A Brief Guide to Writing Lab Reports

Know Your Audience

If you have never written a lab report before, the process can seem daunting. Different professors often require different formatting. When writing, it is important to know your audience, or in this case, your professor. Don’t be afraid to ask what your professor requires in a lab report; it varies from teacher to teacher. It is always better to have a clear idea of what your instructor looks for in a report.

Don’t Be Lazy

There is no room for laziness in a lab report. The point of a lab report is for someone to be able to recreate the experiment. All the data must be presented accurately and all the variables must be explained. Support everything in your report with data, notes, and observations from the experiment. If there is a graph, then there must be a data table; always label data and number figures. In short, label everything in your report. Lab reports are generally typed to avoid illegibility due to handwriting. Data is crucial and if a number is smudged, it could throw the whole experiment off.

• Cite your sources: Citing sources shows you have done your research and allows others to reproduce your research process

• Don’t use Wikipedia: Wikipedia is great for general information when the stakes are low, but in an experiment the stakes are high. If Wikipedia (wrongly) says to use x grams of ammonium, it could ruin the experiment and create an unsafe environment for you and your peers.

• Know what big words mean: It is easy to get tripped up by large words such as “distillation.” Having a grasp on the definitions will help when writing your report.

General Advice

• Label everything.

• Proofread, and then proofread again!

• Always cite your work.
• **Abstract**
  - This section is usually written last because it is a complete picture of the experiment.
  - Concise summary of purpose of experiment, key findings, and main conclusions.
  - Written in present tense.
  - Include a labeled scheme of chemical reaction with reagents and conditions; do not use abbreviations in the abstract.
  - State whether the reaction was successful or unsuccessful.

• **Introduction**
  - Establish significance of experiment and results and entice reader to continue reading.
  - Written in funnel style paragraph; broad to specific
    - Significance of experiment to society.
    - Explanation of specific problem/goals of experiment.
    - Significance of results in relation to goals.

• **Experimental Methods**
  - Include exact methods used to complete experiment, as well as general observations.
  - Label everything: charts, diagrams, graphs, etc.
    - Always include units of measure.
  - Type reports and use computer generated tables, graphs, etc.

• **Results and Discussion**
  - Present outcomes of experiment and interpretation of said outcomes in this section
  - Summarize investigation and include percent yield or any other data, such as boiling point, relevant to proving the experiment.
  - Consider and discuss sources of error if results were inconsistent. Analyze why you think there was an error or what should have been observed and wasn’t.
  - Interpret and analyze data; prove interpretation is correct based on results and knowledge of experiment.
  - Use descriptive headings.

• **Conclusion**
  - Brief summary of lab; interpretation of data in context of the original problem
  - Incorporate chemistry performed, techniques employed, and results obtained.
  - Consider ways to improve the experiment.

• **References**
  - Use (JACs) Journal of the American Chemical Society style. Copies can be found in Science Library.
  - List and number citations for each source used.
  - Cite the reference in the text when used.
    - Put (1) where reference 1 was used and (2) where reference 2 was used.

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**Writing Tips for General Chemistry Laboratory:**

- Don’t use personal pronouns, such as I.
- Use passive voice.
- Don’t use contractions (it’s = it is).
- Don’t use possessives (No: Product’s structure / Yes: Structure of the product).
- Don’t use active verbs when referring to molecules, chemicals, or processes.
- Don’t use the words “never,” or “always.”
**Heading and Title**
- Incorporate an illustrative title that is different from the lab manual.
- Include your name, the TA's name, and a list of lab partners.

**Introduction**
- Discuss the material investigated in the lab and clearly state the objective (or thesis) of the experiment.
- Include instruments and techniques used in the lab.
- Explain what techniques were used in the lab and how they work. Specificity is key.

**Methods**
- Reference procedures outlined in the lab manual in this section. If any changes or variations were made in the procedure, note them.
- If designing your own experiment, detail your procedure, or the steps taken to complete the experiment, here.

**Results**
- Present information gathered in experiment in this section; do not analyze here.
- Label everything: drawings, gels, charts, diagrams, graphs, etc.
  - Use descriptive titles; be specific.
  - Always include units of measure, as well as scientific legends for figures.
- Type reports and use computer generated tables, graphs, etc.

**Discussion**
- Answer questions in lab manual; be specific.
- Consider and discuss sources of error and ways to improve the experiment
- Relate experiment to real life situations—find a reputable source that relates to the lab and discuss. Cite your work.

**References:**
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