

SAFETY DATA SHEET

1. SUBSTANCE AND SOURCE IDENTIFICATION

Product Identifier

SRM Number: 8546
SRM Name: NBS 28 (Silicon and Oxygen Isotopes in Silica Sand)
Other Means of Identification: Not applicable.

Recommended Use of This Material and Restrictions of Use

This Standard Reference Material (SRM) is intended for use in performance evaluation of chemical methods of analysis and in calibrating instrumental methods of analysis. A unit of SRM 8546 consists of one bottle containing 0.4 g of silica sand.

Company Information

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2. HAZARDS IDENTIFICATION

Note: This material consists of sieved sand intended for use as a test material. The health and safety information provided in this SDS are for repeat exposures to silica, crystalline quartz in the form of respirable dust.

Classification

Physical Hazard: Not Classified.
Health Hazard: Carcinogenic Category 1
 STOT, Repeated Exposure Category 1

Label Elements

Symbol



Signal Word

DANGER

Hazard Statement(s)

H350 May cause lung cancer.
 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.
 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: Sand

Other Designations: Quartz; alpha-quartz; silicon dioxide; silica; white crystal sand.

Components are listed in compliance with OSHA's 29 CFR 1910.1200.

Component	CAS Registry	EC Number (EINECS)	Nominal Concentration (%)
Silica, crystalline quartz	14808-60-7	238-878-4	100

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: May cause irritation, 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: Use extinguishing agents 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: Avoid generating dust. Collect spilled material in appropriate container for disposal. Clean up residue with a high-efficiency particulate vacuum. 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 dust does not accumulate on surfaces. See Section 8, "Exposure Controls and Personal Protection". Avoid contact with incompatible materials (see Section 10, "Stability and Reactivity").

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

8. EXPOSURE CONTROLS AND PERSONAL PROTECTION

Exposure Limits			
Components	OSHA (PEL)	ACGIH (TLV)	NIOSH (REL)
Silica, crystalline quartz	TWA: 30/(%SiO ₂ + 2) mg/m ³ (total dust)	TWA: 0.025 mg/m ³ (respirable fraction)	TWA: 0.05 mg/m ³ (respirable dust)
	TWA: 10/(%SiO ₂ + 2) mg/m ³ (respirable fraction)		IDLH: 50 mg/m ³ (respirable dust)
	TWA: 250/(%SiO ₂ + 5) mppcf (respirable fraction)		

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

Density (g/mL)

Vapor Pressure

Vapor Density (air = 1)

Viscosity (cP)

Solubility(ies)

Partition coefficient (n-octanol/water)

Nominal Particle Size

Sand

white or tan, powder

SiO₂

60.09

odorless

not available

not applicable

not applicable

1610 °C (2930 °F)

2.6 to 2.7

0 mmHg at 20 °C

not applicable

not applicable

insoluble in water, acids, organic solvents;
soluble in hydrofluoric acid (produces a corrosive gas, silicon tetrafluoride);
slightly soluble in alkali, hot concentrated phosphoric acid.

not available

<177 µm (>80 mesh)

Thermal Stability Properties

Autoignition Temperature	not applicable
Thermal Decomposition	not applicable
Initial boiling point and boiling range	2230 °C (4046 °F)
Explosive Limits, LEL (Volume %)	not applicable
Explosive Limits, UEL (Volume %)	not applicable
Flash Point	not applicable
Flammability (solid, gas)	not applicable

10. STABILITY AND REACTIVITY

Reactivity: Stable at normal temperatures and pressure.

Stability: X Stable Unstable

Possible Hazardous Reactions: None listed.

Conditions to Avoid: Avoid generating dust.

Incompatible Materials: Bases, halogens, acids, metal salts, metals, oxidizing materials, combustible materials.

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

Hazardous Decomposition: Thermal decomposition will produce miscellaneous compounds.

Hazardous Polymerization: Will Occur X Will Not Occur

11. TOXICOLOGICAL INFORMATION

Route of Exposure: X Inhalation X Skin Ingestion

Symptoms Related to the Physical, Chemical and Toxicological Characteristics: May cause irritation, lung damage, silicosis, and cancer.

Potential Health Effects (Acute, Chronic, and Delayed)

Inhalation: Acute exposure to fine particles containing respirable quartz may result irritation; chronic exposure may result in irritation, chest pain, weight loss, difficulty breathing, digestive disorders, bluish skin color, lung damage, cancer, and death.

Skin Contact: May cause irritation due to mechanical abrasion.

Eye Contact: May cause irritation or eye damage due to mechanical abrasion.

Ingestion: No data available.

Numerical Measures of Toxicity

Acute Toxicity: No data available.

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 1.

Listed as a Carcinogen/Potential Carcinogen X 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)

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 [silica, crystalline (airborne particles of respirable size)] known to the state of California to cause cancer.

U.S. TSCA Inventory: Quartz is listed.

TSCA 12(b), Export Notification: Quartz is not listed.

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

16. OTHER INFORMATION

Issue Date: 10 February 2015

Sources: ChemADVISOR, Inc., SDS, *Quartz*, 15 December 2014.

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 Transportation Agency	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.

Users of this RM 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>.