

SAFETY DATA SHEET

1. SUBSTANCE AND SOURCE IDENTIFICATION

Product Identifier

SRM Number: 692
SRM Name: Iron Ore (Labrador)
Other Means of Identification: Not applicable.

Recommended Use of This Material and Restrictions of Use

This Standard Reference Material (SRM) is intended primarily for use in validation of chemical and instrumental methods of analysis for elemental contents of iron ore, iron ore concentrates, and materials of similar matrix. It can be used to validate value assignment of in-house reference materials. A unit of SRM 692 consists of one bottle containing approximately 100 g of powder with <74 µm (200 mesh) particle sizes.

Company Information

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2. HAZARDS IDENTIFICATION

Classification

Physical Hazard: Not classified.
Health Hazard: Carcinogenic Category 1A
 STOT, Repeat Exposure Category 1

Label Elements

Symbol



Signal Word

DANGER

Hazard Statement(s)

H350 May cause cancer (lung) via inhalation.
 H372 Causes damage to lungs through prolonged or repeat 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 eye protection, protective gloves and clothing.
 P314 Get medical attention if you feel unwell.
 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: Iron ore

Other Designations: Mixture of the following components.

Hematite: ferric oxide red; iron oxide; crocus; diiron trioxide.

Magnetite: magnetic iron oxide; ferrosferric oxide; black iron oxide; lodestone.

Aluminum Oxide: alundum, alumina.

Manganese(II) Oxide: oxomanganese, manganese monoxide.

Components are listed in compliance with OSHA's 29 CFR 1910.1200. The material contains trace amounts of other oxide components; for the actual values see the NIST Certificate of Analysis.

Hazardous Component(s)	CAS Number	EC Number (EINECS)	Nominal Mass Concentration (%)
Iron Oxides, mixture of			≥85
hematite	1309-37-1	215-168-2	
magnetite	1309-38-2	245-169-8	
Silica, crystalline quartz	14808-60-7	238-878-4	≤10.1
Aluminum Oxide	1344-28-1	215-691-6	1.4
Manganese(II) Oxide	1344-43-0	215-695-8	0.5
Non-Hazardous Material (other trace oxide materials)	n/a	n/a	≤3

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 adverse effects occur after ingestion, seek medical treatment.

Most Important Symptoms/Effects, Acute and Delayed: Prolonged exposure to respirable silica particles can cause lung damage (silicosis) and cancer.

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

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).

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. Keep unnecessary people away, isolate hazard area and deny entry.

7. HANDLING AND STORAGE

Safe Handling Precautions: See Section 8, “Exposure Controls and Personal Protection”. Avoid contact with incompatible materials (see Section 10 “Stability and Reactivity”).

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

8. EXPOSURE CONTROLS AND PERSONAL PROTECTION

Exposure Limits			
Components	OSHA (PEL)	ACGIH (TLV)	NIOSH (REL)
Iron Oxide Red	TWA: 15 mg/m ³ (total dust) TWA: 5 mg/m ³ (respirable fraction) TWA: 10 mg/m ³ (fume)	TWA: 5 mg/m ³ (respirable fraction)	TWA: 5 mg/m ³ (Fe dust and fume) IDLH: 2500 mg/m ³ (Fe dust and fume)
Silica, crystalline quartz	TWA: 30/(SiO ₂ + 2) mg/m ³ (total dust) TWA: 10/(SiO ₂ + 2) mg/m ³ (respirable fraction) TWA: 250/(SiO ₂ + 5) mppcf (respirable fraction)	TWA: 0.025 mg/m ³ (respirable fraction)	TWA: 0.05 mg/m ³ (respirable dust) IDLH: 50 mg/m ³ (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.)	not available
Molecular Formula	not available
Molar Mass (g/mol)	not applicable
Odor	not available
Odor threshold	not available
pH	not available
Evaporation rate	not available
Melting point/freezing point	not available
Density:	not available
Vapor Pressure (mmHg)	not available
Vapor Density (air = 1)	not available
Viscosity (cP)	not available
Solubility(ies)	not available
Partition coefficient (n-octanol/water)	not available
Particle Size	<74 µm

Thermal Stability Properties

Autoignition Temperature	not available
Thermal Decomposition	not available
Initial boiling point and boiling range	not available
Explosive Limits, LEL (Volume %)	not available
Explosive Limits, UEL (Volume %)	not available
Flash Point	not available
Flammability (solid, gas)	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. Avoid heat, flames, sparks, and other sources of ignitions. Avoid contact with incompatible materials.

Incompatible Materials: Metals, metal carbide, oxidizing materials, reducing agents, and peroxides.

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

Hazardous Decomposition: Thermal decomposition will produce miscellaneous compounds.

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: May aggravate respiratory disorders.

Potential Health Effects (Acute, Chronic, and Delayed)

Inhalation: Irritation, cough phlegm. Prolonged or repeated exposure to mixtures containing respirable silica may cause cough, expectoration, dyspnea, wheezing, pharyngitis, chronic bronchitis, emphysema, and silicosis.

Skin Contact: May cause mechanical irritation.

Eye Contact: May cause irritation or eye damage.

Ingestion: May cause irritation.

Numerical Measures of Toxicity

Acute toxicity: Not classified.

Hematite: Rat, Oral LD50: >10 000 mg/kg

Silica, crystalline quartz: Rat, Oral LD50: 500 mg/kg

Aluminum oxide: Rat, Oral LD50: >5 000 mg/kg

Skin corrosion/irritation: No data available.

Serious eye damage/eye irritation: No data available.

Respiratory sensitization: No data available.

Skin sensitization: No data available.

Germ Cell Mutagenicity: No data available.

Carcinogenicity: Category 1A.

Listed as a Carcinogen/Potential Carcinogen Yes No

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.

Tumorigenic data: Rat, Inhalation, TCLo: 50 mg/m³ (6 h)

Mutagenic data: Human, 120 mg/L (24 h)

Hematite, magnetite, aluminum oxide, and manganese oxide are not listed by OSHA, IARC or NTP as carcinogens/potential carcinogens.

Hematite, tumorigenic data: Rat, Subcutaneous, TCLo: 135 mg/kg

Hematite, mutagenic data: Human, 4 µg/disk (4 h)

Reproductive Toxicity: No data available.

Specific Target Organ Toxicity, Single Exposure: No data available.

Specific Target Organ Toxicity, Repeated Exposure: Category 1, Lungs.

Repeated and prolonged exposure to respirable quartz may cause chronic bronchitis, emphysema, and silicosis.

Aspiration hazard: Not applicable.

12. ECOLOGICAL INFORMATION

Ecotoxicity Data: No data available.

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.

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: No

CHRONIC HEALTH: Yes

FIRE: No

REACTIVE: No

PRESSURE: No

State Regulations:

California Proposition 65: Warning! This product contains a chemical (quartz) known to the state of California to cause cancer.

U.S. TSCA Inventory: Hematite, magnetite, and quartz are listed.

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

Canadian Regulations: WHMIS Information is not provided for this material.

16. OTHER INFORMATION

Issue Date: 11 January 2023

Sources: ChemADVISOR, Inc., MSDS, *Ferric Oxide Red*, 09 December 2015.

ChemADVISOR, Inc., MSDS, *Magnetite*, 21 March 2014.

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

ChemADVISOR, Inc., MSDS, *Aluminum Oxide*, 09 December 2015.

PubChem Database, National Library of Medicine, *Magnetite (Ferrosferric Oxide) CAS 1309-38-2*, available at <https://pubchem.ncbi.nlm.nih.gov/substance/134979978> (accessed Jan 2023).

PubChem Database, National Library of Medicine, *Manganese (II) Oxide CAS 1344-43-0*, available at <https://pubchem.ncbi.nlm.nih.gov/substance/134979978> (accessed Jan 2023).

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
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

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