MATERIAL SAFETY DATA SHEET

1. SUBSTANCE AND SOURCE IDENTIFICATION

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

SRM Number: 2965
MSDS Number: 2965
SRM Name:
Respirable Cristobalite on Filter Media
(Nominal Mass of Cristobalite, 100 µg)

Date of Issue: 05 April 2012

Telephone: 301-975-2200
FAX: 301-948-3730
E-mail: SRMMSDS@nist.gov

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

Description: This Standard Reference Material (SRM) is intended primarily for the calibration of X-ray diffraction (XRD) spectrometers for the determination of respirable cristobalite using National Institute for Occupational Safety and Health (NIOSH) Method 7500 [1], or the equivalent. A unit of SRM 2965 consists of five polyvinyl chloride (PVC) filters, each containing a nominal mass of 100 µg of respirable cristobalite, and five blank PVC filters containing no cristobalite.

Substance: Respirable cristobalite

Other Designations: Alpha-cristobalite; cristobalite; alpha-crystobalite; crystoballite; metacristobalite; silica, crystalline-cristobalite; silicic anhydride; cristoballite

2. HAZARDS IDENTIFICATION

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

Major Health Hazards: Cancer hazard (in humans).

Physical Hazards: There are no physical hazards associated with this material.

Potential Health Effects (Acute and Chronic)

Inhalation: Inhalation of finely divided crystalline silica dust particles may cause physical discomfort of the respiratory tract. Repeated or prolonged inhalation of dust particles may result in silicosis in a few weeks to six months depending on the level of exposure. Symptoms may include coughing, shortness of breath, and weight loss. Persons diagnosed with silicosis have an increased risk of developing lung cancer.

Skin Contact: Exposure may cause irritation of intact skin due to mechanical abrasion. If the skin is abraded, a heavy growth of scar tissue may be induced.

Eye Contact: Exposure may cause irritation due to mechanical action.

Ingestion: Effects caused by ingestion are due to mechanical action as crystalline silicas are biologically inert.

Listed as a Carcinogen/Potential Carcinogen

	Yes	No
In the National Toxicology Program (NTP) Report on Carcinogens	X[a]	
In the International Agency Report on Carcinogens (IARC) Monographs	X[b]	
By the Occupational Safety and Health Administration (OSHA)		X

[a] NTP lists cristobalite as *known to be a human carcinogen.*
[b] IARC lists cristobalite as Group 1 (*carcinogenic to humans*).

3. COMPOSITION AND INFORMATION ON HAZARDOUS INGREDIENTS

Component[(a)]	CAS Registry	EC Number (EINECS)	Nominal Mass Concentration (%)
Cristobalite	14464-46-1	238-455-4	100

[(a)] Each loaded PVC filter contains 100 µg of cristobalite particulate matter. Hazardous components 1 % or greater; carcinogens 0.1 % or greater are listed in compliance with OSHA 29 CFR 1910.1200.

EC Classification: Not classified.

EC Risk (R No) and EC Safety (S No): Not assigned.

4. FIRST AID MEASURES

Inhalation: If adverse effects occur, remove to uncontaminated area. Give artificial respiration if not breathing. Get immediate medical attention.

Eye Contact: Flush eyes with copious amounts of water for at least 15 minutes. Get medical attention, if necessary.

Skin Contact: Wash affected area with soap and water for at least 15 minutes. Seek medical attention, if needed. Thoroughly clean and dry contaminated clothing and shoes before reuse.

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

5. FIRE FIGHTING MEASURES

Fire and Explosion Hazards: Negligible fire hazard.

Extinguishing Media: Use extinguishing agents appropriate for surrounding fire.

Fire Fighting: Avoid inhalation of material or combustion byproducts. Wear full protective clothing and NIOSH-approved self-contained breathing apparatus (SCBA).

Flash Point: Not applicable.

Autoignition Temp: Not applicable.

Flammability Limits in Air

UPPER (Volume %): Not applicable.
LOWER (Volume %): Not applicable.

6. ACCIDENTAL RELEASE MEASURES

Occupational Release: Collect spilled material in appropriate container for disposal. Avoid generating dust. Clean up residue with a high-efficiency particulate filter vacuum. Keep out of water supplies and sewers.

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

7. HANDLING AND STORAGE

Handling and Storage: Store and handle in accordance with all current regulations and standards. Keep separated from incompatible substances. Sealed filters, as received, should be stored in the dark at temperatures between 15 °C and 25 ºC.

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

8. EXPOSURE CONTROLS AND PERSONAL PROTECTION

Exposure Limits

ACGIH (TWA): 0.025 mg/m^3 (respirable fraction)
NIOSH (TWA): 0.05 mg/m^3 (respirable dust)
NIOSH (IDLH): 25 mg/m^3 (respirable dust)
OSHA (TWA): (1/2)[30/(% SiO_2 + 2)] mg/m^3 (total dust)
OSHA (TWA): (1/2)[250/(% SiO_2 + 5)] mppcf (respirable fraction)
OSHA (TWA): (1/2)[10/(% SiO_2 + 2)] mg/m^3 (respirable fraction)

Ventilation: Use local exhaust ventilation system. Ensure compliance with applicable exposure limits. Refer to the ACGIH document, *Industrial Ventilation, a Manual of Recommended Practices*.

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 chemical safety goggles. An eyewash station should be readily available near areas of use.

Personal Protection: Wear appropriate chemical resistant clothing and gloves to prevent skin exposure.

9. PHYSICAL AND CHEMICAL PROPERTIES

Appearance and Odor:	White particulate loaded on a PVC filter; odorless.
Molar Mass (g/mol):	60.1
Molecular Formula:	SiO_2
Density (g/cm^3):	Not available.
Vapor Density (air = 1):	2.32
Boiling Point (°C):	2230 (4046 °F)
Melting Point (°C):	1710 (3110 °F)
Water Solubility:	Insoluble.

10. STABILITY AND REACTIVITY

Stability: X Stable _____ Unstable

Stable at normal temperatures and pressure.

Conditions to Avoid: Avoid generating dust.

Incompatible Materials: Oxidizing materials, acids, bases, combustible materials.

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

Hazardous Decomposition: Miscellaneous decomposition products.

Hazardous Polymerization: _____ Will Occur X Will Not Occur

11. TOXICOLOGICAL INFORMATION

Route of Entry: X Inhalation _____ Skin _____ Ingestion

Toxicity Data: Human, Inhalation TCLo (intermittent): 16 mppcf (8 h/17.9 year)
Rat, Intratracheal LDLo: 200 mg/kg

Health Effects (Acute and Chronic): See Section 2, "Hazards Identification" for potential health effects.

Target Organs: Respiratory tract.

Tumorigenic

The Registry of Toxic Effects of Chemical Substances (RTECS) lists the following endpoints for tumorigenic effects: Rat, Intrapleural TCLo: 90 mg/kg; Rat, Intrapleural TC: 100 mg/kg.

Medical Conditions Aggravated by Exposure: Respiratory disorders.

12. ECOLOGICAL INFORMATION

Ecotoxicity Data: No ecotoxicity data available.

13. DISPOSAL CONSIDERATIONS

Waste Disposal: Dispose in accordance with all applicable federal, state, and local requirements.

14. TRANSPORTATION INFORMATION

U.S. DOT and IATA: This material is not regulated by DOT or IATA.

15. REGULATORY INFORMATION

U.S. REGULATIONS

CERCLA Sections 102a/103 (40 CFR 302.4): Not regulated for this material.
SARA Title III Section 302 (40 CFR 355.30): Not regulated for this material.
SARA Title III Section 304 (40 CFR 355.40): Not regulated for this material.
SARA Title III Section 313 (40 CFR 372.65): Not regulated for this material.
OSHA Process Safety (29 CFR 1910.119): Not regulated for this material.
SARA Title III Sections 311/312 Hazardous Categories (40 CFR 370.21):

ACUTE:	No
CHRONIC:	Yes
FIRE:	No
REACTIVE:	No
SUDDEN RELEASE:	No

STATE REGULATIONS

California Proposition 65: Warning! This material contains silica, crystalline (airborne particles of respirable size) that is known to the state of California to cause cancer.

CANADIAN REGULATIONS

WHMIS Classification: Not provided for this material.

EUROPEAN REGULATIONS

EC Classification: Not classified.

EC Risk and EC Safety Phrases: Not assigned.

NATIONAL INVENTORY STATUS

U.S. Inventory (TSCA): Listed.

TSCA 12(b)
Export Notification: Not listed.

16. OTHER INFORMATION

Sources: ChemAdvisor, Inc., MSDS *Cristobalite*, 20 December 2011.

ChemIDplus Advanced, *Cristobalite*, *CAS No. 14464-46-1*
http://chem.sis.nlm.nih.gov/chemidplus/ (accessed Apr 2012).

State of California, Environmantal Protection Agency (EPA), Office of Environmental Health Hazard Assessment (OEHHA); *Silica, crystalline (airborne particles of respirable size)*,
http://oehha.ca.gov/prop65/prop65_list/files/P65single031612.pdf (accessed Apr 2012).

OSHA/EPA Occupational Chemical Database, *Silica*, *Crystalline Cristobalite*, *CAS No. 14464-46-1*,
http://www.osha.gov/web/dep/chemicaldata/ (accessed Apr 2012).