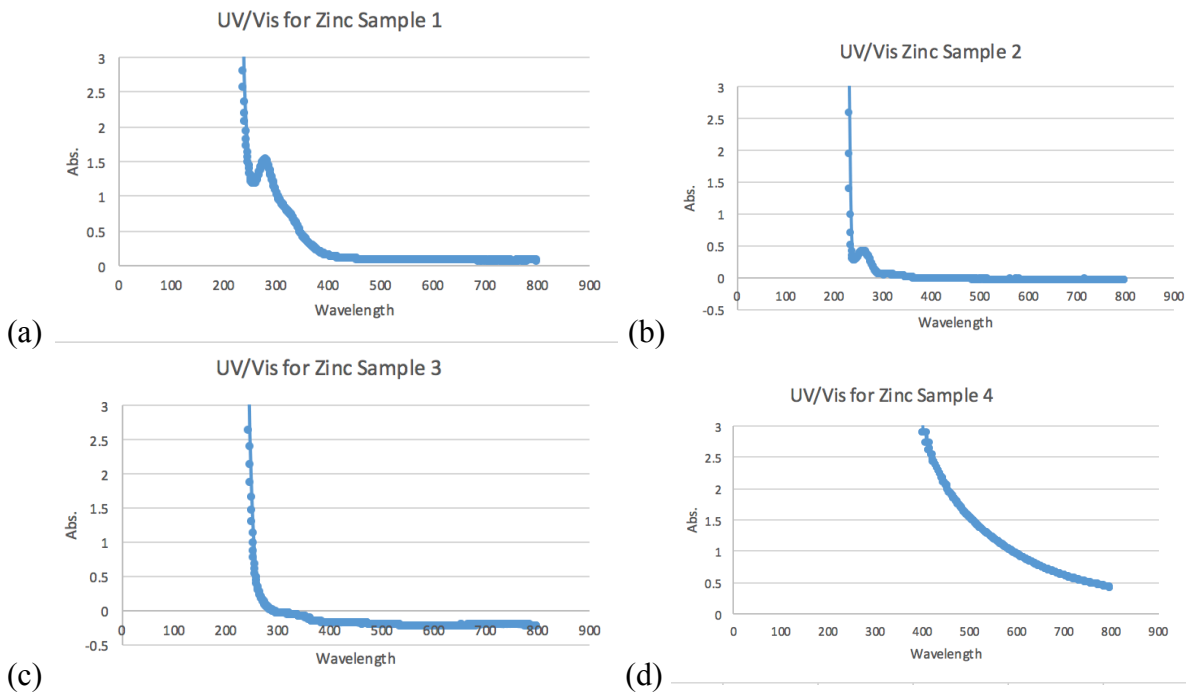


Figure 2 lists the four UV/Vis graphs for the four zinc samples. (a) shows the UV/Vis for the first sample. There is no apparent peak. (b) shows the UV/Vis for the second sample. There is no apparent peak, and the graph goes into negative absorption thus indicating error. (c) shows the UV/Vis for the third sample. There is no apparent peak, and the

graph goes into negative absorption thus indicating error. (d) shows the UV/Vis for the fourth sample. There is no apparent peak.