



Guidance Note

May 2007

Reactions – Chemical Cleaners

HWG-009

Hazards of Cleaning Chemicals

In the past there have been reports of several injuries to custodial personnel throughout the country which were related to mixing chlorinated cleansing chemicals with other regular household cleaning chemicals. Most of the accidents involved standard household bleach (5.25 % sodium hypochlorite).

Hazards

Poisonings

The large number of poisoning incidents involving cleaning products does not mean that these products are more toxic than other household products, it's just that they are more often swallowed. While it is important to choose the least toxic cleaning products you can, even they should be kept safely stored away from children's reach.

Three to Avoid

The three most dangerous cleaning products in the average home are drain cleaners, oven cleaners, and acid-based toilet bowl cleaners. Most of them are labeled "DANGER. Corrosive." Corrosive products can severely burn skin and/or eyes. If accidentally swallowed, a corrosive product could cause internal burns. Many corrosive products can also react violently if mixed with other products. Some rust removers are also corrosive.

Most cleaning products can irritate skin or eyes, but only corrosive products cause burns. There is no reason to have corrosive products in the home. Safer alternatives exist for all of them.

All Choked Up

Also very dangerous if accidentally swallowed are products that contain organic solvents. Most solvent-based products are not cleaners -- petroleum distillates/gasoline, kerosene, lighter fluid, oil-based paints and paint removers, and many automotive products contain solvents. A few cleaning products are also solvent-based as well as some furniture polishes, dry cleaning fluids, spot removers, and some metal polishes. These products will be labeled: "DANGER. Harmful or fatal if swallowed".

If a solvent-based product is swallowed, it can be sucked into the lungs, where it coats the lung surface and causes a pneumonia-like condition that can be fatal. Some solvent-based products can be replaced with water-based products that do the same job.

Bleach and Ammonia/Acids Don't Mix

One of the most common home accidents is the mixing of products containing chlorine bleach with those containing ammonia. A chemical reaction occurs, and a gas called "chloramine" is produced. Chloramine gas is highly irritating to the lungs, and causes coughing and choking. Chlorine bleach also produces dangerous chlorine gas if mixed with an acid product like a toilet bowl cleaner or rust remover.

Breathe Easy

Products containing bleach or ammonia are usually recognizable by their strong odors. Bleach and ammonia are highly irritating to the lungs. They should not be used by people with asthma or with chronic lung or heart problems. Sometimes

manufacturers cover up the strong odors of these products with a lemon or "fresh" scent. This is a bad idea because the unpleasant odor is a warning signal that the product is harmful to breathe.

Also hazardous to inhale are solvent-based spot removers. Used with poor ventilation they could cause health problems, and any use of these products reduces indoor air quality.

Although fragrances are not usually considered toxic, many people cannot tolerate strong fragrances in air fresheners, perfumes, fabric softeners, and cleaning products. Some products are now available without fragrances for those who prefer them.

UCDHSC Incidents

UCDHSC has had incidents reported related to reactions between regular household bleach and other household cleansing chemicals. One reported incident occurred when an employee was cleaning out a public restroom. The employee mixed regular household bleach with an ammonia-containing cleaning compound. The result was a reaction that produced a highly toxic chlorinated amine gas, commonly referred to as a stink bomb. The odor was so strong that a section of an occupied floor was evacuated to allow the occupants to get fresh air.

Safety Guidelines

To reduce the potential of hazardous reactions with cleaning chemicals, please follow the guidelines below:

- a. Whenever acid is mixed with bleach, highly toxic chlorine gas is generated. Never mix common cleaning supplies that contain acids such as toilet bowl cleaners, oven cleaners, and concrete or brick cleaners with household bleach or ammonia containing cleaners such as window cleaners.
- b. In general, in order to prevent potential adverse reactions and the generation of toxic gases; never mix different cleaning solutions together.
- c. Always read the material safety data sheet (MSDS) and labels before using a cleaning solution. It is the responsibility of the employer and the employee to ensure that the working environment is a safe working environment. Safety at work depends on four things:
 1. Knowing what the hazards are,
 2. Knowing how to protect yourself,
 3. Thinking and acting safely, and
 4. Watching out for your co-workers.

MSDS's and labels are good tools to alert you to potential dangers and how to reduce those dangers. For example, many common disinfectants may cause severe damage to the eyes. The MSDS and label will give instructions on handling, proper use, and personal protection equipment needed while using that particular disinfectant.

If there are any questions on this matter, please call EH&S at 303-724-0345.