Safety & Security Talking Points for EH&S

Month of March 2017

Campus Emergency Preparedness:

- Evacuation Drill Scheduled for Escondido Education Center including the Early Childhood Education Center on Wed., March 22 at 11 a.m.

Hazmat:

- February 2017 - (4) Medical Waste Shipments

Safety Issues:

Acid Etching Operation - Building "C" room #15 Report

1. Acid Etching Operations:

a) Nitric acid etching produces yellowish-brown nitrogen dioxide (NO_2). NO_2 has poor warning properties, which means the instructor or student may or may not be able to tell when they are being overexposed. Acute overexposures of highly concentrated nitric acid solution can cause chemical pneumonia. Chronic exposures of low concentrated nitric acid can cause emphysema. Etching operations with nitric acid requires local ventilation. The acid trays and sink where acids are mixed should ideally be equipped with ether a slot exhaust hood or laboratory-type hood with movable sash. A canopy hood such as the one being used in room C-15 is not typically appropriate for nitric acid etching operations. The assessment that was performed at this location involved real-time measurements of NO_2 at levels that could far exceed OSHA limits without the use of a fume hood.

2. Exposure Assessment Results:

a) The results of both personal and area air sampling, conducted on January 17, 2017, indicated that airborne Nitrogen Dioxide and Nitric Oxide concentrations generated during nitric etching operations, were not significant in terms of human exposure. Laboratory results did not detect either contamination over the method's reporting limit.
b) In addition, the reporting limit was well below the American Conference of Governmental Industrial Hygienists (ACGIH) Threshold Limit Value (TLV's) for Nitrogen Dioxide and Nitric Oxide (TLV"s of 0.2 ppm and 25 ppm respectively). The TLV refers to airborne concentrations of substances and represents conditions under which it is believed that nearly all workers may be repeatedly exposed day after day without the use of respiratory protection and without adverse health effects.
c) The above results indicate that even with the current engineering controls, which are not ideal, the levels of contaminates do not represent concentrations deemed by ACGIH to be likely to cause adverse health effects even over a very long-term (chronic) exposure.

3. Recommendations:

a) While exposure to the sampled chemicals were negligible during this assessment, sampling was performed on an experienced instructor with knowledge of the chemical hazards present. Sampling of student exposures may indicate higher concentrations due to alternate procedures, shortcuts, and/or lack of the necessary skills or knowledge.

b) Replacement of the existing canopy hood with a slot exhaust hood, or laboratory-type hood with a movable sash, will help to effectively control exposures under a wider range of conditions and is recommended. The canopy type hood located in room C-2A, while better suited for physical spills, still does not meet the needs of the nitric etching operations being performed in room C-15. Modification or replacement of the hood in room C-15 is recommended.
c) Any modifications or replacement of the fume hood should include a stainless steel working surface and lip to contain spilled solutions within the hood interior. Dilution of acids should then occur fully within the new or modified hood.
d) In addition to the changes recommended to the fume hood, an emergency eyewash and safety shower should be in the immediate vicinity of any mixing of concentrated acids. A tagged and inspected eyewash station is in in room C-15, but an emergency shower is not. There should be no electrical outlets or switches within splash range of the eyewash shower, and any heating element used within the fume hood should be hard-wired rather than plugged into an outlet.

Photograph 1: **Canopy Hood in C-15 showing position of area samples at grinding wheel.**

Photograph 2: **Instructor Lisa Mandel wearing personal samplers and performing etching in C-15.**

Photograph 3: **Close-up of Passive Diffusion Monitor used in personal and area sampling.**

Photograph 4: **Alternate Hood Located in C-2A.**