

Chemistry II: Formal Lab Report Guidelines

The purpose of a lab report is to inform the reader of the experiment and for the reader to be able to reproduce exactly what you did. Therefore, it should be concise and clear, but complete enough so that the reader will know exactly what was done. You may find it helpful to prepare an outline before beginning to write the report.

Writing Style: *Keep in mind that this type of writing is not literary or what you would submit in an English class.* With rare exception, always write in the **past tense** and in the **third person**. Avoid the pronoun "I." Do **NOT** state, "I weighed out 3.50 g of MgO into a beaker." Instead, state "MgO (3.50 g) was weighed and placed into a 250 mL beaker." In your report you are stating what has already been done. However, facts that continue to be true in the present should be stated in the present tense. For example, "The molecular weight of MgO is 40.304 g/mol."

Lab reports should be typed (calculations can be hand written as long as they are neat and organized). *Include the following sections in your lab report:*

1. **Title:** This section includes the title of the experiment, your name, class period and the date.
2. **Introduction:** This is a brief paragraph (3-5 sentences) that indicates the purpose or goal of the experiment. Briefly explain how this goal will be achieved and explain any relevant chemical concepts or experimental techniques that are involved. Finally, include balanced chemical equations that occur in the experiment. Remember to be concise.
3. **Procedure:** Give a step-by-step procedure of what was done in the experiment. In many cases, this will be identical to the procedure given in the experiment. However, it should be given in past tense to reflect what was done. Also, it is important to clearly indicate any changes made from the original procedure. It is likely that you have done something different than outlined in the original procedure.

For example, the procedure may have stated to weigh out 0.20 g of Mg(s). You most likely weighed out a slightly different amount (0.199 g or 0.220 g, etc.). Be sure to indicate these changes in your lab report procedure. *Remember to write in the past tense and third person.*

4. **Data/Observations:** In this section you provide the **data you collected** during the experiment. It is usually best to display this data in a table or chart. If you are unsure how to construct such a table, consult teacher or other classmates for ideas.

Also include any observations from the experiment, such as color changes, heat given off or absorbed, gas evolved, etc. Some experiments will have more observations than others.

5. **Calculations:** In this section you provide the calculations associated with the experiment. The calculations to be performed will be given explicitly by Mr. Christopherson. Calculations for each trial performed should be shown. Be sure to include units for all numbers. For experiments that involve multiple calculations, organize them into steps and label them such that it is clear to the reader what is being done.

6. **Results:** This section should summarize your calculations in an organized and clearly labeled table. Again, if you are unsure how to set up the table, see Mr. Roller for ideas.

7. **Error Analysis:** This section's requirements may change depending on the experiment. However, for most experiments this will involve the calculation of % error at a minimum. The equation is given below:

$$\text{error} = \frac{|\text{Experimental (from lab)} - \text{theoretical (accepted value)}|}{\text{theoretical value}} \times 100 = \%$$

Experimental value: the value that you calculated or measured from the experiment

Theoretical value: the accepted value that is found in a resource or calculated based on ideal conditions (stoichiometry, etc.)

***Note that the numerator is an absolute value**

Additionally, you must reflect on the experiment and/or your technique and discuss possible sources of error. You should include **at least** two sources of error. Be sure to **explain how** the particular source of error affected your results.

For example, stating "A coffee cup calorimeter was used" is not sufficient. Instead, state that "because a coffee cup calorimeter was used, heat may have been lost through the Styrofoam or through the top and bottom cup due to an insufficient seal. As a result, the change in temperature would not appear to be as great, causing the ΔH of the reaction to be smaller."

When looking for sources of error, be sure to reflect on your own lab technique. For example, when transferring the weighed solid into the beaker, a small portion fell onto the lab table. These seemingly insignificant details can greatly affect your results!

Grading:

As this involves a great deal of work, it will be worth a significant number of points (~30-50 points). The points will be distributed over the various sections, so be sure to follow these guidelines carefully and include all sections required. If you have questions, feel free to contact Mr. Christopherson.