

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

### 1.1 Product Identifier

**Chemical Name** 2-Acetyl-1-pyrroline, ~10% w/w in Toluene

**Catalogue #** A187225

### 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.

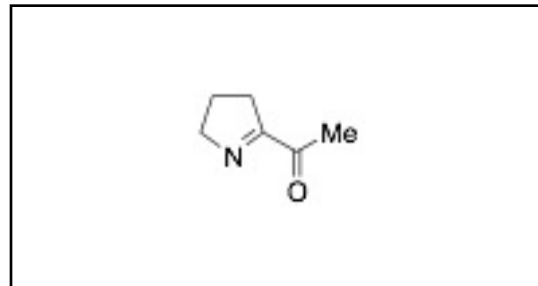
### 1.3 Details of the Supplier of the Safety Data Sheet

**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#** +1(416) 665-9696 between 0800-1700 (GMT-5)

## 2. HAZARDS IDENTIFICATION

### WHMIS Classification (Canada)

B2 Flammable Liquid

D2B Toxic Material Causing Other Toxic Effects  
Moderate Skin/Eye/Respiratory Tract Irritant  
Reproductive Toxin/Teratogen

### 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)

Acute Toxicity, Oral (Category 4)

Skin Irritation (Category 2)

Serious Eye Irritation (Category 2A)

Specific Target Organ Toxicity, Single Exposure; Respiratory Tract Irritation (Category 3)

Specific Target Organ Toxicity, Single Exposure; Central nervous system (Category 3)

Aspiration Hazard (Category 1)

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

Flammable Liquids (Category 2)

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

**Signal Word** Danger

#### GHS Hazard Statements

H302 Harmful if swallowed.



H315	Causes skin irritation.
H319	Causes serious eye irritation.
H335	May cause respiratory irritation.
H336	May cause drowsiness or dizziness.
H304	May be fatal if swallowed and enters airways.
H401	Toxic to aquatic life.
H225	Highly flammable liquid and vapour.

### GHS Precautionary Statements

P261	Avoid breathing dust/fume/gas/mist/vapours/spray
P210	Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking.
P280	
P312	Wear protective gloves/protective clothing/eye protection/face protection.
P301/P310	Call a POISON CENTER or doctor/physician if you feel unwell.
P264	IF SWALLOWED: Immediately call a POISON CENTER or doctor/physician.
P270	Wash hands thoroughly after handling.
P305/P351/P338	Do not eat, drink or smoke when using this product.
P362	IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
P403/P233	Take off contaminated clothing and wash before reuse. Store in a well-ventilated place. Keep container tightly closed.

### 2.3 Unclassified Hazards/Hazards Not Otherwise Classified

No data available.

## 3. COMPOSITION/INFORMATION ON INGREDIENTS

### 3.1 Substances

**Molecular Formula:** C<sub>6</sub>H<sub>9</sub>NO

**Molecular Weight:** 111.14

**CAS Registry #:** 85213-22-5

**EC#:**

#### Synonyms

1-(3,4-Dihydro-2H-pyrrol-5-yl)ethanone; 2-Acetyl-4,5-dihydro-3H-pyrrole

### 3.2 Mixtures

Ingredient	CAS#	EC#	Index-No.	%Composition
Toluene	108-88-3	203-625-9	601-021-00-3	90%
2-Acetyl-1-pyrroline	85213-22-5	214-016-2	N/A	10%

## 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 person 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

The most important known symptoms and effects are described in the labeling (see section 2.2) and/or in section 11.

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

No data available.

### **5. FIREFIGHTING MEASURES**

#### **5.1 Extinguishing Media**

##### **Conditions of flammability**

Flammable in the presence of a source of ignition when the temperature is above the flash point. Keep away from heat/sparks/open flame/hot surface. No Smoking.

##### **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

#### **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: Amber Vial, -86°C Freezer, Under inert atmosphere

#### **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 control parameters**

Components	CAS-No.	Value	Control parameters	Basis
Toluene	108-88-3	TWA	20 ppm	Canada. British Columbia OEL

**Remarks** Adverse reproductive effect

TWA 50 ppm  
188 mg/m<sup>3</sup>

Canada. Alberta, Occupational Health and Safety Code (table 2: OEL)

Substance may be readily absorbed through intact skin

TWAEV 50 ppm  
188 mg/m<sup>3</sup>

Québec. Regulation respecting occupational health and safety, Schedule 1, Part 1: Permissible exposure values for airborne contaminants

Skin (percutaneous)

TWA 20 ppm

USA. ACGIH Threshold Limit Values (TLV)

Visual impairment  
Female reproductive  
Pregnancy loss

TWAEV 20 ppm

Canada. Ontario OELs

## 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

B) Odour

Clear Pale Yellow to Yellow Orange Solution

**C) Odour Threshold**

No data available.

**E) Melting Point/Freezing Point**

N/A

**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.

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 Toluene

**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**

Vapours may form explosive mixture with air.

**10.4 Conditions to Avoid**

Heat, flames and sparks.

**10.5 Incompatible Materials**

Strong oxidizing agents.

**10.6 Hazardous Decomposition Products**

**Other decomposition products:** No data available. In the event of fire: see section 5.

**11. TOXICOLOGICAL INFORMATION**

**11.1 Information on Toxicological Effects**

**A) Acute Toxicity**

**Oral LD50:** No data available.

**Inhalation LC50:** No data available.

**Dermal LD50:** No data available.

**B) Skin Corrosion/Irritation**

Moderate skin irritant.

**C) Serious Eye Damage/Irritation**

No data available

**D) Respiratory or Skin Sensitization**

No data available

**E) Germ Cell Mutagenicity**

Possible human mutagen. Laboratory results have shown mutagenicity in several model systems.

**F) Carcinogenicity**

Limited evidence of a carcinogenic effect.

This compound has been designated as Group 3: Not classifiable as to its carcinogenicity in humans.

**G) Reproductive Toxicity/Teratogenicity**

Possible human reproductive toxin/teratogen.

Several laboratory studies have shown reproductive toxicity/teratogenicity in animal models.

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

Mild respiratory tract irritation.

**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**

Harmful if swallowed. Aspiration hazard - can enter lungs and cause damage.

**Skin**

Harmful if absorbed through skin. Causes skin irritation.

**Eyes**

Causes eye irritation.

**L) Signs and Symptoms of Exposure**

The most important known symptoms and effects are described in the labeling (see section 2.2) and/or in section 11.

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

**M) Additional Information**

RTECS: OB5970000 (2-Acetyl-1-pyrroline), XS5250000 (toluene)

**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**

An environmental hazard cannot be excluded in the event of unprofessional handling or disposal.  
Toxic to aquatic life.

**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): UN1294

IATA: UN1294

IMDG: UN1294

ADR/RID: UN1294

**14.2 UN Proper Shipping Name**

DOT (US)/IATA:

Toluene, solution

IMDG/ARD/RID:

TOLUENE, SOLUTION

**14.3 Transport Hazard Class(es)**

DOT (US): 3	IATA: 3	IMDG: 3	ADR/RID: 3
<b>14.4 Packing Group</b>			
DOT (US): II	IATA: II	IMDG: II	ADR/RID: II
<b>14.5 Environmental Hazards</b>			
DOT (US): None	IATA: None	IMDG: None	ADR/RID: None
<b>14.6 Special Precautions for User</b>			
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

Original Publication Date: 9/4/2015

### 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 2015. 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.