

SAFETY DATA SHEET

1. SUBSTANCE AND SOURCE IDENTIFICATION

Product Identifier

SRM Number: 2430
SRM Name: Scheelite Ore
Other Means of Identification: Not applicable.

Recommended Use of This Material and Restrictions of Use

This Standard Reference Material (SRM) is primarily intended for use in the validation of chemical and instrumental methods of analysis of tungsten-bearing ores and other materials of similar matrix for elemental content. It can be used to validate value assignment of in-house reference materials. A unit of SRM 2430 consists of a bottle containing approximately 100 g of powder ground to pass a 150 mesh sieve (< 0.1 mm).

Company Information

National Institute of Standards and Technology
 Standard Reference Materials Program
 100 Bureau Drive, Stop 2300
 Gaithersburg, Maryland 20899-2300

Telephone: 301-975-2200
 FAX: 301-948-3730
 E-mail: SRMMSDS@nist.gov
 Website: <http://www.nist.gov/srm>

Emergency Telephone ChemTrec:
 1-800-424-9300 (North America)
 +1-703-527-3887 (International)

2. HAZARDS IDENTIFICATION

Classification

Physical Hazard: Not classified.
Health Hazard: Acute Toxicity, Oral Category 4
 Carcinogenicity
 STOT, Repeated Exposure Category 1

Label Elements

Symbol



Signal Word

DANGER

Hazard Statement(s):

H301 Harmful if swallowed.
 H350 May cause lung cancer.
 H372 Causes damage to lungs through prolonged or repeated inhalation.

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.
 P280 Wear protective gloves, protective clothing, and eye protection.
 P301 + P312 If swallowed: call a doctor if you feel unwell.
 P330 Rinse mouth.
 P308 + P313 If exposed or concerned: Get medical attention.
 P405 Store locked up.

P501 Dispose of contents and container according to local regulations.

Hazards Not Otherwise Classified: Not applicable.

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

3. COMPOSITION AND INFORMATION ON HAZARDOUS INGREDIENTS

Substance: Scheelite ore.

Other Designations: Tungsten ore.

This material is a naturally occurring complex mixture, prepared as described in the NIST Certificate of Analysis (COA). The values listed on the COA are reported as elements based on the methods of analysis. Components listed below are in compliance with OSHA's 29 CFR 1910.1200.

Component(s)	CAS Number	EC Number (EINECS)	Nominal Mass Concentration (%)
Scheelite ore	not applicable	not applicable	100
<i>Individual Component(s)</i>			
Tungsten trioxide	1314-35-8	215-231-4	70
Calcium oxide	1305-78-8	215-138-9	19
Silica, crystalline quartz	14808-60-7	238-878-4	>0.1

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.

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

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

Most Important Symptoms/Effects, Acute and Delayed: May cause irritation.

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. Avoid generating dust. See Section 9, "Physical and Chemical Properties" for flammability properties.

Extinguishing Media:

Suitable: Use extinguishing media appropriate for surrounding fire.

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: Any accumulated material on surfaces should be removed and properly disposed of. Use suitable protective equipment; see Section 8, "Exposure Controls and Personal Protection".

Methods and Materials for Containment and Clean up: Collect spilled material in appropriate container for disposal. Keep out of water supplies and sewers.

7. HANDLING AND STORAGE

Safe Handling Precautions: Minimize dust generation and accumulation on surfaces. Routine housekeeping should be instituted to ensure that dusts do not accumulate on surfaces. See Section 8, “Exposure Controls and Personal Protection”.

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

8. EXPOSURE CONTROLS AND PERSONAL PROTECTION

Exposure Limits: No occupational exposure limits have been established for scheelite ore. The following exposure limits are for the individual components.

Exposure Limits			
Component(s)	OSHA (PEL)	ACGIH (TLV)	NIOSH (REL)
Tungsten trioxide	No occupational limits established.		
Calcium oxide	5 mg/m ³ TWA	2 mg/m ³ TWA	2 mg/m ³ TWA 25 mg/m ³ IDLH
Silica, crystalline quartz	(30)/(%SiO ₂ + 2) mg/m ³ TWA (total dust) (250)/(%SiO ₂ + 5) mppcf TWA (respirable fraction) (10)/(%SiO ₂ + 2) mg/m ³ (respirable fraction)	0.025 mg/m ³ TWA (respirable fraction)	0.05 mg/m ³ TWA (respirable dust) 50 mg/m ³ IDLH (respirable dust)

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 splash resistant safety goggles with a face shield. An eye wash 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:

Appearance
(physical state, color, etc.):
Molecular Formula:
Molar Mass (g/mol):
Odor:
Odor threshold:
pH:
Evaporation rate:
Melting point/freezing point (°C):
Specific Gravity (water=1):
Vapor Pressure (mmHg):
Vapor Density (air = 1):
Viscosity (cP):
Solubility(ies):
Partition coefficient (n-octanol/water):
Particle Size:

Scheelite Ore (100 % of this SRM)

powder

not applicable
varies
not available
not available
not available
not applicable
not available
not available
not applicable
not applicable
not applicable
insoluble in water
not available
<0.1 mm

Tungsten Trioxide (70 % of this SRM)

yellow powder

WO₃
231.86
odorless
not applicable
not available
0 (butyl acetate = 1)
1473 (2683 °F)
7.2
not available
not available
not applicable
insoluble in water
not available
<0.1 mm

Thermal Stability Properties:**Scheelite Ore
(100 % of this SRM)****Tungsten Trioxide
(70 % of this SRM)**

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

10. STABILITY AND REACTIVITY

Reactivity: Stable at normal temperatures and pressure.

Stability: Stable Unstable

Possible Hazardous Reactions: None listed.

Conditions to Avoid: Avoid generating dust.

Incompatible Materials: Halogens, halo carbons, oxidizing materials, combustible materials, acids, metals, and metal salts.

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

Hazardous Decomposition: Thermal decomposition will produce miscellaneous decomposition products.

Hazardous Polymerization: Will Occur Will Not Occur

11. TOXICOLOGICAL INFORMATION

Route of Exposure: Inhalation Skin Ingestion

Symptoms Related to the Physical, Chemical and Toxicological Characteristics: Generated dust may cause irritation if inhaled.

Potential Health Effects (Acute, Chronic and Delayed):

Inhalation: Exposure to a large concentration of dust may cause irritation accompanied by coughing and dyspnea. Chronic exposure may cause pulmonary fibrosis accompanied by weight loss, rales in the lung, and exertional dyspnea for tungsten oxide; inflammation and ulceration of the nasal and buccal mucosa, perforation of the nasal septum, and possibly bronchial and gastrointestinal disturbances for calcium oxide; silicosis and cancer for quartz.

Skin Contact: May cause mechanical irritation. Exposure to tungsten oxide may cause erythematous papular type dermatitis at the sites of heaviest exposure.

Eye Contact: May cause mechanical irritation. Repeated or prolonged exposure may cause conjunctivitis.

Ingestion: Acute exposure may cause nausea, vomiting, diarrhea, abdominal cramps and weakness. No data for chronic exposure.

Numerical Measures of Toxicity:

Acute Toxicity: Category 4, Oral

Tungsten trioxide: Rat, Oral LD50: 1059 mg/kg

Calcium oxide: Rat, Oral LD50: 500 mg/kg

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

Serious Eye Damage/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 1.

Listed as a Carcinogen/Potential Carcinogen X Yes No
Scheelite ore, calcium oxide, and tungsten trioxide are not listed by NTP, IARC or OSHA as a carcinogen.
Silica, crystalline quartz is listed as Group 1, *carcinogenic to humans* by IARC, *known human carcinogen* (respirable size) by NTP, and is not listed by OSHA as a designated carcinogen.

Reproductive Toxicity: Not classified; no data available.

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

Specific Target Organ Toxicity, Repeated Exposure: Category 1, cumulative exposure to quartz may result in reduced lung capacity and silicosis.

Aspiration Hazard: Not classified; no data available.

12. ECOLOGICAL INFORMATION

Ecotoxicity Data:

Calcium oxide, Fish Toxicity: Common carp (*Cyprinus carpio*) LC50 (static): 1070 mg/L (96 h)

Persistence and Degradability: No data available.

Bioaccumulative Potential: No bioaccumulation expected for calcium oxide.

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.

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): Not regulated.

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): Not regulated.

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

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: Not listed.

U.S. TSCA Inventory: Tungsten trioxide, calcium oxide, and quartz are listed.

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

Canadian Regulations:

WHMIS Information: Not provided for this material.

16. OTHER INFORMATION

Issue Date: 24 June 2016

Sources: ChemADVISOR, Inc., SDS *Tungsten Oxide*, 09 December 2015.

ChemADVISOR, Inc., SDS *Calcium Oxide*, 09 December 2015.

ChemADVISOR, Inc., SDS *Quartz*, 09 December 2015.

29 CFR Occupational Health and Safety Office (OSHA) 1910.1000, *Limits for Air Contaminants*, Table Z-1; available at

http://www.osha.gov/pls/oshaweb/owadisp.show_document?p_table=STANDARDS&p_id=9992
(accessed June 2016).

Center for Disease Control (CDC) NIOSH Pocket Guide to Chemical Hazards, *Particulates Not Otherwise Regulated*; available at <http://www.cdc.gov/niosh/npg/npgd0480.html> (accessed June 2016).

Key of Acronyms:

ACGIH	American Conference of Governmental Industrial Hygienists	NRC	Nuclear Regulatory Commission
ALI	Annual Limit on Intake	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
EC50	Effective Concentration, 50 %	RM	Reference Material
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 Transport Association	SCBA	Self-Contained Breathing Apparatus
IDLH	Immediately Dangerous to Life and Health	SRM	Standard Reference Material
LC50	Lethal Concentration, 50 %	STEL	Short Term Exposure Limit
LD50	Lethal Dose, 50 %	TLV	Threshold Limit Value
LEL	Lower Explosive Limit	TPQ	Threshold Planning Quantity
MSDS	Material Safety Data Sheet	TSCA	Toxic Substances Control Act
NFPA	National Fire Protection Association	TWA	Time Weighted Average
NIOSH	National Institute for Occupational Safety and Health	UEL	Upper Explosive Limit
NIST	National Institute of Standards and Technology	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>.