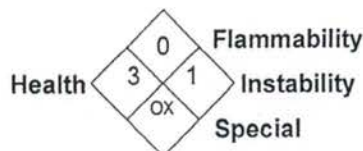




# MacDermid



1401 Blake Street - Denver, CO 80202

NSN:8030-00-057-2354,  
8030-00-811-3723  
8030-01-330-2504, 8030-00-720-9739  
8030-00-663-9847

## Material Safety Data Sheet

Product name IRIDITE 14-2

Code 178659

### 1. Product and company identification

Manufacturer MacDermid Inc.  
1401 Blake Street - Denver, CO 80202  
(Phone) 720-479-3060

QUANTUM CHEMICAL LLC  
8423 BOETTNER RD  
BRIDGEWATER, MI 48115  
PHONE:734.429.0033 FAX:734.944.3781

Date of issue : 8/11/2011.

In case of emergency CHEMTREC (1-800-424-9300)

### 2. Hazards identification

Physical state : Solid. [Red / odorless]

OSHA/HCS status : This material is considered hazardous by the OSHA Hazard Communication Standard (29 CFR 1910.1200).

Emergency overview : DANGER !

CAUSES SEVERE EYE BURNS. CAUSES SKIN BURNS. HARMFUL IF SWALLOWED. CONTAINS MATERIAL THAT CAN CAUSE TARGET ORGAN DAMAGE. CANCER HAZARD - CONTAINS MATERIAL WHICH CAN CAUSE CANCER.

Toxic if swallowed. Severely corrosive to the eyes. Corrosive to the skin. Causes severe burns. Avoid exposure - obtain special instructions before use. Do not ingest. Do not get in eyes or on skin or clothing. Contains material that can cause target organ damage. Contains material which can cause cancer. Risk of cancer depends on duration and level of exposure. Use only with adequate ventilation. Keep container tightly closed and sealed until ready for use. Wash thoroughly after handling.

#### Potential acute health effects

Inhalation : May give off gas, vapor or dust that is very irritating or corrosive to the respiratory system. Exposure to decomposition products may cause a health hazard. Serious effects may be delayed following exposure.

Ingestion : Toxic if swallowed. May cause burns to mouth, throat and stomach.

Skin : Corrosive to the skin. Causes burns.

Eyes : Severely corrosive to the eyes. Causes severe burns.

#### Potential chronic health effects

Chronic effects : Contains material that can cause target organ damage.

Carcinogenicity : Contains material which can cause cancer. Risk of cancer depends on duration and level of exposure.

Mutagenicity : No known significant effects or critical hazards.

Teratogenicity : No known significant effects or critical hazards.

Developmental effects : No known significant effects or critical hazards.

Fertility effects : No known significant effects or critical hazards.

## 2. Hazards identification

**Target organs** : Contains material which causes damage to the following organs: heart, upper respiratory tract, skin, central nervous system (CNS), eye, lens or cornea.  
Contains material which may cause damage to the following organs: blood, kidneys, liver.

### Over-exposure signs/symptoms

**Inhalation** : No specific data.

**Ingestion** : Adverse symptoms may include the following:  
stomach pains

**Skin** : Adverse symptoms may include the following:  
pain or irritation  
redness  
blistering may occur

**Eyes** : Adverse symptoms may include the following:  
pain  
watering  
redness

**Medical conditions aggravated by over-exposure** : Pre-existing digestive disorders and disorders involving any other target organs mentioned in this MSDS as being at risk may be aggravated by over-exposure to this product.

See toxicological information (section 11)

## 3. Composition/information on ingredients

### Hazardous ingredients

	<u>CAS number</u>	<u>%</u>
chromium (VI) trioxide	1333-82-0	50 - 60
barium nitrate	10022-31-8	15 - 25
sodium fluorosilicate	16893-85-9	7 - 17
FERRICYANIDE		7 - 10

There are no ingredients or additional ingredients present which, within the current knowledge of the supplier and in the concentrations applicable, are classified as hazardous to health or the environment and hence require reporting in this section.

## 4. First aid measures

**Eye contact** : Get medical attention immediately. Immediately flush eyes with plenty of water, occasionally lifting the upper and lower eyelids. Check for and remove any contact lenses. Continue to rinse for at least 10 minutes. Chemical burns must be treated promptly by a physician.

**Skin contact** : Get medical attention immediately. Flush contaminated skin with plenty of water. Remove contaminated clothing and shoes. Wash contaminated clothing thoroughly with water before removing or wear gloves. Continue to rinse for at least 10 minutes. Chemical burns must be treated promptly by a physician. Wash clothing before reuse. Clean shoes thoroughly before reuse.

**Inhalation** : Get medical attention immediately. Move exposed person to fresh air. If it is suspected that fumes are still present, the rescuer should wear an appropriate mask or self-contained breathing apparatus. Keep person warm and at rest. If not breathing, if breathing is irregular or if respiratory arrest occurs, provide artificial respiration or oxygen by trained personnel. It may be dangerous to the person providing aid to give mouth-to-mouth resuscitation. If unconscious, place in recovery position and get medical attention immediately. Maintain an open airway. Loosen tight clothing such as a collar, tie, belt or waistband. In case of inhalation of decomposition products in a fire, symptoms may be delayed. The exposed person may need to be kept under medical surveillance for 48 hours.



## 4 . First aid measures

- Ingestion** : Get medical attention immediately. Wash out mouth with water. Remove dentures if any. Move exposed person to fresh air. Keep person warm and at rest. If material has been swallowed and the exposed person is conscious, give small quantities of water to drink. Stop if the exposed person feels sick as vomiting may be dangerous. Do not induce vomiting unless directed to do so by medical personnel. If vomiting occurs, the head should be kept low so that vomit does not enter the lungs. Chemical burns must be treated promptly by a physician. Never give anything by mouth to an unconscious person. If unconscious, place in recovery position and get medical attention immediately. Maintain an open airway. Loosen tight clothing such as a collar, tie, belt or waistband.
- Protection of first-aiders** : No action shall be taken involving any personal risk or without suitable training. If it is suspected that fumes are still present, the rescuer should wear an appropriate mask or self-contained breathing apparatus. It may be dangerous to the person providing aid to give mouth-to-mouth resuscitation. Wash contaminated clothing thoroughly with water before removing or wear gloves.

## 5 . Fire-fighting measures

- Flammability of the product** : No specific fire or explosion hazard.
- Extinguishing media**
- Suitable** : Use an extinguishing agent suitable for the surrounding fire.
- Not suitable** : None known.
- Special exposure hazards** : Promptly isolate the scene by removing all persons from the vicinity of the incident if there is a fire. No action shall be taken involving any personal risk or without suitable training.
- Hazardous combustion products** : Decomposition products may include the following materials:  
nitrogen oxides  
halogenated compounds  
metal oxide/oxides
- Special protective equipment for fire-fighters** : Fire-fighters should wear appropriate protective equipment and self-contained breathing apparatus (SCBA) with a full face-piece operated in positive pressure mode.

## 6 . Accidental release measures

- Personal precautions** : No action shall be taken involving any personal risk or without suitable training. Evacuate surrounding areas. Keep unnecessary and unprotected personnel from entering. Do not touch or walk through spilled material. Provide adequate ventilation. Wear appropriate respirator when ventilation is inadequate. Put on appropriate personal protective equipment (see section 8).
- Environmental precautions** : Avoid dispersal of spilled material and runoff and contact with soil, waterways, drains and sewers. Inform the relevant authorities if the product has caused environmental pollution (sewers, waterways, soil or air).
- Large spill** : Move containers from spill area. Approach release from upwind. Prevent entry into sewers, water courses, basements or confined areas. Vacuum or sweep up material and place in a designated, labeled waste container. Dispose of via a licensed waste disposal contractor. Note: see section 1 for emergency contact information and section 13 for waste disposal.
- Small spill** : Move containers from spill area. Vacuum or sweep up material and place in a designated, labeled waste container. Dispose of via a licensed waste disposal contractor.

## 7. Handling and storage

- Handling** : Put on appropriate personal protective equipment (see section 8). Eating, drinking and smoking should be prohibited in areas where this material is handled, stored and processed. Workers should wash hands and face before eating, drinking and smoking. Do not get in eyes or on skin or clothing. Do not ingest. If during normal use the material presents a respiratory hazard, use only with adequate ventilation or wear appropriate respirator. Keep in the original container or an approved alternative made from a compatible material, kept tightly closed when not in use. Empty containers retain product residue and can be hazardous. Do not reuse container.
- Storage** : Do not store above the following temperature: 48.9°C (120°F). Store in accordance with local regulations. Store in original container protected from direct sunlight in a dry, cool and well-ventilated area, away from incompatible materials (see section 10) and food and drink. Keep container tightly closed and sealed until ready for use. Containers that have been opened must be carefully resealed and kept upright to prevent leakage. Do not store in unlabeled containers. Use appropriate containment to avoid environmental contamination.

## 8. Exposure controls/personal protection

<u>Product name</u>	<u>Exposure limits</u>
chromium (VI) trioxide	<p><b>OSHA PEL (United States, 11/2006).</b> TWA: 0.005 mg/m<sup>3</sup></p> <p><b>ACGIH TLV (United States, 1/2009).</b> TWA: 0.05 mg/m<sup>3</sup>, (measured as Cr) 8 hour(s). Form: Soluble</p> <p><b>OSHA PEL 1989 (United States, 3/1989).</b> TWA: 1 mg/m<sup>3</sup> 8 hour(s).</p> <p><b>NIOSH REL (United States, 6/2009).</b> TWA: 0.001 mg/m<sup>3</sup>, (as CR) 10 hour(s).</p> <p><b>OSHA PEL (United States, 11/2006).</b> TWA: 1 mg/m<sup>3</sup>, (as Cr) 8 hour(s). TWA: 5 ug/m<sup>3</sup> 8 hour(s).</p>
barium nitrate	<p><b>ACGIH TLV (United States, 1/2006). Notes: as Ba</b> <b>1996 Adoption Refers to Appendix A -- Carcinogens.</b> TWA: 0.5 mg/m<sup>3</sup>, (as Ba) 8 hour(s).</p> <p><b>NIOSH REL (United States, 12/2001). Notes: as Ba</b> <b>Note: The REL and PEL also apply to other soluble barium compounds (as Ba) except Barium sulfate.</b> TWA: 0.5 mg/m<sup>3</sup>, (as Ba) 10 hour(s).</p> <p><b>OSHA PEL (United States, 8/1997). Notes: as Ba</b> TWA: 0.5 mg/m<sup>3</sup>, (as Ba) 8 hour(s).</p> <p><b>OSHA PEL 1989 (United States, 3/1989). Notes: as Ba</b> TWA: 0.5 mg/m<sup>3</sup>, (as Ba) 8 hour(s).</p>
sodium fluorosilicate	<p><b>ACGIH TLV (United States, 1/2009).</b> TWA: 2.5 mg/m<sup>3</sup>, (as F) 8 hour(s).</p> <p><b>OSHA PEL 1989 (United States, 3/1989).</b> TWA: 2.5 mg/m<sup>3</sup>, (as F) 8 hour(s).</p> <p><b>OSHA PEL Z2 (United States, 11/2006).</b> TWA: 2.5 mg/m<sup>3</sup> 8 hour(s). Form: Dust</p> <p><b>OSHA PEL (United States, 11/2006).</b> TWA: 2.5 mg/m<sup>3</sup>, (as F) 8 hour(s).</p>

Consult local authorities for acceptable exposure limits.

- Recommended monitoring procedures** : If this product contains ingredients with exposure limits, personal, workplace atmosphere or biological monitoring may be required to determine the effectiveness of the ventilation or other control measures and/or the necessity to use respiratory protective equipment.
- Engineering measures** : If user operations generate dust, fumes, gas, vapor or mist, use process enclosures, local exhaust ventilation or other engineering controls to keep worker exposure to airborne contaminants below any recommended or statutory limits.



## 8 . Exposure controls/personal protection

**Hygiene measures** : Wash hands, forearms and face thoroughly after handling chemical products, before eating, smoking and using the lavatory and at the end of the working period. Appropriate techniques should be used to remove potentially contaminated clothing. Wash contaminated clothing before reusing. Ensure that eyewash stations and safety showers are close to the workstation location.

### Personal protection

**Respiratory** : Use a properly fitted, air-purifying or air-fed respirator complying with an approved standard if a risk assessment indicates this is necessary. Respirator selection must be based on known or anticipated exposure levels, the hazards of the product and the safe working limits of the selected respirator.

**Hands** : Chemical-resistant, impervious gloves complying with an approved standard should be worn at all times when handling chemical products if a risk assessment indicates this is necessary.

**Eyes** : Safety eyewear complying with an approved standard should be used when a risk assessment indicates this is necessary to avoid exposure to liquid splashes, mists, gases or dusts.

**Skin** : 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.

**Environmental exposure controls** : Emissions from ventilation or work process equipment should be checked to ensure they comply with the requirements of environmental protection legislation. In some cases, fume scrubbers, filters or engineering modifications to the process equipment will be necessary to reduce emissions to acceptable levels.

## 9 . Physical and chemical properties

**Physical state** : Solid. [Red / odorless]

## 10 . Stability and reactivity

**Stability** : The product is stable. Under normal conditions of storage and use, hazardous polymerization will not occur.

**Conditions to avoid** : Avoid exposure - obtain special instructions before use.

**Materials to avoid** : Alkalies, combustibles, reducing agents, organic material.

**Hazardous decomposition products** : Chromium compounds, toxic hydrogen cyanide gas

**Hazardous polymerization** : Will not occur.

## 11 . Toxicological information

### Acute toxicity

Product/ingredient name	Result	Species	Dose	Exposure
chromium (VI) trioxide	LD50	Rat	58400 ug/kg	-
	Intraperitoneal			
	LD50 Intravenous	Rat	9260 ug/kg	-
	LD50 Oral	Rat	80 mg/kg	-
	LDLo Dermal	Rat	55 mg/kg	-
barium nitrate	LD50	Rat	293 mg/kg	-
	Intraperitoneal			
	LD50 Oral	Rat	355 mg/kg	-
sodium fluorosilicate	LD50 Oral	Rat	390 mg/kg	-
	LD50 Oral	Rat	125 mg/kg	-
	LDLo	Rat	70 mg/kg	-
	Subcutaneous			

**Conclusion/Summary** : Not available.

## 11. Toxicological information

### Chronic toxicity

Conclusion/Summary : Not available.

### Carcinogenicity

Conclusion/Summary : Not available.

### Classification

Product/ingredient name	ACGIH	IARC	EPA	NIOSH	NTP	OSHA
chromium (VI) trioxide	A1	1	-	+	Proven.	-
barium nitrate	A4	-	-	-	-	-
sodium fluorosilicate	A4	3	-	-	-	-

### Mutagenicity

Conclusion/Summary : Not available.

### Teratogenicity

Conclusion/Summary : Not available.

### Reproductive toxicity

Conclusion/Summary : Not available.

## 12. Ecological information

Environmental precautions : Very toxic to aquatic organisms, may cause long-term adverse effects in the aquatic environment.

### Aquatic ecotoxicity

Product/ingredient name	Test	Result	Species	Exposure
chromium (VI) trioxide	-	Acute LC50 49 mg/L Fresh water	Fish - Channa punctata	96 hours
	-	Acute LC50 21.05 to 141.38 ppm Marine water	Fish - Tilapia mossambica	96 hours
	-	Acute LC50 60000 ug/L Fresh water	Fish - Colisa fasciata	96 hours
	-	Acute LC50 21000 ug/L Fresh water	Fish - Colisa fasciata	96 hours
sodium fluorosilicate	-	Acute LC50 160000 ug/L Marine water	Fish - Menidia beryllina	96 hours
	-	Acute LC50 49000 ug/L Fresh water	Fish - Lepomis macrochirus	96 hours

Conclusion/Summary : Not available.

### Biodegradability

Conclusion/Summary : Not Determined

## 13. Disposal considerations

Waste disposal : The generation of waste should be avoided or minimized wherever possible. Dispose of surplus and non-recyclable products via a licensed waste disposal contractor. Disposal of this product, solutions and any by-products should at all times comply with the requirements of environmental protection and waste disposal legislation and any regional local authority requirements. Avoid dispersal of spilled material and runoff and contact with soil, waterways, drains and sewers.











## 13 . Disposal considerations

Disposal should be in accordance with applicable regional, national and local laws and regulations. Local regulations may be more stringent than regional or national requirements.

The information presented below only applies to the material as supplied. The identification based on characteristic(s) or listing may not apply if the material has been used or otherwise contaminated. It is the responsibility of the waste generator to determine the toxicity and physical properties of the material generated to determine the proper waste identification and disposal methods in compliance with applicable regulations.

Refer to Section 7: HANDLING AND STORAGE and Section 8: EXPOSURE CONTROLS/PERSONAL PROTECTION for additional handling information and protection of employees.

## 14 . Transport information

Regulatory information	UN number	Proper shipping name	Class	PG*	Label	Additional information
DOT Classification	UN3087	OXIDIZING SOLID, TOXIC, N.O.S.  CHROMIC ACID/BARIUM NITRATE	5.1	II	 	<u>Marine pollutant</u> Marine pollutant (P)  <u>Reportable quantity</u> 18 LB
TDG Classification	UN3087	OXIDIZING SOLID, TOXIC, N.O.S.  CHROMIC ACID/BARIUM NITRATE	5.1	II	 	<u>Marine pollutant</u> Marine pollutant (P)
IMDG Class	UN3087	OXIDIZING SOLID, TOXIC, N.O.S.  CHROMIC ACID/BARIUM NITRATE	5.1	II	 	<u>Marine pollutant</u> Marine pollutant (P)
IATA-DGR Class	UN3087	OXIDIZING SOLID, TOXIC, N.O.S.	5.1	II	 	-

## 14 . Transport information

		CHROMIC ACID/BARIUM NITRATE				
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PG\* : Packing group

## 15 . Regulatory information

### United States

#### HCS Classification

: Toxic material  
Corrosive material  
Carcinogen  
Target organ effects

#### U.S. Federal regulations

: TSCA 6 final risk management: chromium (VI) trioxide  
**United States inventory (TSCA 8b):** All components are listed or exempted.  
TSCA 12(b) annual export notification: chromium (VI) trioxide  
TSCA precursor chemical list: sodium fluorosilicate

**SARA 302/304/311/312 extremely hazardous substances:** No products were found.

**SARA 302/304 emergency planning and notification:** No products were found.

**SARA 302/304/311/312 hazardous chemicals:** sodium fluorosilicate; barium nitrate; chromium (VI) trioxide

**SARA 311/312 MSDS distribution - chemical inventory - hazard identification:**  
sodium fluorosilicate: Immediate (acute) health hazard; barium nitrate: Fire hazard,  
Immediate (acute) health hazard; chromium (VI) trioxide: Fire hazard, Immediate (acute)  
health hazard, Delayed (chronic) health hazard

**Clean Water Act (CWA) 307:** chromium (VI) trioxide

**Clean Water Act (CWA) 311:** No products were found.

**Clean Air Act (CAA) 112 accidental release prevention:** No products were found.

**Clean Air Act (CAA) 112 regulated flammable substances:** No products were found.

**Clean Air Act (CAA) 112 regulated toxic substances:** No products were found.

### SARA 313

#### Form R - Reporting requirements

: Product name  
chromium (VI) trioxide  
barium nitrate

#### CAS number

1333-82-0  
10022-31-8

#### Concentration

50 - 60  
15 - 25

#### Supplier notification

: chromium (VI) trioxide  
barium nitrate

1333-82-0  
10022-31-8

50 - 60  
15 - 25

SARA 313 notifications must not be detached from the MSDS and any copying and redistribution of the MSDS shall include copying and redistribution of the notice attached to copies of the MSDS subsequently redistributed.

#### State regulations

: **Connecticut Carcinogen Reporting:** None of the components are listed.  
**Connecticut Hazardous Material Survey:** None of the components are listed.  
**Florida substances:** None of the components are listed.  
**Illinois Chemical Safety Act:** None of the components are listed.  
**Illinois Toxic Substances Disclosure to Employee Act:** None of the components are listed.  
**Louisiana Reporting:** None of the components are listed.  
**Louisiana Spill:** None of the components are listed.  
**Massachusetts Spill:** None of the components are listed.  
**Massachusetts Substances:** The following components are listed: CHROMIUM ANHYDRIDE; BARIUM NITRATE; SODIUM SILICA FLUORIDE  
**Michigan Critical Material:** None of the components are listed.  
**Minnesota Hazardous Substances:** None of the components are listed.  
**New Jersey Hazardous Substances:** The following components are listed: CHROMIC TRIOXIDE; CHROMIC ANHYDRIDE; BARIUM NITRATE; SODIUM FLUOROSILICATE; SILICATE(2-), HEXAFLUORO-, DISODIUM  
**New Jersey Spill:** None of the components are listed.



## 15 . Regulatory information

**New Jersey Toxic Catastrophe Prevention Act:** None of the components are listed.

**New York Acutely Hazardous Substances:** None of the components are listed.

**New York Toxic Chemical Release Reporting:** None of the components are listed.

**Pennsylvania RTK Hazardous Substances:** The following components are listed:  
CHROMIUM OXIDE (CrO<sub>3</sub>);NITRIC ACID, BARIUM SALT

**Rhode Island Hazardous Substances:** None of the components are listed.

### California Prop. 65

**WARNING:** This product contains a chemical known to the State of California to cause cancer and birth defects or other reproductive harm.

<u>Ingredient name</u>	<u>Cancer</u>	<u>Reproductive</u>	<u>No significant risk level</u>	<u>Maximum acceptable dosage level</u>
chromium (VI) trioxide	Yes.	Yes.	0.001 µg/day (inhalation)	No.

### Canada

- WHMIS (Canada)** : Class C: Oxidizing material.  
Class D-1A: Material causing immediate and serious toxic effects (Very toxic).  
Class D-2A: Material causing other toxic effects (Very toxic).  
Class D-2B: Material causing other toxic effects (Toxic).  
Class E: Corrosive material
- Canadian lists** : **CEPA Toxic substances:** The following components are listed: Hexavalent chromium compounds;Inorganic fluorides  
**Canadian ARET:** None of the components are listed.  
**Canadian NPRI:** The following components are listed: Hexavalent chromium compounds  
**Alberta Designated Substances:** None of the components are listed.  
**Ontario Designated Substances:** None of the components are listed.  
**Quebec Designated Substances:** None of the components are listed.

This product has been classified according to the hazard criteria of the CPR and the MSDS contains all the information required by the CPR.

## 16 . Other information

☑ Indicates information that has changed from previously issued version.

### Notice to reader

To the best of our knowledge, the information contained herein is accurate. However, neither the above-named supplier, nor any of its subsidiaries, assumes any liability whatsoever for the accuracy or completeness of the information contained herein.

Final determination of suitability of any material is the sole responsibility of the user. All materials may present unknown hazards and should be used with caution. Although certain hazards are described herein, we cannot guarantee that these are the only hazards that exist.