

# **2024 EHS LAB SAFETY SEMINAR**

## **MATERIALS SCIENCE & ENGINEERING DEPARTMENT**

### **FEBRUARY 2, 2024**

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**ENVIRONMENTAL HEALTH AND SAFETY**

**EHS.VIRGINIA.EDU 434-982-4311**



# AGENDA

- Inspections
  - Top issues & what to do
- Best Practices in Lab Safety
- New Guidelines/Resources
- Incident Reporting
- Incident & Lessons Learned

# LAB INSPECTIONS

- Annual Inspections Wilsdorf & Jesser **June 2023**
- Visit Inspection webpage for resources





# INSPECTIONS

#2 issue (5 deficient labs) hazardous waste labeling

EPA/DEQ Requirement

MUST check major hazard

State Inspection non-compliance findings can carry ~\$72,000 in fines per bottle per day

We are inspected ~ every 3 years

Hazardous Waste Sticker

**HAZARDOUS WASTE**

Major Hazard (check one)

**KEEP CONTAINER CLOSED AT ALL TIMES  
DO NOT FILL WITHIN 2" OF CONTAINER TOP**

CONSTITUENT	%
Ethanol	65
Acetone	35

**FOR EMERGENCIES OR WASTE PICK UP  
CALL EHS @ 982-4911**



# INSPECTIONS

#4 issue (3 deficient labs) , Improper use of sharps containers

No hazardous waste label

No broken glassware sticker



# PROPER SHARPS CONTAINER USE

- Keep label intact, Keep lid in place
- Does not need to be a 'biohazard' to be a sharp.
  - Any needle, scalpel, razor blade
- Common misconception - Glass goes in broken glass boxes



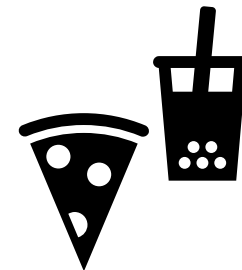
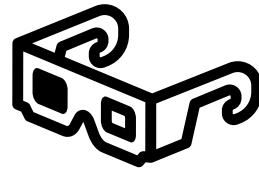


# LIABILITY

- Follow University policies, programs and procedures
- EHS supports and advises
- Rare, but non-compliance could lead to personal liability
- Office of Risk Management



# BEST PRACTICES



# SAFELY STORING GAS CYLINDERS

...they must be secured

No matter the size...



# CHEMICAL STORAGE



# ACIDS & BASES

Keep in separate cabinets!



Salt formation



**How to Identify**

**Acid:**

Usually ends in 'acid'

**Base:**

-hydroxide

-amide

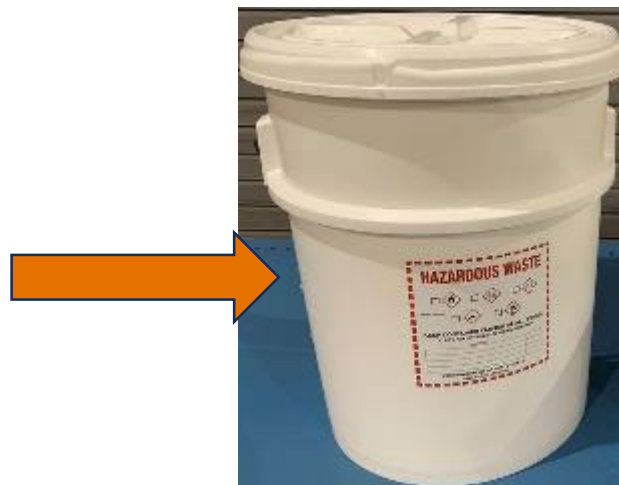
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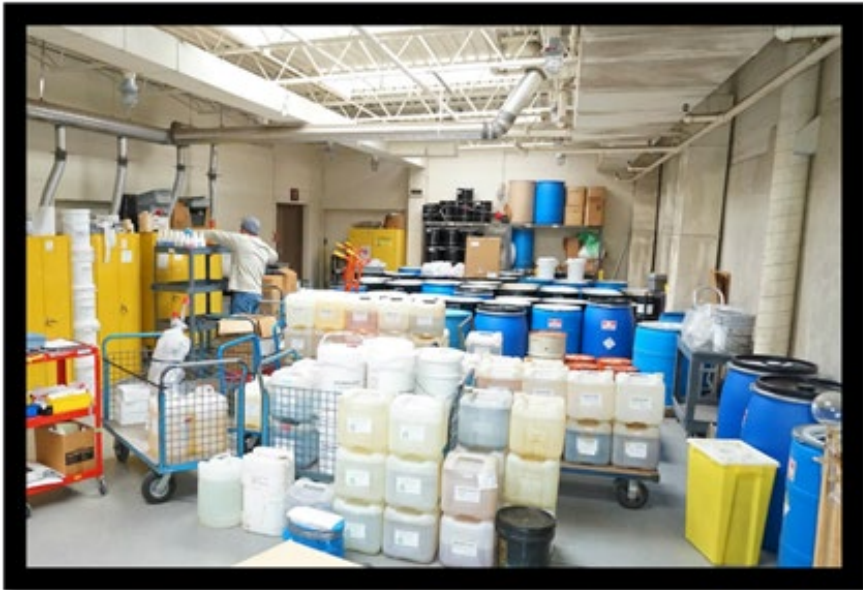
# SPECIAL WASTE CONSIDERATIONS

- Do not let **any** solid materials, such as pipette tips, rubber stoppers, kimwipes, etc. enter a liquid waste bottles/carboys!
- If contaminated, these items must go into the EHS provided buckets.
- Solid materials will damage our equipment used to transfer liquid waste from 1 and 5 gallon bottles to 55 gallon drums.



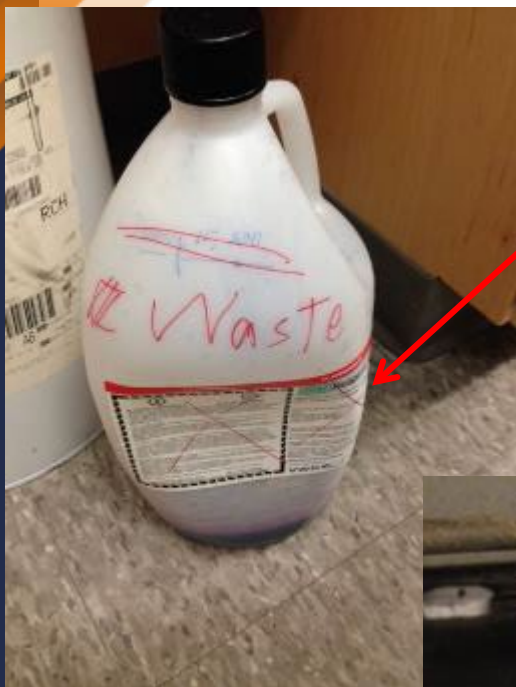
# EHS WASTE PROCESSING

Accurate waste labeling and constituents is important!

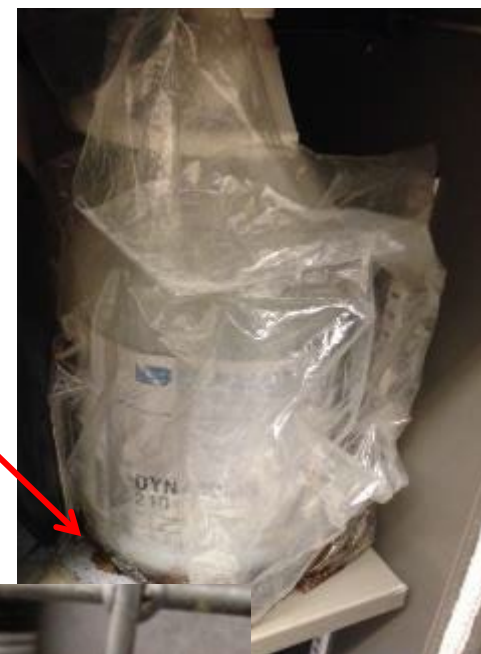




# WHEN IS IT TIME TO CALL IT IN?

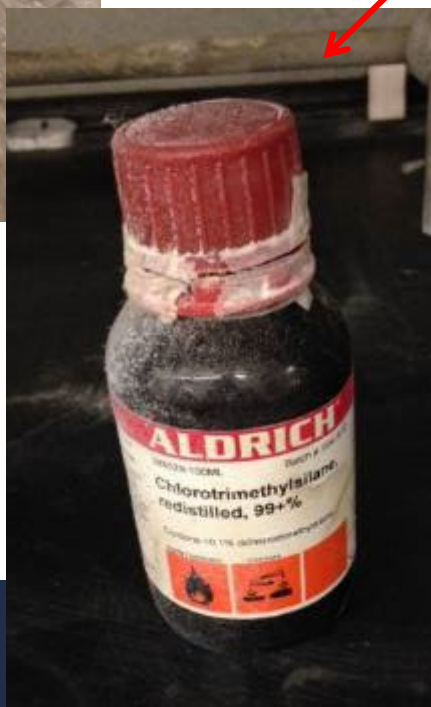


Bulging or collapsed



leaking

crystallization



# SPILLS

- Specific guidance on website for small vs large spill response
  - small = volume which does not exceed the capacity of the lab to clean up with materials on hand.
  - Safe to handle (hazard, location, etc.)
  - Assess your potential needs
    - Extensive oil use? Have oil spill pads available
    - Corrosives use? Compatible chemical absorbent pad
- EHS staff – business and after-hours on-call response

# INSPECT EQUIPMENT



# LAB ATTIRE BEST PRACTICES

- Diverse lab environments – no University policy
- Choose **attire** and **PPE** designed to reduce exposures (Chemical & Physical)



## Hazardous Materials/Operations

- Long pants, closed toe shoes, add PPE - Industry Standard, gold standard for Higher Ed<sup>1</sup>

<sup>1</sup>The National Research Council's publication 'Prudent Practices in the Laboratory' is a set of recommendations (non-mandatory) that is referenced by OSHA

# NO FOOD OR DRINK



## VPRS-001: Prohibition of Food and Drink in Research Laboratories

Minimize risk of exposure to hazardous research materials

- Don't store in lab fridge/freezer, use lab microwaves, etc.
- Marking not for human consumption
- Personal hygiene practices following lab work



# NO GLOVES

Water Fountains



Door Handles



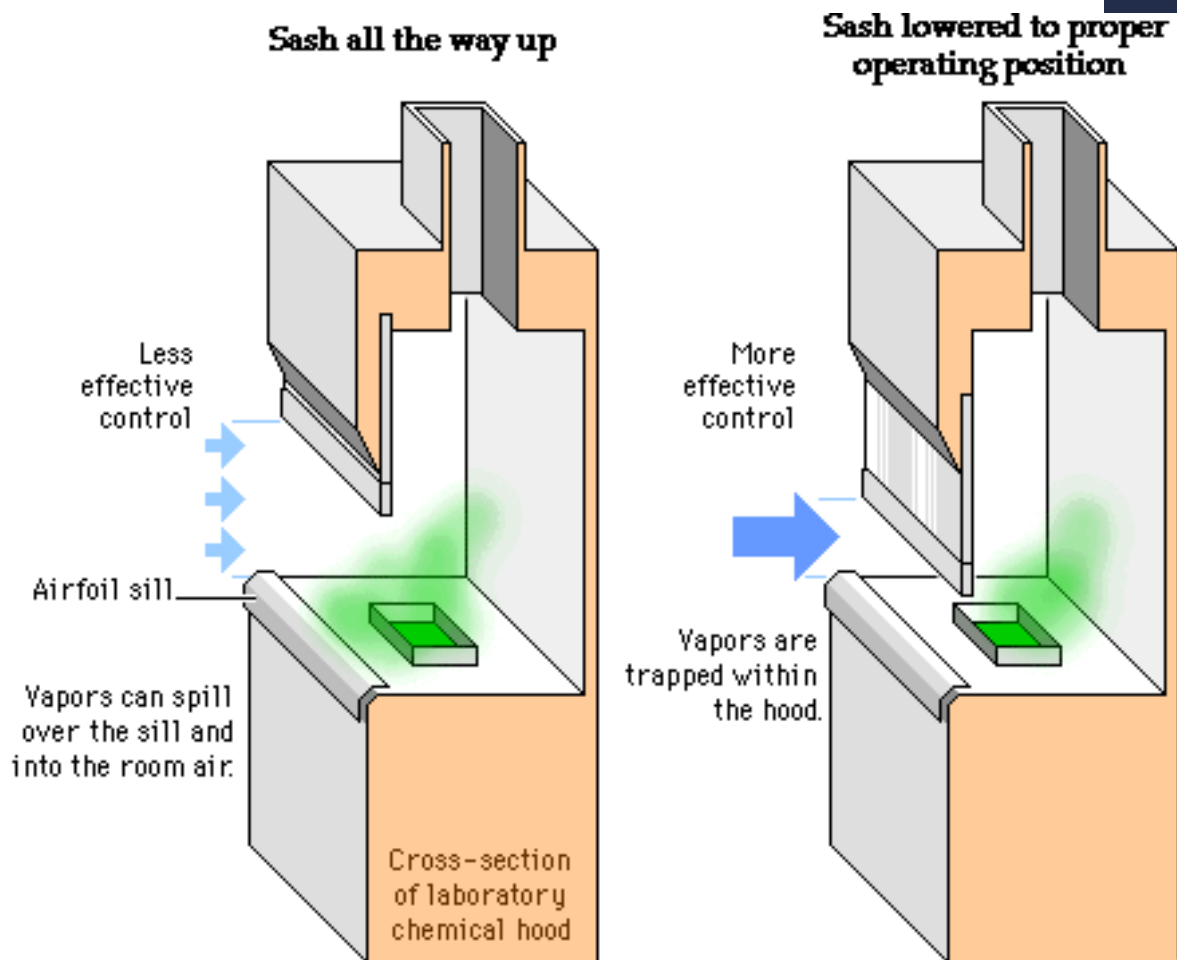
Elevators



Do not touch door handles, elevator buttons, or other common surfaces while wearing gloves.

# CHEMICAL FUME HOOD USE

- Use for volatile, toxic, harmful, smelly materials
- Sash at 18" or lower
- Work 6" in from the edge
- Appropriate PPE
- Keep uncluttered for optimal performance, protection AND safety!!
- Sash down when not working

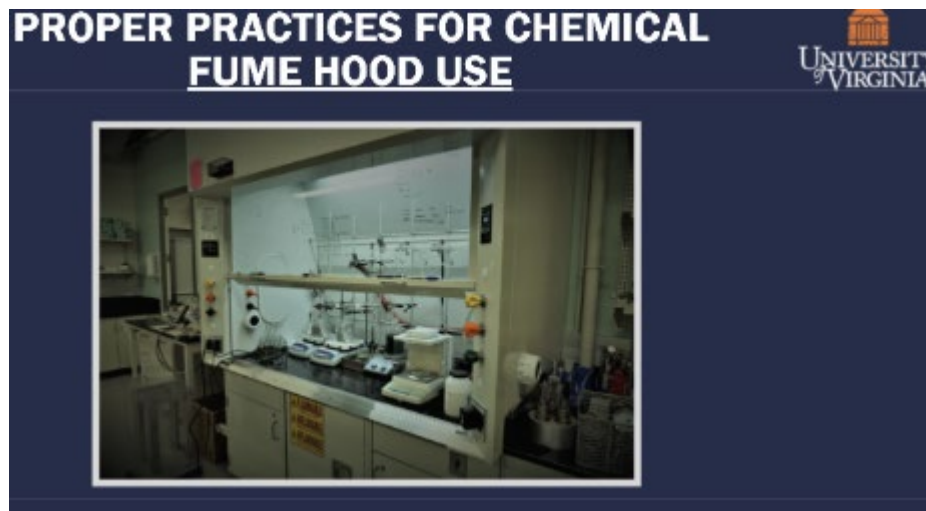






# NEW EDUCATIONAL MODULE ONLINE – CHEMICAL FUME HOODS

- How to determine fume hood safe to use
- What to do if you think it's unsafe or past survey date
- Implementing safe work practices
- How proper airflow is tested & visualized



Access video here



# RECYCLING CHEMICAL CONTAINERS

Container Type:

- NO Glass or Aluminum
- Plastics 1-7
  - Only tissue culture media bottles
  - Alcohol bottles

Preparation:

- Triple rinse, no standing liquid, labeled EMPTY

Place in designated bins

[recycling@virginia.edu](mailto:recycling@virginia.edu) for ?'s on what can be recycled


**NON-HAZARDOUS**

# RECYCLE LAB PLASTICS


**NO ALUMINUM, NO GLASS**




**TIP BOXES**



**PLASTIC PACKAGING**



**\*TISSUE CULTURE  
MEDIA BOTTLES**



**\*ALCOHOL BOTTLES**

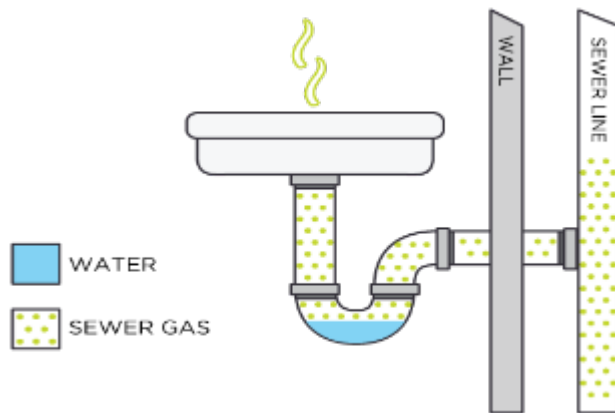
**\*TRIPLE-RINSED, LABELED "EMPTY"**

**EHS.VIRGINIA.EDU 434.982.4911**

**GREENLABS@VIRGINIA.EDU**

## **FUNKY SMELL?**

**IT MIGHT BE DRY DRAIN**



**For other persistent odors, contact EHS.**

## **WHAT IS DRY DRAIN?**

**This occurs when the sink and drains have not been used, and the trap dries out allowing odors to migrate up into the room.**

## **IT'S AN EASY FIX!**

**Periodically run water in all sinks and pour water down floor drains if not being used regularly.**

**This will keep the traps wet and prevent odors from escaping.**



**UNIVERSITY  
of VIRGINIA**

**Environmental Health & Safety**

**[ehs.virginia.edu](http://ehs.virginia.edu)**

**434.982.4911**

# INCIDENT REPORTING

Report a near miss, incident, safety concern or hazardous situation!



## ENVIRONMENTAL HEALTH & SAFETY

PROGRAMS

SERVICES

RESOURCES

ABOUT

NEWS

HELP

HOME

REPORT AN ACCIDENT, SAFETY CONCERN, NEAR-MISS OR HAZARDOUS SITUATION! USE **THIS FORM.**

- EHS follow-up
- Focus on mitigating risk of future events and corrective measures/improvements

# SERIOUS EVENT REPORTING

## **REPORTING AN EMERGENCY? CALL 911 INSTEAD!**

**REPORTING A SERIOUS EVENT?** (work-place fatality, amputation, loss of an eye, inpatient hospitalization of one or more persons, a medical event i.e. heart attack) **GO TO THIS PAGE AND FOLLOW THE INSTRUCTIONS!**

If you learn about any of the above work-related incidents report it immediately!

## LESSONS LEARNED

Sharing real life incidents remind that incidents happen and can happen to you and in your lab.

# REUSE OF CHEMICAL BOTTLE

## 2 DIFFERENT DEPT/LAB OCCURRENCES

### ALMOST IDENTICAL SCENARIO

- Alcohol bottle rinsed and reused for acid waste
- Filled and capped, immediately left room to perform task, heard explosion minute later.
- No injuries or property damage

## ROOT CAUSE – WHY DID IT HAPPEN?

- Residual alcohol and nitric acid reacted, forming a gas (nitrogen oxides).
- Lid was immediately placed back on (expected!), so bottle pressurized
  - 1) Bottle burst at the bottom
  - 2) Lid burst off





# FUTURE INCIDENT PREVENTION & TIPS FOR BOTTLE REUSE

- Only use for same type of waste
  - Ex. Ethanol or IPA – use for non-halogenated solvent wastes
- Rinse with a compatible material
  - Water, solvent
- Deface bottle
  - Write 'MT', 'EMPTY', or mark out with sharpie.

## RESPONSE

- Incident promptly reported to supervisor and EHS notified via online form
- Updated Guidance on EHS webpage

### **EMPTY CONTAINERS**

**Empty Container Disposal:** EHS does not pick up empty chemical reagent bottles, and neither does UVA Recycling.

Triple rinse empty chemical bottles, collect the rinsate as waste, deface the chemical label, and then discard bottles in the trash or reuse for waste collection (labelled appropriately).

If reusing an empty container for waste collection, it is advisable to **ONLY** use the empty container for a similar and compatible material as compared to the original contents! For example, use an empty ethanol bottle for non-halogenated solvent waste collection. Chemical reactions, leading to bottle explosion, have occurred when using empty plastic alcohol bottles for acid waste, even after rinsing!

# Q&A

[clarissa@virginia.edu](mailto:clarissa@virginia.edu)

434-982-4311