

# MATERIAL SAFETY DATA SHEET



Complies with U.S. OSHA  
E.C. Guideline 91/155/EEC:  
Revision: 7  
Last Revision: October 2011  
Replaces: August 2008

**EMERGENCY TELEPHONE NUMBERS:**  
NATIONAL RESPONSE CENTER: 1-800-424-8802  
CHEMTREC U.S. and CANADA: 1-800-424-9300  
CHEMTREC International: 1-202-483-7616 (Collect)

Users of this product are requested to study this data sheet to learn the product's characteristics so that the product can be used safely. If the material is resold, the purchaser should be furnished a copy of this data sheet and the information should be made available to all users.

## SECTION 1 Chemical Product and Company Identification

<b>Product Trade Name</b>	<b>80/20, 50/50, and 65/35 Vanadium-Titanium Mixes (CAB Catalysts)</b>
<b>Article No.</b>	MC 14, MC 14A, and MC 15.
<b>Company Identification</b>	Evraz Stratcor, Inc. Tel.: (501) 262-1270 4285 Malvern Road Fax: (501) 262-2793 Hot Springs, Arkansas 71901; U.S.A.
<b>Inquiry Department</b>	Evraz Stratcor, Inc., Pittsburgh, Pennsylvania; U.S.A. Tel.: 1-412-787-4500; www.evrazstratcor.com

## SECTION 2 Composition and Information on Ingredients

**Chemical Characterization:**

<b>Chemical Description</b>	<b>Mixtures of 50% Vanadium Oxytrichloride and 50% Titanium Tetrachloride; 65% Vanadium Oxytrichloride and 35% Titanium Tetrachloride; and 80% Vanadium Oxytrichloride and 20% Titanium Tetrachloride.</b>
<b>UN Number</b>	<b>UN 3390</b>
<b>DOT Guide</b>	<b>154</b>
<b>CAS No.</b>	
Vanadium Oxytrichloride	<b>7727-18-6</b>
Titanium Tetrachloride	<b>7550-45-0</b>
<b>EINECS No.</b>	
Vanadium Oxytrichloride	<b>231-780-2</b>
Titanium Tetrachloride	<b>231-441-9</b>

## SECTION 3 Hazards Identification

**Potential Hazards for Humans and Animals:**

<b>Eye Contact</b>	Chemical and possible thermal burns with redness, swelling, corneal burns, and possible blindness.
<b>Skin Contact</b>	Liquid causes chemical burns with redness, swelling, blisters, and pain. Vapors and fumes may cause chemical burns.
<b>Inhalation</b>	Fumes cause chemical burns of nasal passages, throat, and respiratory tract, with coughing, chest pain, and breathing difficulty.
<b>Ingestion</b>	Chemical and possible thermal burns of the mouth, throat, stomach, and intestinal tract, with injury to liver and kidneys.

## SECTION 4

### First-Aid Measures

#### General Information:

##### Inhalation

Remove to fresh air. Administer oxygen if breathing difficult. Administer artificial aspiration if breathing has stopped. Call a physician.

##### Skin

Remove contaminated clothing. Dab liquid from skin using DRY cotton or paper toweling. Flood area with plenty of the coldest water available. See a physician if exposure symptoms develop.

##### Eyes

Immediately flood the eyes with plenty of cold water for at least 15 minutes. See a physician and ophthalmologist.

##### Ingestion

Do not induce vomiting. Give at least two glasses of water. Call a physician.

## SECTION 5

### Fire-Fighting Measures

#### Suitable Extinguishing Media

No fire hazard. Use media suitable for surrounding fire.

#### Extinguishing Media Not to Be Used

Cool containers immersed in fire by blanketing with cold water. Product reacts violently with water, releasing dense corrosive fumes. Avoid water contact with product unless absolutely necessary.

#### Special Exposure Hazards

Dense fumes of product, vanadium pentoxide, titanium dioxide, and hydrochloric acid. Product reacts exothermically with water to form hydrochloric acid, vanadium pentoxide, and titanium dioxide.

#### Special Protective Equipment for Fire Fighters

Impermeable acid-resistant clothing. Positive-pressure, self-contained breathing apparatus.

#### Additional Information

The pressure in closed-product containers exposed to fire can build to dangerous levels. Direct extinguishing media to such containers to keep them cool. Shipping container vapor space contains a fusible plug which melts between 75 and 175°C (165 and 350°F) and a relief valve which opens at 11.9 bar (175 psi).

## SECTION 6

### Accidental-Release Measures

#### Personal Precautions

Evacuate the area immediately. Cleanup personnel must wear impermeable acid-resistant clothing, including positive-pressure, self-contained breathing apparatus.

#### Environmental Precautions

Prevent water and moisture contact. Product fumes in air from reaction with atmospheric moisture. Fumes are a mixture of vanadium pentoxide, titanium dioxide, and hydrochloric acid. Vanadium pentoxide is a U.S. EPA-listed hazardous substance with a reportable quantity of 454 kg (1000 lbs.). Titanium tetrachloride is a U.S. EPA-listed hazardous air pollutant (HAP) with a reportable quantity of 0.6 kg (1 lb.).

#### Cleaning Methods

Minor spills can be misted with water and neutralized with soda ash. Dike large spills with clay, earth, or soda ash. Pump or absorb with dry clay and shovel up to a dry polyethylene container. Steel or aluminum may react and dissolve.

#### Additional Information

Product may be neutralized in place using foam and soda ash. Vanadium-pentoxide fume has an OSHA PEL of 0.1 mg/m<sup>3</sup>. Titanium dioxide has an OSHA PEL of 15 mg/m<sup>3</sup>. Shipping-container vapor space is fitted with a fusible plug which melts between 75 and 175°C (165 and 350°F) or a reclosing relief valve which opens at 110% of the container MAWP.

## SECTION 7

### Handling and Storage

<b>Handling</b>	Do not allow contact with moisture. Use only in a closed system. Do not open the container to the atmosphere. Use only approved materials of construction.
<b>Storage</b>	Store in a closed steel container under a dry inert-gas blanket. Storage area should be well ventilated. Protect containers from temperature cycling which may cause breathing.

## SECTION 8

### Exposure Controls and Personal Protection

<b>Recommendations on Equipment Designs</b>	Ensure sufficient ventilation of the workplace. Use recommended materials of construction. Use design and operational practices which exclude atmosphere and moisture contact.
<b>Occupational Exposure Limit</b>	Not listed in OSHA 29 CFR 1910.1000, Table Z-1 (Air Contaminants) 0.05 mg/m <sup>3</sup> for V <sub>2</sub> O <sub>5</sub> (NIOSH TLV TWA) 0.05 mg/m <sup>3</sup> for 15-Minute Ceiling for Vanadium (NIOSH) 0.5 mg/m <sup>3</sup> for TiCl <sub>4</sub> (8 hour TWA, Titanium Metals Corp.) 5 ppm (7 mg/m <sup>3</sup> ) Ceiling for Hydrogen Chloride) from Reaction of VOCl <sub>3</sub> with Moisture 10 mg/m <sup>3</sup> for TiO <sub>2</sub> (ACGIH TLV TWA) from Reaction of Mixture with Moisture.
<b>Personal Safety Equipment:</b>	
<b>Respiratory Protection</b>	Use full-face gas mask approved by NIOSH/MSHA; self-contained breathing apparatus.
<b>Hand Protection</b>	Use impermeable gloves.
<b>Eye Protection</b>	Use goggles, face mask, face shield.
<b>Skin Protection</b>	Use impermeable acid-resistant clothing..
<b>Personal Hygiene</b>	Do not allow contact.

## SECTION 9

### Physical and Chemical Properties

This MSDS reflects available research data and is not a product- or quality-specification document.

<b>Appearance:</b>	
<b>Physical State</b>	Liquid.
<b>Color</b>	Pale yellow, clear.
<b>Odor</b>	Acrid.
<b>Change in Physical State:</b>	
<b>Vapor Pressure</b>	17.5 mm Hg (20°C).
<b>Boiling Point</b>	128°C (261°F).
<b>Flammability</b>	Not flammable.
<b>Oxidizing Properties</b>	Acts as a catalyst in certain chemical environments.
<b>Explosive Properties</b>	None.
<b>Density</b>	1.8.
<b>Solubility in Water (20°C)</b>	Violently hygroscopic; decomposes to hydrochloric acid, vanadium pentoxide, and titanium dioxide.
<b>pH Value</b>	Not applicable.

## SECTION 10

### Stability and Reactivity

<b>Conditions to Avoid</b>	Contact with water in any form.
<b>Incompatible Materials</b>	Water, sodium, polar solvents, most plastics, aluminum.
<b>Hazardous Decomposition</b>	Violently hygroscopic, forming vanadium pentoxide, titanium dioxide, and hydrochloric acid. May generate chlorine on heating.

## SECTION 11 Toxicological Information

<b>Acute Toxicity</b>	VOC <sub>3</sub> LD50 orl-rat: 140 mg/kg. (SAXDPIM) VOC <sub>3</sub> LC 50 inh rat: >1000 ppm (Union Carbide) TiCl <sub>4</sub> LC 50 inh rat: 460 mg/cu. m (SCM Chemicals)
<b>Irritation</b>	Corrosive irritant to skin, eyes, and mucous membranes. Hydrothermic property may cause thermal burns.
<b>Chronic Toxicity</b>	Inhalation of fumes may cause chronic bronchitis, allergic skin reaction, or asthmatic reaction with possible lung injury in susceptible individuals. When exposure ceases, effects are usually reversible.
<b>Carcinogen Status:</b>	
<b>IARC</b>	Not listed, International Agency for Research on Cancer
<b>NTP Annual Report</b>	Not listed, National Toxicology Program
<b>OSHA Subpart Z</b>	Not listed.
<b>U.S. EPA Genetic Toxicity</b>	Not reported. (Vanadium pentoxide is reported.)
<b>Mutagen Status</b>	Decomposition products may have mutagenic effects or may be an experimental teratogen.
<b>Teratogen Status</b>	See above.

## SECTION 12 Ecological Information

<b>Persistence and Degradability</b>	Chemically stable when properly stored.
<b>Aquatic Toxicity and Other Data Relating to Exotoxicity</b>	Violently reacts with water forming vanadium pentoxide, titanium oxychloride, and hydrochloric acid, any of which may be harmful to an aquatic environment.

## SECTION 13 Disposal Considerations

<b>Product Recommendation</b>	Neutralize by slowly reacting with an alkaline solution, preferably lime or sodium hydroxide. Dispose of resulting solution in accordance with local regulatory guidelines
<b>Contaminated-Packaging Recommendation</b>	Rinse with alkaline solution, preferably sodium hydroxide. Dispose of rinseate and cleaned packaging in accordance with local regulatory guidelines.

## SECTION 14 Transport Information

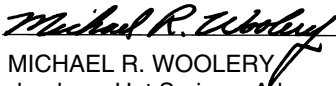
<b>U.N. packaging requirements shall be met for air and non-U.S. shipments.</b>	
<b>Proper Shipping Description</b>	UN 3390, Toxic by Inhalation Liquid, Corrosive, n.o.s., 6.1, 8, PG I, Zone B (Contains vanadium oxytrichloride, titanium tetrachloride).
<b>Land Transport</b>	U.S. DOT or appropriate local guidelines.
<b>Inland-Waterway Transport</b>	U.S. DOT or appropriate local guidelines.
<b>Sea Transport</b>	IMO/IMDG Code. Requires an IMO Shipper's Declaration Form. Container shipments require a Container Packing Certificate or Vehicle Packing Declaration.
<b>Air Transport</b>	Not permitted.

## SECTION 15 Regulatory Information

<b>Classification According to U.N. Guidelines</b>	Corrosive liquid, poisonous.
<b>E.C. Danger Symbol</b>	C (for titanium tetrachloride only)
<b>R-Phrases</b>	R14-34 (36-37) (for titanium tetrachloride only)
<b>S-Phrases</b>	S (1-2) (7-8) 26-45 (for titanium tetrachloride only)
<b>U.S. EPA TSCA Inventory</b>	Ingredients reported in the initial EPA TSCA Inventory.
<b>U.S. EPA SARA III, Section 302</b>	Titanium tetrachloride has a TPQ of 45 kg (100 lbs.).
<b>U.S. EPA SARA III, Section 304</b>	Titanium tetrachloride has a RQ of 0.6 kg (1lb.).
<b>U.S. EPA SARA III, Section 311 and 312</b>	Reporting required. Review regulations.
<b>U.S. EPA SARA III, Section 313</b>	Reporting required above threshold quantity.
<b>U.S. EPA CAA 112(r)</b>	Titanium tetrachloride has a TQ of 1134 kg (2,500 lbs.).
<b>Non-U.S. Requirements</b>	Refer to specific national guidelines.

## SECTION 16 Other Information

Data Sheet Prepared by:

 10-1-11  
MICHAEL R. WOOLERY  
Director of Technology; Hot Springs, Arkansas; U.S.A.

Evraz Stratcor, Inc. believes that the data on this sheet are correct as of the effective date and that the opinions given reflect those of qualified experts. Since Evraz Stratcor cannot control the product or its use, it is the user's responsibility to use the product safely. The data on this sheet apply only to products sold by corporate subsidiaries of Evraz Stratcor and may not apply to products sold by others.

**EVRAZ STRATCOR, Inc.**

4285 Malvern Road  
Hot Springs, Arkansas 71901

[www.evrazstratcor.com](http://www.evrazstratcor.com); [www.evraz.com](http://www.evraz.com)