Section 1 - Product and Company Information

Product Name: TITANIUM(IV) ISOPROPoxide, 99.999%
Product Number: 377996
Brand: Aldrich Chemical
Company: Sigma-Aldrich
Street Address: 3000 Spruce Street
City, State, Zip, Country: SAINT LOUIS, MO 63103 US
Telephone: 314 771 5765
Emergency Phone: 414 273 3850 Ext. 0996
Fax: 400 029 6592

Section 2 - Composition/Information on Ingredient

Substance Name: TETRA-ISOPROPYL ORTHOTITANATE
CAS #: 54668-9
SARA 313: No

Formula: Ti(CH(OCH3))4
Synonyms: Tetraisopropoxide, Isopropyl orthotitanate, Titanium tetraisopropoxide, Tetraisoproxytitanium, Tetraisopropoxide orthotitanate, Tetraisopropoxide titanium, Tetraisopropoxide, Titanium tetrakisopropoxide, Titanium tetraisopropoxide, Titanium tetraisopropoxide (4+), Isopropoxide, Titanium isopropoxide, Titanium tetraisopropoxide, Titanium tetraisopropoxide, Titanium tetraisopropoxide, Titania

Section 3 - Hazards Identification

Emergency Overview
Flammable. Irritant. Irritating to eyes.

HMIS Rating
Health: 1 Flammability: 3 Reactivity: 1

NFPA Rating
Health: 1 Flammability: 3 Reactivity: 1

For additional information on toxicity, please refer to Section 11.

Section 4 - First Aid Measures

Oral Exposure
If swallowed, wash out mouth with water provided person is conscious. Call a physician.

Inhalation Exposure
If inhaled, remove to fresh air. If not breathing give artificial respiration. If breathing is difficult, give oxygen.

Dermal Exposure
In case of contact, immediately wash skin with soap and copious amounts of water.

Eye Exposure
In case of contact, immediately flush eyes with copious amounts of water for at least 15 minutes.

Section 5 - Fire Fighting Measures

Flammable Hazards: Yes

Explosion Hazards
Vapor may travel considerable distance to source of ignition and flash back. Container explosion may occur under fire conditions.

Flash Point: 113 °F 45 °C

Autoignition Temp: N/A

Extinguishing Media
Suitable: Water spray. Carbon dioxide, dry chemical powder, or appropriate foam.

Incombustible Material: Liquid, solid, or fine powder.

Firefighting

Protective Equipment
Wear self-contained breathing apparatus and protective clothing to prevent contact with skin and eyes.

Specific Hazard(s)
Flammable liquid. Emits toxic fumes under fire conditions.

Section 6 - Accidental Release Measures

Procedure to be Followed in Case of Leak or Spill
Evacuate area. Shut off all sources of ignition.

Procedure(s) of Personal Precaution(s)
Wear respirator, chemical safety goggles, rubber boots, and heavy rubber gloves.

Methods for Cleaning Up
Cover with dry-rice, sand, or soda ash. Place in covered containers using non-sparking tools and transport outdoors. Ventilate area and wash spill site after material pickup is complete.

Section 7 - Handling and Storage

Handling
User Exposure
Avoid breathing vapor. Avoid contact with eyes, skin, and clothing. Avoid prolonged or repeated exposure.

Storage
Suitable: Keep tightly closed. Keep away from heat, sparks, and open flame. Handle and store under nitrogen.

Special Requirements
Readily hydrolyzed.

Section 8 - Exposure Controls / PPE

Engineering Controls
Safety shower and eye bath. Use non-sparking tools. Mechanical exhaust required.

Personal Protective Equipment
Respiratory
Government approved respirator.

Hand
Compatible chemical-resistant gloves.

Eye
Chemical safety goggles.
Section 9 - Physical/Chemical Properties

<table>
<thead>
<tr>
<th>Property</th>
<th>Value</th>
<th>At Temperature or Pressure</th>
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</thead>
<tbody>
<tr>
<td>Molecular Weight</td>
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<tr>
<td>Property</td>
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<td>At Temperature or Pressure</td>
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<tr>
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<td>10 mmHg</td>
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<td>MP/VP Range</td>
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<td>Freezing Point</td>
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<td>Vapor Pressure</td>
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<tr>
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<tr>
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<td>Method: closed cup</td>
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<tr>
<td>Solubility</td>
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</tr>
</tbody>
</table>

N/A = not available

Section 10 - Stability and Reactivity

Stability
- Conditions of Instability: May decompose on exposure to moist air or water

Hazardous Decomposition Products
- Carbon monoxide, Carbon dioxide, Titanium/titanium oxides.

Section 11 - Toxicological Information

Route of Exposure
- Skin Contact: May cause skin irritation.
- Skin Absorption: May be harmful if absorbed through the skin.
- Eye Contact: Causes eye irritation.
- Inhalation: May be harmful if inhaled. Material is irritating to mucous membranes and upper respiratory tract.
- Ingestion: May be harmful if swallowed.

Signs and Symptoms of Exposure
To the best of our knowledge, the chemical, physical, and toxicological properties have not been thoroughly investigated.

Section 12 - Ecological Information
No data available.

Section 13 - Disposal Considerations

Appropriate Method of Disposal of Substance or Preparation
- Contact a licensed professional waste disposal service to dispose of this material.
- Burn in a chemical incinerator equipped with an afterburner and scrubber. Use extreme care in igniting as this material is highly flammable.
- Observe all federal, state, and local environmental regulations.

Section 14 - Transport Information

DOT
- Proper Shipping Name: Flammable liquid, n.o.s.
- UN#: 1993
- Class: 3
- Packing Group: Packing Group II
- Hazard Label: Flammable liquid
- PH: Not PH

IATA
- Proper Shipping Name: Flammable liquid, n.o.s.
- IATA UN Number: 1993
- Hazard Class: 3
- Packing Group: II
Section 15 - Regulatory Information

EU Additional Classification
Symbol of Danger: XI
Indication of Danger
Irritant.
Risk Statements
R: 10 36
Flammable. Irritating to eyes.
Safety Statements
S: 16 26 38/37/39
Keep away from sources of ignition - no smoking. In case of contact with eyes, rinse immediately with plenty of water and seek medical advice. Wear suitable protective clothing, gloves, and eye/face protection.

US Classification and Label Text
Indication of Danger
Flammable, irritant.
Risk Statements
Irritating to eyes.
Safety Statements
Keep away from sources of ignition - no smoking. In case of contact with eyes, rinse immediately with plenty of water and seek medical advice. Wear suitable protective clothing, gloves, and eye/face protection.

United States Regulatory Information
SARA Listed: No
TSCA Inventory Item: Yes

Canada Regulatory Information
WHMIS Classification
This product has been classified in accordance with the hazard criteria of the CPR, and the MSDS contains all the information required by the CPR.
DSL: Yes
NDSL: No

Section 16 - Other Information

Disclaimer
For MSD use only. Not for drug, household or other uses.

Warranty
The above information is believed to be correct but does not purport to be all inclusive and shall be used only as a guide. Sigma-Aldrich Inc., shall not be held liable for any damage resulting from handling or from contact with the above product. See reverse side of invoice or packing slip for additional terms and conditions of sale. Copyright 2004 Sigma-Aldrich Co. License granted to make unlimited paper copies for internal use only.