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## Check-In, Lab Safety, Balance and Volumetric Glassware Use, Introduction to Statistics, and MSDS Familiarization

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### Before coming to lab:

- Read Harris Chapter 2 - "Tools of the Trade" - before coming to lab. This chapter is an excellent source of lab techniques and should serve as a reference for techniques to be used during the semester.
- Read Harris Chapter 4, sections 1-3.
- Record the tolerance of a Class A 50 mL buret in your notebook – see page 38 of your textbook.
- Record the tolerance of a Class A 10 mL pipet – see page 42 of your textbook.

**A note on Report Sheets:** All data collected during lab must be recorded in your lab notebook. The report sheet should be filled out after all calculations are done in your lab notebook. (One exception today is Procedures 5 and 6, which may be completed directly on the report sheet.)

**Your Lab Notebook is a record of the work you do in lab.** If your report sheet is lost by yourself or your instructor, you must be able to quickly and easily recreate it using your lab notebook. (This happens often.) All data must be recorded directly into the notebook during lab – numbers, color changes, etc. Calculations can be done in the lab notebook either during lab or afterwards.

**SAFETY:** Safety is of primary concern when in the chemistry lab. The Laboratory Safety Policy of the Department of Chemistry is available on the web at <http://www.cofc.edu/~chem/safety/safety.html>. Remember that you are primarily responsible for your safety in the laboratory. If you have any questions about the safety of any action, check with the instructor. The wearing of safety glasses at all times in the laboratory will be vigorously enforced.

Familiarize yourself with the locations of the fire extinguisher, fire blanket, eyewash station, fire alarm, safety shower, and the exits in room 303. You will be asked to submit a diagram of the lab with each of these items labeled.

**MSDS - MATERIAL SAFETY DATA SHEETS:** A Material Safety Data Sheet (MSDS) is designed to provide chemical, physical, and health and safety information on reagents and supplies. MSDS sheets also provide workers and emergency personnel with the proper procedures for handling or working with chemical substances. While there is no universal form for an MSDS, these forms will provide information such as physical data (melting point, boiling point, flash point, *etc.*), toxicity, health effects, first aid procedures, chemical reactivity, safe storage, safe disposal, protective equipment required, and spill clean-up procedures. Anywhere any type of chemical is used, an MSDS is required to be readily available, even for cleaning supplies at a daycare center or a grocery store.

**BALANCE USE: Analytical balances** are accurate and precise instruments used to measure mass. They are expensive so handle them with great care. Since virtually every experiment starts with the weighing of an unknown sample or standard, it is critical that you learn to make accurate mass measurements. No amount of statistics or guesswork can make up for an inaccurate weighing. **Top Loading Balances** are used when less precision is acceptable. We use this balance for weighing many chemicals that are not unknowns or standards (i.e., not our limiting reagent).

## EXPERIMENTAL PROCEDURE

Data and Calculations for procedures 1-4 should be recorded **in your lab notebook**. The report sheet should be filled in neatly with the results obtained from the data and calculations. Procedure 5 may be filled in directly to the report sheet; this information does not need to be included in your lab notebook.

### PROCEDURE 1: MEASURING MASSES ON THE TOP LOADING BALANCES

1. Record the mass (in g) of metal samples A, B, C and D in your notebook. Record the number of the balance used.
2. Obtain the results from 3 other students at neighboring lab stations. For each sample (A, B, C, D), calculate the following statistical results in correct significant figures:
  - Mean
  - Standard Deviation
  - % Relative standard deviation, % RSD
  - The 95% confidence interval (using t) – see section 4-2 of Harris.
3. From the data, determine what metals you have and record the true atomic mass for each. Determine whether the true value falls within your 95% confidence interval.
4. Obtain the mean results for the four samples from another lab group and calculate t for the comparison of means. Based on this result, are your results significantly different?

On your **results sheet**, tabulate the data and statistical results. Also, record answers to the 3 and 4.

### PROCEDURE 2: CALIBRATION OF VOLUMETRIC GLASSWARE

Follow the instructions on the sheets handed out to you concerning calibration of volumetric glassware. Use distilled water.

### PROCEDURE 3: LEARNING TO READ MSDS DATA SHEETS

1. Use an internet search engine such as Google to obtain MSDS data for 6M HCl. Fill in the table on your Report Sheet.
2. Take the MSDS quiz at the URL <http://www.ilpi.com/msds/quiz/part1.html>. Print the certificate at the end of the quiz to turn in with your report sheet.

Submit the Report sheet and MSDS quiz certificate. Report sheets are always due within one week.