

Spotlight On Safety

www.ehs.ucr.edu

MINIMIZING AEROSOL EXPOSURE

Inhalation of aerosols is a common cause of constant exposure to toxic chemicals/ radioisotopes and of workplace-acquired infections. Aerosols don't have to be inhaled directly to produce their effects. The droplets dry up within a few seconds and, depending on their size, settle on surfaces in the work area or enter in the ventilation system. It is the smaller particles, with diameters less than 5 micrometers that can easily enter the lungs. Listed below are examples of lab equipment/ procedures that generate aerosols and precautions to minimize exposure.

Mixing Solutions

- ✦ Using a vortex rather than vigorous stirring can eliminate aerosols from the source

Using Needles & Syringes

- ✦ Don't pressurize contents of bottle when withdrawing a solution through a rubber stopper
- ✦ Discharge air from syringe before inserting it
- ✦ Wrap a cotton ball soaked in 70% alcohol or other appropriate solution around the needle when removing it from the bottle. Aerosols can also be produced when a needle separates from a syringe during use (needle-locking syringes or syringe-needle units are recommended)
- ✦ Never clip used needles (produces aerosols)

Centrifugation

- ✦ If spinning hazardous materials in poorly sealed tubes, the centrifuge should be placed in a fume hood or biosafety cabinet during operation and decontaminated after use
- ✦ With larger centrifuges, sealed rotors and/or tubes should be used and opened in a fume hood or biosafety cabinet. The rotor/ tube seals or O-rings should be inspected before each run and replaced as needed

Blending & Sonicating (one of the most potent sources of aerosols in the lab)

- ✦ Contents must be allowed to settle for at least 5 minutes after blending and before removing the cover in a fume hood or biosafety cabinet
- ✦ Sonicators must be used with similar precautions

Flaming

- ✦ Gently manipulate the lab equipment, making no sudden movements. If the loop or lip of the tube or flask is wet, an aerosol may be created when flamed (Wipe the tube/ flask with 70% alcohol, vacuum the droplets, or use pre-sterilized plastic loops)

Opening Sealed Ampoules

- ✦ If the tube is under vacuum, the glass should be cracked gently by applying a heated rod to a file mark on the ampoule neck and allowing the pressure to equalize before completely opening
- ✦ Osmium tetroxide ampoules must be opened under water

Cleaning Cages of Animals with Pathogens

- ✦ Cages must be autoclaved before cleaning if required by the Biological Use Authorization or Animal Care Protocol
- ✦ When cleaning animal cages, use a spray bottle filled with water or disinfectant to wet down the litter before dumping. Discard litter as gently as possible into receptacle and seal immediately

Visit www.ehs.ucr.edu for additional information or call EH&S at 827-5528 if you have any questions.