Free Organic Chemistry Resources

This is a **Meta-List of Free Organic Chemistry Resources** compiled with incoming organic chemistry graduate students in mind, though it is likely of value to professional organic chemists, too!.

Permalink for this document: tinyurl.com/yxwwr4rv

Suggestions for what should be on the list?! Please email or tweet Alex Grenning (grenning@ufl.edu | @OChemGrenning) with suggested updates! Thanks

For an even broader list of resources, head to Dr. Alex Zhurakovskyi's Blog:
http://kovsky.net/blog/posts/chemistry-links

FAVORITES!

The Reich Collection: https://organicchemistrydata.org/
[I particularly find the "Chemical Data" and "Reaction Info" sections useful.]

Prof. Dave Evan's Class Notes:
https://www.dropbox.com/sh/y7ynttq7n4ojp4l/AACOWxp3jntzXvlDdM6Zzk46a?dl=0
"Course is designed to introduce upper-level undergraduates and beginning graduate students to advanced topics in organic chemistry."

Having trouble finding a research article?

- https://sci-hub.41610.org/ ***[free science!]***
- https://chemsearch.kovsky.net/ ***[plug your DOI or other article info in here to get a link to the article]***

Beyond SciFinder: http://www.cheminfo.org/wikipedia/
[you can search the Wikipedia structure database and filter out anything that wasn't important enough to have a Wikipedia page!]

Not Voodoo: ***http://www.chem.rochester.edu/notvoodoo/index.php***
[Laboratory Techniques and Methods to Improve Your Experimental Skills]

Table of Contents:

Brushing up: Powerful Undergraduate-Oriented Learning Tools

"R|S Chemistry" *by Prof. Neil Garg*
***Link:* https://rschemistry.com/**
Description: "...Designed to help organic chemistry students master stereochemical assignments."

"Virtual Textbook of Organic Chemistry" *by Prof. William Reusch*
***Link:* https://www2.chemistry.msu.edu/faculty/reusch/VirtTxtJml/intro1.htm**
Description: "...Free, Virtual Undergraduate Organic Chemistry Textbook"

"ChemTube3D"*By Prof. Nick Greeves*
***Link:* https://www.chemtube3d.com/**
Description: "ChemTube3D contains interactive 3D animations and structures."

In the PhysOrg & Synthesis Classrooms – Key Concepts, Reactions, and Applications

"Organic Chemistry Info." *by Prof. Hans Reich*
***Link:* https://www.chem.wisc.edu/areas/organic/index-chem.htm**
Content includes:

- **Named Rules and Effects**
- **Reactive intermediates, ylides, dipoles, & strained compound names** (in Nomenclature)
- **A-values** (in Chemical Data)
- **Electron-pushing** (in Chemical Reactions)
- **Named reagents** (in Chemical Reactions)
- **Syntheses/Reactions organized by named reaction, reagent used, chemoselectivity** (competition), and structure.
- **List of functional groups** (in Course Handouts)
- **Carbonyl Chemistry**
- **Redox Chemistry**
- **Pericyclizations**
- **Organometallic reagents and transition metal catalysis**

Organic Chemistry on Social Media

- **Heterocyclic Chemistry Class 2019. Bonus content: associated problem sets and exams. By Prof. Phil Baran.**
- **Professor Carbon. AKA Prof. Joe Topczewski (shh!)**
- **Synthesis Workshop Videos: Video podcast of recent advances in synthetic organic chemistry.**
- **Red Nile. Broad general chemistry content with high production value.**
- **The Cycloaddition. A podcast for those looking to go above and beyond in their understanding of the synthetic organic literature.**

"Organic Chemistry Portal." *by Prof. Douglass Taber*
Link: https://www.orga
nic-chemistry.org/*Content includes*:

- ***Name reactions** (Listed alphabetically)*
- ***Protecting Groups***
- ***Select Total Syntheses** (Listed alphabetically by Natural Product name)*
- ***Select New Methods***

"Name-Reaction.com."
***Link:* https://www.name-reaction.com/**
Description: "Educating chemists on organic reactions in an interactive, dynamic and easy to understand format."

"Organic Chemistry Problems" *By Prof. Joseph J. Topczewski*
***Link:* https://www.organicchemproblems.com/**
Description: "...to provide extra example problems for students at the introductory graduate student level (i.e. first year graduate students who are in an organic synthesis course who have prior experience with organic chemistry) or advanced undergraduate level."

"ReactionFlash App" ***By Prof. Erick M. Carreira***
Link: **https://www.elsevier.com/solutions/reaxys/who-we-serve/education-and-research/reactionflash**
Description: "ReactionFlash gives access to 875+ Named Reactions, their mechanisms and examples published in peer-reviewed literature."

"Chemistry by Design." ***By Prof. Jón T. Njarðarson***
Link: **http://chemistrybydesign.oia.arizona.edu/**
Description: "…an interactive virtual flashcard to educate on the construction of natural products and pharmaceuticals."

"***Advanced Problems in Organic Chemistry (APOC)***:"
Link (iOS): https://apps.apple.com/ch/app/apoc-advanced-problems-in-organic-chemistry/id1019335489?l=en
Link (Android): https://play.google.com/store/apps/details?id=com.ionicframework.eq4303509&hl=en_US
Description: "apoc - Advanced Problems in Organic Chemistry - is your fully interactive virtual set of enhanced flashcards."

"SynArchive: A total synthesis database." ***Dr. Daniel Beaudoin***
Link: **https://www.synarchive.com/**
Description: "SynArchive is a free web based application that allows you to browse a growing database of organic syntheses."

"Chem Infographic" ***By Dr. Roman Valiulin***
Link: **https://cheminfographic.wordpress.com/**
Content Includes:
- **100 Must Know Mechanisms**
- **100 Must Know Reagents**
- **Chemdraw Tips and Tricks**
- + much more!

"Prof. Dave Evans' Chem 206 Lecture Files." ***By Prof. Dave Evans***
Link: **https://www.dropbox.com/sh/y7ynttq7n4ojp4l/AACOWxp3jntzXvlDdM6Zzk46a?dl=0**
Description: The Dropbox contains Prof. Evans' course notes on subjected related to "graduate level" organic chemistry.

"ChemSpider" **by** ***The Royal Society of Chemistry***
Link: **http://cssp.chemspider.com/**
Description: "ChemSpider SyntheticPages is a free database of practical procedures for research workers in synthetic chemistry, written by chemists for chemists."

"Organic Reactions Wiki" ***by John Wiley and Sons***
Link: **http://organicreactions.org/index.php?title=Welcome_to_the_Organic_Reactions_Wiki_Home_Page**
Description: "*Organic Reactions*® is a comprehensive reference work that contains authoritative, critical reviews of many important synthetic reactions."

Research Group's with Organic Chemistry Resources:
- **Baran lab: https://baranlab.org/research/seminars/**
- **Myers lab: https://faculty.chemistry.harvard.edu/myers/pages/chem-115-handouts**
- **Evan's lab: http://evans.rc.fas.harvard.edu/cgi-bin/seminar.cgi**
- **MacMillan lab: http://chemlabs.princeton.edu/macmillan/presentations/**
- **Fukuyama lab: http://www.f.u-tokyo.ac.jp/~fukuyama/gmproblems.htm#gmp**
- **Trauner lab: https://www.traunergroup.org/denksport**

- **German Cancer Research Center:** **https://www.dkfz.de/en/drugs/Synthesis_Quiz.html**
- **Sarpong Lab:** **http://www.cchem.berkeley.edu/rsgrp/schedule-current.html**
- **Stoltz Lab:** **http://stoltz2.caltech.edu/seminars2.html**
- **Zakarian Lab:** **https://labs.chem.ucsb.edu/zakarian/armen/group-documents.html**
- **Shenvi Lab:** **https://www.shenvilab.org/education**
- **Merlic Lab:** **http://www.chem.ucla.edu/research/org/MERLIC_GROUP/ochem_companion.html**

"Glossary of Terms used in Physical Organic Chemistry." *By Prof. Paul Müller*
Link: **https://www.qmul.ac.uk/sbcs/iupac/gtpoc/cont.html**
Description: Comprehensive lists of definitions integral to organic chemistry

In the Lab – Techniques, Desk References, and Databases.

"Organic Chemistry Info." *by Prof. Hans Reich*
***Link:* https://www.chem.wisc.edu/areas/organic/index-chem.htm**
Content includes:

- Comprehensive pKa data (**DMSO** and H_2O) (in Chemical Data)
- **Comprehensive NMR chemical shifts** (in NMR Spectroscopy)
- **Solvent properties** (in Chemical Data)

"Not Voodoo." by Prof. Alison Frontier
***Link:* http://chem.chem.rochester.edu/~nvd/**
Description: "Laboratory Techniques and Methods to Improve Your Experimental Skills.

"The Schlenk Line Survival Guide" by Dr. Andryj Borys
***Link:* https://schlenklinesurvivalguide.com/**
Description: "Illustrative Guides designed to help you master air and moisture-sensitive chemistry."

"Mayr's Database Of [Nucleophilicity and Electrophilicity] Parameters." *By Prof. Herbert Mayr*
***Link:* https://www.cup.lmu.de/oc/mayr/reaktionsdatenbank/**

"Spectral Database for Organic Compounds, SDBS." *By National Institute of Advanced Industrial Science and Technology (AIST)*
Link: **https://sdbs.db.aist.go.jp/sdbs/cgi-bin/cre_index.cgi**
Description: SDBS is an integrated spectral database system for organic compounds,which includes 6 different types of spectra under a directory of the compounds.

"Internet Bond-Energy Databank (iBonD)" *By Prof. Jin-Pei Cheng*
Link: **http://ibond.nankai.edu.cn/**
Description: Comprehensive collection of homolytic bond dissociation enthalpys and pka values for organic and inorganic compounds.

"http://www.nmrs.io/" *By Christopher Varjas*
Link: **http://www.nmrs.io/**
Description: "NMRS.io was created to provide efficient access to nuclear magnetic resonance spectroscopy resources."

"NMR Multiple Guide and Work Book" *By Prof. James S. Nowick*
Link: **https://www.chem.uci.edu/~jsnowick/groupweb/files/MultipletGuideV4.pdf**
Description: "A user's guide to common coupling patterns in 1H NMR."

"Chemistry Reference Resolver." By Dr. Oleksandr Zhurakovskyi
***Link:* http://chemsearch.kovsky.net/**
"The Chemistry Reference Resolver serves to quickly direct you to a publisher's webpage that contains the article you are looking for."

"Physiochemical calculators" By Dr. Witek Mozga
***Link:* http://trimen.pl/witek/calculators/calculators.html**

Description: “Boiling point, coefficients, concentration, pressure, and temperature calculators.”

“Mass Spectrometry Adduct Calculator.” By Prof. Oliver Fiehn
***Link:* https://fiehnlab.ucdavis.edu/staff/kind/Metabolomics/MS-Adduct-Calculator/**
Description: “This calculator allows to identify some adduct ions from ESI-MS (electrospray) mass spectrometry measurements or other soft ionization techniques like CI-MS or FI-MS or FD-MS or APCI-MS or MALDI-TOF.”

“**Practical Lithiation-Borylation: how to achieve best results.” By Prof. V. K. Aggarwal and/or the Aggarwal group.**
Link: **http://www.chm.bris.ac.uk/org/aggarwal/docs/practical-guides/li-b-guide-aggarwal.pdf**
Description: There is very useful information in this pdf regarding the best practices for using sensitive organometallic reagents and beyond.

Favorite Chemical Vendors (high quality, diverse catalog, and inexpensive!)

- https://www.oakwoodchemical.com/
- https://combi-blocks.com/
- https://www.aablocks.com/

Misc –

The Division of Organic Chemistry "Resources" Page

Link: ***https://www.organicdivision.org/links/***

Description: Great videos, Journals/RSS feeds, and more!

"Top Pharmaceutical and Disease-Focused Pharmaceutical Posters." *By By Prof. Jón T. Njarðarson*
Link: ***https://njardarson.lab.arizona.edu/content/top-pharmaceuticals-poster***
Link: ***https://njardarson.lab.arizona.edu/content/disease-focused-pharmaceutical-posters***
Description: "Posters: Attractive graphical Information for teaching and serving as a springboard for researchers interested in synthetic methods and strategy."

"Diversify Chemistry." *By Prof. Anne J. McNeil*
Link: **https://diversifychemistry.com/**
Description: Highlighting the diverse community of academic chemists.

"Organic Links."
Link: **https://www.organicdivision.org/organicsyntheticfaculty/**
And
Link: **https://organiclinkspui.net/**
Description: Overview of research groups in organic chemistry. Organized by State.

Active Organic Chemistry Blogs

- **In the Pipeline:** **https://blogs.sciencemag.org/pipeline/**
  → "Derek Lowe's commentary on drug discovery and the pharma industry"
- **Open Flask:** **http://openflask.blogspot.com/**
  → "The Baran Laboratory Blog"

Chemical Structure Search Engines (Beyond Scifinder)

- Search Wikipedia
- Search DrugBank