

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

### 1.1 Product Identifier

**Chemical Name** Acetic-1,2-<sup>13</sup>C<sub>2</sub> Acid 1,1'-Anhydride

**Catalogue #** A161583

### 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

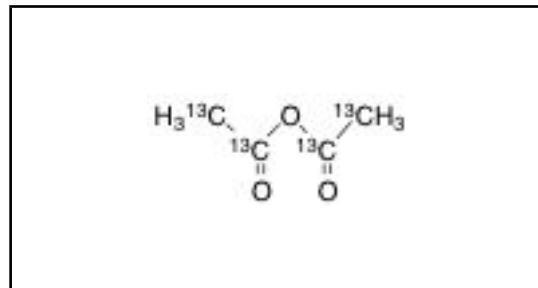
**Telephone** +14166659696

**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)

B3 Combustible Liquid

D1B Toxic Material Causing Immediate and Serious Toxic Effects  
Toxic by Inhalation

E Corrosive Material

### 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)

Flammable Liquids (Category 3)

Acute Toxicity, Oral (Category 4)

Acute Toxicity, Inhalation (Category 3)

Acute Toxicity, Dermal (Category 5)

Skin Corrosion (Category 1B)

Serious Eye Damage (Category 1)

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

Flammable. Toxic by inhalation. Harmful if swallowed. Causes burns. Risk of serious damage to the eyes.

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

Hazard Statements	Hazard Codes
Highly Flammable	F
Toxic	T
Corrosive	C



#### Risk Codes and Phrases

R10 Flammable.

R23 Toxic by inhalation.

- R22 Harmful if swallowed.  
R34 Causes burns.  
R41 Risk of serious damage to the eyes.

#### Safety Precaution Codes and Phrases

- S16 Keep away from sources of ignition - No smoking.  
S23 Do not breathe spray.  
S24/25 Avoid contact with skin and eyes.  
S45 In case of accident or if you feel unwell, seek medical advice immediately (show label where possible).

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

Signal Word Danger



#### GHS Hazard Statements

- H226 Flammable liquid and vapour.  
H302 Harmful if swallowed.  
H331 Toxic if inhaled.  
H313 May be harmful in contact with skin.  
H314 Causes severe skin burns and eye damage.  
H318 Causes serious eye damage.

#### GHS Precautionary Statements

- P210 Keep away from heat/sparks/open flames/hot surfaces. – No smoking.  
P260 Do not breathe dust/fume/gas/mist/vapours/spray.  
P280 Wear protective gloves/protective clothing/eye protection/face protection.  
P305/P351/P338 IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.  
P303/P361/P353 IF ON SKIN (or hair): Remove/Take off immediately all contaminated clothing. Rinse skin with water/shower.  
P301/P312 IF SWALLOWED: Call a POISON CENTER or doctor/physician if you feel unwell.

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

No data available

### 3. COMPOSITION/INFORMATION ON INGREDIENTS

#### 3.1 Substances

Molecular Formula:  $^{13}\text{C}_4\text{H}_6\text{O}_3$

Molecular Weight: 106.06

CAS Registry #: 114510-14-4

EC#:

#### Synonyms

Acetic- $^{13}\text{C}_2$  Acid Anhydride; Acetic- $^{13}\text{C}_2$  Anhydride

#### 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

Remove contaminated clothing and shoes. Wash off with soap and plenty of water. Take victim immediately to hospital. Consult a physician.

##### In Case of Eye Contact

Rinse thoroughly with plenty of water for at least 15 minutes and consult a physician. Continue rinsing eyes during

transport to hospital.

#### **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**

Burning sensation, cough, wheezing, laryngitis, shortness of breath, spasm, inflammation and edema of the larynx, spasm, inflammation and edema of the bronchi, pneumonitis, pulmonary edema

#### **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

#### **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). Adequate ventilation must be provided to ensure vapours or mists are not inhaled. Vapours are heavier than air and may accumulate in low areas. All sources of ignition, including sources of static discharge, must be removed from area.

#### **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).

#### **6.4 Reference to Other Sections**

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 vapours and mists. Remove all sources of ignition and take precautionary measures to prevent the buildup of electrostatic discharge (ground and bond containers as appropriate). 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: No Data Available

#### **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**

##### **Components with workplace exposure levels**

<b>Component</b>	<b>CAS#</b>	<b>Value</b>	<b>Control Parameters</b>	<b>Basis</b>
Acetic anhydride	108-24-7	TWA	1 ppm	Canada. British Columbia OEL
		(c)	5 ppm	Canada. Alberta, Occupational Health and Safety
			21 mg/m <sup>3</sup>	Code (table 2: OEL)

STEL 3 ppm

Canada. British Columbia OEL

TWA 5 ppm

USA. ACGIH Threshold Limit Values (TLV)

## 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 goggles or face shield. 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 "chemical resistant" by EU standard EN 374 with the resistance codes corresponding to the anticipated use of the material. Unrated gloves are not recommended.

Suggested gloves: AnsellPro Sol-Vex nitrile gloves style 37-175, 15 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

Chemical-resistant bodysuit (laminated Tychem SL or equivalent).

### Respiratory Protection

Recommended respirators are NIOSH-approved OV/Multi-gas/P100 or CEN-approved ABEK-FFP3 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**

No Data Available

**B) Odour**

No data available

**C) Odour Threshold**

No data available

**D) pH**

No data available

**E) Melting Point/Freezing Point**

No Data Available

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

No data available

**G) Flash point**

No data available

**H) Evaporation Rate**

No data available

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

No data available

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

No data available

**K) Vapour Pressure**

No data available

**L) Vapour Density**

No data available

**M) Relative Density**

No data available

**N) Solubility**

No Data Available

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

No data available

**P) Auto-Ignition Temperature**

No data available

**Q) Decomposition Temperature**

**R) Viscosity**

No data available

**S) Explosive Properties**

No data available

**9.2 Other Information**

no data available

No data available

**T) Oxidizing Properties**

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**

Heat, flames, sparks.

**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**

LD50 (oral - rat) 1780 mg/kg

LD50 (dermal - rabbit) 4 mL/kg

LC50 (inhalation - rat) 1780 mg/kg

**B) Skin Corrosion/Irritation**

No data available

**C) Serious Eye Damage/Irritation**

Corrosive - causes skin and eye burns. May also cause respiratory tract damage.

**D) Respiratory or Skin Sensitization**

No data available

**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**

Toxic if inhaled. Material is extremely destructive to the mucous membranes and respiratory tract.

**Ingestion**

Harmful if swallowed.

**Skin**

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

**Eyes**

Causes severe eye burns and possible permanent eye damage.

**L) Signs and Symptoms of Exposure**

Burning sensation, cough, wheezing, laryngitis, shortness of breath, spasm, inflammation and edema of the larynx, spasm, inflammation and edema of the bronchi, pneumonitis, pulmonary edema

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

## M) Additional Information

RTECS: AK1925000

## **12. ECOLOGICAL INFORMATION**

### **12.1 Toxicity**

Toxicity to fish: LC50 - Leuciscus idus melanotus - 265 mg/l - 48 h

Toxicity to daphnia and other aquatic invertebrates: EC50 - Daphnia - 55 mg/l - 96 h

### **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): 1715 IATA: 1715 IMDG: 1715 ADR/RID: 1715

### **14.2 UN Proper Shipping Name**

DOT (US)/IATA:

Acetic anhydride

IMDG/ARD/RID:

ACETIC ANHYDRIDE

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

DOT (US): 8 (3) IATA: 8 (3) IMDG: 8 (3) ADR/RID: 8 (3)

### **14.4 Packing Group**

DOT (US): II IATA: II IMDG: II ADR/RID: II

### **14.5 Environmental Hazards**

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

### **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 or a component of this product is registered on the Canadian DSL/NDSL.

#### **B) United States**

**TSCA Status:** This product or a component is 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**

### **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.