

CHEM1100 Lab Overview

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General Chemistry II

This is just a brief overview of the lab and the different experiments. Most of the labs have three parts to each of them.

1. The experiment: the lab schedule details which lab is to be done on which day. Make sure you take the time to read the experiment ahead of time. Note that many experiments have multiple parts that are done over multiple lab days.
2. Data report sheet (DRS): most of the individual experiments require you to turn in a DRS by the end of the lab period. This is necessary since the lab instructor will analyze the data and part of your grade comes from how good your data is. All you need to do is copy the specified data from your lab notebook into the DRS.
3. Report: each individual experiment has a report that is due one week after you turn in the DRS. Follow the instructions in the lab manual for each one. Sometimes it's the Quantitative Analysis Report Form. The reports often require you to photocopy the relevant pages of your lab manual and include them. This is done at your own expense so plan accordingly. ***Do not staple multiple reports together!***

Experiment 1: Quantitative Acid-Base Titrations

Part 1: You will prepare and standardize a NaOH solution that will be approximately 0.1 M. **DRS 1A** on page 1-9 refers to the preparation and **standardization** of your NaOH solution using KHP. Follow pages 1-1 to 1-4. This part is critical since you will use your standardized NaOH solution in a number of experiments and if you do a poor job of standardization, not only will your grade be affected in this part but it will also be affected in the later experiments. The contents of **Report 1A** are described on page 1-4 (the lab manual lists this as Report 1).

Part 2: You will use your standardized NaOH solution to titrate an unknown and determine the concentration of acetic acid. **DRS 1B** on page 1-10 refers to pages 1-5 to 1-6. The contents of **Report 1B** are described on page 1-6 (the lab manual lists this as Report 2).

Part 3: You will use your standardized NaOH solution to determine the molar mass of an unknown acid. **DRS 1C** on page 1-11 refers to pages 1-7 to 1-8. The contents of the **Report 1C** are described on page 1-8 (the lab manual lists this as Report 3).

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Experiment 2: Kinetics: The Iodination of Acetone

The **DRS** is on page 2-7 and will include your group's data for both part 1 and part 2 of this lab. This is listed as "**Group Data**" on the lab schedule.

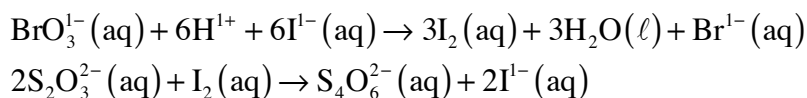
Part 1: You will determine the rate law and the rate constant for the reaction. The procedure is described on pages 2-3 to 2-4. The contents of **Report 2A** are described on pages 2-5 to 2-6 (the lab manual lists this as Report 4).

Part 2: You will determine the activation energy by taking data at additional temperatures. The procedure is described on pages 2-4 to 2-5. The contents of **Report 2B** are described on page 2-6 (the lab manual lists this as Report 5).

Experiment 3: Oxidation-Reduction Titrations

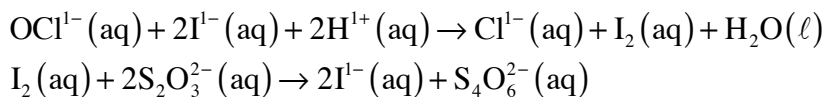
The preparation of the sodium thiosulfate solution is described on pages 3-3 to 3-4. Since you will not need to boil your water (stated in the lab schedule), you will follow the instructions for method **B** on page 3-4.

Part 1: You will prepare and standardize a sodium thiosulfate solution. Just as in experiment 1, the standardization of the sodium thiosulfate solution is critical since it will be used multiple times. The needed equations from pages 3-1 and 3-4 are the following ones.



The procedure is described on pages 3-4 to 3-5. **DRS 3A** is on page 3-11 (the lab manual states this as Expt 3 Part 1). The contents of **Report 3A** are described on pages 3-5 to 3-6 (the lab manual states this as Report 6).

Part 2: You will determine the concentration of a supplied bleach solution. The needed equations from pages 3-6 and 3-7 are the following ones.



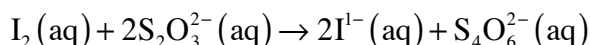
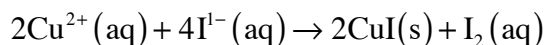
The procedure is described on pages 3-6 to 3-8. **DRS 3B** is on page 3-12 (the lab manual states this as Expt 3 Part 2). The contents of **Report 3B** are described on page 3-8 (the lab manual states this as Report 7).

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Part 3: You will calculate the mole ratio for a solution of copper(II) sulfate. The needed equations from pages 3-2 and 3-7 are the following ones.

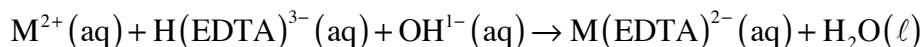


The procedure is described on pages 3-9 to 3-10 (the lab manual states this as Part C). **DRS 3C** is on page 3-13 (the lab manual states this as Expt 3 Part 3). The contents of **Report 3C** are described on page 3-10 (the lab manual states this as Report 8).

Experiment 4: Compleximetric Titrations

Don't forget the prelab on page 4-1. The preparation of the EDTA solution is described on page 4-3 and pay close attention to the second paragraph.

Part 1: You will prepare and standardize a solution of EDTA. The standardization will be done using calcium carbonate. Just like the solutions of NaOH and sodium thiosulfate that were prepared and standardized previously, you must be careful when determining the EDTA concentration since this solution will be used in later experiments. The needed equation from page 4-1 is the following one.



“M²⁺” is a generic symbol for a metal ion with a 2+ charge on it. Simply replace the “M” with “Ca” since we're studying calcium ion and compounds in this experiment. Just as in experiments 1 and 3, the standardization of the EDTA solution is critical. The procedure is described on pages 4-3 to 4-6. You must read the entire procedure before you start the experiment. It does not read as a “laundry list”. **DRS 4A** is on page 4-8 (the lab manual states this as Expt 4 Part 1). The contents of **Report 4A** are described on page 4-6 (the lab manual states this as Report 9).

Part 2: You will determine the concentration of calcium ion in a sample of water. The needed equation from page 4-1 is the same as that used in part 1. The procedure is described on page 4-6. **DRS 4B** is on page 4-9 (the lab manual states this as Expt 4 Part 2). The contents of **Report 4B** are described on page 4-7 (the lab manual states this as Report 10).

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Part 3: You will determine the solubility product, K_{sp} , for calcium carbonate. The needed equation from page 4-1 is the same as that used in parts 1 and 2. The procedure is described on page 4-7. **DRS 4C** is on page 4-10 (the lab manual states this as Expt 4 Part 3). The contents of **Report 4C** are described on page 4-7 (the lab manual states this as Report 11).

Experiment 5: The Determination of pH Curves by Direct Titration

You will turn in a "Group Data Expt 5" sheet. The titration instructions on pages 5-1 to 5-3 apply to each portion of the experiment.

Part 1: This is a titration of a strong acid using your standardized NaOH solution from experiment 1. The procedure is described on pages 5-1 to 5-3. The contents of **Report 5A** are on pages 5-4 to 5-5 (the lab manual lists this as Report 12).

Part 2: This is a titration of a weak acid using your standardized NaOH solution from experiment 1. The procedure is described on pages 5-1 to 5-3. The contents of **Report 5B** are on pages 5-5 to 5-8 (the lab manual lists this as Report 13).

Extra Credit: The procedure is described on pages 5-1 to 5-4. The report is described on pages 5-8 to 5-9.

Experiment 6: Some Compleximetric Reactions

There are no DRS's for this experiment. The procedure is described on pages 6-1 to 6-2. The contents of **Report 6** are on pages 6-2 to 6-3 (the lab manual lists this as Report Part 1).

Experiment 7: Some Redox Reactions

There are no DRS's for this experiment.

Part 1: The procedure is described on pages 7-1 to 7-2. The contents of **Report 7A** are on page 7-2 (the lab manual lists this as Report Part 1).

Part 2: The procedure is described on pages 7-2 to 7-3. The contents of **Report 7B** are on page 7-3 (the lab manual lists this as Report Part 2).

Part 3: The procedure is described on pages 7-3 to 7-4. The contents of **Report 7C** are on pages 7-4 to 7-5 (the lab manual lists this as Report Part 3).

Part 4: The procedure is described on pages 7-5 to 7-6. The contents of **Report 7D** are on page 7-6 (the lab manual lists this as Report Part 4).