Chemistry Safety Notes

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"Chemistry Safety Notes" is published by the Chemistry Dept. Safety Committee, written & edited by Debbie Decker, Safety Mgr.

ChemTag is Halfway Complete

The majority of the Chemistry department laboratories have had their chemical inventory tagged and their data entered into the "Chemicals" inventory application. Thank you all for your time and patience with this process, as well as for your suggestions on improvements that will benefit upcoming labs.

The Chemistry Storeroom is now integrated with the Chemicals application. To assist labs in maintaining an accurate inventory, the Storeroom/Receiving staff will enter as many details as possible about the containers they receive into the Chemicals application. The containers will then be transferred within the application to your laboratory. This step requires you to "accept" the containers.

Pro Tip for Accepting Containers

Labs will need to "accept" the containers in Chemicals. Some labs have found that creating a default "temporary-receiving" sub-location allows all lab members to accept packages from the Storeroom/ Receiving, even though they may not know the final destination or sub-location of the containers. In the next week or so, a kiosk will be available in Receiving to accomplish this step before you leave Receiving. Stay tuned for an update.

Questions and Resources

Thank you once again for your time and attention to this project. Feedback is always welcome at chemtag@ucdavis.edu or via our Google Form. More information and resources are posted on the ChemTag webpage.

A Couple of Reminders …

Hazardous Waste Management: Labs are NOT recharged for hazardous waste disposal. So there is no excuse for not getting rid of waste in a timely way.

While we're on the subject—use the WASTe application to create a label and to facilitate pick-up. You may use the old hazardous waste labels as an interim while you're collecting waste, but the containers must have a WASTe label on it for pick up

Empty Containers: You can retain empty chemical containers to collect hazardous waste. Be sure the container is clean and dry, with no free liquid. See SafetyNet #124—Empty Container Management for more details.

Reporting Incidents or Injuries

There has been some confusion and an incident recently so this information bears repeating.

If you hear a loud or unusual noise—bang, boom, whoosh, clang, clunk—that seems out of place, please call 911 and your friendly Safety Manager (530.304.6738). Don't assume others will call or that it's not something serious. Let the nice people at emergency dispatch sort it out.

If you know where the loud noise came from, please don't enter the area. Look as best you can from safety or bang on the door to see if anyone is in the area and may be injured. Do not become part of the emergency response by going into danger. Let the professional responders make entry.

If someone is injured in your area, please follow the guidance in the Department Injury and Illness Prevention Plan, accessible from the Safety tab on the Department website. The injury reporting information starts on page 11. Create a Department incident report or similar lab-specific incident report and forward it to me. It's also important to discuss incidents and corrective actions within your work group. Document the discussion as a training opportunity.

If you have any questions or concerns, please let me know.

Fire Cabinets—Out of Service

You will have noticed this signage on the corridor fire cabinets. As part of the fire suppression project, the hoses, cabinets and outlets will be removed and capped. If there's a fire, call for help and evacuate. Let our professional fire fighters do their thing.

SOP Requirements

Campus EH&S has published a very nice SOP Requirements document that may be helpful to you. All laboratories have an SOP collection but it's probably a good idea to review what you have developed. Make sure everything is up to date or at least has been reviewed in the last 12 months. Also, please make sure you have the right SOPs applicable to your chemical inventory.

Everyone needs to be trained on the SOPs which are applicable to their work. Training is to occur initially, when there are changes to the SOP, and at least every 3 years.

Impaired

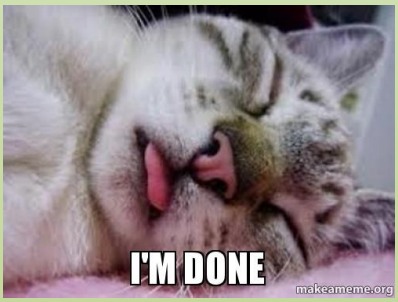
Recently, a researcher related to me a story about one of her co-workers. This co-worker – let's call her Ann - wasn't herself. She'd been clumsy, had made a couple of simple but significant errors, and seemed frustrated and short-tempered. All of these behaviors were out of character for Ann. The researcher and another lab member engaged Ann in conversation and discovered that she hadn't been sleeping well, hadn't eaten that day, and couldn't remember if she'd eaten the day before. She had also created an artificial project deadline for herself which contributed to an already difficult research situation. The two researchers, senior to Ann in the lab pecking order, insisted she take a break and have some juice and a granola bar. And then, with the support of the PI, they sent her home to sleep and eat a proper meal. Ann was impaired. She was a danger to herself and to others in the lab.

Extreme fatigue can present symptoms similar to impairment. The Army Corps of Engineers recognizes this safety issue and has developed some guidance. A "Fatigue Management Plan should be implemented whenever work hours:

(1) Exceed 10-hours a day for more than 4 consecutive days;
(2) Exceed 50-hours in a 7-day work week;
(3) Exceed 12-hours a day for more than 3 consecutive days, or
(4) Exceed 58-hours a week for sedentary (to include office) work."

Starts to sound like graduate school hours! The Army Corps recommends a minimum of 8-hours rest in any 24-hour period. The Corps goes on to define "rest" as "off duty; not performing work, including administrative tasks; and affording the opportunity for uninterrupted sleep." (*Ref: 30 Nov14 edition of the US Army Corps of Engineers "Safety & Health Requirements Manual," EM 385-1-1).*

If you notice a co-worker or colleague struggling with issues of substance abuse, please encourage him/her to seek help from the resources available. Employees seeking support or treatment programs may contact Academic and Staff Assistance Program (ASAP); 752-2727. Students seeking support or treatment programs may contact Alcohol Tobacco and Other Drugs Program, 752-6334, or the Counseling and Psychological Services: 752-0871. Sometimes, offering to accompany a colleague or co-worker as they seek help is what a struggling person needs.



Self-care is important. Taking time off is critical to maintain perspective and give your brain a break. Sometimes, creative solutions will present themselves when you are away from work.

The Chemistry of Ice Cream (yum!)

Posted by Kristi Brekhus on 19th Jul 2018 https://www.calpaclab.com/blog/the-chemistry-of-ice-cream-yum/

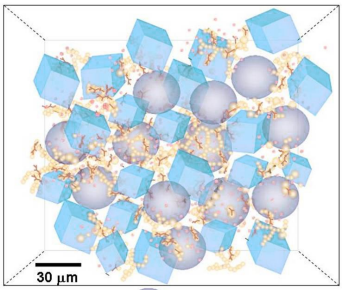
What's better on a hot day than ice cream? We grew up eating different varieties, textures and flavors… but what is the science behind our favorite summer treat?

Fats, Proteins and Emulsifiers (Oh my!)

Ice cream is simple – its composition consists of water, sweeteners, flavorings (natural and artificial) emulsifiers, stabilizers, milk fat and milk solids.

The richness we taste when we indulge in ice cream comes from the fat content – provided by the milk or cream. When it comes down to physical chemistry, Ice cream has a colloidal structure - this means it's comprised of small air bubbles and ice crystals dispersed through water and a network of fat globules.

Different emulsifiers are used to make up the surface proteins and help with forming the network of fat globules. When the cream is whipped, the air that's introduced helps the fat to coalesce and stabilize the air bubbles. After the whipping process, the cream is cooled at a lower temperature than the average freezing point to ensure ice crystals form.



Structure of Ice Cream:

The ice crystals that form when ice cream freezes are integral to the quality of the end product. Soft serve, or smooth ice cream, requires very small ice crystals. To guarantee small crystals, ice cream needs to be frozen quickly. However, ice cream is still made up of 55 – 64% water and when served at an average temperature of -16 degrees Celsius only about 72% of the water is frozen. This allows the ice cream to be "scoopable".

The Flavors and Colors of Ice Cream:

What makes ice cream taste so good? The flavor chemistry of this creamy treat consists of a complex mix of fatty and watery components – leaving a lot of room for enhancement. Many ice cream manufacturers have to use different artificial flavors (sometimes a mix of three or four) to achieve their signature flavor. A frequently used artificial flavor is Vanillin for Vanilla ice cream. Furthermore, the color of ice cream is important for flavor profiling. Anthocyanins, color pigments found in plants, is what gives strawberry ice cream it's iconic pink color.

The process of making ice cream is always evolving as food chemists come up with different ways to whip, flavor and freeze the concoction. The next time you sit down to enjoy this cool treat, think about the years of trial and error that have lead up to producing your favorite flavor. What is your favorite ice cream? *(Editor's Note: Personal Fave: mocha almond fudge—scooped by the nice people at the ice cream stand at Camp Richardson, Lake Tahoe)*

Sources:

Halford, B. "Ice Cream: The Finer Points of Physical Chemistry and Flavor Release Make this Favorite Treat so Sweet." *Chemical & Engineering News,* Nov 6^2, 6448: http://pubs.acs.org/cen/whatstuff/stuff/8245icecr... [accessed July 2018].