



MATERIAL SAFETY DATA SHEET
COMPLIES WITH 29 CFR 1910.1200.
OSHA HAZARD COMMUNICATION RULE

DATE OF LAST REVISION: 03-15-95

CHEMICAL IDENTITY

LABEL IDENTITY	Cadmium Selenide		
CHEMICAL NAME/SYNONYMS	Cadmium Selenide		
FORMULA	CdSe		
CHEMICAL FAMILY	Metal Selenide		
CAS REGISTRY NUMBER	1306-24-7		
HAZARDOUS INGREDIENTS	Cadmium Selenide		
%	OSHA/PEL	ACGIH TLV	OTHER LIMITS
0.0 - 100.00	5ug(Cd)/m3	.05mg(Cd)/m3	CL 0.6mg/m3

PHYSICAL AND CHEMICAL PROPERTIES

COLOR, FORM AND ODOR	Brown-brownish red powder, pieces, odorless
BOILING POINT	NE or NA
VAPOR DENSITY (AIR=1)	NA
VAPOR PRESSURE (MM HG)	NA
% VOLATILE BY VOLUME (%)	ND
REACTION WITH WATER	ND
EVAPORATION RATE (H2O=1)	NA
SOLUBILITY IN WATER	Insoluble
MELTING POINT	NE or NA
SPECIFIC GRAVITY (WATER=1)	5.81 @ 4.0°C

FIRE AND EXPLOSION HAZARD DATA

FLASH POINT: **NA** FLAMMABILITY: **Nonflammable**

EXTINGUISHING MEDIA: **Not applicable. Use suitable extinguishing media for surrounding materials and type of fire.**

SPECIAL FIRE FIGHTING PROCEDURES: **fire fighters must wear full face, self-contained breathing apparatus with full protective clothing to prevent contact with skin and eyes. Fumes from fire are hazardous. Isolate runoff to prevent environmental pollution.**

UNUSUAL FIRE & EXPLOSION HAZARDS : **when heated to decomposition, cadmium selenide may emit toxic fumes of cadmium, selenium and oxides of cadmium and selenium. Material may react exothermically on contact with water or moisture. Decomposes in air or acids. On contact with water or moisture, hydrogen selenide may be evolved.**



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HEALTH HAZARD INFORMATION

TOXICITY DATA

No data

HMIS RATING:

HEALTH: **4*** FLAMMABILITY: **0** REACTIVITY: **1** PERSONAL PROTECTION: **J**

ROUTES OF ENTRY

INHALATION:	Yes
EYES:	No
SKIN:	No
INGESTION:	Yes

MEDICAL CONDITIONS AGGRAVATED BY OVEREXPOSURE: **Kidney, liver or respiratory dysfunction, skin, blood or bone disorders.**

HEALTH HAZARDS (acute and chronic): **to the best of our knowledge the chemical, physical and toxicological properties of cadmium selenide have not been thoroughly investigated or recorded.**

Cadmium compounds are confirmed carcinogens producing lung tumors. Poison by ingestion. Inhalation of fumes or dusts affects the respiratory tract and the kidneys. Brief exposure to high concentrations may result in pulmonary edema and death. Fatal concentrations may be breathed without sufficient discomfort to warn a worker to leave the exposure. Cadmium oxide fumes can cause metal fume fever. (Sax, Dangerous Properties of Industrial Materials, 8th edition)

Selenium compounds are poison by inhalation and intravenous routes. Some selenium compounds are experimental carcinogens. Long term exposure may be a cause of amyotrophic lateral sclerosis in humans, just as it may cause "blind staggers" in cattle. Elemental selenium has low acute systemic toxicity, but dust or fumes can cause serious irritation of the respiratory tract. Inorganic selenium compounds can cause dermatitis. (Sax, Dangerous Properties of Industrial Materials, 8th edition.)

INHALATION: (acute) may cause irritation of the upper respiratory system vertigo, constriction of the throat, metallic taste in the mouth and cough, garlic odor to breath, nervousness, depression, dyspnea, cyanosis, chest pain, flu-like symptoms, pulmonary edema and acute seleniosis. More severe exposure may cause pulmonary fibrosis/hypertrophy of bronchial vessels and renal necrosis and/or liver damage. (chronic) may cause irreversible lung injury, pulmonary fibrosis, damage to the olfactory nerve and chronic seleniosis. All routes of entry may cause kidney damage, osteomalacia, osteoporosis, spontaneous fractures, hemolytic and iron-deficiency anemia, weight loss, irritability, renal tubular necrosis, cardiovascular effects, liver damage, and prostratic and respiratory cancers.



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HEALTH HAZARD INFORMATION CONTINUED

INGESTION: (acute) may cause irritation of mouth, throat and digestive system, increased salivation, burning sensation and cramps in stomach, nausea, headache, vomiting, weakness, dizziness, diarrhea, shock, convulsions, coma and death. (chronic) may cause irreversible renal tubular dysfunction, functional changes in the liver, pancreas and adrenal glands.

SKIN: (acute) may cause local irritation and possible burns. (chronic) may cause dermatitis.

EYES: (acute) may cause irritation, redness, pain and smarting. (chronic) may cause conjunctivitis and blurred vision.

TARGET ORGANS: may affect the respiratory system, liver, kidneys, prostate, blood, skin and eyes.

CARCINOGENICITY: Yes **NTP:** Yes **IARC MONOGRAPHS:** Yes **OSHA REGULATE:** Yes

SIGNS AND SYMPTOMS OF EXPOSURE:

INHALATION: throat dryness, cough, headache, vomiting, chest pain, extreme restlessness and irritability, pneumonitis, possibly bronchopneumonia. Acute selenosis may cause: nervousness, fever, vomiting, somnolence, drop in blood pressure, labored breathing, spasms and the toxic action on the nervous system from prolonged convulsions, may lead to respiratory failure. Chronic selenosis may cause: depression, marked pallor, coated tongue, gastrointestinal disturbances, garlic odor breath, kidney, liver and spleen damage, hemolytic anemia, and loss of nails and hair.

SKIN: redness, itching and burning.

EYES: redness itching, burning and watering.

REACTIVITY DATA

STABILITY	Stable
CONDITIONS CONTRIBUTING TO UNSTABILITY	None
INCOMPATIBILITY (MATERIALS TO AVOID)	Strong oxidizing agents and acids
HAZARDOUS DECOMPOSITION PRODUCTS	Airborne cadmium fumes, cadmium oxide, hydrogen selenide and hydrogen gas
HAZARDOUS POLYMERIZATION	Will Not Occur
CONDITIONS TO AVOID	None



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HEALTH HAZARD INFORMATION CONTINUED

EMERGENCY AND FIRST AID PROCEDURES:

INHALATION: remove victim to fresh air; if conscious, encourage victim to blow nose, cough up, then spit out mucous and saliva; keep warm and quiet; give oxygen if breathing is difficult and seek medical attention immediately.

INGESTION: seek medical attention immediately.

SKIN: remove contaminated clothing from affected area; brush material off skin. Wash affected area with mild soap and water. Seek medical attention immediately.

EYES: flush eyes with lukewarm water, lifting upper and lower eyelids, for at least 15 minutes. Seek medical attention.

SAFE HANDLING AND USE

STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED: wear appropriate respiratory and protective equipment specified below “special protective information”. Isolate spill area and provide ventilation. Scoop or vacuum up spill using a high efficiency particulate absolute (HEPA) air filter and place in a closed container for proper disposal. Take care not to raise dust.

WASTE DISPOSAL METHOD: dispose of in accordance with applicable federal, state and local regulations for disposal.

SPECIAL PROTECTIVE INFORMATION

RESPIRATORY PROTECTION	NIOSH/MSHA approved respirator
LOCAL EXHAUST	Maintain below PEL, TLV
MECHANICAL (general)	Not recommended
SPECIAL	Enclose process if possible
OTHER	Engineering and work practices
PROTECTIVE GLOVES	Rubber, butyl, PVC
EYE PROTECTION	Vented goggles and/or face shield
OTHER PROTECTIVE CLOTHING/EQUIPMENT	Protective gear to suitable to prevent contamination of skin and clothing.

Implement engineering and work practice controls to reduce and maintain concentration of exposure to cadmium at or below PEL. [OSHA 29 CFR 1910.1027 (f)(1)(I)]. Handle in controlled, inert atmosphere. Minimize exposure of cadmium by local exhaust and enclosing process if/when possible. Use good housekeeping and sanitation practices. Do not use tobacco or food in work area. Wash thoroughly before eating or smoking. Shower and change clothes at the end of work shift (DO NOT wear contaminated clothing home). Do not blow dust off clothing or skin with compressed air.



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SPECIAL PRECAUTIONS

PRECAUTIONS TO BE TAKEN IN HANDLING/STORAGE: **The above is OSHA 29 CFR 1910.1027 (m)(3)(ii) minimum requirement for cadmium warning labels. Store in tightly sealed container in a cool, dry area away from heat and sources of ignition. Wash thoroughly after handling.**

TRANSPORTATION REQUIREMENTS	DOT CLASS:	ND
	UN NUMBER:	ND
	IMCO CLASS:	ND

HAZARD LABEL INFORMATION:

DANGER: CONTAINS CADMIUM

AVOID CREATING DUSTS (Use chemical splash goggles and face shield)

CAN CAUSE LUNG AND KIDNEY DISEASES

OTHER PRECAUTIONS: **DO NOT breath or ingest dust.**

THE ABOVE INFORMATION IS ACCURATE TO THE BEST OF OUR KNOWLEDGE. HOWEVER, SINCE DATA, SAFETY STANDARDS AND GOVERNMENT REGULATIONS ARE SUBJECT TO CHANGE THE CONDITIONS OF HANDLING AND USE, OR MISUSE ARE BEYOND OUR CONTROL, **ANGSTROM SCIENCES** MAKE NO WARRANTY, EITHER EXPRESSED OR IMPLIED, WITH RESPECT TO THE COMPLETENESS OR CONTINUING ACCURACY OF THE INFORMATION CONTAINED HEREIN AND DISCLAIMS ALL LIABILITY FOR THE RELIANCE THEREON. USER SHOULD SATISFY HIMSELF THAT HE HAS ALL CURRENT DATA RELEVANT TO HIS PARTICULAR USE.

NA= NOT APPLICABLE

ND= NO DATA FOUND

NR=NOT RECORDED