Maverick Safety Matters

Environmental Health & Safety SPRING 2017

E H & S

MANAGEMENT TEAM:

Leah V. Hoy
Director, Radiation & Laser Safety Officer
hoy@uta.edu

Robert Smith
Associate Director Fire & Life Safety
rasmith@uta.edu

Ramon Ruiz
Environmental & Laboratory Program Manager
ruiz@uta.edu

Environmental Health & Safety Office
500 Summit Ave.
Box 19257
Arlington, TX 76019
Ph: 817-272-2185
Fax: 817-272-2144

UTA Focuses on Building A Culture of Safety in Laboratories

The Environmental Health & Safety Office is responsible for establishing an effective Laboratory Safety Program for the University, under the direction and with the support of campus administration. Research and teaching laboratories as well as academic and non-academic shops use a variety of hazardous materials and potentially hazardous equipment that carry the potential for causing physical injuries. UTA is committed to providing a place of employment and learning that is as free as possible from recognized hazards that cause, or are likely to cause, harm to faculty, staff, students, or the surrounding community.

Laboratory Principal Investigators play a primary role in developing and promoting a culture of safety within their labs and research groups. Some core institutional values that have been identified to instill and nurture a culture of safety include:

1. Safety is everyone's responsibility.
2. Good Science is safe science.
3. Safety training and safety education are essential elements of research and education.
4. An improved culture of safety is necessary to truly reduce risk.

"Safety should be an integral part of all laboratory operations, it should be automatic, never questioned and never compromised," states UTA President Vistasp Karbhari. Please read the entire president's message regarding the importance of laboratory safety at UTA.

The many substances, equipment, and activities used in laboratories are governed by an array of local, state, and/or federal regulations. EH&S has implemented a Laboratory Evaluation Program to assist all laboratory users in complying with these regulations. These evaluations also ensure that:

- proper laboratory safety practices and procedures are being utilized;
- chemicals are being stored and labeled correctly;
- chemical inventory is being maintained;
- hazardous waste is being collected and disposed of properly;
- safety equipment (fume hoods, eyewashes, safety showers) has been tested;
- proper personal protective equipment (PPE) is being worn; and
- good housekeeping practices are being followed.

For a more detailed explanation of the Laboratory Evaluation Program, review SOP: Laboratory Evaluation Program. Other helpful guidelines and documents to help laboratory Principal Investigators or responsible individuals prepare for the laboratory evaluation process and interpret findings can be found on the laboratory evaluation page on the EH&S website. Please contact EH&S if you require technical assistance or would like consultation on any lab safety issue.

817-272-2185 or
ehsafety@uta.edu

The EH&S office also conducts workplace hazard assessments, provides safety training, picks up hazardous waste and facilitates its final disposal, and arranges for and assists with the shipment of dangerous goods.

The EH&S lab evaluation team, from left: Elisabeth Rowlett, Harvey Richey, Rose Hall, Rick Stell, Merja Karwoski, Shea McDowell, Ramon Ruiz. Not pictured: Laura Warren.

EH&S STAFF:

Joel Box
Fire Safety Specialist
jbox@uta.edu

Dave Doerr
Construction Project Coordinator, Fire Safety
david.doerr@uta.edu

Tracy Gardner
Workers' Compensation Claims Analyst
gardner@uta.edu

Rose Hall
Occupational Safety Specialist
vrhall@uta.edu

Merja Karwoski
Biological Safety Specialist
merjak@uta.edu

Debbie Kirkley
Administrative Assistant
debk@uta.edu

Shea McDowell
Chemical Safety Specialist
shea.mcdowell@uta.edu

Caron Miller
Workers' Compensation Claims Analyst
clmiller@uta.edu

The Storm Sewer System vs. Sanitary Sewer System

What's the Difference?

It's as simple as inside vs. outside.

Storm drain systems consist of natural and manmade channels and underground pipes that transport rainwater from streets, yards, rooftops, and other areas *outside* your home. This water goes directly to creeks, rivers, streams, and lakes carrying pollutants with it. Water entering the storm drain is not treated.

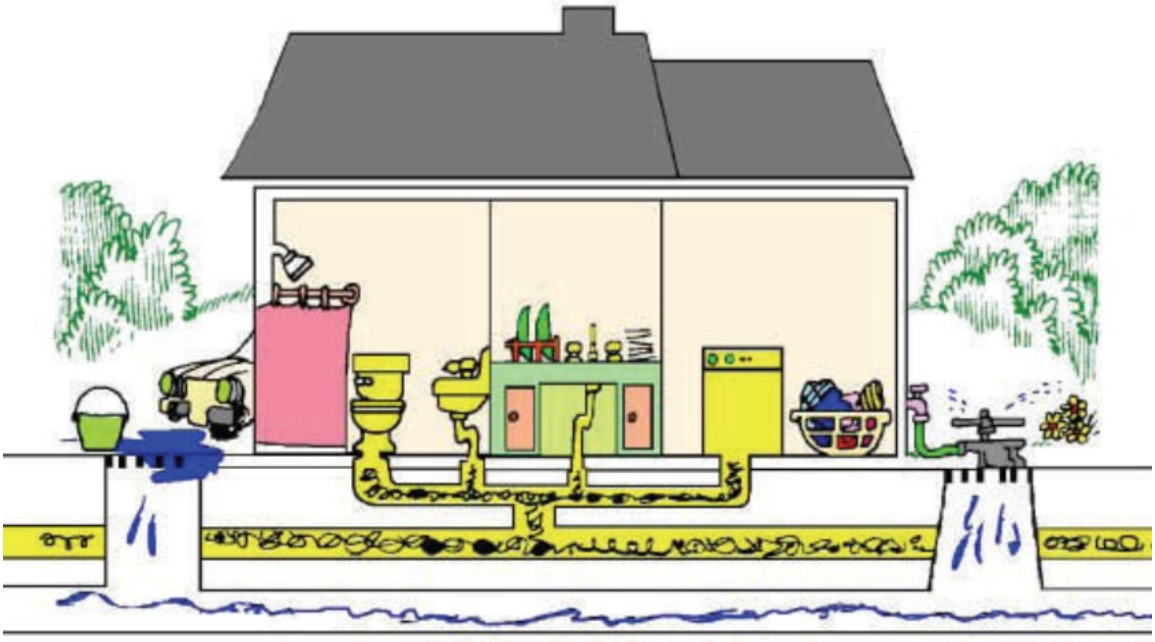
Sanitary Systems are composed of a branching network of pipes and manholes. This system is used to collect and transport the water (also known as wastewater) from sinks, washing machines, toilets, and other *indoor* plumbing**. Wastewater** entering the sanitary system flows directly to a wastewater treatment plant where it is treated, disinfected, and then released to area water sources. (***wastewater*** is water that has been used, as for washing, flushing, or in a manufacturing process, and so contains waste products; sewage.)

These two systems are not connected in any way.

Stormwater is any precipitation from a storm event (rain, snow, sleet, etc). Stormwater runoff is any precipitation that does not soak into the ground but instead runs off its surface.

Non-porous or impervious surfaces such as driveways, sidewalks, and streets block precipitation from soaking naturally into the ground. Stormwater runoff picks up contaminants such as chemicals, motor oil, pet feces, and other harmful substances and carries them DIRECTLY into lakes, streams, rivers, or wetlands. In most cases, whatever enters the storm sewer system is discharged UNTREATED into the water bodies we use for swimming and fishing and from which we get our drinking water.

The blue area in the figure below represents the stormwater system (outside the home) while the yellow area represents the sanitary sewer system (inside the home).



Many people wonder why stormwater goes untreated. Simply, gutters (curb inlets/catch basins) are designed to prevent flooding. Their job is to remove water from the street as quickly as possible during a rainstorm or other precipitous event. The storm drain system they deposit into is designed to remove water from the streets and dispose of it quickly. The quickest way to dispose of thousands of gallons of water is to allow it to flow into rivers, lakes, or streams, *immediately*.

In addition, because stormwater comes in large amounts at unpredictable times, treating it as wastewater would be very expensive and quite unmanageable. If the sanitary and storm sewer systems were combined, many treatment plants would not be able to handle the quantity and velocities of water that intense storms produce.

If stormwater is not managed properly, it can harm the environment causing:

- Increased risk of flooding
- Impaired water quality
- Increased surface runoff
- Increased soil erosion

Remember, if it's on the ground it's in your water!

Help prevent stormwater pollution. To report any illegal dumping, please contact the EH&S office at 817-272-2185.

**Information republished courtesy of the City of Arlington, Citizen's Guide to Stormwater Pollution Prevention.*

Dangers of Peroxide Forming Chemical Use in Labs

Peroxides are highly reactive materials and may be extremely shock-sensitive. A violent decomposition can be initiated by heat, light, introduction of oxygen, loss of an inhibitor, mechanical shock, or friction.

Simply moving or just screwing the cap off a bottle that is contaminated with peroxides can lead to an explosion, injury and/or death.

For this reason, it is important to identify and monitor chemicals which form potentially explosive peroxides. In general, the more volatile the compound, the greater its hazard, since the evaporation of the compound allows the peroxide to concentrate. Organic peroxide forming materials can form shock-sensitive organic peroxide crystals over time or upon exposure to air. Check each material's Safety Data Sheet (SDS) to determine if a chemical can form peroxides, and to check for other hazards—most are highly irritating to skin, eyes, and mucous membranes. Minimize exposure to them.

There are inorganic and organic peroxide forming chemicals. Some ***inorganic*** peroxide formers are generally okay to handle, but pose serious incompatibility issues when used with organic chemicals. Some examples are: (Refer to SDS before use!)

Potassium metal (K)
Potassium amide (KNH_2)
Sodium amide ($NaNH_2$)

Organic peroxidizables are among the most hazardous substances handled in the lab. Examples are:

Isopropyl ether (C6H14O)
Cyclohexane (C6H12)
Tetrahydrofuran (C4H8O)

Most are highly flammable and extremely sensitive to shock, heat, spark, friction, impact, and ultraviolet light. They are also very sensitive to contamination (especially heavy metal compounds, strong acids, and even dust and dirt). The presence of these materials can initiate rapid, uncontrolled decomposition of peroxides and possible fire or explosion. Once withdrawn, the peroxide must never be returned to its storage container.

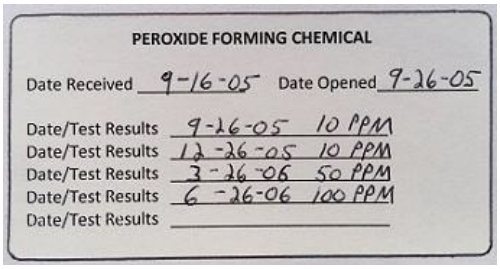
Appearance of crystals on chemical bottles

Peroxides can occur in virtually any kind of organic chemical, however, certain chemicals are particularly prone to peroxide formation and pose special hazards, such as **Peroxide Forming Solvents.** Evaporative concentration or distillation can produce dangerous levels of peroxides. In fact, most Group B solvents are sufficiently volatile that multiple openings of a single container can result in significant and dangerous peroxide concentration.

Inorganic and organic peroxides, because of their exceptional reactivity and oxidative potential, are widely used in research laboratories, and many are being used and/or stored here at UT Arlington. PIs/ Chemical Owners and laboratory users should be knowledgeable of the hazards and safety issues associated with the laboratory use, handling, and storage of peroxide forming compounds. In addition, these types of chemicals must be tested for peroxide concentration upon opening and every three (3) months thereafter. They must be properly disposed of if the peroxide concentration is greater than or equal to 100 ppm, or when the maximum storage time is reached, whichever occurs first (refer to SOP-Peroxide Forming Chemicals).

Storage and Handling

All peroxide forming chemicals should be stored away from light and heat with tightly secured caps and labeled with the date of receipt and date of opening. A laboratory routine should be established to test all peroxide forming chemicals when opened and every 3 months thereafter.
Example of a label:



All **peroxide forming solvents** should be checked for the presence of any peroxides prior to distillation or evaporation.

Solvents with an inhibitor, such as Butylated Hydroxytoluene (BHT), should be used whenever the presence of this stabilizer does not interfere with intended application.

Uninhibited materials should be stored with care and frequently checked for peroxide formation.

Peroxide-forming solvents should be purchased in limited quantities and older material in inventory should be used first.

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EH&S STAFF:

Bruce O'Keefe
Fire Safety Coordinator
bruce.okeefe@uta.edu

Jeanette Rea
Administrative Assistant
jmrea@uta.edu

Harvey Richey
Laser Safety Specialist
hrichey@uta.edu

Elisabeth Rowlett
Chemical Management Specialist
rowlett@uta.edu

Grace Sauce
Accountant
saucegg@uta.edu

Richard Stell
Safety Specialist Storm Water
rstell@uta.edu

Laura Warren
Radiation Safety Specialist
lwarren@uta.edu

Eric Woods
Fire Safety Specialist
eric.woods@uta.edu

Check out EH&S on Facebook to keep up with all our events & training:

UT Arlington Environmental Health & Safety Office

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Peroxide Forming Chemicals *(continued from page 3)*

Uninhibited materials should be stored with care and frequently checked for peroxide formation.

BE AWARE that when purchasing chemicals from the list in Table A: Severe Peroxide Hazard (as shown in SOP-Peroxide Forming Chemicals), they must be discarded 3 months after opening. When purchasing uninhibited chemicals from Table C: Shock and Heat Sensitive, they must be discarded within 24 hours of opening. These chemicals can spontaneously decompose and become explosive after exposure to air, even without concentration. Substitute a more stable solvent if possible.

Peroxide Detection

There are a variety of methods suitable for the detection of peroxides. The test strips method is the easiest to perform. **In all cases,** run a blank sample (one you know doesn't form peroxides, such as *n*-hexane) so you know what a negative result looks like. If possible, also run a blank sample that you have spiked with some hydrogen peroxide so you will recognize a positive test result. For more information on testing refer to SOP- Peroxide Forming Chemicals.

Never under any circumstances touch or attempt to open a container of a peroxide-forming liquid if there are whitish crystals around the cap and/or in the bottle. The friction of unscrewing the cap could detonate the bottle with disastrous results.

DO NOT TOUCH OR MOVE THE SUSPECT BOTTLE YOURSELF FOR ANY REASON. CALL EH&S at 817-272-2185.

Visit the New EH&S Emergency Source Page

The Emergency Source Page contains information and guidelines on how to handle a variety of different emergency situations, including links to other university resources, all consolidated in one convenient place.

Being A Maverick means Being Prepared! Every member of the campus community needs to know what to do in the event of an emergency. Take the time to become familiar with exits and evacuation routes for your building, storm shelters, locations of fire extinguishers and other safety equipment, and common emergency terms and instructions.

EH&S TRAINING COURSES

Online safety training is located on the EH&S training management website: https://uta-ehs.org

Bloodborne Pathogens for Laboratory Research Personnel
Bloodborne Pathogens (Non-Research)
BioSafety Level 2
On-Site Biohazardous Waste Management
Vaccinia Virus
Laser Safety
Radiation Awareness
Radiation Producing Machine
Hazard Communication & Waste Mgmt- Academic
Hazard Communication & Waste Mgmt- Non-Academic
Fire Alarm Device
Back Injury Prevention
Confined Space Entry Awareness
Hand & Power Tool Safety
Hearing Conservation
Lockout/Tagout
Respiratory Protection
Class C Underground Storage Tank
Defensive Driving Awareness
12 & 15 Passenger Van
Powered Industrial Truck (Forklift)

Call us at 817-272-2185 to schedule specific trainings not available online:
Radioactive Materials **Hot Work Safety** **Fire Extinguisher** **Respirator Fit Testing**

DRIVING UTA VEHICLES
Defensive Driving Awareness - This online course must be completed every 3 years to remain an authorized driver of UTA vehicles. Additionally, an individual driving record check (MVR) must be updated annually.

12 & 15-Passenger Van Training: Take the online course first. A behind-the-wheel driving test is also required and will be conducted on the dates and times below at the EH&S office, 500 Summit Ave. Drivers must have already passed the Defensive Driving Course and have a current approved driving record check to attend. ***Class size is limited, so please call 817-272-2185 to register ahead of time***.

May 10—2:00pm
May 18—10:00am
June 5—10:00am
June 21—2:00pm
July 10—10:00am
August 4—10:00am