

# Quantitative Analysis Expectations and Grading

Chem 113000-2: Section-33

May 6, 2022

## 1 General Remarks

This lab is spanned across 3 weeks. We will in be in-lab April 21 and May 5th. For the first two weeks, you will submit the pre-lab assignments and essentially updates on your progress (see below). This will enable you to begin thinking about and formulating conclusions prior to the last week and your subsequent lab report. The general point break down will be

1. Week 1 (105 points) Due April 28
  - (a) Pre-Lab (35 points)
  - (b) Notebook pages (40 points)
  - (c) Progress Report (30 points)
2. Week 2 (45 points) Due May 5
  - (a) Progress Report (45 points)
3. Week 3 (150 points) Due May 12
  - (a) Final Lab Report (150 points)

Through out, make sure your lab partner's name is on every document. All figures and tables should have a caption explaining what they contain. Lastly, do not plagiarize the lab manual! Ensure you cite where necessary, and all citations follow ACS style (see Journal of the American Chemical Society for examples of what this looks like in publications).

As always, please let me know if you have any questions/concerns. **Finally, this document may change during the course of the lab. In the event that updates are made, I will notify you via Canvas and provide you with an updated lab expectations document. Note the date at the top of the front page is last when I edited it.**

## 2 Week 1 (Due April 28)

### 2.1 Week 1 General Remarks

Only the progress report needs to be typed. You may include images and pictures as supplemental; however, handwritten equations will not be considered. That is, if you want to take pictures during the course of the in-person lab, you may attach those; however, do not hand-write chemical equations and math equations and upload those.

### 2.2 Pre-Lab (35 Points)

There are 2 questions. The first question is worth 21 points and the second equation is worth 14 points. Each part is 5 points each. These pre-lab questions help you prepare for the lab time time by considering what you will do to begin identifying compounds. **Please bring a copy of your pre-lab to lab time (I will check to see that you have it). I will sign it and you can then submit the signed copy with your week 1 progress report.**

### 2.3 Notebook pages (40 Points)

Make sure you record all of your data and observations. Also, include your partners name on all pages. Please provide me with the carbon copy at the end of the lab section, but also scan and upload your notebook pages to canvas with your week 1 progress report.

### 2.4 Progress Report (30 Points)

This is a typed document that summarizes all identifications made from the first week. (15 points) Furthermore, you need to give an outline of how you will perform analysis during week 2 (what are your objectives and how you will accomplish that) (15 points). For example, you may need to do research/discuss with your lab partner how you will distinguish between two different possible compounds.

## The following is tentative

### 3 Week 2 (Due May 5)

#### 3.1 Week 2 General Remarks

This is just a typed progress report. We are NOT in-person this week. *Some useful suggestions/hints to consider:*

- How can you distinguish or identify  $\text{CO}_3^{2-}$  over  $\text{Cl}^-$  or  $\text{NO}_3^-$ ?
- There is NO  $\text{NH}_4^+$  only  $\text{NH}_3$ .** That is, there is no anion for  $\text{NH}_3$ .
- If each cation is only in each solution once, can there be multiple acids?
- Look up the how  $\text{Fe}^{3+}$  reacts with  $\text{SCN}^-$ .

#### 3.2 Progress Report (45 points)

Please provide the following (again typed)

- Experimental data and observations
- Organize your thoughts into a data table to provides details on what each solution is or could possibly contain (based off of what you know so far)
- Provide a list of the unknown cations and anions that you currently know.
- For each of the cations that you have successfully identified, provide reasoning (pulling in references from literature etc) to support this finding. This will help you substantially when it comes to the final lab report.

### 4 Week 3 (Due May 12)

#### 4.1 Week 3 General Remarks

This week we will be in-person to finalize any identifications that you may need. Take this time to perform secondary experiments to confirm or deny presence of ions in the solutions based off of your analysis from week 2. The final lab report will be slightly different from other lab reports in the style (see below). **If it is found that you either copied results from another group or section, you will receive a 0 for the lab report. Additionally, if it is suspected that you did not perform any experiments during the lab time, then you will not receive full credit either!**

#### 4.2 Introduction (0 Points)

No formal introduction is needed, however, provide a sentence or two that introduces the reader to what has been done.

### 4.3 Experimental Procedure (0 Points)

Only report deviations from the lab manual here. A citation is required here.

### 4.4 Results and Discussion (140 Points)

At the beginning of this section, summarize your results. That is, provide a table that is as follows

Solution	Cation	Anion
...		

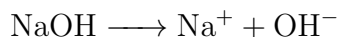
Table 1: Caption

Next, walk through each solution and explain how you identified its compounds. Please write the net ionic dissolution reaction for each salt as well as for any reactions that you considered in its identification. You may provide additional tables or figures to reference results from (that is, if you take a picture of the micro-well plates with all of the reactions, you may insert this image as a figure and refer to it in your analysis). For flame test data, please cite the lab manual for confirmation of the identity. For solubility of certain compounds please cite the appropriate source you got this information from (lab manual, textbook, others...).

You will be graded the following way. Each solution is worth 10 points. **2 points for identifying an anion and 2 points for identifying a cation. You will no longer be graded on correctness; only on your logical reasoning.** 2 points will be awarded for writing the balance net ionic reaction for the solution. The remaining 4 points are awarded for your logical explanation of the identification of the ion and if you had performed enough tests to support the logic you have provided.

### 4.5 Organization and Writing (10 points)

A lab report is a formal document. It should be well written and properly organized. This document I provide to you should give you the proper framework of what to include in the report and where to include. Make sure you cite your sources using ACS style, all equations and chemical equations are formatted properly using the equation editor, and all graphs and tables have a caption and proper labeling. For example, do NOT write  $\text{NaOH} \rightarrow \text{Na}^+ + \text{OH}^-$ , this is sloppy. Instead



is much neater.