

JOB SAFETY ANALYSIS

Safety Information for the University of California, Berkeley

HYDROGEN FLUORIDE EMERGENCY RESPONSE

* Hydrogen fluoride is a highly corrosive material and poses health hazards of potential inhalation and/or contact. Because of the potential for explosion, fire, and injury, at least one other person should be within sight and hearing range of the person performing the following tasks and be informed the procedure is about to begin.

TASK	HAZARDS	CONTROLS
<p>1. Assess the spill for volume, concentration and contaminated area.</p>	<p>Exposure to HF by contact and inhalation.</p>	<p>Avoid entry into area where release happened; discuss cause of release with person handling the material at a location away from contaminated area.</p> <p>Determine the activities that were being conducted at the release site.</p> <p>Determine if there are substances in the vicinity that may react with the HF.</p> <p>Determine if there are heat sources in the vicinity that may cause the HF to vaporize and de-energize them.</p> <p>Determine if there are other chemicals that could be an exposure problem during the cleanup.</p> <p>Make sure there is a sufficient supply of calcium gluconate gel within reach at the site during cleanup.</p> <p>Locate eye-wash and shower stations, and plot route of approach should the need either arise during cleanup.</p> <p>Locate sharp or abrasive lab equipment to prevent PPE damage during cleanup.</p> <p>Assess ventilation to determine if other areas could be contaminated if the HF were to vaporize.</p> <p>Plan entry and control during the tailgate safety meeting before entering cleanup area.</p>

	2. Select and don appropriate PPE.	Inadequate protection of selected PPE	Select the PPE based on the spill assessment of Task 1. Double check adequacy of PPE with an industrial hygienist or experienced responder.
		Slipping and falling during the donning of PPE	Suit up in an area free of equipment and debris. Don foot PPE while sitting. Use "buddy" system while donning with one assisting the other.
	3. Monitor atmosphere based on Task 1 using the appropriate Drager.	Exposure to HF by contact and inhalation	While monitoring for HF, wear appropriate PPE that has been double checked by an industrial hygienist or experienced responder for adequacy. Have calcium gluconate gel within reach by responders.
		Body injury and/or PPE failure due to the sharp ends of the separated Drager tube	Handle the separated Drager tube with caution and keep away from PPE. Deposit sharp end of the Drager tube immediately in an appropriate sharps container and set the container aside. Insert and secure the Drager tube into the pump carefully. Upon completion of the monitoring, place the used Drager tube in a sharps container and set the container outside of the cleanup area.
	4. Identify perimeter of contaminated area as well as equipment and furniture nearby that are also contaminated with HF.	Vision impairment due to PPE and/or inadequate lighting in the release area.	Wear PPE that fits well to afford full vision while performing tasks. Provide adequate lighting to the spill area to enable responder(s) to identify even small areas of contamination.
5. Apply neutralizer and search for other HF contamination near cleanup area.	Reaction with other chemicals that may be present within the spill area	Conduct a pilot application in a small area of the spill to make sure that only HF is present. If pilot application indicates presence of other chemical(s), depart cleanup area and conduct assessment of new chemical away from release site.	

		Contact with the HF	<p>Use the appropriate PPE with adequate protection.</p> <p>Systematically apply neutralizer starting from perimeter and working inwards to center of spill.</p> <p>Sprinkle the neutralizer on the spill area; do not dump material.</p> <p>Ensure that a sufficient supply of neutralizer is available and within reach.</p> <p>Avoid touching your bare skin, such as your neck.</p> <p>Have calcium gluconate gel within easy reach of responders.</p>
		Contact with other chemicals in the cleanup area	<p>Avoid contact with open containers such as pans or Petri dishes in the cleanup area.</p> <p>Use "buddy" system during cleanup so both can monitor the area.</p>
6. Decontaminate cleanup area and search for other HF-contaminated areas nearby.		Contact with unneutralized HF and other chemicals in the cleanup area.	<p>Do not use vacuum cleaner to pick up used neutralizer.</p> <p>If more HF contamination is discovered, apply more neutralizer; avoid destruction (tearing, puncturing, etc.) of PPE during cleanup and</p>
		Electrical hazards	<p>Disconnect or de-energize nearby equipment prior to handling and set them away from cleanup area if possible.</p> <p>Avoid contact with heat sources.</p>
		Other physical hazards	<p>Use tongs to pick up broken glass and other small items contaminated with HF or other chemicals.</p> <p>Hand decontaminated small items and remove them from the cleanup area as they are decontaminated.</p> <p>Properly dispose of used neutralizers, towels, other generated waste in a poly-bag or appropriate container and set aside.</p>
7. Check the pH of the decontaminated surfaces and search for other HF-contaminated area.		Exposure to un-neutralized HF.	<p>Use tongs when applying pH strips on the cleanup area to avoid contact exposure.</p> <p>Have calcium gluconate gel within reach of responders.</p>

<p>Other Information: Contributors: Created: JSA Library Number:</p>	8. Collect and appropriately contain generated waste; search for other HF-contaminated areas.	Body injury due to lifting twisting, and bending; physical hazards in the way	Use proper lifting techniques and practice proper handling of heavy or unwieldy objects; keep away from physical hazards during response.
		Sharps	Deposit sharps in appropriate sharps container.
		Slipping and falling	Ensure that footing is secure while moving equipment and supplies.
	9. Perform final cleanup and make	Contact with un-neutralized HF	Perform appropriate tasks on the newly discovered contaminated locations. Keep wearing appropriate PPE while performing the additional tasks.
		Slips and falls	Be sure footing is secure while moving equipment and supplies.
	10. Transport generated waste to designated collection point.	Inadequate controls	Refer to JSA for hazardous materials/waste transportation and handling.
	Required Training:	Required Personal Protective Equipment (PPE)	
	1. 24-hour initial Hazwoper training and current refresher trainings	1. Eye protection – safety glasses or goggles	
	2. Hazardous waste driver training and license	2. Face shield	
	3. Respirator training and fitting with required respirator or face piece	3. Double nitrile gloves, outer glove with gauntlet	
	4. Full protective suit impervious to HF		
	5. Slip resistant booties impervious to HF		
	6. Steel-toed shoes if warranted by physical hazards present at the cleanup site		
	<p>Emergency Response: EH&S Specialist Ave Tolentino; EH&S Specialist Gary Bayne October 2002 EHS-ER-34</p> <p><i>The development of Job Safety Analyses is a Balanced Scorecard initiative of the AVC-BAS Safety Committee, sponsored by the Associate Vice Chancellor-Business and Administrative Services (AVC-BAS) and the AVC-BAS Leadership Team ● http://bas.berkeley.edu/balancedscorecard</i></p>		