
Notice!

I've found that this book project has been showing up on more and more search engines lately and is also being directly linked to for the information it contains⁽¹⁾. I therefore find it necessary to warn all persons viewing this document that it is a work in progress, and as such it contains errors of all kinds, be them in experimental procedures that may cause harm, or in faulty reasoning that would get you slapped by nearly any chemistry instructor. Please for now take the information here with a grain of salt.

Most Importantly!

By reading further you agree not to hold the authors of this document responsible for any injuries/fatalities that may occur from attempting to make any of the products or following any of the procedures that are outlined within. Chemistry inherently possesses a degree of danger and you must understand this, wear gloves and more if the situation calls for it, your safety is in your own hands, not mine!

Also note that this project is open for contribution by any party on the internet. Simply submit a section to Rob.Vincent@gmail.com and it will be added into the text pending editing and such within a few weeks. Any person contributing will have their name mentioned in the credits. Thank you for reading this, and enjoy!

1 Although this document may be directly linked to, it will not work in that manner as I have hotlink protection for documents, however directly linking to the html document is possible, still though I would prefer links be to the main project page.

7.0 Choosing your own experiments

A good way to figure out what experiments you want to do on your own is to keep track of what experiments you see. Whenever you're reading a book or surfing the internet and you come across an interesting reaction, one where you have all the reagents or they are readily available, an experiment where you could make a product that could be useful in creating another product down the road, or maybe just something that changes color in just the right way to catch your fancy, copy it down into a book. Be sure to write down whatever important reaction details it gives (temperature, pressure, stirring, etc.) and a complete chemical reaction if it is available. Also be sure to include some bibliographical information as to where you found this source so if you ever have to cite it or go back to it you won't have any difficulties.

7.1 Researching

As has been said time and time again, you do not want to re-invent the wheel. If someone has already gone before you and discovered the best way to a compound or already tried a modification you have on your mind it is very helpful to find this information before actually digging into something. The internet is a great guide but books are the best resource, try to find a local library, even college libraries do not usually require you to be a student to use their resources.

7.1a Internet

The internet is a good starting point for nearly any chemical research to be done. The one thing it is great for is giving an overview of the current knowledge available. However as many people here are aware there is no policy against posting complete and utter garbage on the internet and passing it off for the gospel truth. There are no checks and balances on the internet to prove that the information that you have is correct. However it is usually easy to get a feel for a site and determine whether it seems legitimate. On top of superficial looks, most good information that you find online is either backed up with direct experimental evidence by the individual posting it, or better yet, references to written works. Now, both of these can be faked as well, they simply add credence to whatever information you are reading. Further research can be done from here, looking up anything you can find on the individual posting this information and determine their credibility and also looking up references in paper form, which is something you should probably do anyway if the information that you are looking for has any true importance to you.

Finding good information on the internet requires that you use search engines with very large databases, at the time of writing this google.com and yahoo.com being some of the largest in the English speaking world. However the more languages you know the better, this allows you to use other search engines in different languages, not to mention the obvious fact that you are capable of reading those languages.

Whole books can be found online if you only search, *.pdf files being the most common format for them, however *.djvu is also an up and coming format. Some of the more advanced search engines allow you to specifically search for file types under the advanced search options, a button for which is always located somewhere near the actual search button. This should not be something done consistently though, as there is much good information to be found in normal html files online. The normal methods to refine a search still hold true when searching for chemistry information:

Problem:	Solution:
Too Many Results	Results should be narrowed by taking advantage of quotation marks around phrases that are unique to your subject or multi word chemical names, i.e., "Potassium Cyanide" vs. Potassium Cyanide. Some of the more common chemicals can also show up frequently on pages that are hardly related to chemistry, a

	<p>little hard chemistry can help sort them out. For example, lead chromate is a chemical that is often found in paints as a yellow pigment, however by searching for PbCrO₄ many results (although some useful results) will be filtered out. Other key words that help to give chemistry specific results include yield, precipitate, solvent, cation, anion, oxidized, reduced, and innumerable other words, trying different combinations can always help to reduce the amount of irrelevant information you come across.</p>
Too Few or no Results	<p>Determine synonyms for your name or reaction of interest. For example mercuric chloride can also be known as mercury (II) chloride. Try chemical formulas and if using quotation marks remove them. Check your spellings and try to trace your steps backward by looking at pages that mention the processes leading up to the process of interest or pages that mention things relating to your compound of interest to best determine changes in your search that you may have to make to increase results, always give a different search engine a try if you are having trouble finding anything.</p>

Really though there are many sites online that can teach you to search for documents of all kind using search engines. Just remember these key things:

- 1) Many compounds have more than one name to describe them, especially organic compounds, but also inorganics such as FeSO₄ (Ferrous Sulfate vs. Iron (II) Sulfate vs. Iron (II) Sulphate vs. Ferrous Sulphate).
- 2) Chemical formulas can hurt or help your searches, be sure to try both, also they can be helpful for finding the names of unknown compounds.
- 3) Using words that are directly related to the reaction you are wondering about or products or precursors to a product in your search can help to find more pinpoint results.

7.1b Library

7.1b1 Following up on footnotes

7.1c CAS

7.2 Scaling up and Scaling Down

7.3 Being through

7.4 The Importance of Keeping a Log

When I first started doing experiments I would figure out how much of A to mix with B, write it down on a little scrap of paper, then read off that when I did the experiment. Later though I would wonder, “Did I mix 25 ml of A with 15 ml B, or was it 15 ml A with 25 ml B?” Or I would try to explain to someone exactly what I did different then them, only to find that whatever I didn’t different wasn’t something important enough to stick in my mind. It took nearly two years of running experiments for me to come to the conclusion that I needed some permanently bound book to write nearly everything that crossed my mind in, one reference work by me that I could add to, alter, and make notes in, and come back to again and again. And once I realized it for myself I made sure to stick to writing in it, even when it was less continent to drag it out then it was to just grab a scrap of paper and make a note.

7.5 Trouble Shooting

7.6 Words of encouragement, stories of “Try Try Again”

7.7 Lengthy Story about procedure with details