# Modification Form for Permit BIO-UWO-0149

## Permit Holder: Jun Yang

**Approved Personnel**
**(Please stroke out any personnel to be removed)**

**Additional Personnel**
**(Please list additional personnel here)**

| | Please stroke out any approved Biohazards to be removed below | Write additional Biohazards for approval below. * |
|---|---|---|
| **Approved Microorganisms** | Staphylococcus aureus | E-coli K12 |
| **Approved Cells** | | Endothelial cells, Jurkat cells |
| **Approved Use of Human Source Material** | proteins from blood | |
| **Approved GMO** | | |
| **Approved use of Animals** | | |
| **Approved Toxin(s)** | | Nanomaterials → $TiO_2$ see email attached re: UWO Nanotechnology program |

* *PLEASE ATTACH A MATERIAL SAFETY DATA SHEET OR EQUIVALENT FOR NEW BIOHAZARDS.*
** *PLEASE ATTACH A BRIEF DESCRIPTION OF THE WORK THAT EXPLAINS THE BIOHAZARDS USED AND HOW THEY WILL BE USED.*

**Classification:** 2

**Date of last Biohazardous Agents Registry Form:** Oct 12, 2006

**Signature of Permit Holder:**

**BioSafety Officer(s):**

**Chair,Biohazards Subcommittee:**

## 1. Ecoli: K12, ATCC#29425 (website info attached at the end)

From:
http://www.atcc.org/ATCCAdvancedCatalogSearch/ProductDetails/tabid/452/Default.aspx?ATCCNum=29425&Template=bacteria

Biosafety level: Level 1

Growth medium: Nutrient agar or nutrient broth

### Research:

**Culture to test antibacterial property**

## 2. Human Aortic Endothelial cell: (MSDS attached at the end)

Medium from:

https://bcprd.lonza.com/shop/b2c/display/(xcm=lonza_b2b&cpgsize=&layout=5.1-6_1_75_65_8_11&uiarea=3&carea=DCEA1D183A4564F18C7C001A4B525E10&cpgnum=1)/.do

### Research:

**Culture to study mechanical property of endothelial cells**

## 3. Jurkat cell: (MSDS attached at the end)

Advanced RPMI 1640

### Research:

**Culture to study cell interaction process**

## 4. Nanomaterials: (MSDS attached at the end)

### Research:

Study mechanical and electronic property of nanomaterials, and study antibacterial property of nanomaterials (Titanium dioxide)

**Subject:** Nanomaterials - Dr. J. Yang
**From:** Jennifer Stanley <jstanle2@uwo.ca>
**Date:** Fri, 18 Sep 2009 11:54:50 -0400
**To:** Anne Marie Mc Cusker <amccuske@uwo.ca>
**CC:** Seung-Won Lee <slee785@uwo.ca>

Hi Anne Marie
Can you confirm is Dr. Jun Yang (use of titanium dioxide nanomaterials) is in the UWO Nanotechnology Program?
Thanks,
Jennifer

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### Bacteria

**ATCC® Number:** 29425™ Order this Item **Price:** $195.00

| | |
|---|---|
| **Organism:** | *Escherichia coli* (Migula) Castellani and Chalmers |
| **Designations:** | K12 |
| **Isolation:** | Basel, 1969 [185139] |
| **Depositor:** | R Yuan |
| **History:** | ATCC <<--R Yuan<<--W. Arber |
| Biosafety Level: | 1 |
| **Shipped:** | freeze-dried |
| **Growth Conditions:** | ATCC medium3: Nutrient agar or nutrient broth<br>**Temperature:** 37.0°C<br>Duration: aerobic |
| **Permits/Forms:** | In addition to the MTA mentioned above, other ATCC and/or regulatory permits may be required for the transfer of this ATCC material. Anyone purchasing ATCC material is ultimately responsible for obtaining the permits. Please click here for information regarding the specific requirements for shipment to your location. |
| **References:** | 185139: R Yuan, personal communication |

**Related Links**
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- Material Transfer Agreement
- Technical Support
- Related Products

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All prices are listed in U.S. dollars and are subject to change without notice. A discount off the current list price will be applied to most cultures for nonprofit institutions in the United States. Cultures that are ordered as test tubes or flasks will carry an additional laboratory fee. Fees for permits, shipping, and handling may apply.

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# Material Safety Data Sheet

**Revision Date:** 10-Jul-2007

## 1. IDENTIFICATION OF THE SUBSTANCE/PREPARATION AND THE COMPANY/UNDERTAKING

**Product code** C0065C
**Product name** HAEC, 500,000 cells/vial

**Company/Undertaking Identification**

INVITROGEN CORPORATON
1600 FARADAY AVENUE
PO BOX 6482
CARLSBAD, CA 92008
760-603-7200

INVITROGEN CORPORATION
3 FOUNTAIN DRIVE
INCHINNAN BUSINESS PARK
PAISLEY, PA4 9RF
SCOTLAND
011 44 141 814 6100

INVITROGEN CORPORATION
2270 INDUSTRIAL STREET
BURLINGTON, ONT
CANADA L7P 1A1
1-800-263-6236

CASCADE BIOLOGICS
INVITROGEN CORPORATION
1341 S.W. CUSTER DRIVE
PORTLAND, OR 97219
++1 503-292-9521
++1 800-778-4770

## 2. COMPOSITION/INFORMATION ON INGREDIENTS

**Hazardous/Non-hazardous Components**

| Chemical Name | CAS-No | Weight % |
|---|---|---|
| dimethylsulfoxide | 67-68-5 | 7-13 |

The product contains no substances which at their given concentration, are considered to be hazardous to health

## 3. HAZARDS IDENTIFICATION

## 3. HAZARDS IDENTIFICATION

**Emergency Overview**
Components of the product may be absorbed into the body through the skin
The product contains no substances which at their given concentration, are considered to be hazardous to health

**Form**
Suspension

**Principle Routes of Exposure/ Potential Health effects**

| | |
|---|---|
| **Eyes** | Mild eye irritation. |
| **Skin** | Moderate skin irritation. Components of the product may be absorbed into the body through the skin. |
| **Inhalation** | No information available |
| **Ingestion** | May be harmful if swallowed. |

**Specific effects**

| | |
|---|---|
| **Carcinogenic effects** | No information available |
| **Mutagenic effects** | No information available |
| **Reproductive toxicity** | No information available |
| **Sensitization** | No information available |

**Target Organ Effects** No information available

**HMIS**

| | |
|---|---|
| Health | 1 |
| Flammability | 0 |
| Reactivity | 0 |

## 4. FIRST AID MEASURES

| | |
|---|---|
| **Skin contact** | Wash off immediately with soap and plenty of water removing all contaminated clothes and shoes. |
| **Eye contact** | Rinse thoroughly with plenty of water, also under the eyelids. |
| **Ingestion** | Rinse mouth. |
| **Inhalation** | Move to fresh air |
| **Notes to physician** | Treat symptomatically |

## 5. FIRE-FIGHTING MEASURES

| | |
|---|---|
| **Suitable extinguishing media** | Water spray. Carbon dioxide (CO2). Foam. Dry powder. alcohol-resistant foam. The product is not flammable. |
| **Special protective equipment for firefighters** | Wear self-contained breathing apparatus and protective suit |

## 6. ACCIDENTAL RELEASE MEASURES

| | |
|---|---|
| **Personal precautions** | Use personal protective equipment |
| **Methods for cleaning up** | Soak up with inert absorbent material. Clean contaminated surface thoroughly. Take up mechanically and collect in suitable container for disposal. |

## 7. HANDLING AND STORAGE

**Handling** Avoid contact with skin and eyes.
**Storage** Keep in properly labelled containers.

## 8. EXPOSURE CONTROLS / PERSONAL PROTECTION

Occupational exposure controls

Exposure limits

| Chemical Name | OSHA PEL (TWA) | OSHA PEL (Ceiling) | ACGIH OEL (TWA) | ACGIH OEL (STEL) |
|---|---|---|---|---|
| dimethylsulfoxide | - | - | - | - |

**Engineering measures** Ensure adequate ventilation, especially in confined areas

Personal protective equipment

**Respiratory protection** In case of insufficient ventilation wear suitable respiratory equipment
**Hand protection** Protective gloves
**Eye protection** Safety glasses with side-shields
**Skin and body protection** Lightweight protective clothing
**Hygiene measures** Handle in accordance with good industrial hygiene and safety practice
**Environmental exposure controls** Prevent product from entering drains

## 9. PHYSICAL AND CHEMICAL PROPERTIES

General Information

**Form** Suspension

Important Health Safety and Environmental Information

| | | |
|---|---|---|
| **Boiling point/range** | °C No data available | °F No data available |
| **Melting point/range** | °C No data available | °F No data available |
| **Flash point** | °C No data available | °F No data available |
| **Autoignition temperature** | °C No data available | °F No data available |
| **Oxidizing properties** | No information available | |
| **Water solubility** | soluble | |

## 10. STABILITY AND REACTIVITY

**Stability** Stable.
**Materials to avoid** No information available
**Hazardous decomposition products** No information available
**Polymerization** Hazardous polymerisation does not occur

## 11. TOXICOLOGICAL INFORMATION

Acute toxicity

| Chemical Name | LD50 (oral,rat/mouse) | LD50 (dermal,rat/rabbit) | LC50 (inhalation,rat/mouse) |
|---|---|---|---|
| dimethylsulfoxide | 14500 mg/kg (Rat) | No data available | No data available |

**Principle Routes of Exposure/ Potential Health effects**

| | |
|---|---|
| **Eyes** | Mild eye irritation. |
| **Skin** | Moderate skin irritation. Components of the product may be absorbed into the body through the skin. |
| **Inhalation** | No information available |
| **Ingestion** | May be harmful if swallowed. |

**Specific effects**

| | |
|---|---|
| **Carcinogenic effects** | No information available |
| **Mutagenic effects** | No information available |
| **Reproductive toxicity** | No information available |
| **Sensitization** | No information available |

**Target Organ Effects** No information available

## 12. ECOLOGICAL INFORMATION

| | |
|---|---|
| **Ecotoxicity effects** | No information available. |
| **Mobility** | No information available. |
| **Biodegradation** | Inherently biodegradable. |
| **Bioaccumulation** | Does not bioaccumulate. |

## 13. DISPOSAL CONSIDERATIONS

Dispose of in accordance with local regulations

## 14. TRANSPORT INFORMATION

**IATA**

| | |
|---|---|
| **Proper shipping name** | Not classified as dangerous in the meaning of transport regulations |
| **Hazard Class** | No information available |
| **Subsidiary Class** | No information available |
| **Packing group** | No information available |
| **UN-No** | No information available |

## 15. REGULATORY INFORMATION

**International Inventories**

| Chemical Name | TSCA | PICCS | ENCS | DSL | NDSL | AICS |
|---|---|---|---|---|---|---|
| dimethylsulfoxide | Listed | Listed | Listed | Listed | - | Listed |

**U.S. Federal Regulations**

**SARA 313**
This product is not regulated by SARA.

**Clean Air Act, Section 112 Hazardous Air Pollutants (HAPs) (see 40 CFR 61)**
This product does not contains HAPs.

**U.S. State Regulations**

| Chemical Name | Massachusetts - RTK | New Jersey - RTK | Pennsylvania - RTK | Illinois - RTK | Rhode Island - RTK |
|---|---|---|---|---|---|
| dimethylsulfoxide | - | - | - | - | - |

**California Proposition 65**
This product does not contain chemicals listed under Proposition 65

**WHMIS hazard class:**
Non-controlled

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

## 16. OTHER INFORMATION

This material is sold for research and development purposes only. It is not for any human or animal therapeutic or clinical diagnostic use. It is not intended for food, drug, household, agricultural, or cosmetic use. An individual technically qualified to handle potentially hazardous chemicals must supervise the use of this material.

The above information was acquired by diligent search and/or investigation and the recommendations are based on prudent application of professional judgment. The information shall not be taken as being all inclusive and is to be used only as a guide. All materials and mixtures may be present unknown hazards and should be used with caution. Since Invitrogen Corporation cannot control the actual methods, volumes, or conditions of use, the Company shall not be held liable for any damages or losses resulting from the handling or from contact with the product as described herein. THE INFORMATION IN THIS MSDS DOES NOT CONSTITUTE A WARRANTY, EXPRESS OR IMPLIED, INCLUDING ANY IMPLIED WARRANTY OF MERCHANTABILITY OR FITNESS FOR ANY PARTCULAR PURPOSE.

**End of Safety Data Sheet**

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# Material Safety Data Sheet

**Revision Date:** 18-Jul-2008

## 1. IDENTIFICATION OF THE SUBSTANCE/PREPARATION AND THE COMPANY/UNDERTAKING

**Product code** 11835055
**Product name** RPMI 1640 Medium (1X), liquid

**Company/Undertaking Identification**

INVITROGEN CORPORATON
5791 VAN ALLEN WAY
PO BOX 6482
CARLSBAD, CA 92008
760-603-7200

INVITROGEN CORPORATION
5250 MAINWAY DRIVE
BURLINGTON, ONT
CANADA L7L 6A4
800-263-6236

GIBCO PRODUCTS
INVITROGEN CORPORATION
3175 STALEY ROAD P.O. BOX 68
GRAND ISLAND, NY 14072
716-774-6700

## 2. COMPOSITION/INFORMATION ON INGREDIENTS

**Hazardous/Non-hazardous Components**
The product contains no substances which at their given concentration, are considered to be hazardous to health

## 3. HAZARDS IDENTIFICATION

**Emergency Overview**
The product contains no substances which at their given concentration, are considered to be hazardous to health

**Form**
Liquid

**Principle Routes of Exposure/ Potential Health effects**

**Eyes** No information available
**Skin** No information available

## 3. HAZARDS IDENTIFICATION

**Inhalation** No information available
**Ingestion** No information available

**Specific effects**

**Carcinogenic effects** No information available
**Mutagenic effects** No information available
**Reproductive toxicity** No information available
**Sensitization** No information available

**Target Organ Effects** No information available

**HMIS**

| | |
|---|---|
| Health | 0 |
| Flammability | 0 |
| Reactivity | 0 |

## 4. FIRST AID MEASURES

**Skin contact** Wash off immediately with plenty of water
**Eye contact** Rinse thoroughly with plenty of water, also under the eyelids.
**Ingestion** Never give anything by mouth to an unconscious person
**Inhalation** Move to fresh air
**Notes to physician** Treat symptomatically.

## 5. FIRE-FIGHTING MEASURES

**Suitable extinguishing media** Dry chemical
**Special protective equipment for firefighters** Wear self-contained breathing apparatus and protective suit

## 6. ACCIDENTAL RELEASE MEASURES

**Personal precautions** Use personal protective equipment
**Methods for cleaning up** Soak up with inert absorbent material.

## 7. HANDLING AND STORAGE

**Handling** No special handling advice required
**Storage** Keep in properly labelled containers

## 8. EXPOSURE CONTROLS / PERSONAL PROTECTION

**Occupational exposure controls**

**Exposure limits**
**Engineering measures** Ensure adequate ventilation, especially in confined areas

**Personal protective equipment**

**Respiratory protection** In case of insufficient ventilation wear suitable respiratory equipment
**Hand protection** Protective gloves
**Eye protection** Safety glasses with side-shields
**Skin and body protection** Lightweight protective clothing.

| | |
|---|---|
| **Hygiene measures** | Handle in accordance with good industrial hygiene and safety practice |
| **Environmental exposure controls** | Prevent product from entering drains. |

## 9. PHYSICAL AND CHEMICAL PROPERTIES

General Information

| | | |
|---|---|---|
| **Form** | Liquid | |

Important Health Safety and Environmental Information

| | | |
|---|---|---|
| **Boiling point/range** | °C No data available | °F No data available |
| **Melting point/range** | °C No data available | °F No data available |
| **Flash point** | °C No data available | °F No data available |
| **Autoignition temperature** | °C No data available | °F No data available |
| **Oxidizing properties** | No information available | |
| **Water solubility** | No data available | |

## 10. STABILITY AND REACTIVITY

| | |
|---|---|
| **Stability** | Stable. |
| **Materials to avoid** | No information available |
| **Hazardous decomposition products** | No information available |
| **Polymerization** | Hazardous polymerisation does not occur. |

## 11. TOXICOLOGICAL INFORMATION

Acute toxicity

Principle Routes of Exposure/ Potential Health effects

| | |
|---|---|
| **Eyes** | No information available |
| **Skin** | No information available |
| **Inhalation** | No information available |
| **Ingestion** | No information available |

Specific effects

| | |
|---|---|
| **Carcinogenic effects** | No information available |
| **Mutagenic effects** | No information available |
| **Reproductive toxicity** | No information available |
| **Sensitization** | No information available |

Target Organ Effects — No information available

## 12. ECOLOGICAL INFORMATION

| | |
|---|---|
| **Ecotoxicity effects** | No information available. |
| **Mobility** | No information available. |
| **Biodegradation** | Inherently biodegradable. |
| **Bioaccumulation** | Does not bioaccumulate. |

## 13. DISPOSAL CONSIDERATIONS

## 13. DISPOSAL CONSIDERATIONS

Dispose of in accordance with local regulations

## 14. TRANSPORT INFORMATION

IATA

| | |
|---|---|
| **Proper shipping name** | Not classified as dangerous in the meaning of transport regulations |
| **Hazard Class** | No information available |
| **Subsidiary Class** | No information available |
| **Packing group** | No information available |
| **UN-No** | No information available |

## 15. REGULATORY INFORMATION

**International Inventories**

**U.S. Federal Regulations**

**SARA 313**
This product is not regulated by SARA.

**Clean Air Act, Section 112 Hazardous Air Pollutants (HAPs) (see 40 CFR 61)**
This product does not contains HAPs.

**U.S. State Regulations**

**California Proposition 65**
This product does not contain chemicals listed under Proposition 65

**WHMIS hazard class:**
Non-controlled

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

## 16. OTHER INFORMATION

This material is sold for research and development purposes only. It is not for any human or animal therapeutic or clinical diagnostic use. It is not intended for food, drug, household, agricultural, or cosmetic use. An individual technically qualified to handle potentially hazardous chemicals must supervise the use of this material.

The above information was acquired by diligent search and/or investigation and the recommendations are based on prudent application of professional judgment. The information shall not be taken as being all inclusive and is to be used only as a guide. All materials and mixtures may be present unknown hazards and should be used with caution. Since Invitrogen Corporation cannot control the actual methods, volumes, or conditions of use, the Company shall not be held liable for any damages or losses resulting from the handling or from contact with the product as described herein. THE INFORMATION IN THIS MSDS DOES NOT CONSTITUTE A WARRANTY, EXPRESS OR IMPLIED, INCLUDING ANY IMPLIED WARRANTY OF MERCHANTABILITY OR FITNESS FOR ANY PARTCULAR PURPOSE.

**End of Safety Data Sheet**

# TITANIUM DIOXIDE

**MSDS Number: T3627** --- ***Effective Date: 02/15/98***

## 1. Product Identification

**Synonyms:** Titanium (IV) Oxide; C.I. 77891; Titania
**CAS No.:** 13463-67-7
**Molecular Weight:** 79.87
**Chemical Formula:** TiO2
**Product Codes:**
J.T. Baker: 4162, 4962
Mallinckrodt: 0993

## 2. Composition/Information on Ingredients

| Ingredient | CAS No | Percent | Hazardous |
|---|---|---|---|
| Titanium Dioxide | 13463-67-7 | 99 - 100 | Yes |

## 3. Hazards Identification

**Emergency Overview**

**CAUTION! MAY CAUSE IRRITATION TO SKIN, EYES, AND RESPIRATORY TRACT. MAY AFFECT LUNGS.**

**J.T. Baker SAF-T-DATA(tm)** Ratings (Provided here for your convenience)

Health Rating: 3 - moderate
Flammability Rating: 0 - None
Reactivity Rating: 0 - None
Contact Rating: 3 - Moderate
Lab Protective Equip: GOGGLES; LAB COAT
Storage Color Code: Orange (General Storage)

**Potential Health Effects**

**Inhalation:**
May cause mild irritation to the respiratory tract.
**Ingestion:**
Not expected to be a health hazard via ingestion.
**Skin Contact:**
May cause mild irritation and redness.
**Eye Contact:**
May cause mild irritation, possible reddening.
**Chronic Exposure:**
Long-term exposure to titanium dioxide dust may result in mild fibrosis (scarring of the lungs).
**Aggravation of Pre-existing Conditions:**
Persons with pre-existing lung disease may be more susceptible to the effects of this substance.

## 4. First Aid Measures

**Inhalation:**
Remove to fresh air. Get medical attention for any breathing difficulty.
**Ingestion:**
Not expected to require first aid measures. If large amounts were swallowed, give water to drink and get medical advice.
**Skin Contact:**
Immediately flush skin with plenty of soap and water for at least 15 minutes. Remove contaminated clothing and shoes. Wash clothing before reuse. Thoroughly clean shoes before reuse. Get medical attention if irritation develops.
**Eye Contact:**
Immediately flush eyes with plenty of water for at least 15 minutes, lifting upper and lower eyelids occasionally. Get medical attention if irritation persists.

## 5. Fire Fighting Measures

Fire:
Not considered to be a fire hazard.
**Explosion:**
Not considered to be an explosion hazard.
**Fire Extinguishing Media:**
Use any means suitable for extinguishing surrounding fire.
**Special Information:**
In the event of a fire, wear full protective clothing and NIOSH-approved self-contained breathing apparatus with full facepiece operated in the pressure

demand or other positive pressure mode.

## 6. Accidental Release Measures

Ventilate area of leak or spill. Wear appropriate personal protective equipment as specified in Section 8. Spills: Sweep up and containerize for reclamation or disposal. Vacuuming or wet sweeping may be used to avoid dust dispersal.

## 7. Handling and Storage

Keep in a tightly closed container, stored in a cool, dry, ventilated area. Protect against physical damage. Containers of this material may be hazardous when empty since they retain product residues (dust, solids); observe all warnings and precautions listed for the product.

## 8. Exposure Controls/Personal Protection

**Airborne Exposure Limits:**
Titanium Dioxide:
- OSHA Permissible Exposure Limit (PEL) -
15 mg/m3 (TWA).
- ACGIH Threshold Limit Value (TLV) -
10 mg/m3 (TWA), A4 - Not classifiable as a human carcinogen.
**Ventilation System:**
A system of local and/or general exhaust is recommended to keep employee exposures below the Airborne Exposure Limits. Local exhaust ventilation is generally preferred because it can control the emissions of the contaminant at its source, preventing dispersion of it into the general work area. Please refer to the ACGIH document, *Industrial Ventilation, A Manual of Recommended Practices*, most recent edition, for details.
**Personal Respirators (NIOSH Approved):**
If the exposure limit is exceeded, a half-face dust/mist respirator may be worn for up to ten times the exposure limit or the maximum use concentration specified by the appropriate regulatory agency or respirator supplier, whichever is lowest. A full-face piece dust/mist respirator may be worn up to 50 times the exposure limit, or the maximum use concentration specified by the appropriate regulatory agency, or respirator supplier, whichever is lowest. For emergencies or instances where the exposure levels are not known, use a full-facepiece positive-pressure, air-supplied respirator. WARNING: Air-purifying respirators do not protect workers in oxygen-deficient atmospheres.
**Skin Protection:**
Wear protective gloves and clean body-covering clothing.
**Eye Protection:**
Use chemical safety goggles and/or full face shield where dusting or splashing of solutions is possible. Maintain eye wash fountain and quick-drench facilities in work area.

## 9. Physical and Chemical Properties

**Appearance:**
White Powder.
**Odor:**
Odorless.
**Solubility:**
Insoluble in water.
**Specific Gravity:**
4.26
**pH:**
ca. 6 - 7
**% Volatiles by volume @ 21C (70F):**
0
**Boiling Point:**
2500 - 3000C (4532 - 5432F)
**Melting Point:**
1855C (3371F)
**Vapor Density (Air=1):**
Not applicable.
**Vapor Pressure (mm Hg):**
Not applicable.
**Evaporation Rate (BuAc=1):**
No information found.

## 10. Stability and Reactivity

**Stability:**
Stable under ordinary conditions of use and storage.
**Hazardous Decomposition Products:**
No information found.
**Hazardous Polymerization:**
Will not occur.
**Incompatibilities:**
For Titanium Dioxide: A violent reaction with lithium occurs around 200C (392F) with a flash of light; the temperature can reach 900C. Violent or incandescent reaction may also occur with other metals such as aluminum, calcium, magnesium, potassium, sodium, and zinc.
**Conditions to Avoid:**
Dusting and incompatibles.

## 11. Toxicological Information

**Toxicological Data:**
No LD50/LC50 information found relating to normal routes of occupational exposure. Investigated as a tumorigen and mutagen.
**Carcinogenicity:**
NIOSH considers this substance to be a potential occupational carcinogen.

--------\Cancer Lists\----------

| Ingredient | ---NTP Carcinogen--- Known | Anticipated | IARC Category |
|---|---|---|---|
| Titanium Dioxide (13463-67-7) | Yes | Yes | 3 |

## 15. Regulatory Information

--------\Chemical Inventory Status - Part 1\----------

| Ingredient | TSCA | EC | Japan | Australia |
|---|---|---|---|---|
| Titanium Dioxide (13463-67-7) | Yes | Yes | Yes | Yes |

--------\Chemical Inventory Status - Part 2\----------

| Ingredient | Korea | --Canada-- DSL | NDSL | Phil. |
|---|---|---|---|---|
| Titanium Dioxide (13463-67-7) | Yes | Yes | No | No |

--------\Federal, State & International Regulations - Part 1\----------

| Ingredient | -SARA 302- RQ | TPQ | ------SARA 313------ List | Chemical Catg. |
|---|---|---|---|---|
| Titanium Dioxide (13463-67-7) | No | No | No | No |

--------\Federal, State & International Regulations - Part 2\----------

| Ingredient | CERCLA | -RCRA- 261.33 | -TSCA- 8(d) |
|---|---|---|---|
| Titanium Dioxide (13463-67-7) | No | No | No |

Chemical Weapons Convention: No TSCA 12(b): No CDTA: No
SARA 311/312: Acute: Yes Chronic: Yes Fire: No Pressure: No
Reactivity: No (Pure / Solid)

**Australian Hazchem Code:** No information found.
**Poison Schedule:** No information found.
**WHMIS:**
This MSDS has been prepared according to the hazard criteria of the Controlled Products Regulations (CPR) and the MSDS contains all of the information required by the CPR.

## 16. Other Information

**NFPA Ratings:** Health: **3** Flammability: **0** Reactivity: **0**
**Label Hazard Warning:**
CAUTION! MAY CAUSE IRRITATION TO SKIN, EYES, AND RESPIRATORY TRACT. MAY AFFECT LUNGS.
**Label Precautions:**
Avoid contact with eyes, skin and clothing.
Wash thoroughly after handling.
Avoid breathing dust.
Keep container closed.
Use with adequate ventilation.
**Label First Aid:**
In case of contact, immediately flush eyes or skin with plenty of water for at least 15 minutes. Get medical attention if irritation develops or persists. If inhaled, remove to fresh air. Get medical attention for any breathing difficulty.
**Product Use:**
Laboratory Reagent.
**Revision Information:**
MSDS Section(s) changed since last revision of document include: 1, 3, 4, 5, 6, 7, 8, 9, 10, 11, 16.
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