

Chemistry Safety Notes

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Reflecting on a year of really interesting stuff

Since I've just completed my first year as your Safety Manager, I'd like to take a bit of space to reflect on what we've accomplished over the past year. With the help and support of Michael Sisto, Jessica Potts, Chair Jackie and Chair Susan, we've had a very busy year:

- Disposed over 10,000 pounds of legacy hazardous waste from the Department.
- Accomplished laboratory safety training for ALL Department laboratory workers. Created a mechanism to sustain compliance.
- Completed the UCOP/EH&S required Standard Operating Procedures. All lab workers trained on the contents of the SOPs.
- Completed comprehensive mock-Cal/OSHA audits of the Department. Corrected corrective actions.
- Completed comprehensive Fire Code inspection. Corrected corrective actions.
- Developed and deployed the Department Injury and Illness Prevention Program.
- Accomplished 100% compliance with the Laboratory Hazard Assessment for PPE requirements.
- Attest, three times, to our 100% compliance with the conditions of the LA District Attorney's Settlement Agreement.

You all should be rightly proud of how much we have accomplished!

LHAT and PPE Distribution Event

Thank you to everyone who worked hard to accomplish 100% compliance with the Laboratory Hazard Assessment requirements. Don't forget to [register](#) for (and attend!) the distribution event during the week of February 10th. Laundry pick up and drop off will remain in 143 Chemistry or Annex dispensary.

Mindfulness

A professor reminded me of a nasty incident at UT, Austin, in 1996, (very similar in nature to our incident on the 5th) which caused damage to 40,000 ft² of building space and destroyed 20 years of research. So it makes me think about mindfulness and what it really means to our work with and around dangerous materials. My very heavy, hardcopy American Heritage Dictionary defines "mindful" as attentive; heedful. But how to maintain that level of attentiveness, day in and day out, when Nothing Bad happens? Our researcher told me that he was on "autopilot." I wonder if the researcher at UT all those years ago was also on "autopilot." We all experience that feeling and it's particularly scary when it happens behind the wheel of your car. That "How the heck did I get here?" experience. I welcome your comments and input – how can we construct our work to be robust enough to withstand those occasional "autopilot" moments we all have?



Incident of the Month

A Department researcher was seeking to dry molecular sieves in a round bottom flask that was under vacuum. While using a flame to dry the sieves, residual acetone over-pressurized the flask, causing it to fail catastrophically. When the flask failed, the acetone flared up, causing a brief, but exciting, bit of fire.

No humans were damaged in this incident but the flask was a total loss. The cause of the incident was a clogged needle that allowed the flask to over-pressurize.

Corrective action will be to oven dry molecular sieves overnight and oven dry the flask, too, if need be. No more flames!

It's always important to check and inspect all of your equipment, even something simple like a needle, to be sure everything is in proper working order before beginning work.



Eyewash and Shower Testing

Equipment has been purchased to help you comply with the monthly eyewash/shower check requirement. Michael Sisto has graciously offered to keep the rig in the Machine Shop for checkout. A simple spreadsheet with each month listed, tester's initials and an "okay" check mark, posted by the shower, is appropriate. The point of the test is to make sure the shower (or eyewash) turns on and turns off and that water comes out of the fixture.

“Just wrapping people up in a lab coat and gloves doesn’t automatically make them safe.”

- Debbie Decker, Safety Officer, Department of Chemistry, UC Davis. Quoted by Jyllian Kemsley, Senior West Coast Editor, Chemical and Engineering News, August 26, 2013.



Pinpointing Pigments in 3D

By Sarah Everts Excerpted from Chemical and Engineering News, January 27, 2014.

A technique for visualizing the three-dimensional location of pigments in human tissue is set to help cultural heritage researchers do the same for pigments used in valuable masterpieces. The technology's many potential art applications include finding forgeries or informing conservation strategies.

The new technique builds upon femtosecond pump-probe microscopy, a noninvasive method used to measure pigments such as hemoglobin and melanin in living tissues.

Knowing the exact depth and location of different pigments in the many layers of a painting helps researchers trying to authenticate a masterpiece or those planning a smart approach to restoring it. The technique may also allow conservation scientists to map distinct brushstrokes in a painting. Brushstrokes often can be correlated to the hands of individual painters and thus be useful for authentication.

Modifying the laser-based femtosecond pump-probe microscopy technique so that it could detect artist pigment anywhere on a painting was not a trivial endeavor. Artist pigments can range from inorganic molecules to minerals, which have a wider range of absorption.

The lasers have to operate at extremely low power to protect valuable works of art. The system's sensitivity had to be boosted so that it would work at extremely low laser power to protect valuable works of art.

Next up, researchers aim to make a cheaper, more portable version of the laser instrument that can be used to study art that cannot be moved for security reasons or paintings that don't fit on a lab bench.