



Name: _____

Partner's Name(s): _____

Lab Date: _____ Lab Instructor's Name: _____

QUALITATIVE DETERMINATION OF SELECTED METAL CATIONS LAB NOTEBOOK PAGES

All purpose, procedure(s), and data/observations must be recorded in the lab notebook in pen with permanent, waterproof ink (black or blue). No information can be recorded elsewhere and transferred after leaving the lab. Lab notebooks can be digital or paper; you may write directly on the lab notebook pages in your lab manual or download a digital copy onto your electronic device and then write in it. Refer to the Guide for Success in the General Chemistry Laboratory section in the front of this lab manual for more detailed instructions.

- ⦿ **Before Lab:** Make sure to complete the Purpose and Procedure sections as well as any required data tables in the Data and Observations section in your lab notebook pages.
- ⦿ **After Lab:** Upload your notebook pages to the appropriate Carmen assignment within 48 hours after the start time of your in-person lab session. If you used the notebook pages in your paper copy of your lab manual, you should scan or take photos of the pages. Do not remove them from your lab manual. Refer to the QUL Notebook upload assignment in Carmen for more detailed instructions.

PURPOSE _____

Describe the what, why, and how of the experiment in bullet points or a few sentences. Consult the Expected Learning Outcomes and the procedure for the experiment to develop the purpose.

PROCEDURE CITATION _____

Chemistry 1210: General Chemistry Laboratory Manual, Fall 2025–Summer 2026.; Weaver, T. A., Opoku-Agyeman, B., Fontes N. Da Silva, C., Welch, A. N., Stern, J. E., Wroblewski, R. A., Walter, C., van Helmond, A. Eds.; Van-Griner Learning: Cincinnati, OH; pp. 151–162.

PROCEDURE

PART A. REACTIONS OF KNOWN METAL IONS WITH SELECTED ANIONS

Write a summary or step-by-step procedure for this part of the experiment in the space below.

PART B. ANALYSIS OF UNKNOWN SOLUTION

Before Lab: Write a *step-by-step* procedure you plan to use. Be as detailed as possible.

During Lab: Note any updates/adjustments you made to your procedure before you leave the lab.

CLEAN UP AND WASTE DISPOSAL

Microcentrifuge tubes and plastic unknown vials should be emptied and rinsed into your personal waste beaker. Emptied and rinsed plastic tubes should be shown to your lab instructor then disposed of in the Blue Solid Waste bucket on the bottom of the reagent cart. All solutions should be collected in a beaker at your desk and transferred to the class Chemical Waste beakers in Hood B upon completion of the experiment. You must fill in the Chemical Waste Disposal Form. Your lab instructor will dispose of the total volume in the appropriate container. Used Pasteur pipets should be placed in the Orange Glass Waste bucket inside Hood A. After cleaning up, wipe down your work area with 70% ethanol spray and a paper towel. Wash your hands thoroughly after completing this experiment.

DATA AND OBSERVATIONS

QUALITATIVE DETERMINATION OF SELECTED METAL CATIONS

PART A. REACTIONS OF KNOWN METAL IONS WITH SELECTED ANIONS

IONS	Na ₂ SO ₄	KI	Na ₂ CO ₃
Co ²⁺			
Cu ²⁺			
Fe ³⁺			
Mn ²⁺			
Pb ²⁺			
Zn ²⁺			

QUL: QUALITATIVE DETERMINATION OF SELECTED METAL CATIONS

IONS	NaOH	NH ₃
Co ²⁺		
Cu ²⁺		
Fe ³⁺		
Mn ²⁺		
Pb ²⁺		
Zn ²⁺		

IN-LAB QUESTIONS

Use the Pigment Handbook as you answer these questions.

1. Which cations should you be looking for to identify which white pigment is in your solution?

2. Which cations should you be looking for to identify which blue pigment is in your solution?

3. Are there any cations you will not test for?

PART B. ANALYSIS OF UNKNOWN SOLUTION

Based on your procedure, create your own Data and Observations section. We recommend creating a table similar to the one on the previous page. Make sure to be as detailed as possible when recording observations.

Unknown: QUL-_____

INITIAL OBSERVATIONS OF UNKNOWN SOLUTION. BE AS DESCRIPTIVE AS POSSIBLE.

