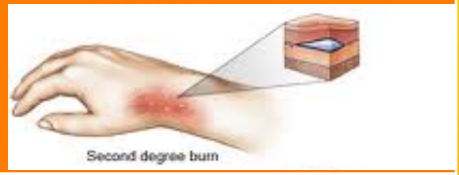
Ericka Huston & Carol Fortney & The Safety Class
Harrison Lawson, Mike Bremer, Brandon Myrga
Layla Annous, Alex Gerber, and Andrew Warburton
Amber, Deena, Gabby
Apurva Shinde, Joy Shon, Yiming Wang
Courtney Benson, Hannah Stump, Kristin Arbutina

EH&S
The Horne Group

## Thermal Burns

### First Degree
- Outer Layer of skin is burned
- Burned area is red
- Low to moderate pain
- No blisters

### Second Degree
- Skin burned to second layer
- Tissue below skin unaffected
- Burned area is dark red with blisters
- High pain




### Third Degree
- Skin and tissue below skin are burned
- Skin is charred black, white, or dark red
- Blisters might or might not be present
- Pain is high or absent (if nerve damage)

Iburn images from: www.myhealthtips.in/2013/09/easy-home-remedies-for-minor-burns.html

## Burn Hazards

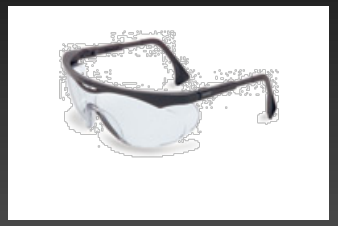
Alex Slitz/Daily News | Posted: Friday, July 13, 2012 5:16 pm

**Minimize Hazards with**
- Common sense
- Awareness
- PPE
- Proper equipment and instrument use

**Respond**
- Treat all burns with care
- Remove heat source
- Remove jewelry and clothing if easy to do
- If no blisters or closed blisters, cool with water
- If open blisters cool with sterile water only (infection risk)

# Eye Protection

**Impact resistant safety glasses and chemical splash safety goggles provide different levels of protection…**



Safety Glasses

Goggles

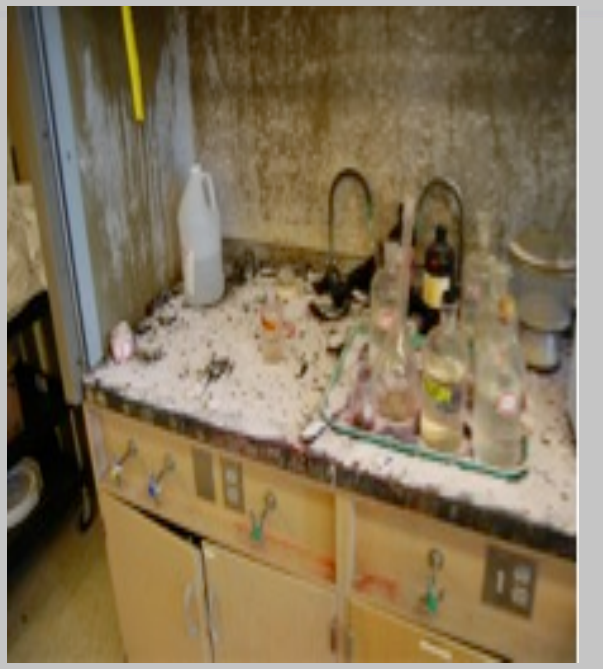
**ALWAYS Wear Eye Protection when in any lab, especially when working with:**
**Chemicals, Glassware, Heat, and Flying Particles**

**SAFETY GLASSES:**
One can pass finger between the device and the face. Safety glasses of the "impact type" (directly ventilated) are not suitable for chemical splash protection.

**GOGGLES:**
Are required in Undergraduate Teaching labs in the University of Pittsburgh Department of Chemistry (per a 2008 Memo practically since 1996)
Are recommended when using Hazardous Chemicals E.g., Nitric Acid

Appropriate eye protection is defined by the
American National Standards Institute (ANSI) Z-87.1 standard.

# Handling Nitric Acid



**Key Safety Points:**

- *Use only **in a certified chemical fume hood***
- *Avoid **all** flammables, sparks, open flames, and hot surfaces*
- *Understand that contact with combustible/organic substances such as enthonol, ethers, and acetone may cause an explosion*
- *Understand that nitric acid causes burns by all exposure routes (inhalation, ingestion, dermal)*

***Proper PPE:***

- *Goggles and face shield*
- *Flame-resistant lab coat*
- *Neoprene gloves*

***Disposal:***

- *Use dedicated nitric acid waste container*
- *Do **not** combine with organic waste*

***SOPs:***

- *Check with lab director and co-workers about other procedures and precautions*

**Recent Nitric Acid Accidents**

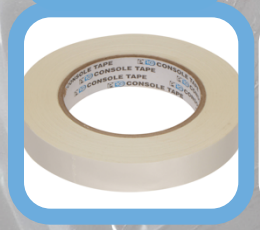
- Texas Tech
- Boise State
- University of Pittsburgh

# Broken Glass

## Broken Glass Clean up

If Something is falling, let it drop!
Don't risk cutting your hand

Avoid touching broken glass!
Grab a dustpan and brush for cleanup.



As necessary,
Pick up larger pieces of glass with cut resistant gloves or forceps. Pick up smaller pieces with tape or an absorbent pad.

Always inspect glassware before use.
When in doubt, throw it out.

Sharps and broken glass need to be placed in rigid, puncture resistant container

Proper disposal

Sharps need rigid, puncture resistant container

**Chemically contaminated** glass should be placed in a properly labeled suitable container

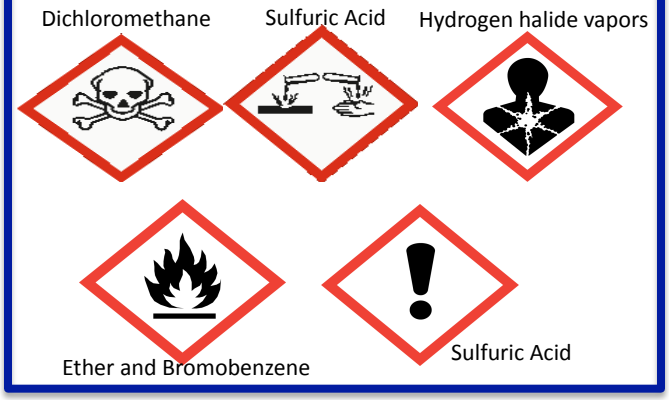
**Not contaminated** glass should be disposed of in a broken glass box.

# Preparation and Reactivity of Grignard Reagents

## PPE:

- Gloves
- Goggles
- Lab Coat
- Full-length pants
- Closed-Toed Shoes
- No exposed skin

## Symbols:




## Cautions:

- Wear gloves when handling reagents
- Wear goggles to protect your eyes
- Methyl iodide is a suspected carcinogen
- Ether and bromobenzene are flammable
- Dichlormethane is toxic
- Grignard reagents react violently with water
- Sulfuric acid is corrosive

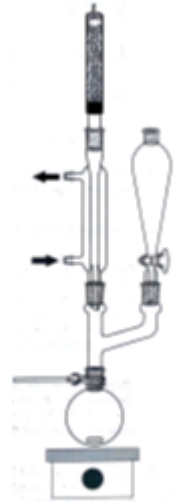


Fig. D (Bandik, 2012)

## Lab Safety Rap:

https://www.youtube.com/watch?v=XYbOSmYme6Y

## First Aid Procedures for grignard reagents:

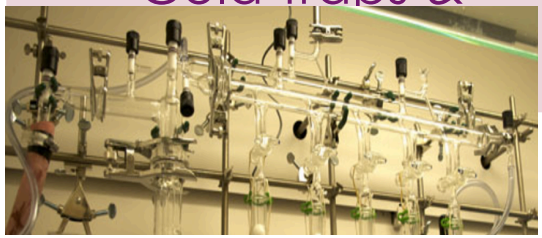
**If inhaled:** Move to fresh air. If the person is not breathing, give artificial respiration. Avoid mouth to mouth contact

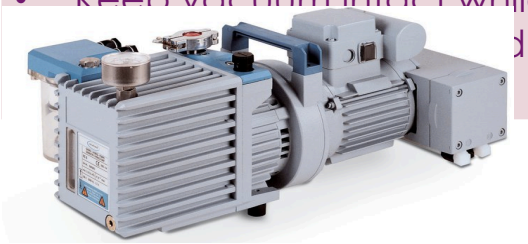
**In case of skin contact:** Remove all contaminated clothing. Immediately (within seconds) flush affected area for FIFTEEN (15) minutes. Wash clothing before reuse. Get medical attention.

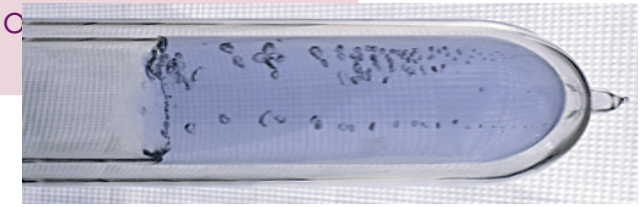
**In case of eye contact:** Remove any contact lenses. Use nearest emergency eyewash immediately for at least 15 minutes. Get medical attention immediately.

# Vacuum Safety

| Potential Hazard | Precautions |
|---|---|
| Flying Broken Glass | • Keep apparatus clamped and in a certified chemical fume hood<br>• Check for faulty glassware |
| Chemical Toxicity | • Review SDS sheets<br>• Know what you are working with<br>• Lower fume hood sashes before venting apparatus |
| Cold Traps & | • Wear proper PPE<br>• Keep vacuum intact while using cold trap |

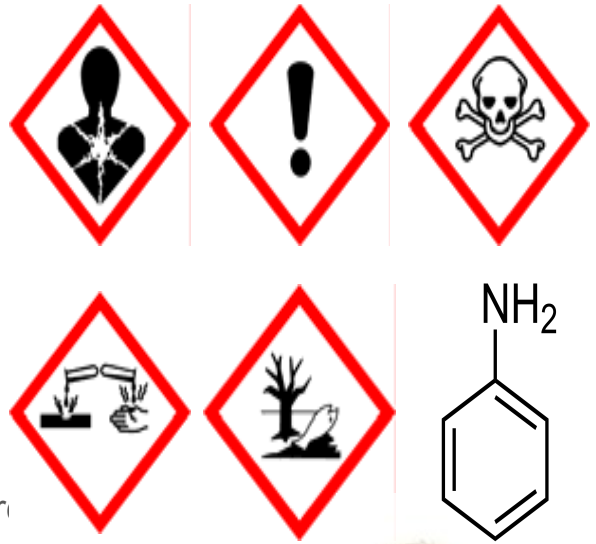






1. National Research Council (US) Committee on Prudent Practices in the Laboratory. *Prudent Practices in the Laboratory: Handling and Management of Chemical Hazards: Updated Version*. Washington (DC): National Academies Press (US); 2011.

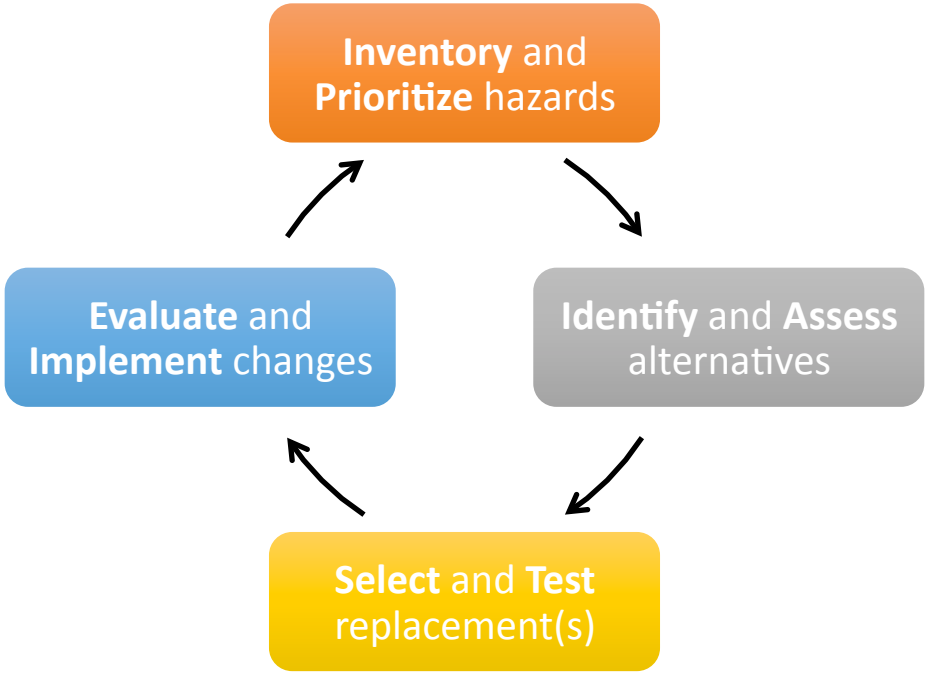
# Syringe Dispensing of Aniline



- Aniline Health Hazards:
  - Combustible (SDS Fire Hazard: 2)
  - Carcinogenic and mutagenic (SDS Health Hazard: 3)
- Advantage of Syringe Use
  - Reduce risk of aniline exposure
  - Reduce risk of $Cl_2$ production by isolating aniline from bleach Part II of the experiment (limits potential of common glasswar
- Proper Syringe Technique
  - Wear appropriate PPE (latex gloves, goggles, lab coat, etc.)
  - Hold syringe vertically
  - Never fill a syringe past ¾ full
  - Never forcefully pull or push plunger
  - Use multi-level containment during transport
- Proper Disposal
  - Rinse used syringe with ethanol into the specially labeled amine waste
  - Put rinsed needle free syringe into solid waste

# Transitioning to Safer Chemicals

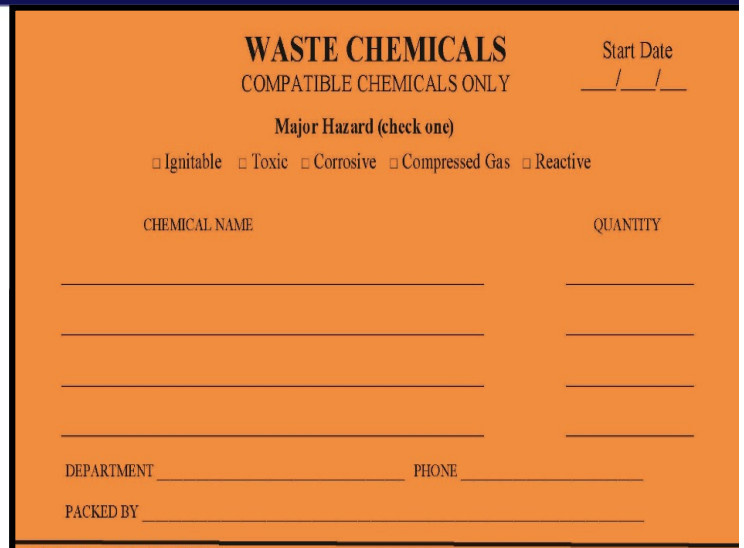
- **Compliance** with regulation on hazardous chemicals **is the minimum**
- **Going beyond can have benefits** in cost, efficiency, environmental impact
- **Informed substitution** with safer alternatives can reduce hazards
- **Research, test, and apply alternatives** where possible




*Transitioning to Safer Chemicals: A Toolkit for Employers and Workers*
www.osha.gov/dsg/safer_chemicals/

# Chemical Waste

- Chemical waste labels must be completed and placed on the container when the waste is initially added
- Waste chemicals should be identified on the waste label by using the common chemical names
- Chemical waste containers MUST be kept closed at all times (except when actively adding waste to the bottle)
- Waste containers should be stored in secondary containment with other compatible wastes


WASTE CHEMICALS
COMPATIBLE CHEMICALS ONLY
Start Date ___/___/___
Major Hazard (check one)
□ Ignitable □ Toxic □ Corrosive □ Compressed Gas □ Reactive
CHEMICAL NAME
QUANTITY
DEPARTMENT _____ PHONE _____
PACKED BY _____
To be Completed by EH&S
□ HAZARDOUS WASTE
EH&S Accumulation Date: ____/____/____
PS1692 Rev1216