

MATERIAL SAFETY DATA SHEET

1. SUBSTANCE AND SOURCE IDENTIFICATION

National Institute of Standards and Technology
Standard Reference Materials Program
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SRM Number: 2780
MSDS Number: 2780
SRM Name: Hard Rock Mine Waste

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Description: This Standard Reference Material (SRM) is intended for use in the evaluation of methods and for the calibration of apparatus used to determine heavy metals and other elements in hard rock mine waste and materials of a similar matrix. SRM 2780 is composed of material collected from a waste pile of an abandoned mine site near Silverton, CO. A unit consists of approximately 50 g of material of which 90 % passes a 150 µm (No. 100) sieve.

Substance: Mine Waste

Other Designations: Not applicable.

2. HAZARDS IDENTIFICATION

NFPA Ratings (Scale 0–4): Health = 1 Fire = 0 Reactivity = 0

NOTE: The health and physical hazard information provided in this MSDS are for silica (quartz) and lead. No physical or chemical data are listed for this compound mixture. The actual effects of the material may differ from the individual components.

Major Health Hazards: Lead is a cumulative toxin and repeated exposures can cause high levels to build up in the Overexposure to lead, either through acute or chronic exposure, can result in severe damage to the nervous system, urinary system, reproductive system and hemato-poietic system.

Physical Hazards: Not applicable..

Potential Health Effects:

Inhalation:

Silica: Acute and chronic exposure: irritation, digestive disturbances, chest pain, fatigue, sleep disturbances, muscle cramps, kidney damage, liver damage, paralysis, brain damage, convulsions.

Lead: Short term (acute) exposure to high concentrations of lead or lead compounds may result in irritation of the respiratory tract, nausea vomiting, stomach pain, convulsions, kidney damage, liver damage, brain damage, eye damage, hormonal disorders, blood disorders, nerve damage, reproductive disorders in both men and women and birth defects. Long term (chronic) exposure may result in all of the same effects as acute exposure. There is no sharp dividing line between the acute and chronic effects of lead exposure.

Skin Contact: Silica and Lead: Acute: mechanical irritation; chronic: dermatitis.

Eye Contact: Silica and Lead: Acute: mechanical irritation; chronic: conjunctivitis

Ingestion: See above for inhalation.

Listed as a Carcinogen/Potential Carcinogen: Silica and Lead

	Yes	No
National Toxicology Program (NTP) Report on Carcinogens	X ^(a)	_____
International Agency for Research on Cancer (IARC) Monographs	X ^(b)	_____
Occupational Safety and Health Administration (OSHA)	_____	X

^(a)Silica, crystalline, is listed as a known carcinogen per NTP. Lead is listed as reasonably anticipated to be a human carcinogen per NTP.

^(b)IARC lists crystalline silica a Group 1 (carcinogenic to humans). IARC lists inorganic lead in Group 2A (probably carcinogenic to humans).

3. COMPOSITION AND INFORMATION ON HAZARDOUS INGREDIENTS

Component	CAS Number	EC Number (EINECS)	Nominal Concentration (%)
Silica as quartz	14808-60-7	238-878-4	31
Lead	7439-92-1	231-100-4	0.6

NOTE: The material's average particulate size, as manufactured, is above the inhalation particulate size (100 micrometers or 100 microns) established by the ACGIH, Appendix D. This material contains organic and inorganic compounds incorporated in the hard rock waste matrix (see Certificate of Analysis), which have been reported to have toxic, mutagenic, and/or carcinogenic properties, and should be handled with care. The concentration of the ones not listed above are below the reportable limit: hazardous components (1 %); carcinogens (0.1 %), required by OSHA, 29 CFR 1910.1200 (g)(2)(i)(C)(1), for MSDS information.

Component: Silica

EC Classification (assigned): not classified.

EC Risk (R): not assigned.

EC Safety (S): not assigned.

Component: Lead

EC Classification (assigned): Xn, N

EC Risk (R): R20/22, R33, R50/53, R61, R62.

EC Safety (S): S45, S53, S60, S61.

EC Risk/Safety Phrases: See Section 15, "Regulatory Information".

4. FIRST AID MEASURES

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

Skin Contact: Rinse affected area with soap and water for at least 15 minutes. Seek medical assistance if necessary.

Eye Contact: Immediately flush eyes, including under the eyelids, with copious amounts of water for at least 15 minutes. Seek immediate medical attention.

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

5. FIRE FIGHTING MEASURES

Fire and Explosion Hazards: Slight fire hazard. Dust/air mixtures may ignite.

Extinguishing Media: Regular dry chemical, carbon dioxide, water, regular foam.

Fire Fighting: Avoid inhalation of combustion by-products.

Flash Point (°C): Not applicable.

Method Used: Not applicable.

Autoignition Temp. (°C): Not applicable.

Flammability Limits in Air

UPPER (Volume %): Not applicable.

LOWER (Volume %): Not applicable.

6. ACCIDENTAL RELEASE MEASURES

Occupational Release: Minimize dust. Collect spilled material in appropriate container for proper disposal.

Disposal: Refer to Section 13, "Disposal Considerations".

7. HANDLING AND STORAGE

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

Safe Handling Precautions: See Section 8 "Exposure Controls and Personal Protection".

8. EXPOSURE CONTROLS AND PERSONAL PROTECTION

Exposure Limits:

Quartz:

OSHA (TWA): (30)/(%SiO₂ + 2) mg/m³ (total dust); (10)/(%SiO₂ + 2) mg/m³ (respirable fraction)

ACGIH (TWA): 0.025 mg/m³ (respirable fraction)

NIOSH (TWA): 0.05 mg/m³ (respirable dust)

NIOSH (IDLH): 50 mg/m³ (respirable dust)

UK WEL (TWA): 0.1 mg/m³ (quartz, respirable crystalline) 8 hour

UK WEL (TWA): 6 mg/m³ (inhalable dust, silica, amorphous) 8 hour

UK WEL (TWA): 2.4 mg/m³ (respirable dust, silica, amorphous) 8 hour

Lead:

OSHA (TWA): 50 µg/m³; 30 µg/m³ action level

ACGIH (TWA): 0.05 mg/m³

NIOSH (TWA): 0.05 mg/m³

NIOSH (IDLH): 100 mg/m³

EU (TWA): 0.15 mg/m³

Ventilation: Local exhaust ventilation system.

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

Eye Protection: Wear safety goggles. An eye wash station and drench shower should be readily available near the handling and use areas.

Personal Protection: Chemically resistant gloves and clothing are recommended.

9. PHYSICAL AND CHEMICAL PROPERTIES

Property	Silica	Lead
Appearance and Odor	Colorless to white, odorless.	White to gray solid; odor not available
Molar Mass	60.09 g/mol	207.2 g/mol
Molecular Formula	SiO ₂	Pb
Specific Gravity (water = 1)	1.5027 (25 °C)	11.3
Water Solubility	Miscible	Almost insoluble
Vapor Pressure	0 mmHg (20 °C)	1.3 mmHg (970 °C)

NOTE: The physical and chemical data provided are for the pure components. Physical and chemical data for the hard rock mine waste does not exist.

10. STABILITY AND REACTIVITY

Stability: Stable Unstable

Stable at normal temperature and pressure.

Conditions to Avoid: Avoid heat, flames, sparks, and other ignition sources. Avoid generating dust. Avoid contact with incompatible materials.

Incompatible Materials: Oxidizing materials, metals, metal salts, halogens, combustible materials, reducing agents, bases, acids.

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

Hazardous Decomposition: Oxides of carbon, oxides of lead

Hazardous Polymerization: _____ Will Occur X Will Not Occur

11. TOXICOLOGICAL INFORMATION

The toxicological information of the SRM as a whole has not been studied. The toxicological properties of the hazardous components listed in Section 2 are detailed below.

Route of Entry : X Inhalation _____ Skin _____ Ingestion

Toxicity Data:

Silica:

May cause irritation and a cough.

Lead:

Oral, human (lowest published lethal dose): 155 mg/kg

Inhalation, human (lethal concentration): 271 mg/m³

Inhalation, human (lowest published toxic dose): 10 µg/m³

Oral, rat (lowest published toxic dose): 0.2 mg/kg

Health Effects: See Section 2: "Hazards Identification" for potential health effects.

Target Organs:

Silica: Respiratory tract

Lead: nervous system, kidneys, teratogen

Medical Conditions Generally Aggravated by Exposure:

Silica: Any individual with a chronic pulmonary disorder should protect against exposure to silica.

Lead: Blood system disorders, gastrointestinal disorders, respiratory disorders.

12. ECOLOGICAL INFORMATION

Ecotoxicity Data: No information listed for this material specifically. For informational purposes the following information is included for lead:

Fish Toxicity: Common carp (*Cyprinus carpio*) LC50: 0.44 mg/L [semi-static] (96 Hr)

Rainbow trout (*Oncorhynchus mykiss*) LC50: 1.17 mg/L [flow-through] (96 Hr)

Rainbow trout (*Oncorhynchus mykiss*) LC50: 1.32 mg/L [static]

Invertebrate: Water flea EC50: 600 µg/L (48 Hr)

13. DISPOSAL CONSIDERATIONS

Waste Disposal:

Hard Rock Mine Waste is exempted from RCRA per section 3001(b)(3)(A)(ii).

Lead: Hazardous waste Number: D008. Dispose in accordance with US EPA 40 CFR 262 for concentrations at or above 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 lb. (4.54 kg) final RQ (no report of releases of this hazardous substance is required if the diameter of the material is larger than 100 micrometers).

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: 0.1 % Supplier information.

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

SARA TITLE III SARA 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:

Silica: known as cancer causing for silica crystalline particles of respirable size.

Lead: known as cancer causing; known to cause reproductive/developmental effects. Keep out of water supplies and sewers.

CANADIAN REGULATIONS

WHMIS Information: Not provided for this information.

EUROPEAN REGULATIONS

Silica

EC Classification: Not classified.

EC Risk and Safety Phrases: Not assigned.

Lead

EC Classification (assigned):

Xn – Harmful;

N – Dangerous to the environment, Reproductive Toxin Category 1, Reproductive Toxin Category 3.

EC Risk Phrases:

R20/22 – Harmful by inhalation and if swallowed.

R33 – Danger of cumulative effects.

R50/53 – Very toxic to aquatic organisms, may cause long-term adverse effects in the aquatic environment.

R61 – May cause harm to unborn child.

R62 – Possible risk of impaired fertility.

EC Safety Phrases:

S45 – In case of accident or if you feel unwell, seek medical advice immediately (show label where possible).

S53 – Avoid exposure – obtain special instructions before use.

S60 – This material and its container must be disposed of as hazardous waste.

S61 – Avoid release to the environment. Refer to special instructions/Safety data sheet.

NATIONAL INVENTORY STATUS

U.S. Inventory (TSCA): Lead is listed.

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

16. OTHER INFORMATION

Sources: ChemAdvisor, MSDS *Quartz*, 06 December 2010.

ChemAdvisor, MSDS *Lead*, 06 December 2010.

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