

Principal Investigator: _____

Date Approved: _____

This document covers basic chemical safety information for dimethylcadmium and supplements the laboratory Chemical Hygiene Plan as appropriate. The use of dimethylcadmium is subject to pre-approval by the Principal Investigator (PI) and/or designated Laboratory Responsible Safety Person. DO NOT USE DIMETHYLCADMIUM UNTIL YOU HAVE OBTAINED THE NECESSARY PRE-APPROVAL.

Dimethylcadmium

Dimethylcadmium ($\text{Cd}(\text{CH}_3)_2$) is a toxic, colorless, foul-smelling liquid that fumes in air due to its relatively high vapor pressure (33 mm Hg at 25 °C). This highly flammable substance (flash point = -18 °C) is also water reactive, producing the flammable gas methane and toxic cadmium oxide vapors upon contact with water or moist air. It can form explosive metal peroxides upon exposure to air. It can be fatal in small doses when ingested or inhaled. Dimethylcadmium also has the potential to cause cancer and interfere with fertility, fetal development, and/or lactation.

Dimethylcadmium is typically used in organic chemical synthesis and metal-organic chemical vapor deposition (MOCVD).



Personal Protective Equipment & Personnel Monitoring

**Lab Coat**

Flame-resistant lab coat.

**Gloves**

If used outside of a glove box, Silver Shield/4H gloves should be worn underneath nitrile gloves.

**Eye Protection**

ANSI Z87.1-compliant safety goggles, or face shield if a splash hazard is present.

Do not wear latex gloves.

Labeling & Storage

Store in a glove box whenever possible. Otherwise keep container tightly closed in a cool, dry, and well-ventilated place. Store away from water and aqueous solutions. Isolate from incompatible materials such as strong oxidizers, strong acids, and strong bases. Store away from heat sources and in a flameproof area. Containers which are opened must be carefully resealed and kept upright to prevent leakage. Keep contact with air or oxygen limited to prevent formation of cadmium oxide vapors or dimethylcadmium peroxide – a friction-sensitive explosive.

Each container's label must include appropriate pictograms and identify the material as water reactive, acutely toxic, a reproductive toxicant, and a carcinogen. Containers of these materials must be stored in leak-proof secondary containment within a designated area. The secondary container's label must include appropriate pictograms and identify the material as water reactive, acutely toxic, a reproductive toxicant, and a carcinogen. Also, if not plainly visible (e.g., through a cabinet window), labelling must be applied to storage locations where dimethylcadmium is stored to avoid an inadvertent encounter.

Engineering Controls, Equipment & Materials

Glove Box Work under an inert atmosphere (e.g., argon, nitrogen) in a glove box.

Fume Hood If a glove box can't be used, work in a chemical fume hood away from any water or ignition sources. If your protocol does not permit the handling of dimethylcadmium in a fume hood, contact the Department of Environmental Health, Safety and Sustainability (EHSS) to determine whether additional respiratory protection is warranted.

Housekeeping

Spills Notify others in the area of the spill, including your PI/Responsible Safety Person. If it is a small spill that you can easily handle, use the contents of your lab spill kit to clean it up. If it is a large spill, then evacuate the area where the spill occurred. Call Vanderbilt University Public Safety (VUPS) at 615-421-1911 or use the VandySafe app on your smart phone. Report any exposure through Risk and Insurance Management's Origami portal and mark that it occurred in research when prompted. Both VUPS and the Origami system will notify EHSS of the incident. Remain on site at a safe distance to provide detailed information to first responders.

Decontamination Wearing proper PPE, wipe up any residue with absorbent pads and clean the area with an alcohol solvent. Dispose of the contaminated disposables as extremely hazardous waste following the EHSS guidelines.

Waste Dimethylcadmium should be collected in a sealed container free from water and disposed of as extremely hazardous waste.
Refer to the laboratory *Chemical Hygiene Plan* (Section 6.7) for information on proper chemical waste disposal procedures.

First Aid & Emergencies

Fire **DO NOT** use water to put out fire, instead use a Class B fire extinguisher.

Skin Contact Immediately remove contaminated clothing and shoes; flush skin with water for at least 15 minutes. Get medical attention immediately.

Eye Contact Check for and remove contact lenses. Immediately flush eyes with water for at least 15 minutes. Get medical attention immediately.

Inhalation Move person into fresh air. Get medical attention immediately.

Ingestion Do not induce vomiting. Get medical attention immediately.

Name	Signature	Date