

**08 % Copper in Brass Lab (9809083)**

Question

[1](#) [2](#) [3](#) [4](#) [5](#) [6](#) [7](#)**Description**

Safety: This lab uses concentrated nitric acid to dissolve samples of brass.

Wear goggles and gloves when handling concentrated nitric acid.

This process evolves a noxious nitrogen oxide gas and must be performed in a fume hood.

Do not do this reaction in an open room!

**Instructions**

## Calibration

1. Associate the spectrometer with your device using Bluetooth or USB connection.
2. Open the spectrometry application on the iPad or laptop.
3. Select ANALYZE SOLUTION from the menu at the top of the screen.
4. Select the calibrate dark button (second button from the left) from the menu at the bottom of the screen. The spectrometer will turn off all of its lights and perform an internal calibration. A check mark will appear when the calibration is finished.
5. Cuvette #1 contains distilled water. The spectrometer will send light through the water and then neglect any absorbance it may contain. From this point on, the spectrometer will only see the absorbance of the ions dissolved in the water and not the water itself. Always handle the cuvette by the ridged sides. Wipe off any fingerprints using a lint free wipe. Place cuvette #1 into the spectrometer so that the ridged sides are facing the violet and green light icons and clear sides face the white light and absorbance spectrum icons.
6. Select the calibrate reference button (third button from the left) from the menu at the bottom of the screen. A check mark will appear when the calibration is complete.

## Finding a Wavelength to Analyze

1. Place cuvette #6 (0.10 M) into the spectrometer. Always handle the cuvette by the ridged sides. Wipe off any fingerprints using a lint free wipe.
2. Start collecting data by pushing the START RECORDING button in the bottom menu (1st button on the left).
3. Use SCALE TO FIT button in the bottom menu (4th button from the left) to rescale your data.
4. Use the ADD COORDINATE tool button in the bottom menu (5th button from the left) to locate a wavelength to analyze on the curve.
5. A small hand will replace your cursor. Move it to the box that has appeared on the graph and drag the box slowly toward the curve. As you get near the curve, an arrow will appear that indicates a specific wavelength on the curve. Releasing the box will

snap the box to the point on the curve where the arrow is pointing.

6. Drag the box along the curve to find a desirable wavelength to analyze. This is usually a high point on the curve; however, if your curve plateaus near the top of the graph, the absorbance is too large in that area to be used for analysis and another wavelength should be selected.

7. Once you have found a desirable wavelength, select the blue check mark to the left of the selected wavelength value. Press the stop button.

#### Creating a Concentration-Absorbance Calibration Curve

1. Select CONCENTRATION from the menu at the top of the screen. A table will appear on the left side of the screen that has columns for Concentration and Absorbance.

2. Highlight the concentrations in the column titled Concentration and type over the given values with the concentrations of the samples your instructor has prepared from largest to smallest.

4. Using the sample with the highest concentration into the spectrometer, click the record button and look at the cell in the Absorbance column that corresponds to the respective concentration. Once the absorbance stabilizes, select the check next to the absorbance to record the value.

5. You may wish to turn off SHOW LIVE SCAN DISPLAY.

6. Place the samples of lesser concentration into the spectrometer and record their absorbance values. Continue until all of the samples are analyzed.

7. Stop data collection.

8. Use SCALE TO FIT to rescale your data.

9. Select SHOW LINEAR FIT to create a best-fit line and display the equation for the line.

10. Place the cuvette containing the solution of unknown concentration into the spectrometer.

11. Select the box below Absorbance in the table titled DETERMINE UNKNOWN CONCENTRATION at the bottom of the screen under a column labeled Absorbance.

12. Start Recording Data

13. Once the absorbance stabilizes, select the check mark next to the absorbance to record the value.

14. Stop data collection.

15. Use the equation for the line to determine the unknown concentration and type it into the box below "Concentration" in the "Determine Unknown Concentration" table.

Preparing the sample:

1. Find the exact mass of your brass sample (between 1 and 2 grams). Place it in a

100 mL beaker.

2. Put on goggles and gloves. Place the beaker in the fume hood and add about 8mL (2 squirts) of concentrated nitric acid.

3. After ten minutes the brass should be dissolved. Using a wash bottle, add about 30mL of distilled water and swirl the beaker in the hood. The beaker is now safe to bring to your lab station.

4. Transfer the dissolved brass/nitric acid solution to a 250 mL volumetric flask. Use distilled water from a wash bottle to rinse all of remaining solution into the volumetric flask. Then fill the volumetric flask to the mark. Place a cap on the flask and swirl it to stir the contents.

5. Place this solution in cuvette #7, analyze it with the spectrometer and use the calibration curve you created to determine the concentration.

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1. Question Details

Objective and procedure summary [3413760]

Restate the objective in your own words using complete sentences. Summarize the steps in your procedure. (Be sure and include any safety concerns).

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2. Question Details

Lab Partners [1837468]

Enter the name(s) of your lab partner(s). (If you worked by yourself, enter "none").

## 3. Question Details

% Copper in Brass Lab [3704549]

Cuvette #	Concentration (M)	Absorbance
1	4.0 ✓ <input type="text"/>	4.0 ✓ <input type="text"/>
2	4.0 ✓ <input type="text"/>	4.0 ✓ <input type="text"/>
3	4.0 ✓ <input type="text"/>	4.0 ✓ <input type="text"/>
4	4.0 ✓ <input type="text"/>	4.0 ✓ <input type="text"/>
5	4.0 ✓ <input type="text"/>	4.0 ✓ <input type="text"/>
6	4.0 ✓ <input type="text"/>	4.0 ✓ <input type="text"/>

a. Enter the experimental mass (from the balance) of the brass: 4.0 ✓  g

b. Enter the absorbance for cuvette 7: 4.0 ✓

c. Calculate the concentration of the solution for cuvette 7 using the trendline equation: 4.0 ✓  M

d. Calculate the percent of copper in your brass sample: 4.0 ✓  %

## 4. Question Details

Upload Lab Photo [3413757]

Upload a photo of the lab apparatus with your face in the photo as you perform some part of the lab. Title the image with a unique file name before you upload it. (Maybe use your initials and part of the lab title)  no file selected It must be less than 5 MB in size.

## 5. Question Details

Upload Lab Graph Cu in Brass [3704624]

Upload a photo of the graph you created. Title the image with a unique file name before you upload it. (Maybe use your initials and part of the lab title and the word graph.)  no file selected It must be less than 4.5MB in size.

## 6. Question Details

Upload Calculations (Show Work) [3418656]

Upload a photo of your calculations, showing your work. Make sure your name and the date are written on the page. Title the image with a unique file name before you upload it. (Maybe use your initials and part of the lab title and the word Calcs)

no file selected

## 7. Question Details

Observations, Skills utilized and learning [3413764]

What observations did you make during the lab? What chemistry concepts, laws, and/or skills were necessary to complete this lab? What did you learn or re-learn? Use complete sentences.

Name (AID): **08 % Copper in Brass Lab (9809083)**  
Submissions Allowed: **5**  
Category: **Homework**  
Code:  
Locked: **Yes**  
Author: **Ryan, Matt** ( [mryan@allsaintsschool.org](mailto:mryan@allsaintsschool.org) )  
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