

EE2 2003: Instructions for Writing Lab Reports

There are two kinds of reports: brief reports and full reports. Check the web page for each exercise to see whether a full report is required.

Brief reports:

The report should include tables and graphs showing the measured values and values calculated during the analysis requested on the web page for the exercise. Show one example of how the calculations were carried out (if you use a computer, use Mathematica or Matlab and include a printout of the code you wrote to do the calculations. Do not use Excel). Label figures and tables (for example: Fig. 1, Table 1, etc.) and include figure captions and table captions that state clearly what is being shown. State the answer to any questions raised in the analysis section of the web page for the exercise. Explain your reasoning behind the answers you give. Compare your results with known values from handbooks, tables in textbooks or articles. Make sure you give a complete reference to the source you use. If you cannot find values for the particular chemicals you worked with, then compare with values that are available for similar chemicals. Discuss possible reasons for any discrepancies. Use SI units except for quantities where chemists normally use other units. Always give final results also with SI units even when other units are typically used (for example, chemists typically use kcal/mol for energy, but the SI units are kJ/mol).

The title of the exercise, the date it was carried out and your name should be written clearly at the top of the first page. At the end of the report, state the date at which the report was finished and sign your name. If printouts were collected during the exercise, they need to be included with one of the reports from each group. Other members of the group should state whose report has the original printouts.

Full reports:

In full reports, the experiment is described in much more detail **in addition to** all the things listed above for brief reports. Full reports should be composed in a way similar to research articles in scientific journals. The report should be written as a continuous text with logical flow and it should specify completely without gaps what was being done and what results were obtained. Read the instructions in chapter I of SGN. It should be divided up into sections, as described below:

1. *Introduction* - State briefly the purpose of the measurement, what method is being used and what instruments are involved. Give a short derivation of the equations that will be used to analyse the measured values.

2. *Experimental method* - To large extent you can simply refer to the directions you followed (refer to specific pages in the book, web page and/or handout). Any deviation from the prescribed procedure must be described in detail.

3. *Results* - List all measured quantities, including for example the concentration of solutions, etc. Enough information should be given so that others could repeat your measurements and obtain the same results (within the uncertainty in the measurements). Estimate the uncertainty in your measurements and calculate what error that corresponds to in the final results (error propagation, see chapter II in SGN, especially "rejection of discordant data", "significant figures", "propagation of error", and "graphs"). Make sure the number of significant figures in your final results is consistent with the experimental error and approximations in the theoretical analysis.

4. *Discussion* - Write continuous text that includes in particular answers to questions raised in the "analysis" section of the web page for the exercise. Compare with known values of the quantities you obtain from your measurements and discuss possible discrepancies. Suggest improvements in the experiment (procedure, instruments, ...). Which quantity limits the accuracy of the final result?