



Not Voodoo X.4

Laboratory Techniques and Methods
to Improve Your Experimental Skills

COLLECT OF LESSONS LEARNED AND
LAB MISHAPS WITH A "VOTE UP"
MECHANISM TO INDICATE SIMILAR
EXPERIENCES

DATA RELATED TO UNDERGRADUATE
ORGANIC CHEMISTRY RESEARCH

[HTTPS://WWW.CHEM.ROCHESTER.EDU
/NOTVOODOO/INDEX.PHP](https://www.chem.rochester.edu/notvoodoo/index.php)



Not Voodoo X.4

Demystifying Synthetic Organic Chemistry since 2004



[Magic Formulas](#)

[Tips and Tricks](#)

[Troubleshooting](#)

[How To](#)

[Rookie Mistakes](#)

[Chemists Weigh In](#)

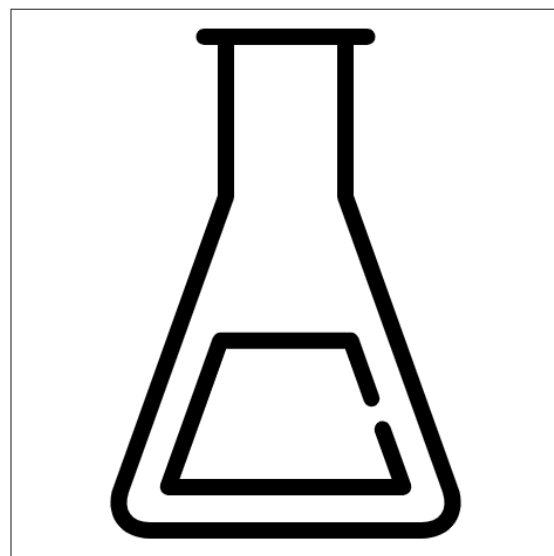
[Chromatography](#)

[Reagents and Solvents](#)

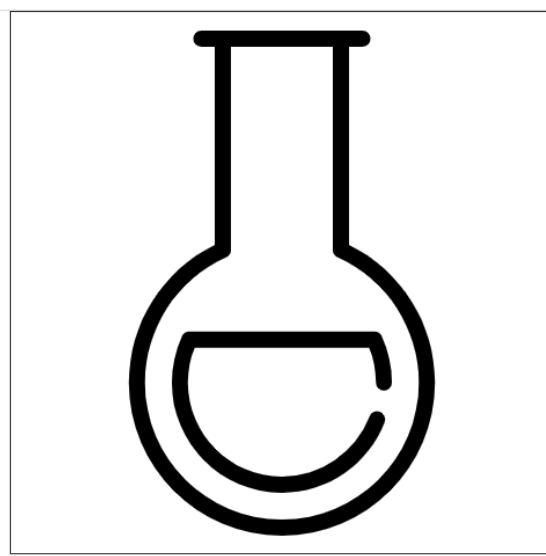
[Workup](#)

[Purification](#)

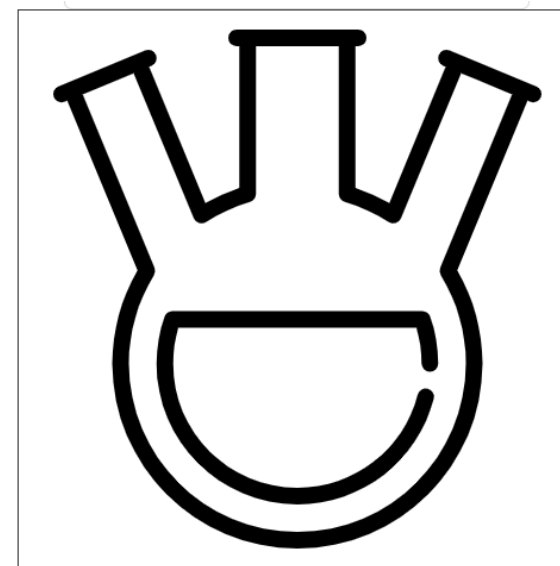
Laboratory Techniques and Methods to Improve Your Experimental Skills



[For First-Time Independent Researchers](#) ▼



[For Beginning Ph.D. Students](#) ▼



[For Advanced Researchers](#) ▼



For First-Time Independent Researchers ▼

How to Wash Glassware
How to Run a Reaction
Flammable Reagents
Explosive Reagents [↗](#)
Toxic Reagents
First Time Through a Procedure
Leaving the Lab
How to Stain your TLC plate
How to Get a High Quality NMR Spectrum
Stirring
Weighing
Drying Methods
Proverbs

For Beginning Ph.D. Students ▼

Reagents
Common Formulas
Rules of Thumb
How To...
How to Run a Reaction
Troubleshooting an Experiment
Rookie Mistakes
Proverbs
A Day in the Life of Successful Researcher
1,2,3... Ph.D.

For Advanced Researchers ▼

TLC Stains
Magic Formulas
Cooling Bath Mixtures
Protecting Groups
Oxidants
Reagents
Buy It or Make It?
Purification
Workup Tricks: Reagents
Emulsions



Magic Formulas

Tips and Tricks

Troubleshooting

How To

Rookie Mistakes



Chemists Weigh In

Chromatography

Reagents and Solvents

Workup

Purification

About

Rookie Mistakes:

About

Equipment

Reagents

Setup

TLC

Column Chromatography

Spectroscopy

The Workup

The Vacuum Apparatus

Labels and Bookkeeping

Ouch

Under Pressure

The Sound of Breaking Glass

Spills

Fire in the Lab

Just... Wow

Top Ten

This collection of pages began with a list of eleven mistakes in September 2004. The idea was that beginning experimentalists might learn from experienced chemists, chemists who have run hundreds of reactions, and made lots of mistakes.

What follows is the collected wisdom of years of shaky chemistry, documented for posterity in the hopes that you, will learn from our mistakes. But we wouldn't bet on it!

The Rookie Mistakes did not exactly work out that way. What began as an innocent compilation of beginner bumbles evolved into an entertaining catalog of honest errors, freak accidents, relatively innocuous events that cascaded in horrific directions, and incidents worthy of a Darwin award. After a few years of this, reading the list involved scrolling through a vast catalog of catastrophe encompassing all the classes of chemical experimentation.

Over time, I learned that "Rookie Mistakes" was appreciated for reasons far beyond its intended role as a guide to help people avoid common pitfalls in the lab. Incredibly, students told me that the list was an unexpected source of solace after a frustrating day in the lab. That's partly because it's funny, but also because you don't feel quite so incompetent after reading about how other people accidentally destroyed their experiments.

With these observations in mind, Rookie Mistakes X has some new features:

1. The mistakes are divided into different categories (listed on the lefthand menu), focusing on important aspects of experimentation, or common themes. For rare and mystifying mistakes, take a look at "[Just...Wow.](#)"
2. You can [search](#) the mistakes by keyword , or view the Top Ten most common mistakes.
3. You can use the tab "add your experience" to help us count common mistakes or to add new mistakes (...your bumbling technological distinctiveness will be added to our own...)

Not Voodoo X.4 > Rookie Mistakes



Top Ten

[Add Your Own](#)

Rookie Mistakes:

- About ▲
- Equipment
- Reagents
- Setup
- TLC
- Column Chromatography
- Spectroscopy
- The Workup
- The Vacuum Apparatus
- Labels and Bookkeeping
- Ouch
- Under Pressure
- The Sound of Breaking Glass
- Spills
- Fire in the Lab
- Just... Wow
- Top Ten**
- Search



Mistake	Vote	#Rookies
Tried to drain sep funnel with stopper still in.	↑	3182
Put a TLC in the jar and walked away to to something else... remembered the TLC half an hour later.	↑	3005
Forgot to pre-weigh your round bottom flask.	↑	1945
During column chromatography, forgot to change the vessel for collecting the eluant, it overflowed, some product was lost.	↑	1772
Poured a reaction mixture into a sep funnel without closing the tap. Recovered reaction mixture from the bottom of the fume hood.	↑	1686
Stabbed yourself with a syringe needle	↑	1418
While cleaning beakers with stir bars inside, poured the stir bars down the drain.	↑	1153
Didn't label a flask. One week later, have NO idea what is inside.	↑	1058
Whilst trying to clean glassware with soap solution, dropped it in the sink and smashed it.	↑	1047
Burned hand on hot plate because it didn't look hot!	↑	989



Not Voodoo X.4 > Rookie Mistakes > Top Ten



About Reagents and Solvents

Reagents & Solvents: Reagents

About

Reagents

Reagent Tips

Molecular Sieves

Can I Use it Right out of the
Bottle?

How to Add Reagents to a
Reaction

How to Work with Thiols

How to Handle Azides [↗](#)

How to Make LDA

How to Make Jones Reagent

How to Store Reagents

How to Titrate Alkylolithiums

How to Work with Pyrophoric
Reagents [↗](#)

Pyrophoric Reagents

Desert Island Oxidations

Rookie Mistakes

Should I Buy It or Make It
Myself?

When you're just starting out in the organic chemistry lab, every experiment involves a new and unfamiliar reagent. You'll have a lot of questions. [Should you buy it or should you make it in the lab?](#) If you found a bottle in the lab, should you add it directly to your reaction, or [should you purify it first?](#) If you bought a new bottle, [how should you store it?](#) Is the reagent [especially toxic](#), or likely to [catch fire or explode](#)? Once you've got a handle on these important questions, you'll want to [weigh the reagent](#), and [add it to your reaction](#). Easier said than done, in some instances.

You will also find that you're running reactions in many different solvents, and that each one has [unique properties](#). Each solvent behaves differently when it comes time to isolate your product, and using the wrong technique can lead to serious headaches during workup and purification. Check the list of [workup tricks](#) to find methods for:

- Performing aqueous workup when your [solvent is polar or miscible with water](#)
- Removing [tin](#), [copper](#) and [boron](#) byproducts, [amines](#) and many other [common reagents](#) and [solvents](#)
- Removing byproducts generated during [aluminum hydride reductions](#), [Wittig reactions](#), [DCC couplings](#), and [m-CPBA oxidations](#).

Ever wonder: [which oxidant should I use?](#) Do you want to [make LDA](#) or the [Jones reagent](#), or need to [titrate n-BuLi](#)? Are you curious about [molecular sieves](#), or [exotic solvents](#)?

Aaaand, visit [Rookie Mistakes: Reagents](#) for a different perspective on the subject.

Solvents

Chemists use solvents for reactions, column chromatography, and crystallization. For successful experimentation, the properties of various solvents are important to understand. Furthermore, since much of the chemical waste we generate is derived from solvent, the environmental impact of common solvents is a growing concern.

You can find information on relative solvent polarity, solvent properties relevant to chromatography, and a "solvent selection guide" from GSK comparing the toxicity of different solvents.

An article expanding on the GSK solvent selection guide can be [found here](#) [↗](#)

For a chart of suggested replacements for undesirable solvents (as used at Pfizer), see [this article](#). [↗](#)

Not Voodoo X.4 > Reagents and Solvents

Should I Buy It or Make It Myself?

[Add Your Own](#)

Reagents & Solvents:

[About](#)[Reagents](#)[Reagent Tips](#)[Molecular Sieves](#)[Can I Use it Right out of the Bottle?](#)[How to Add Reagents to a Reaction](#)[How to Work with Thiols](#)[How to Handle Azides](#)[How to Make LDA](#)[How to Make Jones Reagent](#)[How to Store Reagents](#)[How to Titrate Alkylolithiums](#)[How to Work with Pyrophoric Reagents](#)[Pyrophoric Reagents](#)[Desert Island Oxidations](#)[Rookie Mistakes](#)[Should I Buy It or Make It Myself?](#)

Should you buy or make this reagent?	Total Votes		Vote	
(+) or (-) (Ipc)2BOMe for Brown allylations/crotylations	143	65% say make it	<input type="button" value="Make It!"/>	<input type="button" value="Buy It!"/>
(Pyridine)(Tetrahydroborato)Zinc ([Zn(BH4)2(Py)])	26	65% say make it	<input type="button" value="Make It!"/>	<input type="button" value="Buy It!"/>
(Trimethylsilyl)diazomethane ((CH3)3SiCHN2)	144	90% say buy it	<input type="button" value="Make It!"/>	<input type="button" value="Buy It!"/>
1 1'-thiocarbonyldiimidazole	39	90% say buy it	<input type="button" value="Make It!"/>	<input type="button" value="Buy It!"/>
1,1,1,3,3,3-hexachloropropan-2-ol	17	76% say buy it	<input type="button" value="Make It!"/>	<input type="button" value="Buy It!"/>
1,8-diaminonaphthalene	34	91% say buy it	<input type="button" value="Make It!"/>	<input type="button" value="Buy It!"/>
1-acetoxybutadiene	21	57% say buy it	<input type="button" value="Make It!"/>	<input type="button" value="Buy It!"/>
2,4,4,6-Tetrabromo-2,5-cyclohexadienone	8	75% say buy it	<input type="button" value="Make It!"/>	<input type="button" value="Buy It!"/>
2-iodoxybenzoic acid (IBX)	364	93% say make it	<input type="button" value="Make It!"/>	<input type="button" value="Buy It!"/>
AD mix alpha and beta	293	88% say buy it	<input type="button" value="Make It!"/>	<input type="button" value="Buy It!"/>
AIBN (Azobisisobutyronitrile)	103	95% say buy it	<input type="button" value="Make It!"/>	<input type="button" value="Buy It!"/>
Alkyne Hydration Catalyst	59	93% say buy it	<input type="button" value="Make It!"/>	<input type="button" value="Buy It!"/>

Not Voodoo X.4 > Reagents and Solvents > Should I Buy It or Make It Myself?