

SAFETY DATA SHEET

1. SUBSTANCE AND SOURCE IDENTIFICATION

Product Identifier

SRM Number: C2418
SRM Name: High-Purity Lead
Other Means of Identification: Not applicable.

Recommended Use of This Material and Restrictions of Use

This Standard Reference Material (SRM) is intended for use as a composition standard for optical emission spectrometric methods of analysis. A unit of SRM C2418 consists of one disk approximately 50 mm (2 in.) in diameter and 16 mm (5/8 in.) thick.

Company Information

National Institute of Standards and Technology
 Standard Reference Materials Program
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 FAX: 301-948-3730
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 1-800-424-9300 (North America)
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2. HAZARDS IDENTIFICATION

Classification

Physical Hazard: Not classified.
Health Hazard: Acute Toxicity, Oral – Category 4
 Acute Toxicity, Inhalation – Category 4
 Carcinogenicity – Category 1B
 Reproductive Toxicity – Category 1A
 STOT, Repeated Exposure – Category 2

Label Elements

Symbol:



Signal Word: DANGER

Hazard Statement(s):

H302 Harmful if swallowed.
 H332 Harmful if inhaled.
 H350 May cause cancer.
 H360 May damage fertility or the unborn child.
 H373 May causes damage to organs through prolonged or repeated exposure.

Precautionary Statement(s):

P201 Obtain special instructions before use.
 P202 Do not handle until all safety precautions have been read and understood.
 P260 Do not breathe dust.
 P264 Wash hands thoroughly after handling.
 P270 Do not eat, drink or smoke when using this product.
 P271 Use only outdoors or in a well-ventilated area.
 P280 Wear protective gloves, protective clothing, and eye protection.

P301 + P312 If swallowed: Call a doctor if you feel unwell.
P330 Rinse mouth.

P304 + P340 If inhaled: Remove person to fresh air and keep comfortable for breathing.

P308 + P313 If exposed or concerned: Get medical attention.

P405 Store locked up.

P501 Dispose of contents and container in accordance with applicable regulations.

Hazards Not Otherwise Classified: Not applicable.

Ingredients(s) with Unknown Acute Toxicity: Not applicable.

3. COMPOSITION AND INFORMATION ON HAZARDOUS INGREDIENTS

Substance: Lead

Other Designations: Plumbum

Hazardous Component(s)	CAS Number	EC Number (EINECS)	Nominal Mass Concentration (%)
Lead	7439-92-1	231-100-4	99.99

4. FIRST AID MEASURES

Description of First Aid Measures:

Inhalation: If adverse effects occur, remove to uncontaminated area. If not breathing, give artificial respiration or oxygen by qualified personnel. Seek immediate medical attention.

Skin Contact: Wash skin with soap and water for at least 15 minutes. If necessary, seek medical attention.

Eye Contact: Flush eyes with water for at least 15 minutes. If necessary, seek medical attention.

Ingestion: If a large amount is swallowed, seek medical attention.

Most Important Symptoms/Effects, Acute and Delayed: Nausea, vomiting, metallic taste, thirst, a burning sensation in the mouth and throat, salivation, abdominal pain with severe colic. Delayed effects include cancer, birth defects, and reproductive effects.

Indication of any immediate medical attention and special treatment needed, if necessary: If any of the above symptoms are present, seek medical attention if needed.

5. FIRE FIGHTING MEASURES

Fire and Explosion Hazards: Negligible fire hazard. See Section 9, "Physical and Chemical Properties" for flammability properties.

Extinguishing Media:

Suitable: Use extinguishing media appropriate for the surrounding area.

Unsuitable: None listed.

Specific Hazards Arising from the Chemical: None listed.

Special Protective Equipment and Precautions for Fire-Fighters: Avoid inhalation of material or combustion byproducts. Wear full protective clothing and NIOSH approved self-contained breathing apparatus (SCBA).

NFPA Ratings (0 = Minimal; 1 = Slight; 2 = Moderate; 3 = Serious; 4 = Severe)

Health = 1

Fire = 0

Reactivity = 0

6. ACCIDENTAL RELEASE MEASURES

Personal Precautions, Protective Equipment and Emergency Procedures: Keep unnecessary personnel away. Use suitable protective equipment; see Section 8, "Exposure Controls and Personal Protection".

Methods and Materials for Containment and Clean up: Notify safety personnel of spills. Collect spilled material in appropriate container for disposal. Isolate hazard area and deny entry.

7. HANDLING AND STORAGE

Safe Handling Precautions: See Section 8, “Exposure Controls and Personal Protection”.

Storage: Store and handling in accordance with all current regulations and standards.

8. EXPOSURE CONTROLS AND PERSONAL PROTECTION

Exposure Limits:

NIOSH REL (TWA): 0.050 mg/m³

NIOSH REL (IDLH): 100 mg/m³

ACGIH TLV (TWA): 0.05 mg/m³

OSHA PEL (TWA): 50 µg/m³

OSHA PEL (Action Level): 30 µg/m³ (See 29 CFR 1910.1025)

Engineering Controls: Provide local exhaust or process enclosure ventilation system. Ensure compliance with applicable exposure limits.

Personal Protection: In accordance with OSHA 29 CFR 1910.132, subpart I, wear appropriate Personal Protective Equipment (PPE) to minimize exposure to this material.

Respiratory Protection: If workplace conditions warrant a respirator, a respiratory protection program that meets OSHA 29CFR 1910.134 must be followed. Refer to NIOSH 42 CFR 84 for applicable certified respirators.

Eye/Face Protection: Wear chemical resistant safety goggles. An eyewash station should be readily available near areas of use.

Skin and Body Protection: Personal protective equipment for the body should be selected based on the task being performed and the risks involved and should be approved by a specialist before handling this product. Chemical-resistant gloves should be worn at all times when handling chemicals.

9. PHYSICAL AND CHEMICAL PROPERTIES

Descriptive Properties:

Lead

Appearance (physical state, color, etc.):	solid white to gray
Molecular Formula:	Pb
Molar Mass (g/mol):	207.20
Odor:	not available
Odor threshold:	not available
pH:	not available
Evaporation rate:	not applicable
Melting point/freezing point (°C):	328 (622 °F)
Relative Density (g/L):	11.3 (relative to water)
Vapor Pressure (mmHg):	1.3 at 970 °C
Vapor Density (air = 1):	not applicable
Viscosity (cP):	not applicable
Solubility(ies):	almost insoluble in water and soluble in nitric acid and hot concentrated sulfuric acid
Partition coefficient (n-octanol/water):	not available
Particle Size:	not applicable

Descriptive Properties:**Lead****Thermal Stability Properties:**

Autoignition Temperature (°C):	not available
Thermal Decomposition (°C):	not available
Initial boiling point and boiling range (°C):	1740 (3164 °F)
Explosive Limits, LEL (Volume %):	not available
Explosive Limits, UEL (Volume %):	not available
Flash Point (°C):	not available
Flammability (solid, gas):	not available

10. STABILITY AND REACTIVITY

Reactivity: Stable at normal temperatures and pressure.

Stability: X Stable Unstable

Possible Hazardous Reactions: No data available.

Conditions to Avoid: None reported.

Incompatible Materials: Oxidizing materials, halogens, combustible materials, peroxides, metals, metal carbide, and acids.

Fire/Explosion Information: See Section 5, "Fire Fighting Measures".

Hazardous Decomposition: Oxides of lead.

Hazardous Polymerization: Will Occur X Will Not Occur

11. TOXICOLOGICAL INFORMATION

Route of Exposure: X Inhalation Skin X Ingestion

Symptoms Related to the Physical, Chemical and Toxicological Characteristics: Fatigue, weakness, anorexia, anemia, jaundice, encephalopathy.

Potential Health Effects (Acute, Chronic and Delayed):

Inhalation: Short term inhalation of lead may cause irritation, nausea, vomiting, kidney damage, liver damage. Prolonged exposure to lead may result in an accumulation in body tissues and exert adverse effects on the blood, nervous system, heart, endocrine and immune systems, kidneys, and reproduction.

Skin Contact: Prolonged or repeated exposure to lead may cause irritation; exposure to lead powder may cause dermatitis.

Eye Contact: Contact with lead may cause eye irritation

Ingestion: Ingestion of this material is unlikely under normal conditions of use. Ingestion of lead may cause kidney damage or liver damage; chronic ingestion may result in accumulation in body tissues and may also cause cancer.

Numerical Measures of Toxicity:

Acute Toxicity: Category 4 oral and Category 4 inhalation.

Lead is classified as Category 4 oral and Category 4 inhalation.

Skin Corrosion/Irritation: Not classified; no data available.

Serious Eye damage/ Eye irritation: Not classified; no data available.

Respiratory Sensitization: Not classified; no data available.

Skin Sensitization: Not classified; no data available.

Germ Cell Mutagenicity: Not classified; no data available.

Carcinogenicity: Category 1B

Listed as a Carcinogen/Potential Carcinogen X Yes No

Lead is listed as reasonably anticipated to be a human carcinogen per NTP.

IARC lists inorganic lead in Group 2A (probably carcinogenic to humans).

Reproductive Toxicity: Category 1A; lead crosses the placenta and may affect the fetus causing birth defects, mental retardation, behavioral disorders, and death during the first year of childhood.

Specific Target Organ Toxicity, Single Exposure: Not classified; no data available.

Specific Target Organ Toxicity, Repeated Exposure: Category 2; lead can accumulate in body tissues.

Aspiration Hazard: Not applicable.

12. ECOLOGICAL INFORMATION

Ecotoxicity Data:

Lead Fish Toxicity:

Carp (*Cyprinus carpio*), LC50: 0.44 mg/L (96 hours, semi-static)

Trout (*Oncorhynchus mykiss*), LC50: 1.17 mg/L (96 hours, flow-through)

Persistence and Degradability: No data available.

Bioaccumulative Potential: No data available.

Mobility in Soil: No data available.

Other Adverse effects: No data available.

13. DISPOSAL CONSIDERATIONS

Waste Disposal: Dispose of waste in accordance with all applicable federal, state, and local regulations. Lead Hazardous Waste Number(s): D008. Lead subject to U.S. EPA 40 CFR 262 for concentrations at or above the Regulatory level of 5.0 mg/L.

14. TRANSPORTATION INFORMATION

U.S. DOT and IATA: Not regulated by DOT or IATA.

15. REGULATORY INFORMATION

U.S. Regulations:

CERCLA Sections 102a/103 (40 CFR 302.4):

Lead: 10 lbs final RQ (4.54 kg final RQ) – no reporting of releases of this hazardous substance is required if the diameter of the pieces of the solid metal released is >100 µm.

SARA Title III Section 302 (40 CFR 355.30): Not regulated.

SARA Title III Section 304 (40 CFR 355.40): Not regulated.

SARA Title III Section 313 (40 CFR 372.65):

Lead: 10 lbs final RQ: 0.1 % Supplier notification limit; 0.1 % de minimis concentration (when contained in stainless steel, brass, or bronze).

OSHA Process Safety (29 CFR 1910.119): Not regulated for this SRM.

SARA Title III Sections 311/312 Hazardous Categories (40 CFR 370.21):

ACUTE HEALTH: Yes.

CHRONIC HEALTH: Yes.

FIRE: No.

REACTIVE: No.

PRESSURE: No.

State Regulations:

California Proposition 65:

WARNING! This product contains chemicals (lead) known to the state of California to cause cancer.

WARNING! This product contains a chemical (lead) known to the state of California to cause reproductive/developmental effects.

U.S. TSCA Inventory: Lead listed.

TSCA 12(b), Export Notification: Not listed.

Canadian Regulations:

WHMIS Information: Not provided for this material.

16. OTHER INFORMATION

Issue Date: 25 June 2014

Sources: ChemAdvisor, Inc., MSDS *Lead*, 21 March 2014.

Key of Acronyms:

ACGIH	American Conference of Governmental Industrial Hygienists	NTP	National Toxicology Program
CAS	Chemical Abstracts Service	OSHA	Occupational Safety and Health Administration
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act	PEL	Permissible Exposure Limit
CFR	Code of Federal Regulations	RCRA	Resource Conservation and Recovery Act
DOT	Department of Transportation	REL	Recommended Exposure Limit
EINECS	European Inventory of Existing Commercial Chemical Substances	RQ	Reportable Quantity
EPCRA	Emergency Planning and Community Right-to-Know Act	RTECS	Registry of Toxic Effects of Chemical Substances
IARC	International Agency for Research on Cancer	SARA	Superfund Amendments and Reauthorization Act
IATA	International Air Transportation Agency	SCBA	Self-Contained Breathing Apparatus
IDLH	Immediately Dangerous to Life and Health	SRM	Standard Reference Material
LC50	Lethal Concentration	STEL	Short Term Exposure Limit
LD50	Median Lethal Dose or Lethal Dose, 50 %	STOT	Specific Target Organ Toxicity
LEL	Lower Explosive Limit	TLV	Threshold Limit Value
MSDS	Material Safety Data Sheet	TPQ	Threshold Planning Quantity
NFPA	National Fire Protection Association	TSCA	Toxic Substances Control Act
NIOSH	National Institute for Occupational Safety and Health	TWA	Time Weighted Average
NIST	National Institute of Standards and Technology	UEL	Upper Explosive Limit
n.o.s.	Not Otherwise Specified	WHMIS	Workplace Hazardous Materials Information System

Disclaimer: Physical and chemical data contained in this SDS are provided only for use in assessing the hazardous nature of the material. The SDS was prepared carefully, using current references; however, NIST does not certify the data in the SDS. The certified values for this material are given in the NIST Certificate of Analysis.

Users of this SRM should ensure that the SDS in their possession is current. This can be accomplished by contacting the SRM Program: telephone (301) 975-2200; fax (301) 948-3730; e-mail srmmsds@nist.gov; or via the Internet at <http://www.nist.gov/srm>.