How to Keep Your Lab Book.

1. **Cover** - Your name, Book number, Year, Institution, Fogg (or other) research group
2. **Inside cover** - give your address and contact info as well as that for the lab, in case the book is lost or stolen. Note that your lab book should NOT leave the lab. It is the permanent property of the research group (wardens of the data): it stays after you leave.
3. **Index** - The first few pages should be left blank for an index which should include from the left: page number column, equation for experiment. All experiments are then identified as follows: initials (or name) – book number – page, e.g. Amoroso-01-22. This means you need to number all pages in your lab book.
4. **Lab book pages** - The lab book pages should be set up as described below. See also the image scanned in below, which corresponds to the right-hand page in a properly set up lab book.

**Lab book page set up.**

*Use the left-hand page for calculations (these must be written out using line equations and crossing off units as you go. Do NOT do the calculation in your calculator -- this way you have a record that will allow you to identify a mistakes, if mistakes are made!*

*Use the right-hand page for your experimental procedures, observations and results, as follows:*

**What is the purpose of keeping a lab book?** If your answer is to keep a record for yourself, you're only half right. These are critical documents that will be used by others in the group as well, and they are also the primary documents for publication and patent purposes. ANYBODY must be able to read your lab book and understand what you have done.

1. **Date** – upper left corner (THIS DETERMINES PATENT PRIORITY -- it must be included)
2. **Reaction scheme** – at top of page, draw the equation for the reaction (give informative drawings for product, not line formula!) showing all reagents, conditions, & expected product
3. **Theoretical Yield** – in upper right corner, give MW (molecular weight) and TY (theoretical yield) of expected product
4. **Reference** – under the reaction scheme give a literature reference, or (if it's a compound that we synthesized) a reference to your or someone else's lab book showing the "best practice" experiment (e.g. Amoroso-13-58). Literature references must be in Organometallics format with all author names (bear in mind that anyone must be able to track your references back without wasting their time). Finally, but importantly and most interestingly: also indicate here your reason for doing the experiment.
5. **Reagents and solvents** – give table as follows for ALL reagents, additives, solvents, starting with the limiting reagent (normally the organometallic species). SM = starting material.

<table>
<thead>
<tr>
<th>Compound</th>
<th>MW</th>
<th>mass</th>
<th>millimol (# equiv)</th>
</tr>
</thead>
<tbody>
<tr>
<td>SM DEF-IX-12</td>
<td>958.89</td>
<td>0.532 g</td>
<td>0.555 mmol</td>
</tr>
<tr>
<td>dppb</td>
<td>426.47</td>
<td>0.237 g</td>
<td>0.5556 mmol</td>
</tr>
<tr>
<td>CH2Cl2</td>
<td></td>
<td>5 mL</td>
<td></td>
</tr>
</tbody>
</table>
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If you (or somebody else) made the starting material, **give its reference #** (initials, book, page) so you can track back a "bad prep" if you get anomalous results.

6. Give time you started the reaction and time of any modifications in the left margin, so it's easy to see what you did and when.

7. Describe your procedure simply, with actual details of what you did, your observations, and yields.

8. What is the result and how do you know? Give key spectroscopic data - don't say "Ran NMR / IR" - say what the NMR or IR indicated. For TLC, draw it.

9. What is your interpretation? comments about whether the reaction worked, possible reasons why it didn't; suggestions for further work and improvement.

10. Make sure your pages are numbered and that you update your index at least weekly.

**EXAMPLE OF PROPER LAB PAGE**

*Left side of the page.* This page should include all calculations and NMR spectra. Save space by cutting out NMRs or printing smaller (expand key areas; make peak heights and integrations as large as possible). Label spectra with reaction number and rx / compound, date & time of spectrum, and NMR solvent.