

LABORATORY REPORTS

Reports for Submission

Learning to write up experimental work is an important aspect of students' scientific training. A minimum requirement for any record of laboratory work is that it should contain enough information for any practising chemist to replicate the work exactly.

A format for writing up reports is given below. Pay particular attention to how the experimental section is written. Do not copy out any section of the manual – it is not necessary to draw diagrams of equipment used or rewrite the safety data in the manual. A good report does not need to be any more than three or four sides of A4. Reports that are considerably longer than this will incur penalties – remember you are in the laboratory to learn how to work as a chemist and write up your results **concisely**.

Mechanisms

Mechanisms may be hand drawn, although it is a good idea to get used to using ChemDraw. ChemDraw can be downloaded free for student use from:

<http://sitelicense.cambridgesoft.com/sitelicense.cfm?sid=844>

Follow the instructions - this will enable you to download the software.

Students must place sample vials containing their solid products in a polythene bag and staple the bag to the report. **Failure to produce authentic samples of compounds that have been described in a report will result in a substantially reduced mark. Samples of liquid products are not required.**

When an experiment is completed, you should write it up word-processed, answer all the questions and secure all the sheets together (stapled) along with relevant spectra, chromatograms *etc.* The completed experiment, with samples should be handed in to a demonstrator or staff member. It's your responsibility to make sure that any work you hand in is initialled – by member of staff/demonstrator – to acknowledge receipt.

Typical format for lab reports:

Experiment Number

Experiment Title

Aims

A 1-2 sentence description *in your own words* of the aims of the experiment. If appropriate, include the reaction scheme.

Experimental

A **short** description *in your own words* of the experimental procedure used (maximum half a page).

Do **not** copy the procedure in the manual. Make sure you record the quantities which you actually used. Record any observations or unusual features of the experiment. A typical format might be:

Xxx(specify substrate)xxx (4.1 g, 0.02 mol) was added dropwise over a period of 30 min to a solution of xxx(specify reagent)xxx (2.8 g, 0.02 mol) in xxx(specify solvent)xxx (50 mL) and the mixture was heated under reflux for 30 min. The solvent was removed under reduced pressure and water (25 mL) followed by dilute hydrochloric acid (2M, 20 mL) were added to the residue. The mixture was extracted with xxx(specify solvent)xxx (3× 30 mL), the combined organic extracts were dried (MgSO₄) and the solvent was removed under reduced pressure. The solid which was obtained (xx g) was recrystallised from xxx(specify solvent)xxx to give the pure product (xx g) which was used for IR spectroscopy.

Note the style of the above section – particularly the use of third person passive tense. This style of writing is used in scientific journals and it is useful to get into the habit of writing in this style.

Results and Discussion

For most experiments you will be asked to record:

Yields and percentage yields **BASED ON MOLES**

Melting points or boiling points – which you should compare with literature data where possible, and discuss any discrepancies

For some experiments you will be asked to record:

IR or NMR spectra – tabulate the peaks and make full assignments with appropriate explanations. **This is important – an unassigned NMR spectrum is of little value.**

Questions

Answer the questions.

Conclusions

Write 1-2 sentences explaining the outcome of the experiment.

The Royal Society of Chemistry website gives detailed instructions on how to write an experimental section. See:

<http://www.rsc.org/Publishing/ReSource/AuthorGuidelines/ArticleLayout/sect3.asp>

Samples – Where asked for in the manual submit samples of **SOLIDS ONLY** in a small glass vial. Fix it to the front of your report using the provided small plastic bags.

How to write up a failed experiment

In the event of a failed experiment students should consult a demonstrator for advice on how best to proceed with the write-up. One of two courses of action will generally be recommended.

- (a) Repeat the experiment. This is the simplest remedy for a failed experiment, but students **must** consult with a demonstrator as to whether they have sufficient time available in which to carry out the repeat experiment. Excessive repetitions of the same experiment will not be permitted.
- (b) Write-up the experiment as is. Depending on the quality of the results, it will usually be possible to complete a report on a failed experiment. A detailed analysis of errors in procedure can compensate in part for poor results. As long as the experiment has been undertaken in a competent manner and written up properly it will receive a “pass” mark. You may use spectra etc from another student to allow you to write a complete report **BUT YOU MUST STATE THAT YOU HAVE DONE THIS** as to use someone else’s work without acknowledgement is plagiarism.

Sanctions for late hand-in of reports

It is in your interests to hand in reports soon after you complete the experiment as this will allow you to take into account feedback from the marked reports before writing the next report.

The last week of the laboratory

During the seventh week of the laboratory no practical work of any type is allowed. You must hand in all reports by 5pm on the Friday of the seventh week. **Without prior agreement by Dr. Peter Kirsop no reports will be accepted after this time and a mark of zero will be recorded for the missing reports.**

Laboratory work and plagiarism

Students should note that copying by one student of another student’s laboratory reports constitutes plagiarism, and could therefore be considered as academically fraudulent and an offence against university discipline. The university may therefore invoke sanctions in cases where a candidate uses the work of another person or persons in this way.