

SAFETY DATA SHEET

1. SUBSTANCE AND SOURCE IDENTIFICATION

Product Identifier

SRM Number: 1881a
SRM Name: Portland Cement (Blended with Slag and Fly Ash)
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 evaluating chemical methods of analysis and in the calibration of instrumental methods for analysis of cements and materials of similar matrix. A unit of SRM 1881a consists of four sealed vials, each containing approximately 5 g of portland cement blended with slag and fly ash by the manufacturer and ground by NIST to pass a 75 µm (No. 200) sieve.

Company Information

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2. HAZARDS IDENTIFICATION

Classification

| | | |
|-------------------------|-------------------------|------------|
| Physical Hazard: | Not classified. | |
| Health Hazard: | Skin Corrosion/Irritant | Category 2 |
| | Eye Damage/Irritation | Category 1 |
| | STOT, Single Exposure | Category 3 |

Label Elements

Symbol



Signal Word

DANGER

Hazard Statement(s)

| | |
|------|-----------------------------------|
| H315 | Causes skin irritation. |
| H318 | Causes serious eye damage. |
| H335 | May cause respiratory irritation. |

Precautionary Statement(s)

| | |
|----------------|---|
| P261 | Avoid breathing dust. |
| P264 | Wash hands thoroughly after handling. |
| P271 | Use only outdoors or in a well-ventilated room. |
| P280 | Wear protective gloves and eye protection. |
| P302+P352 | If on skin: Wash with plenty of water. |
| P332+P313 | If skin irritation occurs: Get medical attention. |
| P305+P351+P338 | If in eyes: Rinse cautiously with water for several minutes. Remove contact lenses if present and easy to do. Continue rinsing. |
| P310 | Immediately call a doctor. |
| P304 | If inhaled: Remove person to fresh air and keep comfortable breathing. |
| P312 | Call a doctor if you feel unwell. |
| P362+P364 | Take off contaminated clothing and wash it before reuse. |
| P403+P233 | Store in a well-ventilated place. Keep container tightly closed. |
| P405 | Store locked up. |
| P501 | Dispose of contents and container according to local regulations. |

Hazards Not Otherwise Classified: None.

Ingredients(s) with Unknown Acute Toxicity: None.

3. COMPOSITION AND INFORMATION ON HAZARDOUS INGREDIENTS

Substance: Portland cement

Other Designations: Hydraulic cement; cement (portland); silicate, portland cement; portland cement silicate.

Components are listed in compliance with OSHA's 29 CFR 1910.1200. Cement may contain trace amounts of oxides and other chemicals due to the starting materials and manufacturing process, including chromium compounds. This SDS is for portland cement with <0.1% of quartz. Actual concentrations for constituents in SRM 1881a are listed in the NIST Certificate of Analysis.

| Hazardous Component(s) | CAS Number | EC Number (EINECS) | Nominal Mass Concentration (%) |
|----------------------------|------------|-----------------------|-----------------------------------|
| Portland cement | 65997-15-1 | 266-043-4 | >99.9 |
| 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 well-ventilated (uncontaminated) area. If breathing is difficult, qualified personnel may administer oxygen. If not breathing, qualified personnel should give artificial respiration. Seek immediate medical attention.

Skin Contact: Rinse affected skin with water for at least 15 minutes, and then wash thoroughly with soap or mild detergent and water. If skin irritation persists, seek medical aid and bring the container or label.

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.

Most Important Symptoms/Effects, Acute and Delayed: Inhalation of dust particles may cause irritation. 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 immediate medical attention.

5. FIRE FIGHTING MEASURES

Fire and Explosion Hazards: Negligible fire hazard. See Section 9, “Physical and Chemical Properties” for flammability properties.

Extinguishing Media

Suitable: Use extinguishing agents appropriate to surrounding fire.

Unsuitable: None listed.

Specific Hazards Arising from the Chemical: Not applicable.

Special Protective Equipment and Precautions for Fire-Fighters: Move container from fire area if it can be done without personal risk. Avoid inhalation of material or combustion by-products. 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 = 2

Fire = 0

Reactivity = 0

6. ACCIDENTAL RELEASE MEASURES

Personal Precautions, Protective Equipment and Emergency Procedures: Use suitable protective equipment; see Section 8, “Exposure Controls and Personal Protection”.

Methods and Materials for Containment and Clean up: Avoid generating dust. Collect in appropriate container for disposal.

7. HANDLING AND STORAGE

Safe Handling Precautions: Use suitable personal protection equipment (PPE) to prevent skin and eye contact and inhalation of generated dust. See Section 8, “Exposure Controls and Personal Protection”.

Storage and Incompatible Materials: Store in a well-ventilated area. Samples should be used immediately after opening the Mylar bag and vial.

8. EXPOSURE CONTROLS AND PERSONAL PROTECTION

| Exposure Limits | | | |
|----------------------------|---|---|--|
| Components | OSHA (PEL) | ACGIH (TLV) | NIOSH (REL) |
| Portland Cement | TWA: 15 mg/m ³ (total dust) TWA: 5 mg/m ³ (respirable fraction) TWA: 50 mppcf (<1 % crystalline silica) | TWA: 1 mg/m ³ (respirable fraction, particulate matter containing no asbestos and <1 % crystalline silica) | TWA: 10 mg/m ³ (total dust) TWA: 5 mg/m ³ (respirable dust) IDLH: 5000 mg/m ³ |
| 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 Measures: In accordance with OSHA 29 CFR 1910.132, subpart I, wear appropriate 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 Protection: Splash resistant safety goggles and emergency eyewash are recommended.

Skin and Body Protection: Chemical resistant clothing and gloves are recommended.

9. PHYSICAL AND CHEMICAL PROPERTIES

| Descriptive Properties | Portland Cement |
|--|-----------------------|
| Molar Mass (g/mol) | not applicable |
| Molecular Formula | not applicable |
| Appearance (physical state, color, etc.) | white to gray powder |
| Odor | odorless |
| Odor threshold | not available |
| pH | 12 to 13 (wet cement) |
| Evaporation rate | 0 % |
| Melting point/freezing point | not available |
| Relative Density as Specific Gravity (water = 1) | 3.15 |
| Density | not available |
| Vapor Pressure | not available |
| Vapor Density (air = 1) | not applicable |
| Viscosity | not applicable |
| Solubilities | water: 0.1 % to 1 % |
| Partition coefficient (n-octanol/water) | not applicable |
| Particle size | 75 µm |
| Thermal Stability Properties | |
| Autoignition Temperature | not applicable |
| Thermal Decomposition | not applicable |
| Initial boiling point and boiling range | not applicable |
| 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: Stable Unstable

Possible Hazardous Reactions: Not applicable.

Conditions to Avoid: Avoid generating dust.

Incompatible Materials: No data available.

Hazardous Decomposition: 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: Respiratory irritation; eye and/or skin irritation.

Potential Health Effects (Acute, Chronic, and Delayed)

Inhalation: Irritation, cough accompanied by phlegm. Prolonged exposure to mixed cement dusts may cause cough, expectoration, dyspnea, wheezing, pharyngitis, chronic bronchitis, emphysema, cement pneumoconiosis, and silicosis.

Skin Contact: Irritation (possibly severe) and dermatitis. Direct contact with wet cement, combined with prolonged contact time and pressure may cause ulcerations and possibly burns. Sensitivity to constituents of cement may induce allergic skin reactions (chromium compounds).

Eye Contact: Irritation, visual disturbances, eye damage. In addition, wet cement may cause a burning sensation, corneal edema indicated by seeing halos around lights, and injury to the conjunctiva.

Ingestion: Irritation (long-term) and possible gastroduodenal ulcers.

Numerical Measures of Toxicity

Acute Toxicity: Not classified.

Portland cement: No data available.

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

Skin Corrosion/Irritation: Category 2, Skin irritation.

Exposure may cause irritation (rash, scaling, and cracking) and dermatitis. May cause burns in the presence of moisture.

Eye Damage/Irritation: Category 1, Eye irritation.

Exposure to portland cement dust may cause eye irritation and burns in the presence of moisture.

Respiratory Sensitization: No data available.

Skin Sensitization: Classification not possible; no data available.

Portland cement may contain trace amounts of hexavalent chromium compounds which may cause allergic skin reactions.

Germ Cell Mutagenicity: No data available.

Carcinogenicity: Not classified.

Listed as a Carcinogen/Potential Carcinogen _____ **Yes** _____ **X** **No**

Portland cement is not listed by OSHA, IARC, or NTP as a carcinogen or potential carcinogen.

Silica, crystalline quartz (less than 0.1 % of this SRM) 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.

STOT, Single Exposure: Category 3, Respiratory Tract Irritation.

May cause irritation to mucous membranes when wet due to caustic nature of material.

STOT, Repeated Exposure: Not classified.

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 in accordance with all applicable federal, state, and local regulations.

14. TRANSPORTATION INFORMATION

U.S. DOT and IATA: Not regulated by DOT and 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: No
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: Portland cement and silica, crystalline 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: 16 July 2014

Sources: ChemADVISOR, Inc., MSDS *Portland Cement*, 23 December 2013.

United States Department of Labor Occupational Safety and Health Administration, *Preventing Skin Problems from Working with Portland Cement*, available at <https://www.osha.gov/dsg/guidance/cement-guidance.html> (accessed July 2014).

Key of Acronyms:

| | | | |
|--------|---|-------|--|
| ACGIH | American Conference of Governmental Industrial Hygienists | OSHA | Occupational Safety and Health Administration |
| CAS | Chemical Abstracts Service | PEL | Permissible Exposure Limit |
| CERCLA | Comprehensive Environmental Response, Compensation, and Liability Act | RCRA | Resource Conservation and Recovery Act |
| CFR | Code of Federal Regulations | REL | Recommended Exposure Limit |
| DOT | Department of Transportation | RQ | Reportable Quantity |
| EINECS | European Inventory of Existing Commercial Chemical Substances | RTECS | Registry of Toxic Effects of Chemical Substances |
| EPCRA | Emergency Planning and Community Right-to-Know Act | SARA | Superfund Amendments and Reauthorization Act |
| IARC | International Agency for Research on Cancer | SCBA | Self-Contained Breathing Apparatus |
| IATA | International Air Transportation Agency | SRM | Standard Reference Material |
| IDLH | Immediately Dangerous to Life and Health | STEL | Short Term Exposure Limit |
| LC50 | Lethal Concentration | STOT | Specific Target Organ Toxicity |
| LD50 | Median Lethal Dose or Lethal Dose, 50 % | TCLo | Lowest Toxic Concentration |
| LEL | Lower Explosive Limit | TLV | Threshold Limit Value |
| MSDS | Material Safety Data Sheet | TPQ | Threshold Planning Quantity |
| NFPA | National Fire Protection Association | 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 |
| NTP | National Toxicology Program | | |

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 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>.