Title:	Safe use of Hexamethyldisilazane - HMDS
Issue Date:	14-August-2013
SOP#	SOP-EMC-YANG-020
Revision #	1

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Author of this Revision: Date:

First Name, Last Name, Title (i.e Ph.D)

Role (ie. Professor, Department of Biology)

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Reviewed by: Date:

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Role

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Approved by: Date:

First Name, Last Name, Title

Role

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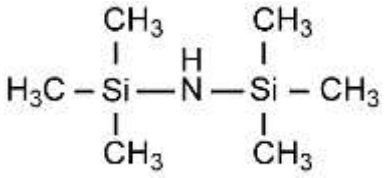
Authorized by: Date:

First Name, Last Name, Title

Role

1.0 **Purpose**:

HMDS $(CH_3)_3SiNHSi(CH_3)_3$ is a reagent used for biological sample preparation for SEM viewing. The aim of this guideline is to inform all personnel who use the Hexamethyldisilazane - HMDS about the proper procedures, safety concerns and to maximize the degree of efficiency.



2.0 **Scope and Applicability**:

This document applies to any persons who may be using Hexamethyldisilazane - HMDS to prepare solution or handling acidic solutions. Or anyone who may be in the area where these solutions will be handled.	
	Department, Lab or Center: Geochemistry Unit, Electron Microscopy Centre
	Research Group:
	Lab Bldg., Room(s): Science Building, Suite 012
	Operation/Experiment:

3.0 **Responsibilities**:

The user shall perform the following procedure within a biology lab where a fume hood is available to perform SEM sample preparation by using Hexamethyldisilazane - HMDS. Only trained personnel should perform the experiment. Individual's supervisor should be responsible to train and oversee the experiment when HMDS is involved.

4.0 **Health, Safety and Environmental Considerations**:

4.1 **Materials and Hazards**

Principal Materials Used	Flammable	Corrosive	Sensitizer	Mutagen	Teratogen	Biological Toxin	Acutely Toxic	Pyrophoric	Water-Reactive	Shock Sensitive	Carcinogen	Unstable	Other Comments
Hexamethyldisilazane - HMDS	X												Irritant, toxic

MSDS attached	X	Yes	If not, please explain:											
		No												
Describe equipment/instrumentation used to monitor/control hazards:														

	Permits:
	Mgmt. Approval:
	Training:
	Medical Surveillance:
	Other: • HMDS is extremely sensitive to moisture and should be handled under dry conditions. • Use only in a well-ventilated area and keep away from ignition sources.

4.3 **Special Emergency Procedures**

Fire/Evacuation:	**Fire Extinguishing Media:** Dry chemical, alcohol-resistant foam or carbon dioxide. **Do not use water.** **Special Information:** • In the event of a fire, wear full protective clothing and CSA-approved self-contained breathing apparatus with full face-piece operated in the pressure demand or other positive pressure mode. • Vapors can flow along surfaces to distant ignition source and flash back. • Water spray may be used to extinguish surrounding fire and cool exposed containers. Water spray will also reduce fume and irritant gases. **WARNING:** Air purifying respirators do not protect workers in oxygen-deficient atmospheres.

Chemical Spill:	• Ventilate area of leak or spill. • Remove all sources of ignition. • Wear appropriate personal protective equipment. Isolate hazard area. • Keep unnecessary and unprotected personnel from entering. Contain and recover liquid when possible. • Use non-sparking tools and equipment. • Collect liquid in an appropriate container or absorb with an inert material (e. g., vermiculite, dry sand, earth), and place in a chemical waste container. • Do not use combustible materials, such as saw dust. • Do not flush to sewer!
Medical Emergency:	**Inhalation:** Remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Call a physician immediately. **Ingestion:** If swallowed, DO NOT INDUCE VOMITING. Give large quantities of water. Never give anything by mouth to an unconscious person. Get medical attention immediately. **Skin Contact:** Wash exposed area with soap and water. Get medical advice if irritation develops. **Eye Contact:** Immediately flush eyes with plenty of water for at least 15 minutes, lifting lower and upper eyelids occasionally. Get medical attention immediately.
Personal Exposure:	

5.0 **Equipment and Supplies**:

Material(s):	

Special PPE Required:	
X	Goggles
	Face Shield
	Chemical Resistant Apron
X	Protective Clothing: lab coat

X	Gloves	
		Butyl
		Nitrile
		PVC
		Latex
		Neoprene
		Silver Shield brand
		Kevlar
	X	Other: Powder free gloves
	Respirator (If yes, contact EHS Office for additional assistance)	

Note: If special PPE and/or protective clothing is not required, standard PPE and protective clothing required in Part II. of the Department Chemical Hygiene Plan must be utilized.

6.0 **Terms and Definitions**:

Not Applicable

7.0 **Procedure**:

Biological Specimen Preparation with HMDS.

- Fix specimen with RM fix (3.0% formaldehyde + 1.5% Glutaraldehyde in 0.1M Na Cacodylate + 5mM Ca2+, 2.5% Sucrose, pH 7.4) at room temperature for about one hour.
- Wash in 0.1M Cacodylate /2.5% sucrose pH 7.4 3X 15' EA.
- (Optional) Post fix with 1% OsO_4 for 5 minutes, light tight. Rinse 3x with 100 mM sodium cacodylate.

  Note: Please refer to the SOPs regarding to safe use of OsO4 and sodium cacodylate buffers.
- One quick rinse in distilled water, then one quick rinse in cold 50% ethanol.
- Dehydrate with graded series of cold ethanol (70, 90, 100%); three 15' washes in freshly opened 100% ethanol at room temperature.

- Exchange with 50% ethanol/50% Hexamethyldisilazane (HMDS), 5 minutes rocking gently.
- Exchange with 100% HMDS, 10 minutes rocking gently.
- Exchange with 100% HMDS, remove excess and set to dry uncapped under the hood.

Storage

- If properly stored, this reagent is stable indefinitely.
- Store in a brown bottle or amber ampule at room temperature, in a dry, well-ventilated area away from ignition sources. Outside or detached storage is preferred.
- Containers should be bonded and grounded for transfers to avoid static sparks.
- Contact with strong oxidizers may cause fire.
- This highly flammable liquid must be kept from sparks, open flame, hot surfaces, and all sources of heat and ignition.

Handling HMDS

- Use non-sparking type tools and equipment, including explosion proof ventilation.
- Do not attempt to clean empty containers since residue is difficult to remove.
- Do not pressurize, cut, weld, braze, solder, drill, grind or expose such containers to heat, sparks, flame, static electricity or other sources of ignition: they may explode and cause injury or death.

Waste Disposal

- Whatever cannot be saved for recovery or recycling should be handled as hazardous waste and sent to or disposed in a SMU approved waste facility.
- Containers of this material may be hazardous when empty since they retain product residues (vapors, liquid); observe all warnings and precautions listed for the product.
- Processing, use or contamination of this product may change the waste management options.

Task	Hazards	Precautions

8.0 **References**:

Not Applicable

9.0 **Applicable regulations and/or legislation:**

10.0 **Revision History**:

Rev #	Revision Date	Review Date	SOP Section(s)	Revision Description	Revised By
0	14-August-2013			SOP-EMC-YANG-020 created	Xiang Yang
1	Feb 20, 2015		9.0	- Added	Xiang Yang