



▶ LESSONS LEARNED..... 4



▶ CHLOROFORM SAFETY CONCERNS..... 5

Lab	Lab Director	Lab Manager	Lab Assistant	Lab Technician	Lab Intern	Lab Student
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▶ LAB ROSTERS 6

ISSUE 6 ○

Safety *first*

BRINGING A SAFETY WORKPLACE TO ALL MEMBERS OF THE CHEMISTRY BUILDING

Pizza Inspection

As we talked about in past issues, every few months the Safety Strategy Team will be going around to each lab and looking for a specific item such as housekeeping, ergonomics, proper PPE, etc. The goal of these inspections is to promote safety throughout the building. The lab that is found to be best at the chosen item will be given a pizza party for their lab. For our most recent spot inspections, the Safety Strategy Team went through the building looking for housekeeping issues again.

Many labs we found to have done a great job of keeping their labs clean, and many of the labs had a marked improvement in general cleanliness since the last time we did this spot inspection.

The two main issues we are still finding in the building are general clutter on floors and counters and overflowing chemical shelving. Please try to take the time to dispose of old, expired chemicals and keep your area free of trash and debris to make our building a safer place.

The lab that was found to have the best housekeeping practices and cleanest lab was the **Koutmou Lab**.



Welcome Back Laurie

As many of you know, our Waste Coordinator for Chemistry has been gone for the last several months and others have been covering waste pickups and cleanouts.

Laurie has returned so feel free to welcome her back if you see her in the halls.

All waste requests and questions can be directed to Laurie at lanald@umich.edu or 4-7325.

Runaway Hotplates

There was a small fire in one of our graduate research labs caused by what is known as a “runaway hotplate”. A graduate student was heating a solution of DMSO and Tris-succinic anhydride in an oil bath to 70 degrees Celsius. Once at the correct temperature, the graduate student shut off the heat to the hot plate (the stirrer was left on) and allowed the solution to cool. The student left the room for approximately 10 minutes and when they returned the oil bath had gotten hot enough to catch fire.

The student immediately grabbed a fire extinguisher and put out the fire without issue. No one was injured during the incident and no equipment was damaged other than the hot plate.



This fire appears to have been caused by what is known as a “runaway” hotplates. This occurs when malfunctions in certain models of hotplates cause them to spontaneously heat up when they are in the OFF position. This primarily occurs in older models that do not have temperature feedback controls.

MIT created a list of hotplates brands and models that are prone to this malfunction. This can be found on the next page.

The department of Environment, Health & Safety has partnered with Fisher Scientific to create a hot plate turn in program and give a special discount on new hotplates for labs to get rid of their older hotplates. Please go to the below website for more information: <http://ehs.umich.edu/wp-content/uploads/2019/04/UMich-SHP-trade-in-Promo-2019-.pdf>

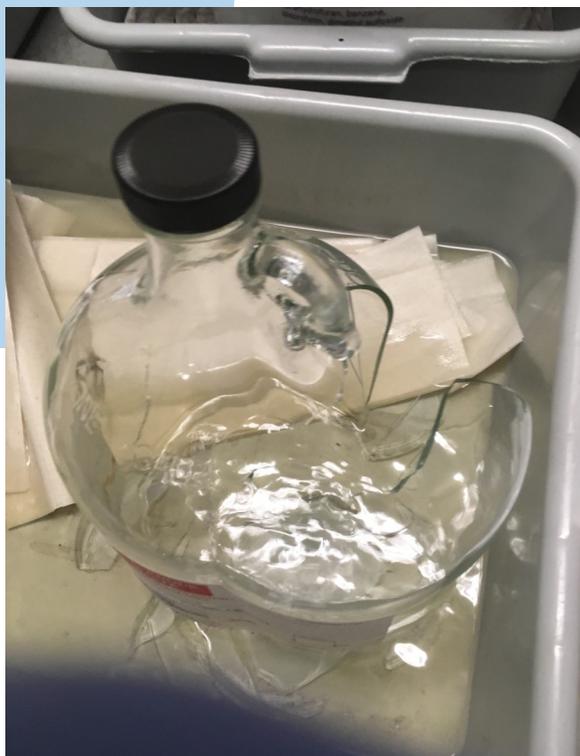


List of Hotplates Prone to Malfunction

THE FOLLOWING IS A LIST OF STIRRING HOT PLATES THAT HAVE BEEN REFERENCED BY INSITUTIONS AS HAVING REPORTED INCIDENTS				
Brand	Model	Spontaneous Heating	Runaway Heating	Notes
Corning	PC-35	X		No temperature feedback.
	PC-351	X		No temperature feedback.
	PC-200		X	"Off" does not disconnect power from heating element.
	PC-220		X	"Off" does not disconnect power from heating element.
	PC-320	X		
	PC-400D	X		
	PC-420	X	X	"Off" does not disconnect power from heating element.
	PC-420D	X	X	"Off" does not disconnect power from heating element.
VWR	7X7 Aluminum Top(no model # provided)	X		
Fisher	Isotemp 11-600-49H/ 11-700-49H			"Off" does not disconnect power from heating element.
Troemner	97042-714 Professional 97042-642 Advanced			MIT electronics tech evaluated 2 models of Troemner hot plates and found safety hazards based on the design and manufacturing practices.
Chemglas	Optimag-St CG-1994-10 & -50/ CG-1993-T-50	X		MIT electronics tech verified that this model heated to 300 within a min even though it was off.
IKA			X	Errors out easily; prone to overshoot when heating.
Cimarec**	SP46925	X		No temperature feedback
	H-4954.xx		X	
**Sold under Thermolyne, Barnstead/Thermolyne, and Fisher names depending on age.				

Chart created from info on MIT Unsafe Hot Plate Webpage: <https://ehs.mit.edu/site/laboratory-safety/unsafe-hot-plates>

Hazardous Waste Issues



In the last several months, we have had three incidents involving full waste bottles being broken. One of these was caused by the student hitting the bottle against another causing it to break. Since our bottles are glass, they can easily break if hit in the wrong spot.

The other two appear to have broken due to the contents overpressurizing. To prevent these issues please allow any reactions to complete prior to closing the caps on the waste bottles.

Additionally, please leave headspace on top of the bottles to prevent this pressurization. Bottles should only be filled to the shoulder.

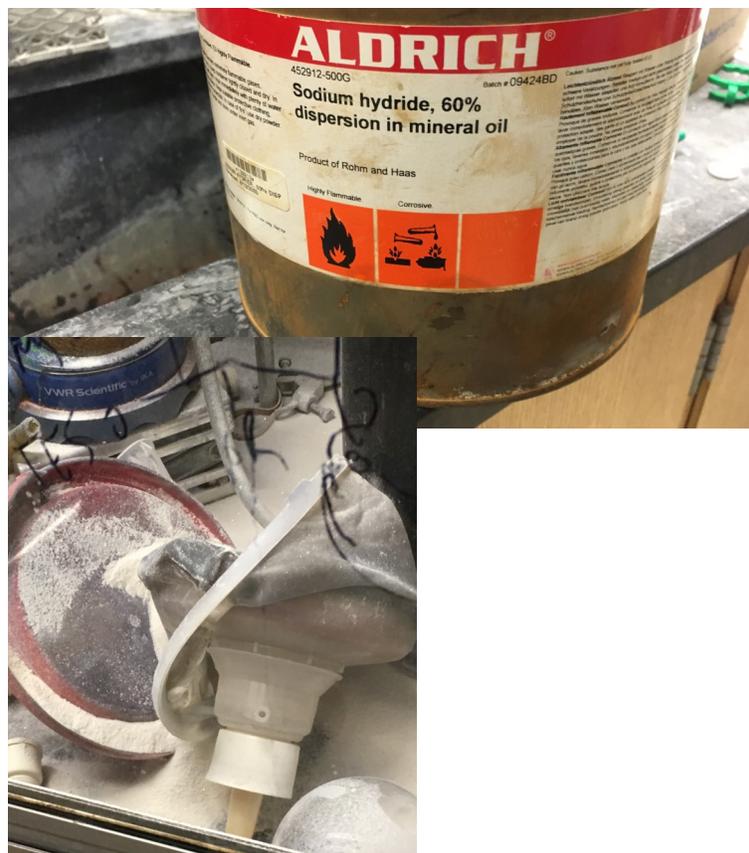
Lessons Learned

Sodium Hydride Fire

There was a small fire in one of our graduate research labs involving a graduate student quenching a large quantity (approximately 300mg) of sodium hydride dispersion in mineral oil using toluene, isopropanol and water. The morning after the material was quenched, the student poured an addition 10ml of water into the funnel going to this quenched solution. A small amount of sodium hydride that remained on the funnel reacted with the water and ignited.

The student immediately grabbed a nearby Class D fire extinguisher and put out the fire without issue. No one was injured during the incident and no equipment was damaged other than the funnel.

Quenching reactive material is an extremely dangerous procedure that should be done with the utmost care. If there are large quantities of materials that need to be quenched please contact the Chemistry waste coordinator, Laurie MacDonald at 4-7325 and we will take care of it for you. Additionally, never try to quench something if you are not comfortable doing so. Please contact the waste coordinator instead.

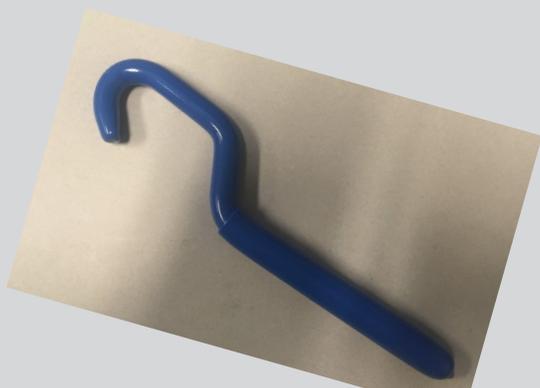


Cylinder opening incident

There was a near miss incident recently caused by a graduate student attempting to open a stuck cylinder cap on a carbon dioxide gas cylinder by putting a wrench in the hole and turning it. This unfortunately turned the valve on the cylinder instead and partially opened the valve. After they realized they turned the valve several students in the lab were able to quickly get the cap off the cylinder and close the valve but not before the venting caused one of the gas alarms in the lab to go off.

Occasionally we receive cylinders with caps that are difficult to open. This mostly occurs in winter due to the extreme temperature swings from the cylinders being outside to inside but stuck caps may occur at any time.

We have specialty wrenches designed to open cylinder caps safely. If you have a stuck cap and need to borrow one of these wrenches please contact Christopher Peters (chrpeter@umich.edu).



Chloroform Creating Phosgene

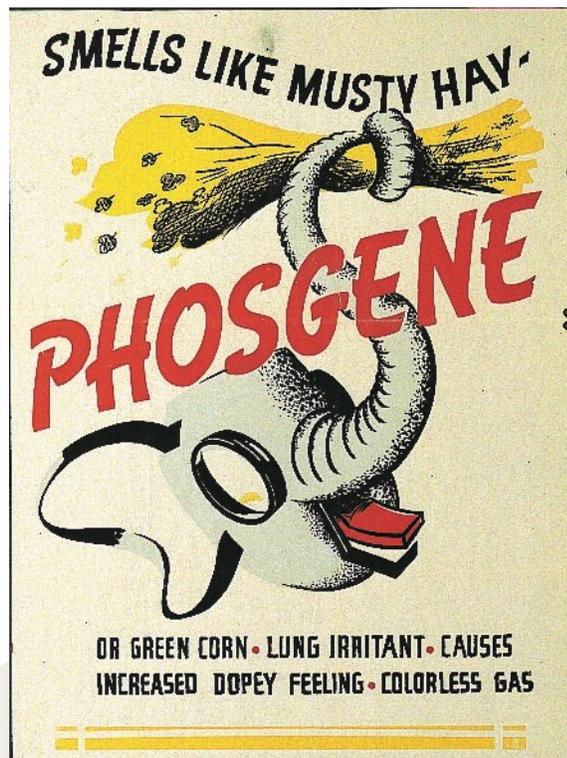
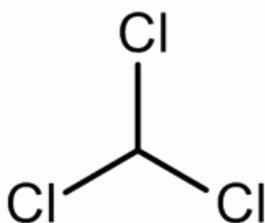
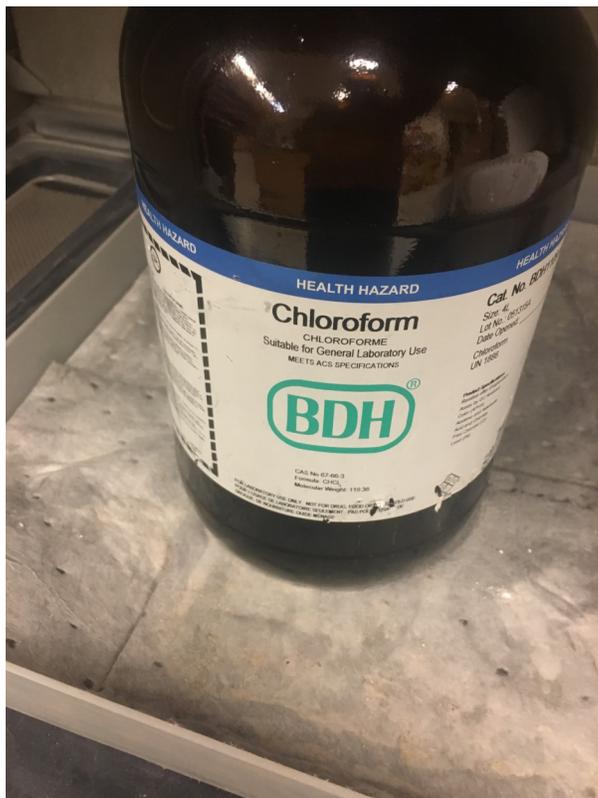
Earlier this year, the Chemistry Building had a near miss incident with an expired chloroform bottle which had formed gas over time. The bottle released a large amount of gas when opened which was later confirmed to be phosgene. This incident occurred in a fume hood, so there was no exposure but it could have been much worse.

We believe that this issue mainly affects chloroform that is stabilized with amylene/pentene but all chloroform may form phosgene over time and should be checked regularly. **Please check the expiration date of the chloroform bottles in your lab. If you have any that are expired put it in your waste pickup area for disposal, do not try to open it, even in a hood.**

Bottles of chloroform with amylene stabilizer usually expire in 18 months and bottles with ethanol as the stabilizer expire in 5 years, so if you find a bottle that does not have an expiration date and you don't remember how long it's been in the lab it would be best to assume it is expired and put it out for disposal. Additionally, due to the relatively short lifespan, it is highly recommended to use smaller (1L or less) bottles of chloroform whenever possible

Below is an ACS article about chloroform forming phosgene gas as well as instructions on how to make test strips if you want to test any nonexpired bottles for phosgene production.

<http://pubs.acs.org/cen/safety/19980302.html>



Laboratory Rosters

The Department of Chemistry needs to keep track of which graduate students, staff and post docs work in which labs. To accomplish this we ask each lab to give us a roster of all of the

people working in their labs. The primary reason for these rosters are to know who works in a lab in case

of an emergency. These rosters, however, help us in many other ways such as helping us determine where a package goes when it does not have a room number on the label. It also is

extremely helpful for safety issues it tells us who the safety officer and assistant safety officer is in each lab.

In May, an email was sent out to all current safety officers in the building requesting an updated roster as well as a blank template to start a new roster. Please make sure that the updated rosters are sent to Chris Peters

The primary reason for these rosters are to know who works in a lab in case of an emergency

(chrpeter@umich.edu). These rosters should also be updated regularly when people start in and leave a lab.



UPCOMING INSPECTION

Always Be Ready!



The Chemistry Building is due for a MDEQ inspection in the near future. Although MDEQ inspections primarily focus on issues with chemical waste we also must be prepared for MiOSHA and other regulatory agencies at any time. Please make sure your lab is always in compliance with health and safety regulations.

Events

Classes begin May 7, Tues
Memorial Day (Holiday) May 27, Mon
Classes end (Spring Half). June 24, Mon
Study Days June 25 - 26,
Tues - Wed
Examinations June 27 - 28,
Thurs - Fri
Spring Half Term ends June 28, Fri
Summer Half Term classes
begin July 3, Wed
Independence Day July 4, Thurs
Classes end Aug 15, Thurs
Study Day Aug 16-18,
Fri-Sun
Examinations Aug 19 - 20,
Mon-Tues
Full Term and Summer Half Term
end Aug 20, Tues

Dry Ice/LN2

Dry Ice

Dry ice is available from 10:00am-11:00am and from 2:00pm-3:00pm Monday-Friday in room A601

Liquid Nitrogen

Department dewars are accessible 24 hours a day outside of room A602 for small (under 15L) liquid nitrogen quantities.

Large dewars of liquid nitrogen can be ordered by emailing chrpeter@umich.edu or steventi@umich.edu at least one business day before it's needed.



Contact Information

Package Shipping

Hawaii Maliga — hmaliga@umich.edu
Phone—615-5034

Waste Issues

Laurie MacDonald — lanald@umich.edu
Phone 764-7325

Safety Issues/Concerns

Christopher Peters — chrpeter@umich.edu
Phone—763-4527

Tracy Stevenson — steventi@umich.edu
Phone—764-7316

Chemical Inventory Questions

Anson Pesek — ahpesek@umich.edu
Phone—647-8932

Maintenance Requests

Routine Work Request Form on Chemistry Intranet

This puppy wants you to be safe

