



# Safety Data Sheet - Version 5.0

Preparation Date 12/19/2014

Latest Revision Date (If Revised)

SDS Expiry Date 12/17/2017

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

### 1.1 Product Identifier

**Chemical Name** (3R,4R)-4-Acetoxy-3-[(R)-1-(tert-butyl(dimethylsilyloxy)ethyl)]-2-azetidinone

**Catalogue #** A164500

### 1.2 Relevant Identified Uses of the Substance or Mixture and Uses Advised Against

**Product Uses** To be used only for scientific research and development. Not for use in humans or animals.

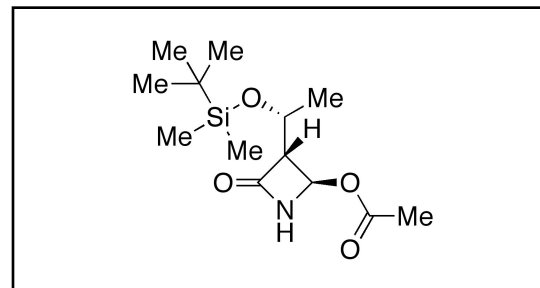
### 1.3 Details of the Supplier of the Safety Data Sheet

**Company** Toronto Research Chemicals  
2 Brisbane Road  
Toronto, ON M3J 2J8  
CANADA

**Telephone** +14166659696

**FAX** +14166654439

**Email** orders@trc-canada.com



### 1.4 Emergency Telephone Number

**Emergency#** +14166659696 between 0800-1700 (GMT-5)

## 2. HAZARDS IDENTIFICATION

### WHMIS Classification (Canada)

D2B Toxic Material Causing Other Toxic Effects  
Moderate Skin/Eye Irritant  
Skin Sensitizer

### WHMIS Symbols (Canada)



### 2.1/2.2 Classification of the Substance or Mixture and Label Elements

#### GHS Hazards Classification (According to EU Regulation 1272/2008 and US OSHA 1910.1200)

Skin Irritation (Category 2)

Serious Eye Irritation (Category 2)

Sensitisation, Skin (Category 1)

Hazardous to the Aquatic Environment, Acute Hazard (Category 2)

#### EU Classification (According to EU Regulation 67/548/EEC)

Irritating to eyes and skin. May cause sensitization by skin contact. Toxic to aquatic organisms

#### EU Risk and Safety Statements (According to EU Regulation 67/548/EEC)

##### Hazard Statements

Irritant

##### Hazard Codes

Xi



##### Risk Codes and Phrases

R36/38 Irritating to eyes and skin.

R43 May cause sensitization by skin contact.

R51 Toxic to aquatic organisms

##### Safety Precaution Codes and Phrases

S36/37/39 Wear suitable protective clothing, gloves and eye/face protection.

- S24/25 Avoid contact with skin and eyes.  
S27/28 After contact with skin, take off immediately all contaminated clothing and wash with plenty of soap and water.  
S61 Avoid release to the environment. Refer to special instructions.

### **GHS Hazards Identification (According to EU Regulation 1272/2008 and US OSHA 1910.1200)**

**Signal Word** Warning



#### **GHS Hazard Statements**

- H315 Causes skin irritation.  
H319 Causes serious eye irritation.  
H317 May cause an allergic skin reaction.  
H401 Toxic to aquatic life.

#### **GHS Precautionary Statements**

- P261 Avoid breathing dust/fume/gas/mist/vapours/spray.  
P280 Wear protective gloves/protective clothing/eye protection/face protection.  
P302/P352 IF ON SKIN: Wash with plenty of soap and water  
P305/P351/P338 IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.  
P273 Avoid release to the environment.  
P391 Collect spillage.

### **2.3 Unclassified Hazards/Hazards Not Otherwise Classified**

No data available

## **3. COMPOSITION/INFORMATION ON INGREDIENTS**

### **3.1 Substances**

**Molecular Formula:** C<sub>13</sub>H<sub>25</sub>NO<sub>4</sub>Si

**Molecular Weight:** 287.43

**CAS Registry #:** 76855-69-1

**EC#:** 408-050-9

#### **Synonyms**

[3R-[3α(R\*),4β]]-4-(Acetyloxy)-3-[1-[[[(1,1-dimethylethyl)dimethylsilyl]oxy]ethyl]-2-azetidinone; (1'R,3R,4R)-4-Acetoxy-3-(1'-tert-butylidimethylsilyloxyethyl)-2-azetidinone; (3R,4R)-4-Acetoxy-3-[(R)-1-(tert-butylidimethylsiloxy)ethyl]azetidindione; (3R,4R)-4-Acetoxy-3-[(R)-1-(tert-butylidimethylsilyloxy)ethyl]azetidindione;

### **3.2 Mixtures**

Not a mixture

## **4. FIRST AID MEASURES**

### **4.1 Description of First Aid Measures**

#### **General Advice**

If medical attention is required, show this safety data sheet to the doctor.

#### **If Inhaled**

If inhaled, move casualty to fresh air. If not breathing, give artificial respiration and consult a physician.

#### **In Case of Skin Contact**

Wash affected area with soap and water. Consult a physician if any exposure symptoms are observed.

#### **In Case of Eye Contact**

Immediately rinse eyes with plenty of water for at least 15 minutes. Consult a physician.

#### **If Swallowed**

Never give anything by mouth to an unconscious person. Rinse mouth with water. Do NOT induce vomiting unless advised to do so by a physician or Poison Control Center. Seek medical attention.

### **4.2 Most Important Symptoms and Effects, Both Acute and Delayed**

No data available

#### **4.3 Indication of any Immediate Medical Attention and Special Treatment Needed**

No data available

### **5. FIREFIGHTING MEASURES**

#### **5.1 Extinguishing Media**

##### **Suitable Extinguishing Media**

Use water spray, alcohol-resistant foam, dry chemical or carbon dioxide.

#### **5.2 Special Hazards Arising from the Substance or Mixture**

Carbon oxides, Nitrogen oxides, Silicon oxides

#### **5.3 Advice for Firefighters**

Wear self contained breathing apparatus for fire fighting if necessary.

#### **5.4 Further Information**

No data available

### **6. ACCIDENTAL RELEASE MEASURES**

#### **6.1 Personal Precautions, Protective Equipment and Emergency Procedures**

Use recommended personal protective equipment (see Section 8). Prevent the formation of dusts and mists. Adequate ventilation must be provided to ensure dusts or mists are not inhaled.

#### **6.2 Environmental Precautions**

Material should not be allowed to enter the environment. Prevent further spillage or discharge into drains, if safe to do so.

#### **6.3 Methods and Materials for Containment and Cleaning Up**

Contain the spill and then collect using non-combustible absorbent material (such as clay, diatomaceous earth, vermiculite or other appropriate material). Place material in a suitable, sealable container and then dispose according to local/national regulations and guidance (see Section 13).

For protective equipment, refer to Section 8. For disposal, see Section 13.

### **7. HANDLING AND STORAGE**

#### **7.1 Precautions for Safe Handling**

Avoid contact with skin and eyes. Ventilation and proper handling are to be used to prevent the formation of dusts and mists. Normal measures for preventative fire protection. No smoking, eating or drinking around this material. Wash hands after use.

#### **7.2 Conditions for Safe Storage, Including any Incompatibilities**

Ensure container is kept securely closed before and after use. Keep in a well ventilated area and do not store with strong oxidizers or other incompatible materials (see Section 10).

Storage conditions: Refrigerator

#### **7.3 Specific End Uses**

For scientific research and development only. Not for use in humans or animals.

### **8. EXPOSURE CONTROLS/PERSONAL PROTECTION**

#### **8.1 Control Parameters**

Contains no components with established occupational exposure limits.

#### **8.2 Exposure Controls**

##### **Appropriate Engineering Controls**

A laboratory fumehood or other appropriate form of local exhaust ventilation should be used to avoid exposure.

##### **Personal Protective Equipment**

All recommendations below are advisory in nature and a risk assessment should be performed by the employer/end user prior to use of this product. The type of protective equipment must be selected based on the amount and concentration of the dangerous material being used in the workplace.

##### **Eye/Face Protection**

Safety glasses or safety goggles. All equipment should have been tested and approved under appropriate standards, such as NIOSH (US), CSA (Canada), or EN 166 (EU).

### Skin Protection

Gloves should be used when handling this material. Gloves are to be inspected prior to use. Contaminated gloves are to be removed using proper glove removal technique so that the outer surface of the glove does not contact bare skin. Dispose of contaminated gloves after use in compliance with good laboratory practices and local requirements.

Gloves used for incidental exposures (splash protection) should be designated as "low chemical resistant" or "waterproof" by EU standard EN 374. Unrated gloves are not recommended.

Suggested gloves: AnsellPro nitrile gloves style 92-500 or 92-600, 5 mil thickness.  
Penetration time has not been determined.

Gloves used for prolonged direct exposure (immersion) should be designated "chemical resistant" as per EN 734 with the resistance codes corresponding to the anticipated use of the material.

Suggested gloves: AnsellPro Viton/Butyl gloves style 38-612, 4/8 mil thickness.  
Penetration time has not been determined.

These recommendations may not apply if the material is mixed with any other chemical, or dissolved into a solution. A risk assessment must be performed to ensure the gloves will still offer acceptable protection.

### Body Protection

Fire resistant (Nomex) lab coat or coveralls.

### Respiratory Protection

Recommended respirators are NIOSH-approved N95 or CEN-approved FFP2 particulate respirators. These are to be only used as a backup to local exhaust ventilation or other engineering controls. If the respirator is the only means of protection, a full-face supplied air respirator must be used.

## 9. PHYSICAL AND CHEMICAL PROPERTIES

### 9.1 Information on Basic Physical and Chemical Properties

**A) Appearance**

White Solid

**C) Odour Threshold**

No data available

**E) Melting Point/Freezing Point**

108-110°C

**G) Flash point**

No data available

**I) Flammability (Solid/Gas)**

No data available

**K) Vapour Pressure**

No data available

**M) Relative Density**

No data available

**O) Partition Coefficient: n-octanol/water**

No data available

**Q) Decomposition Temperature**

No data available

**S) Explosive Properties**

No data available

**B) Odour**

No data available

**D) pH**

No data available

**F) Initial Boiling Point/Boiling Range**

No data available

**H) Evaporation Rate**

No data available

**J) Upper/Lower Flammability/Explosive Limits**

No data available

**L) Vapour Density**

No data available

**N) Solubility**

Chloroform, Methanol

**P) Auto-Ignition Temperature**

No data available

**R) Viscosity**

No data available

**T) Oxidizing Properties**

No data available

**9.2 Other Information**

no data available

## 10. STABILITY AND REACTIVITY

### 10.1 Reactivity

No data available

### 10.2 Chemical Stability

Stable under recommended storage conditions.

### 10.3 Possibility of Hazardous Reactions

No data available

#### **10.4 Conditions to Avoid**

No data available

#### **10.5 Incompatible Materials**

Strong oxidizing agents.

#### **10.6 Hazardous Decomposition Products**

No data available

### **11. TOXICOLOGICAL INFORMATION**

#### **11.1 Information on Toxicological Effects**

##### **A) Acute Toxicity**

No data available

##### **B) Skin Corrosion/Irritation**

Moderate skin irritant.

##### **C) Serious Eye Damage/Irritation**

Moderate eye irritant.

##### **D) Respiratory or Skin Sensitization**

May cause an allergic skin reaction.

##### **E) Germ Cell Mutagenicity**

No data available

##### **F) Carcinogenicity**

No data available

##### **G) Reproductive Toxicity/Teratogenicity**

No data available

##### **H) Single Target Organ Toxicity - Single Exposure**

No data available

##### **I) Single Target Organ Toxicity - Repeated Exposure**

No data available

##### **J) Aspiration Hazard**

No data available

##### **K) Potential Health Effects and Routes of Exposure**

###### **Inhalation**

May be harmful if inhaled. May cause respiratory tract irritation.

###### **Ingestion**

May be harmful if swallowed.

###### **Skin**

May be harmful if absorbed through skin. Causes skin irritation.

###### **Eyes**

Causes eye irritation.

##### **L) Signs and Symptoms of Exposure**

No data available

To the best of our knowledge, the chemical, physical, and toxicological properties of this material have not been thoroughly investigated.

##### **M) Additional Information**

RTECS: Not listed

### **12. ECOLOGICAL INFORMATION**

#### **12.1 Toxicity**

No data available

#### **12.2 Persistence and Degradability**

No data available

#### **12.3 Bioaccumulative Potential**

No data available

#### **12.4 Mobility in Soil**

No data available

## **12.5 Results of PBT and vPvB Assessment**

No data available

## **12.6 Other Adverse Effects**

No data available

# **13. DISPOSAL CONSIDERATIONS**

## **13.1 Waste Treatment Methods**

### **A) Product**

Product may be burned in an incinerator equipped with afterburner and scrubber. Excess and expired materials are to be offered to a licensed hazardous material disposal company. Ensure that all Federal and Local regulations regarding the disposal and destruction of this material are followed.

### **B) Contaminated Packaging**

Dispose of as above.

### **C) Other Considerations**

Product is not to be disposed of in sanitary sewers, storm sewers, or landfills.

# **14. TRANSPORT INFORMATION**

## **14.1 UN Number**

DOT (US): N/A                      IATA: 3077                      IMDG: 3077                      ADR/RID: 3077

## **14.2 UN Proper Shipping Name**

DOT (US)/IATA:

Not dangerous goods / Environmentally hazardous substance, solid, n.o.s. ((3R,4R)-4-Acetoxy-3-[(R)-1-(tert-butyl)dimethylsilyloxy]ethyl]-2-azetidinone)

IMDG/ARD/RID:

ENVIRONMENTALLY HAZARDOUS SUBSTANCE, SOLID, N.O.S. ((3R,4R)-4-Acetoxy-3-[(R)-1-(tert-butyl)dimethylsilyloxy]ethyl]-2-azetidinone)

## **14.3 Transport Hazard Class(es)**

DOT (US): N/A                      IATA: 9                      IMDG: 9                      ADR/RID: 9

## **14.4 Packing Group**

DOT (US): N/A                      IATA: III                      IMDG: III                      ADR/RID: III

## **14.5 Environmental Hazards**

DOT (US): None                      IATA: Marine pollutant                      IMDG: Marine pollutant                      ADR/RID: Marine pollutant

## **14.6 Special Precautions for User**

None

# **15. REGULATORY INFORMATION**

This safety data sheet complies with the requirements of WHMIS (Canada), OSHA 1910.1200 (US), and EU Regulation EC No. 1907/2006 (European Union).

## **15.1 Safety, Health and Environmental Regulations/Legislation Specific for the Substance or Mixture**

### **A) Canada**

**DSL/NDSL Status:** This product is not listed on the Canadian DSL/NDSL.

### **B) United States**

**TSCA Status:** This product is not listed on the US EPA TSCA.

### **C) European Union**

**ECHA Status:** This product or a component is registered with the EU ECHA.

## **15.2 Chemical Safety Assessment**

No data available

# **16. OTHER INFORMATION**

## **16.1 Revision History**

Original Publication Date: 12/19/2014

## **16.2 List of Abbreviations**

LD50	Median lethal dose of a substance required to kill 50% of a test population.
LC50	Medial lethal concentration of a substance required to kill 50% of a test population.
LDLo	Lowest known lethal dose
TDLo	Lowest known toxic dose
IARC	International Agency for Research on Cancer
NTP	National Toxicology Program
RTECS	Registry of Toxic Effects of Chemical Substances

## **16.3 Further Information**

Copyright 2013. Toronto Research Chemicals Inc. Copies may be made for internal use only. The above information is believed to be correct to the best of our knowledge, but is to be only used as a guide. To the best of our knowledge, the chemical, physical, and toxicological properties have not been thoroughly investigated. Please take all due care when handling this product.