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Developed By: University Department of Environmental Health and Safety

Standard Operating Procedures For Handling, Storage and Disposal of Acrolein

Purpose

The purpose of this document is to establish specific standard operating procedures for handling, storage, and disposal of Acrolein. The requirements established in this SOP are in conjunction with the University's Chemical Hygiene Plan.

Overview

Acrolein, A.K.A. propenal, is the simplest unsaturated aldehyde. Acrolein is primarily used as an intermediate in the synthesis of acrylic acid and as a biocide. It was used as a chemical weapon in World War II. Acrolein has a strong odor like burning fat.

Acrolein is a highly toxic chemical that is also extremely flammable and reactive. It may form explosive peroxides upon standing. Reactions may be very rapid and violent.

It is very hazardous in case of skin contact, and can severely irritate the eyes, throat, and respiratory system. Liquids or sprays may damage tissue, particularly mucous membranes. Skin inflammation may include itching, scaling, reddening, blistering or even burns. Inhalation of spray mist may produce severe irritation of the respiratory tract, characterized by coughing, choking, or shortness of breath. Severe over-exposure can result in death. Acrolein has a mutagenic effect on mammalian somatic cells and may be a reproductive hazard. Studies have found connections between acrolein in tobacco smoke to the risk of lung cancer.

Standard Operating Procedures

Handling

1. The Material Safety Data Sheet and this SOP must be reviewed before use of acrolein in the laboratory.

2. The laboratory's principal investigator must develop specific written experimental procedures for the use of acrolein in the laboratory before any work can be permitted to begin. The written procedures must be approved by the Department of Environmental Health and Safety.
3. As a peroxide-forming chemical, the receive and open dates must be written upon the label.
4. All manipulations with acrolein that can generate vapors, fumes or sprays must be done in a properly working chemical fume hood, glove box, local exhaust system or other suitable containment device that exhaust directly outside.
5. Proper personal protection equipment (PPE) must be worn at all times to prevent eye and skin contact. The minimum requirements for PPE are safety glasses with side shields, a cotton laboratory coat and protective gloves.
6. Be sure to inspect all PPE prior to and after use.
7. The laboratory must be equipped with a working eyewash station and safety shower.
8. Always practice good laboratory hygiene. Wash hands, face, neck and forearms frequently. Wash hands before eating and do not eat, drink, or smoke in the laboratory.
9. Keep good housekeeping procedures. All disposable materials contaminated with acrolein must be disposed as hazardous waste.
10. Any amount of acrolein spilled must be immediately reported as a major spill event.

Storage

1. Acrolein must be stored in a cool, dry well-ventilated location, away from any ignition sources. A standard flammable liquids storage room or cabinet is sufficient.
2. Do not store this material with incompatible materials. Reacts with acids, amines, alkalis, sulfur dioxide, metal salts, oxidants, thiourea, dimethylamine or weak acid conditions such as nitrogen or carbon dioxide.
3. Do not store acrolein uninhibited under any circumstances.
4. Acrolein must not be stored in the lab for more than 12 months.
5. Due to the hazardous nature of the material only minimal quantities of material should be purchased and stored.

Disposal

1. All waste must be collected in a sealable compatible container and disposed as hazardous waste as per University Hazardous Waste Guidelines.
2. All residual materials and rinse water from empty containers of this material must be collected and disposed as hazardous waste.
3. The rinse water from decontamination of all non-disposable equipment must be collected and disposed as hazardous waste.
4. All disposable materials contaminated with this material must be disposed as hazardous waste.
5. **Drain disposal of any of these materials is strictly forbidden.**
6. A chemical pick-up request form must be completed and submitted when the hazardous waste needs to be removed. The pick-up request must be made before 12 months of receiving the chemical.