

## FORMAL LAB REPORT GUIDELINES

One of the most important skills a person can develop is the ability to communicate effectively. In chemistry, as in all laboratory sciences, scientists need to communicate exactly what happened in each experiment, what patterns they discovered, and what conclusions may be drawn from their data and the patterns they see. Students need to practice these skills.

It is expected that with each laboratory report you practice these skills. The report in chemistry is much the same as any paper in an English class. It should be well written, well organized and nicely presented.

The following parts should be included in your report. The report should include diagrams, flow charts, and equations.

1. **Title & ABSTRACT:** The report should be titled giving an idea of what the study is about. The Abstract summarizes what you did and what results you uncovered. Generally an abstract is less than 100 words.

2. **INTRODUCTION (Purpose and Theory):** The purpose should be a brief description of the objectives of the experiment. The theory of the experiment explains the concepts behind the objectives. As an example, if you are doing a report on a titration experiment of acids and bases, the neutralization reactions should be shown as well as an explanation of what molarity and normality is. If a colored indicator is used, what happens to the color of the indicator should be discussed. Use material from the lab manual as well as outside sources.

3. **EXPERIMENTATION (Procedure & Observations):** For the procedure you do not have to give a detailed explanation of what you did. For example, do not begin by saying, *'First I went to the hood and obtained 17 mL of 6 M NaOH and then I put it in a bottle. Then I added water to it so that the water went up to the shoulder of the bottle'*. Those kinds of details do not need to be spelled out. A much more acceptable way of describing the procedure for preparing the NaOH solution would be this: *"A 0.20 M solution of NaOH was prepared from 17 mL of 6M NaOH and diluting it with water in a 500 mL bottle."* Or simply draw a flow chart summarizing the procedure. For the Qualitative Analysis experiments, this section should include the flow chart for the known and maybe a few personal observations. A drawing or picture of your apparatus may be included as well as any tables summarizing chemical preparation.

4a. **RESULTS (Data/Observations/Calculations):** When present original data and observations must be included in your report. You should prepare a data table using the data you collected. Whenever possible, use tables to display your data. Be sure that all data is well labeled with units. What you want to remember is your report is a description of what you did experimentally. Someone reading your report should be able to duplicate what you did accurately. In the calculations section you need only show a sample calculation if several runs are made. A summary of the results of the calculation should be shown in table form.

4b. **(Graphs):** If the experiment you have done for the report involves the graphing of data, the graphs should be titled. In addition, the axes should be labeled with appropriate numerical values and the units shown. All graphs should be done in ink or on the computer. **MAKE SURE YOU INTRODUCE WITH WORDS ANY TABLES OR GRAPHS AND AFTER PRESENTING THE TABLE OR GRAPH, DISCUSS THE SIGNIFICANCE FOR THAT TABLE OR GRAPH.**

5. **CONCLUSIONS:** Summarize the results of your experiments. Include any unknown numbers and results. Discuss any conclusions that can be drawn from your results as well as any possible real sources of error. Correlate what you stated in the introduction to the results you reported. Did you prove what you discussed in your introduction?