

# 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: 103a  
MSDS Number: 103a  
SRM Name: Chrome Refractory

Date of Issue: 14 September 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 for use in checking chemical methods of analysis and in calibration with instrumental methods of analysis. A unit of SRM 103a contains 60 g of powder in a bottle.

**Substance:** Chrome refractory

**Other Designations:** No information available.

## 2. HAZARDS IDENTIFICATION

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

**Note:** This material contains inorganic compounds which have been reported to have toxic, mutagenic, and/or carcinogenic properties and should be handled with care. The inorganic compounds are reported as oxides, but are not freely available in the material as sold. Health and safety information associated with these oxides is provided as a reference for the user. For actual concentrations, see the Certificate of Analysis.

**Major Health Hazards:** May cause respiratory tract irritation and lung damage. Cancer hazard (in animals).

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

**Potential Health Effects (Acute and Chronic)**

**Inhalation:** Exposure may cause respiratory irritation. Repeated or prolonged exposure may result in cough, weight loss, chest pain, difficulty breathing, bluish skin color, metal fume fever, lung damage, and cancer.

**Skin Contact:** Exposure to intact skin may cause irritation.

**Eye Contact:** Particulates may cause mechanical irritation.

**Ingestion:** Ingestion of this material may result in irritation.

**Listed as a Carcinogen/Potential Carcinogen**

	Yes	No
In the National Toxicology Program (NTP) Report on Carcinogens	X <sup>(a)</sup>	
In the International Agency Report on Carcinogens (IARC) Monographs	X <sup>(a,b)</sup>	
By the Occupational Safety and Health Administration (OSHA)		X

<sup>(a)</sup> IARC lists titanium dioxide as Group 2b (*possibly carcinogenic to humans*).

<sup>(b)</sup> IARC lists chromium(III) oxide as Group 3 (*not classifiable as to its carcinogenicity to humans*).

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### 3. COMPOSITION AND INFORMATION ON HAZARDOUS INGREDIENTS

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Component	CAS Registry	EC Number (EINECS)	Nominal Concentration (%)
Chrome refractory	not applicable	not applicable	100
<b>Components<sup>(a)</sup></b>			
Aluminate silicate	1327-36-2	215-475-1	34.6
Chromium(III) oxide (Cr <sub>2</sub> O <sub>3</sub> )	1308-38-9	215-160-9	32.1
Magnesium oxide (MgO)	1309-48-4	215-171-9	18.5
Iron oxide (FeO)	1345-25-1	215-721-8	12.4
Titanium dioxide (TiO <sub>2</sub> )	13463-67-7	236-675-5	0.2

<sup>(a)</sup> Concentrations of the components are listed as required by OSHA, 29 CFR 1910.1200 (g)(2)(i)(C)(1), for MSDS information with hazardous components (1 % or greater) and carcinogens (0.1 % or greater).

**EC Classification:** No classification assigned.

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

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### 4. FIRST AID MEASURES

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

**Eye Contact:** Flush eyes with plenty of water for at least 15 minutes. Seek medical attention, if needed.

**Skin Contact:** Wash skin with soap and water for at least 15 minutes. Seek medical attention, if needed.

**Ingestion:** If a large amount is swallowed, seek immediate medical attention.

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### 5. FIRE FIGHTING MEASURES

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**Fire and Explosion Hazards:** Negligible fire hazard.

**Extinguishing Media:** Use extinguishing agents appropriate to surrounding fire.

**Fire Fighting:** Avoid inhalation of combustion by-products.

**Flash Point:** Not applicable.

**Autoignition Temp:** Not applicable.

**Flammability Limits in Air**

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

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

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### 6. ACCIDENTAL RELEASE MEASURES

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**Occupational Release:** Collect spilled material in appropriate container for disposal. Avoid generating dust. Clean up residue with a high-efficiency particulate filter vacuum.

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

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### 7. HANDLING AND STORAGE

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**Handling and Storage:** Store and handle in accordance with all current regulations and standards. Keep separated from incompatible substances.

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

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## 8. EXPOSURE CONTROLS AND PERSONAL PROTECTION

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No occupational exposure limits are established for chrome refractory. The limits listed below are for the individual components.

Exposure Limits			
Components	OSHA (PEL)	ACGIH (TLV)	NIOSH (REL)
Aluminate silicate	No occupational exposure limits established.		
Chromium(III) oxide (as Cr, related to Chromium (III) Compounds)	0.5 mg/m <sup>3</sup> TWA	No occupational exposure limits established.	0.5 mg/m <sup>3</sup> TWA 25 mg/m <sup>3</sup> IDLH
Magnesium oxide	15 mg/m <sup>3</sup> TWA (fume, total particulate)	10 mg/m <sup>3</sup> TWA (inhalable fraction) 750 mg/m <sup>3</sup> IDLH (fume)	No occupational exposure limits established.
Iron oxide	No occupational exposure limits established.		
Titanium dioxide	15 mg/m <sup>3</sup> TWA (total dust)	10 mg/m <sup>3</sup> TWA 5000 mg/m <sup>3</sup> IDLH	No occupational exposure limits established.

**Ventilation:** Use local exhaust ventilation system. Ensure compliance with applicable exposure limits.

**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.

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## 9. PHYSICAL AND CHEMICAL PROPERTIES

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**Appearance and Odor:** Solid, fine powder; no odor information available.

**Molecular Formula:** Not applicable.

**Density:** Not available.

**Melting Point:** Not available.

**Water Solubility:** Insoluble.

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## 10. STABILITY AND REACTIVITY

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**Stability:**   X   Stable        Unstable

Stable at normal temperatures and pressure.

**Conditions to Avoid:** Avoid generating dust.

**Incompatible Materials:** Acids, bases, combustible materials, halogens, metals, oxidizing materials, halo carbons.

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

**Hazardous Decomposition:** Miscellaneous decomposition products.

**Hazardous Polymerization:**        Will Occur   X   Will Not Occur

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## 11. TOXICOLOGICAL INFORMATION

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**Route of Entry:**        X   Inhalation                             Skin                             Ingestion

There is no toxicity data and endpoints listed by Registry of Toxic Effects of Chemical Substances (RTECS) for chrome refractory. Toxicity data and endpoints listed by RTECS are below for the individual components.

Components	Toxicity Data	
Aluminate silicate	No data available.	
Chromium(III) oxide	Rat, Inhalation LC <sub>50</sub> :	No data available.
	Rat, Oral LD <sub>50</sub> :	No data available.
	Rabbit, Dermal LD <sub>50</sub> :	No data available.
	Mutagenic:	<i>Bacillus subtilis</i> : 10 mmol/L; Hamster: 34 mg/L
	Reproductive:	No data available.
Magnesium oxide	Tumorigenic:	Rat, Intratracheal TDLo: 90 mg/kg
	Rat, Inhalation LC <sub>50</sub> :	No data available.
	Rat, Oral LD <sub>50</sub> :	No data available.
	Rabbit, Dermal LD <sub>50</sub> :	No data available.
	Mutagenic:	No data available.
Iron oxide	Reproductive:	No data available.
	Tumorigenic:	Hamster, Intratracheal TDLo: 480 mg/kg (30 weeks)
	No data available.	
Titanium dioxide	Rat, Inhalation LC <sub>50</sub> :	No data available.
	Rat, Oral LD <sub>50</sub> :	>10000 mg/kg
	Rabbit, Dermal LD <sub>50</sub> :	No data available.
	Mutagenic:	Human: 5 µmol/L (72 h); 20 µg/disk (4 h)
	Reproductive:	No data available.
	Tumorigenic:	Rat, Inhalation TCLo: 250 mg/m <sup>3</sup> (6 h)

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

**Target Organs:** Respiratory tract.

**Medical Conditions Aggravated by Exposure:** Respiratory disorders, skin disorders, eye disorders, and allergies.

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## 12. ECOLOGICAL INFORMATION

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**Ecotoxicity Data:** No ecotoxicity data available.

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## 13. DISPOSAL CONSIDERATIONS

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**Waste Disposal:** Dispose in accordance with all applicable regulations. Hazardous Waste Number(s): D007. Dispose of chromium(III) oxide in accordance with U.S. EPA 40 CFR 262 for concentrations at or above the Regulatory level of 5.0 mg/L.

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## 14. TRANSPORTATION INFORMATION

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

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## 15. REGULATORY INFORMATION

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### 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): 1.0 % de minimis concentration (except for Chromite ore mined in the Transvaal Region of South Africa and the unreacted ore component of the Chromite ore processing residue (COPR), Chemical Category N090, related to Chromium(III) Compounds).

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:	Yes
CHRONIC:	Yes
FIRE:	No
REACTIVE:	No
PRESSURE:	No

#### State Regulations

California Proposition 65: Warning! This product contains titanium dioxide which is known to the state of California to cause cancer.

#### Canadian Regulations

WHMIS Classification: Not provided for this material.

#### European Regulations

**EC Classification:** No classification assigned.

**EC Risk and EC Safety Phrases:** Not assigned.

#### National Inventory Status

**U.S. Inventory (TSCA):** Aluminate silicate, chromium(III) oxide, magnesium oxide, iron oxide, and titanium dioxide are listed.

**TSCA 12(b); Export Notification:** Not listed.

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## 16. OTHER INFORMATION

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**Sources:** ChemAdvisor, Inc., MSDS, *Aluminate Silicate*, 23 June 2009.  
ChemAdvisor, Inc., MSDS, *Chromium(III) Oxide*, 18 June 2012.  
ChemAdvisor, Inc., MSDS, *Magnesium Oxide*, 20 December 2011.  
ChemAdvisor, Inc., MSDS, *Iron(II) Oxide*, 10 June 2011.  
ChemAdvisor, Inc., MSDS, *Titanium Dioxide*, 18 June 2012.

**Disclaimer:** Physical and chemical data contained in this MSDS are provided only for use in assessing the hazardous nature of the material. The MSDS was prepared carefully, using current references; however, NIST does not certify the data in the MSDS. The certified values for this material are given in the NIST Certificate of Analysis.