Standard Operating Procedures (SOP) for Using Benzene

Benzene Use SOP		
1. Process (if applicable)	Injections of benzene standards for gas chromatograph calibrations and sample analyses. **Note**: *All use of benzene is strictly regulated by OSHA (29 CFR 1910.1028).*	
2. Chemical(s)	Benzene, at known and unknown concentrations.	
3. Engineering & Administrative Controls	Benzene-containing solutions should be dispensed and used only in a properly operating fume hood. Syringe purging should also be done in the fume hood.	
4. Personal Protective Equipment (PPE)	Chemical splash goggles, butyl or natural rubber gloves, and a lab coat or apron is required.	
5. Special Handling Procedures & Storage Requirements	Mixing and dispensing done in fume hood with all sources of ignition turned off (hot plates, burners, etc.). Benzene stored in metal safety cans or glass bottles (4 liter maximum). Transported in spill-proof carriers. Benzene is stored in a flammables cabinet, separate from acids, bases, and oxidizers. The flammables cabinet is located _____.	
6. Spill & Accident Procedures	For small benzene spills (<1L): Turn on and open fume hood. Close lab door. Remove/turn off all sources of ignition in the spill area. Locate spill kit. Use absorbent pads from spill kit to absorb spill. For benzene spills >1L or beyond lab staff capabilities: evacuate lab and call UNM PD (277-2241) and SRS (277-2753). For benzene contact with eyes: immediately flush eyes in eyewash station for at least 15 minutes. For benzene contact with skin: immediately wash skin with soap and water and remove any contaminated apparel. After clean-up, room air must be monitored by SRS prior to re-occupancy.	
7. Waste Disposal	For spills: double-bag used absorbent pads, label as "Hazardous Waste, Benzene Spill Cleanup Materials, Flammable" and request waste pickup from SRS. Hazardous Waste labels and pickup requests are both available on the SRS website: srs.unm.edu	
8. Special Precautions for Animal Use (if applicable)	*	
Particularly Hazardous Substance involved?	_X_ YES	Parts 9, 10 & 11 are mandatory
	___ NO	Parts 9, 10 & 11 are optional
9. Approval Required	Users must receive specific physical and health hazard information and safe laboratory work practices training from their supervisor. Representative breathing zone air sampling shall be taken to ensure that exposures do not exceed regulated levels. (Contact SRS for additional information)	
10. Decontamination	Immediately wash with soap and water.	
11. Designated Area	Room _____ . Special signage may be required depending on air sampling results.	
Name:	Title:	
Signature:	Date:	

**to be filled in by PI or Supervisor*

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Additional Information about Benzene

Exposure Limits as Set by OSHA (29 CFR 1910.1028):

8-hour Action Level (AL):	0.5 ppm
8-hour Permissible Exposure Limit (PEL):	1.0 ppm
15-minute Short Term Exposure Limit (STEL):	5.0 ppm

Hazards:

Benzene liquid is highly flammable. It should be stored in tightly closed containers in a cool, well ventilated area or a flammables cabinet. Benzene vapor may form explosive mixtures in air. All sources of ignition must be controlled. Use non-sparking tools when opening or closing benzene containers. Fire extinguishers, where provided, must be readily available. Know where they are located and how to operate them. Smoking is prohibited in areas where benzene is used or stored.

Benzene can affect your health if inhaled, if it contacts skin or eyes, or if ingested. The most frequent work place route of entry is by inhalation, but benzene can also be absorbed through the intact skin and will be absorbed faster through abraded skin.

Short-term (acute) exposures to high concentrations of benzene may result in feelings of breathlessness, irritability, euphoria, giddiness, or irritation of the eyes, nose or respiratory tract. Headaches, dizziness and feelings of nausea or intoxication may also occur. Severe exposures may lead to convulsions and loss of consciousness.

Periodic and long-term exposures to lower levels (chronic exposures) may result in various blood disorders, ranging from anemia to leukemia (an irreversible, fatal disease). Many blood disorders associated with benzene exposure may occur without symptoms.

Exposure Monitoring

The supervisor must determine by breathing zone air monitoring if employees are being exposed to concentrations of benzene that are over the AL or STEL. If levels are below the AL and STEL, no further air sampling is required unless procedures change. Affected employees must be informed of air monitoring results within 15 days of the supervisor receiving the results.

Training Requirements:

The Principal Investigator or supervisor must provide initial training to all personnel using benzene. If airborne levels reach or exceed the AL, annual benzene training is required. The training content must include the hazards of benzene, safety information, regulatory requirements, signs and symptoms of possible exposures to benzene, and medical surveillance requirements.

Medical Surveillance

Any employee who is exposed to benzene above the AL for more than 30 days per year, or exposed to benzene above the PEL for more than 10 days per year, must be evaluated by the Employee Occupational Health Services (EOHS). Based on the evaluation results, EOHS may recommend further evaluation, exposure restrictions, or job reassignment. Contact SRS at 505-277-2753 for safety information, guidance for air monitoring strategies, equipment and analytical result interpretation.

Last revised on 05/2018