

Pre-lab Report Guideline for Pipet Calibration (Experiment #1)

Due on **Oct. 07 - 10** at the beginning of the lab period (depending on enrolled lab section)

A. Resources for the Pipet Calibration Assignment (Experiment #1)

1. Technique Videos: [Use of a Pipet Pump](#) (Watch an additional demo [here](#))
2. Online Resources: [Tutorial on Significant Figures](#)
3. Pictures of Common Laboratory Items (Refer to the file posted on Bruin Learn)

If you need a copy of the procedure and the background reading materials from the lab manual for this experiment, you may download the file from Bruin Learn. All assignments will be organized by week on Bruin Learn.

Any materials and/or procedures that are directly from laboratory manual will no longer be posted online after this first experiment.

B. Pre-lab Report Guideline

PPE Policy: Please make sure to follow the proper PPE policy when attending the laboratory section. A mandatory laboratory safety check will be conducted at the beginning of the lab. Students without proper PPE including safety glasses, flame resistant lab coat, long pants and closed-toe shoes will be dismissed from the laboratory.

Lab Attendance: Please show up to your lab section on time. A Pre-lab report that is not turned in within the FIRST 10 minutes of the lab section will receive no credit. Any student that is more than 20 minutes late to the lab will NOT be allowed to complete the experiment (i.e. NO CREDIT for the entire lab).

Complete the pre-lab work in the lab notebook. Typed assignment is NOT acceptable for the course. A completed hand-written pre-lab report is required in order to work on the experiment.

Objectives and Learning Goals:

In this experiment, students will practice using a volumetric pipet and to calibrate a 10-mL volumetric pipet using water to determine the exact calibrated volume.

1. Complete title of the Assignment
2. Complete Citation /Reference
Complete reference of the lab manual (Refer to book chapter in print under "ACS Reference Style")
3. Procedure (Flowchart Format – MAXIMUM ONE PAGE IN LENGTH)

A copy of the "Sample Flowchart" is posted on Bruin Learn. You will construct a procedural flowchart for the "Calibration of a 10-mL Volumetric Pipet" (refer to page V.4 in the manual) for this pre-lab report.

In addition, indicate in your flowchart to follow "Procedure 5" on page III.6 on how to properly use a volumetric pipet and pipet pump. There is no need to construct a separate flowchart for "Procedure 5" on page III.6. You simply need to refer to it in the flowchart so you can follow the steps when using the volumetric pipet and pipet pump in the lab.

4. Study Questions – Review lecture #1 and tutorial on significant figures shown on page 1 before working on the study questions
Complete the following study questions (SHOW ALL YOUR WORK AND REASONING)

- (i) Determine the % relative error for the quantity **(0.6180 ± 0.0005 g)**
- (ii) (a) What is the minimum absolute error for a measurement of **110.8 mL**?
(b) How about the minimum % relative error?
- (iii) Determine the % relative error for the following quantities:

If there is no uncertainty given for a specific value, assume an absolute error of "1" in the last digit.

For example, if there is no uncertainty provided for the value of "0.048", you will assume the absolute error to be ±0.001 or 0.048±0.001 (i.e. an uncertainty of "1" in the last significant digit)

$$\begin{aligned} \text{(a)} & \quad (0.0600 \pm 0.0002 \text{ L}) \times (2.5083 \pm 0.0001 \frac{\text{mol}}{\text{L}}) \\ \text{(b)} & \quad 38.50 + 5.10 - 9.64 \end{aligned}$$

- (iv) Determine the absolute error for the final value in (iii-a) ONLY

**Turn in your work for sections (1) – (4) to your TA
at the BEGINNING of the lab period**

5. Data Table

Start a NEW page in your lab notebook for the data table section. This will allow you to turn in sections (1) – (4) to your TA at the beginning of the lab period. You will turn in a copy of the data/observations to your TA at the end of the lab period after you recorded all the data during the experiment.

- You will complete this experiment individually in the lab (not as a group)
- Set up a data table for the three trials of the pipet calibration. Numerical data should include the temperature of the distilled water, the weight of the empty weighing bottle and the weight of the weighing bottle plus water for each trial.
- You will need to complete THREE trials of the calibration.

In other words:

Each trial consists of ONLY ONE pipetting of a 10-mL volumetric pipet. You will need to complete THREE calibrations of a 10-mL volumetric pipet.

**Turn in a copy of the recorded data/observation to your TA
at the END of the lab period**