

# MATERIAL SAFETY DATA SHEET

## Protein Carbonyl Hydrochloric Acid

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Cayman Chemical Company  
1180 E. Ellsworth Rd.  
Ann Arbor, MI 48108

Printed: 02/04/2011  
Revision: 02/04/2011  
Supersedes Revision: 05/11/2009  
Date Created: 03/01/2005

### 1. Product and Company Identification

**Product Code:** 10005845  
**Product Name:** Protein Carbonyl Hydrochloric Acid  
**Manufacturer Information**  
**Company Name:** Cayman Chemical Company  
**Emergency Contact:** Cayman Chemical Company (800)364-9897  
**Information:** Cayman Chemical Company (734)971-3335  
**Synonyms:** No data available.

### 2. Hazards Identification

**Emergency Overview:** Corrosive.  
Avoid contact and inhalation.

**Route(s) of Entry:** Inhalation? Yes Skin? Yes Eyes? Yes Ingestion? Yes Other: Injection

**Potential Health Effects (Acute and Chronic):** Causes severe burns.  
Harmful by inhalation, ingestion, or skin absorption.  
Material is extremely destructive to the tissue of the mucous membranes and upper respiratory tract, eyes, and skin.

**LD 50 / LC 50:** Please refer to Section 11.

**Signs and Symptoms Of Exposure:** Exposure may cause: burning sensation, coughing, wheezing, laryngitis, shortness of breath. Inhalation may result in spasm, inflammation, and edema of the larynx and bronchi, chemical pneumonitis, and pulmonary edema.  
To the best of our knowledge, the toxicological properties have not been thoroughly investigated.

**Medical Conditions Generally Aggravated By Exposure:** No data available.

### 3. Composition/Information on Ingredients

Hazardous Components (Chemical Name)	CAS #	Concentration	EC#	RTECS #
1. Hydrochloric acid	7647-01-0	33.0 -40.0 %	231-595-7	MW4025000
2. Water	7732-18-5	60.0 -67.0 %	231-791-2	ZC0110000

### 4. First Aid Measures

**Emergency and First Aid Procedures:** If inhaled, remove to fresh air. If not breathing, give artificial respiration or give oxygen by trained personnel. Get immediate medical attention.  
If swallowed, wash out mouth with water provided person is conscious. Never give anything by mouth to an unconscious person. Get medical attention. Do NOT induce vomiting unless directed to do so by medical personnel.  
In case of contact with eyes, hold eyelids apart and flush eyes with plenty of water for at least 20 minutes. Have eyes examined and tested by medical personnel.  
In case of skin contact, immediately wash skin with soap and plenty of water for at least 20 minutes. Remove contaminated clothing. Get medical attention if symptoms occur. Wash clothing before reuse.

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### 5. Fire Fighting Measures

<b>Flash Pt:</b>	No data.
<b>Explosive Limits:</b>	LEL: No data. UEL: No data.
<b>Autoignition Pt:</b>	No data available.
<b>Fire Fighting Instructions:</b>	As in any fire, wear self-contained breathing apparatus pressure-demand (NIOSH approved or equivalent), and full protective gear to prevent contact with skin and eyes.
<b>Flammable Properties and Hazards:</b>	No data available.
<b>Hazardous Combustion Products:</b>	No data available.
<b>Suitable Extinguishing Media:</b>	Use alcohol-resistant foam, carbon dioxide, water, or dry chemical spray. Use water spray to cool fire-exposed containers.
<b>Unsuitable Extinguishing Media:</b>	A solid water stream may be inefficient.

### 6. Accidental Release Measures

<b>Steps To Be Taken In Case Material Is Released Or Spilled:</b>	Avoid release into the environment. Avoid breathing vapors and provide adequate ventilation. As conditions warrant, wear a NIOSH approved self-contained breathing apparatus, or respirator, and appropriate personal protection (rubber boots, safety goggles, and heavy rubber gloves). Absorb spill with inert material (e.g. dry sand or earth), then place in a chemical waste container.
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### 7. Handling and Storage

<b>Hazard Label Information:</b>	Avoid contact with skin and eyes. Do not reuse this container. Use with adequate ventilation. Wash thoroughly after handling
<b>Precautions To Be Taken in Handling:</b>	Avoid breathing (dust, vapor, mist, gas). Avoid prolonged or repeated exposure.
<b>Precautions To Be Taken in Storing:</b>	Keep tightly closed. Store at correct temperature.

### 8. Exposure Controls/Personal Protection

Hazardous Components (Chemical Name)	CAS #	OSHA TWA	ACGIH TWA	Other Limits
1. Hydrochloric acid	7647-01-0	CEIL: 5 ppm	CEIL: 2 ppm)	No data.
2. Water	7732-18-5	No data.	No data.	No data.

<b>Protective Equipment Summary - Hazard Label Information:</b>	Compatible chemical-resistant gloves Eye wash station in work area Lab coat Safety glasses Safety shower in work area Vent Hood
<b>Respiratory Equipment (Specify Type):</b>	NIOSH approved respirator, as conditions warrant.
<b>Eye Protection:</b>	Safety glasses
<b>Protective Gloves:</b>	Compatible chemical-resistant gloves
<b>Other Protective Clothing:</b>	Lab coat
<b>Engineering Controls (Ventilation etc.):</b>	Use process enclosures, local exhaust ventilation, or other engineering controls to control airborne levels below recommended exposure limits.
<b>Work/Hygienic/Maintenance Practices:</b>	Do not take internally. Facilities storing or utilizing this material should be equipped with an eyewash facility and a safety shower. Wash thoroughly after handling.

### 9. Physical and Chemical Properties

<b>Physical States:</b>	[ ] Gas [ X ] Liquid [ ] Solid
<b>Melting Point:</b>	No data.

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<b>Boiling Point:</b>	No data.
<b>Autoignition Pt:</b>	No data.
<b>Flash Pt:</b>	No data.
<b>Specific Gravity (Water = 1):</b>	No data.
<b>Vapor Pressure (vs. Air or mm Hg):</b>	No data.
<b>Vapor Density (vs. Air = 1):</b>	No data.
<b>Evaporation Rate (vs Butyl Acetate=1):</b>	No data.
<b>Solubility in Water:</b>	No data.
<b>Percent Volatile:</b>	No data.
<b>Appearance and Odor:</b>	No data available.

### 10. Stability and Reactivity

<b>Stability:</b>	Unstable [ <input type="checkbox"/> ]    Stable [ <input checked="" type="checkbox"/> ]
<b>Conditions To Avoid - Instability:</b>	No data available.
<b>Incompatibility - Materials To Avoid:</b>	alkali metals amines bases fluorine hexalithium disilicide metals metal acetylides permanganates
<b>Hazardous Decomposition Or Byproducts:</b>	hydrogen chloride gas
<b>Possibility of Hazardous Reactions:</b>	Will occur [ <input type="checkbox"/> ]    Will not occur [ <input checked="" type="checkbox"/> ]
<b>Conditions To Avoid - Hazardous Reactions:</b>	No data available.

### 11. Toxicological Information

	The toxicological effects of this product have not been thoroughly studied.
	Hydrochloric acid - Toxicity Data: Oral LD50 (rabbit): 900 mg/kg; Inhalation LC50 (rat): 3124 ppm (1h);
<b>Chronic Toxicological Effects:</b>	Only select Registry of Toxic Effects of Chemical Substances (RTECS) data is presented here. See actual entry in RTECS for complete information. Hydrochloric acid RTECS Number: MW4025000
<b>Carcinogenicity/Other Information:</b>	No data available.
<b>Carcinogenicity:</b>	NTP? No    IARC Monographs? No    OSHA Regulated? No

### 12. Ecological Information

Avoid release into the environment.  
Runoff from fire control or dilution water may cause pollution.

### 13. Disposal Considerations

<b>Waste Disposal Method:</b>	Dispose in accordance with local, state, and federal regulations.
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### 14. Transport Information

#### LAND TRANSPORT (US DOT)

<b>DOT Proper Shipping Name</b>	Hydrochloric acid
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**DOT Hazard Class:** 8  
**DOT Hazard Label:** CORROSIVE  
**UN/NA Number:** 1789  
**Packing Group:** II

**LAND TRANSPORT (European ADR/RID)**

**ADR/RID Shipping Name** Hydrochloric acid  
**UN Number:** 1789  
**Packing Group:** II

**AIR TRANSPORT (ICAO/IATA)**

**ICAO/IATA Shipping Name** Hydrochloric acid  
**UN Number:** 1789  
**Packing Group:** II  
**IATA Classification:** 8

**Additional Transport Information:** Transport in accordance with local, state, and federal regulations.

### 15. Regulatory Information

**European Community Hazard Symbol codes** C: Corrosive

**European Community Risk and Safety Phrases**

- R34 - Causes burns.
- S24/25 - Avoid contact with skin and eyes.
- S26 - In case of contact with eyes, rinse immediately with plenty of water and seek medical advice.
- S36/37/39 - Wear suitable protective clothing, gloves and eye/face protection.
- S45 - In case of accident or if you feel unwell, seek medical advice immediately (show the label whenever possible.)

**US EPA SARA Title III**

Hazardous Components (Chemical Name)	CAS #	Sec.302 (EHS)	Sec.304 RQ	Sec.313 (TRI)	Sec.110
1. Hydrochloric acid	7647-01-0	Yes 500 LB	Yes 5000 LB	Yes	No
2. Water	7732-18-5	No	No	No	No

**US EPA CAA, CWA, TSCA**

Hazardous Components (Chemical Name)	CAS #	EPA CAA	EPA CWA NPDES	EPA TSCA	HPV/LPV
1. Hydrochloric acid	7647-01-0	HAP, ODC ()	No	Inventory	
2. Water	7732-18-5	HAP, ODC ()	No	Inventory	

### 16. Other Information

**Company Policy or Disclaimer**

For research use only, not for human or veterinary use.

DISCLAIMER: This information is believed to be accurate and represents the best information currently available to us. However, we make no warranty of merchantability or any other warranty, express or implied, with respect to such information, and we assume no liability resulting from its use. Users should make their own investigations to determine the suitability of the information for their particular purposes.

**N.A.=Not available, N.P.=Not applicable, N.D.=Not determined, N.E.=Not established, N.R.=Not required**

# MATERIAL SAFETY DATA SHEET

## Protein Carbonyl DNPH

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Cayman Chemical Company  
1180 E. Ellsworth Rd.  
Ann Arbor, MI 48108

Printed: 02/04/2011  
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Supersedes Revision: 05/11/2009  
Date Created: 03/10/2005

### 1. Product and Company Identification

**Product Code:** 10005846  
**Product Name:** Protein Carbonyl DNPH  
**Manufacturer Information**  
**Company Name:** Cayman Chemical Company  
**Emergency Contact:** Cayman Chemical Company (800)364-9897  
**Information:** Cayman Chemical Company (734)971-3335  
**Synonyms:** No data available.

### 2. Hazards Identification

**Emergency Overview:** Flammable solid.  
Harmful.  
Avoid contact and inhalation.  
Target Organ(s): blood.

**Route(s) of Entry:** Inhalation? Yes Skin? Yes Eyes? Yes Ingestion? Yes Other: Injection

**Potential Health Effects (Acute and Chronic):** Causes eye irritation.  
Harmful if swallowed or absorbed through the skin.  
Material may be irritating to the mucous membranes and upper respiratory tract.  
May be harmful by inhalation.  
May cause skin or respiratory system irritation.

**Signs and Symptoms Of Exposure:** Absorption into the body leads to the formation of methemoglobin.  
Sufficient concentrations of methemoglobin may cause cyanosis; onset may be delayed 2 to 4 hours or longer.  
To the best of our knowledge, the toxicological properties have not been thoroughly investigated.

**Medical Conditions Generally Aggravated By Exposure:** No data available.

### 3. Composition/Information on Ingredients

Hazardous Components (Chemical Name)	CAS #	Concentration	EC#	RTECS #
1. 2,4-Dinitrophenylhydrazine	119-26-6	<70.0 %	204-309-3	MV3325000
2. Water	7732-18-5	>30.0 %	231-791-2	ZC0110000

### 4. First Aid Measures

**Emergency and First Aid Procedures:** If inhaled, remove to fresh air. If not breathing, give artificial respiration or give oxygen by trained personnel. Get immediate medical attention.  
If swallowed, wash out mouth with water provided person is conscious. Never give anything by mouth to an unconscious person. Get medical attention. Do NOT induce vomiting unless directed to do so by medical personnel.  
In case of contact with eyes, hold eyelids apart and flush eyes with plenty of water for at least 20 minutes. Have eyes examined and tested by medical personnel.  
In case of skin contact, immediately wash skin with soap and plenty of water for at least 20 minutes. Remove contaminated clothing. Get medical attention if symptoms occur. Wash clothing before reuse.

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### 5. Fire Fighting Measures

**Flash Pt:** No data.

**Explosive Limits:** LEL: No data. UEL: No data.

**Autoignition Pt:** No data available.

**Fire Fighting Instructions:** As in any fire, wear self-contained breathing apparatus pressure-demand (NIOSH approved or equivalent), and full protective gear to prevent contact with skin and eyes.

**Flammable Properties and Hazards:** Container explosion may occur under fire conditions.  
Sensitive to static discharge.

**Hazardous Combustion Products:** No data available.

**Suitable Extinguishing Media:** Use alcohol-resistant foam, carbon dioxide, water, or dry chemical spray.  
Use water spray to cool fire-exposed containers.

**Unsuitable Extinguishing Media:** A solid water stream may be inefficient.

### 6. Accidental Release Measures

**Steps To Be Taken In Case Material Is Released Or Spilled:** Avoid release into the environment.  
Avoid raising and breathing dust, and provide adequate ventilation.  
Remove all sources of ignition.  
As conditions warrant, wear a NIOSH approved self-contained breathing apparatus, or respirator, and appropriate personal protection (rubber boots, safety goggles, and heavy rubber gloves).  
Transfer to a chemical waste container for disposal.

### 7. Handling and Storage

**Hazard Label Information:** Avoid contact with skin and eyes. Do not reuse this container. Use with adequate ventilation.  
Wash thoroughly after handling

**Precautions To Be Taken in Handling:** Avoid breathing (dust, vapor, mist, gas).  
Avoid prolonged or repeated exposure.  
Keep away from sources of ignition.  
Prevent the build up of electrostatic charge.

**Precautions To Be Taken in Storing:** Keep away from heat, sparks and flame.  
Keep tightly closed.  
Store at correct temperature.

### 8. Exposure Controls/Personal Protection

Hazardous Components (Chemical Name)	CAS #	OSHA PEL	ACGIH TLV	Other Limits
1. 2,4-Dinitrophenylhydrazine	119-26-6	No data.	No data.	No data.
2. Water	7732-18-5	No data.	No data.	No data.

**Protective Equipment Summary - Hazard Label Information:** Compatible chemical-resistant gloves Eye wash station in work area Lab coat Safety glasses Safety shower in work area Vent Hood

**Respiratory Equipment (Specify Type):** NIOSH approved respirator, as conditions warrant.

**Eye Protection:** Safety glasses

**Protective Gloves:** Compatible chemical-resistant gloves

**Other Protective Clothing:** Lab coat

**Engineering Controls (Ventilation etc.):** Use process enclosures, local exhaust ventilation, or other engineering controls to control airborne levels below recommended exposure limits.

**Work/Hygienic/Maintenance Practices:** Do not take internally.  
Facilities storing or utilizing this material should be equipped with an eyewash facility and a safety shower.  
Wash thoroughly after handling.

### 9. Physical and Chemical Properties

**Physical States:** [ ] Gas [ ] Liquid [ X ] Solid  
**Melting Point:** No data.  
**Boiling Point:** No data.  
**Autoignition Pt:** No data.  
**Flash Pt:** No data.  
**Specific Gravity (Water = 1):** No data.  
**Vapor Pressure (vs. Air or mm Hg):** No data.  
**Vapor Density (vs. Air = 1):** No data.  
**Evaporation Rate (vs Butyl Acetate=1):** No data.  
**Solubility in Water:** No data.  
**Percent Volatile:** No data.  
**Appearance and Odor:** A powder

### 10. Stability and Reactivity

**Stability:** Unstable [ ] Stable [ X ]  
**Conditions To Avoid - Instability:** may be shock-sensitive if dry  
protect from direct sunlight  
protect from heat  
protect from heat, flame, and ignition sources  
**Incompatibility - Materials To Avoid:** strong oxidizing agents  
**Hazardous Decomposition Or Byproducts:** carbon dioxide  
carbon monoxide  
nitrogen oxides  
**Possibility of Hazardous Reactions:** Will occur [ ] Will not occur [ X ]  
**Conditions To Avoid - Hazardous Reactions:** No data available.

### 11. Toxicological Information

The toxicological effects of this product have not been thoroughly studied.  
**Chronic Toxicological Effects:** No data available.  
**Carcinogenicity/Other Information:** No data available.  
**Carcinogenicity:** NTP? No IARC Monographs? No OSHA Regulated? No

### 12. Ecological Information

Avoid release into the environment.  
Runoff from fire control or dilution water may cause pollution.

### 13. Disposal Considerations

**Waste Disposal Method:** Dispose in accordance with local, state, and federal regulations.

### 14. Transport Information

**LAND TRANSPORT (US DOT)**

**DOT Proper Shipping Name** Flammable solid, organic, n.o.s. (2,4-dinitrophenylhydrazine)  
**DOT Hazard Class:** 4.1  
**DOT Hazard Label:** FLAMMABLE SOLID

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## Protein Carbonyl DNPH

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 Supercedes Revision: 05/11/2009

**UN/NA Number:** 1325  
**Packing Group:** II  
**LAND TRANSPORT (European ADR/RID)**  
**ADR/RID Shipping Name** Flammable solid, organic, n.o.s. (2,4-dinitrophenylhydrazine)  
**UN Number:** 1325  
**Packing Group:** II

**AIR TRANSPORT (ICAO/IATA)**

**ICAO/IATA Shipping Name** Flammable solid, organic, n.o.s. (2,4-dinitrophenylhydrazine)  
**UN Number:** 1325  
**Packing Group:** II  
**IATA Classification:** 4.1

**Additional Transport Information:** Transport in accordance with local, state, and federal regulations.

### 15. Regulatory Information

**European Community Hazard Symbol codes** F: Highly Flammable; Xn: Harmful

**European Community Risk and Safety Phrases**

- R1 - Explosive when dry.
- R11 - Highly flammable.
- R22 - Harmful if swallowed.
- S24/25 - Avoid contact with skin and eyes.
- S36/37/39 - Wear suitable protective clothing, gloves and eye/face protection.

**US EPA SARA Title III**

Hazardous Components (Chemical Name)	CAS #	Sec.302 (EHS)	Sec.304 RQ	Sec.313 (TRI)	Sec.110
1. 2,4-Dinitrophenylhydrazine	119-26-6	No	No	No	No
2. Water	7732-18-5	No	No	No	No

**US EPA CAA, CWA, TSCA**

Hazardous Components (Chemical Name)	CAS #	EPA CAA	EPA CWA NPDES	EPA TSCA	HPV/LPV
1. 2,4-Dinitrophenylhydrazine	119-26-6	HAP, ODC ()	No	Inventory	
2. Water	7732-18-5	HAP, ODC ()	No	Inventory	

### 16. Other Information

**Company Policy or Disclaimer**

For research use only, not for human or veterinary use.  
 DISCLAIMER: This information is believed to be accurate and represents the best information currently available to us. However, we make no warranty of merchantability or any other warranty, express or implied, with respect to such information, and we assume no liability resulting from its use. Users should make their own investigations to determine the suitability of the information for their particular purposes.

**N.A.=Not available, N.P.=Not applicable, N.D.=Not determined, N.E.=Not established, N.R.=Not required**



# MATERIAL SAFETY DATA SHEET

## Protein Carbonyl TCA Solution

Cayman Chemical Company  
1180 E. Ellsworth Rd.  
Ann Arbor, MI 48108

Revision: 09/21/2011  
Supersedes Revision: 02/04/2011

### 1. Identification of the Substance/Mixture and of the Company/Undertaking

**Product Code:** 10005847

**Product Name:** Protein Carbonyl TCA Solution

**Manufacturer Information**

**Company Name:** Cayman Chemical Company

**Emergency Contact:** CHEMTREC Within USA and Canada: +1 (800)424-9300

**Alternate Emergency Contact:** CHEMTREC Outside USA and Canada: +1 (703)527-3887

**Information:** Cayman Chemical Company +1 (734)971-3335

**Web site address:** www.caymanchem.com

**Synonyms:** Trichloroacetic acid;

### 2. Hazards Identification

**Emergency Overview:** Corrosive.  
Dangerous for the environment.  
Vesicant.  
Avoid contact and inhalation.  
Target Organ(s): central nervous system.

**Route(s) of Entry:** Inhalation? Yes    Skin? Yes    Eyes? Yes    Ingestion? Yes    Other: Injection

**Potential Health Effects (Acute and Chronic):** Causes severe burns.  
Harmful by inhalation, ingestion, or skin absorption.  
Material is extremely destructive to the tissue of the mucous membranes and upper respiratory tract, eyes, and skin.

**LD 50 / LC 50:** Please refer to Section 11.

**Signs and Symptoms Of Exposure:** Exposure may cause: burning sensation, coughing, wheezing, laryngitis, shortness of breath.  
Exposure may cause: CNS depression.  
Inhalation may result in spasm, inflammation, and edema of the larynx and bronchi, chemical pneumonitis, and pulmonary edema.  
To the best of our knowledge, the toxicological properties have not been thoroughly investigated.

**Medical Conditions Generally Aggravated By Exposure:** No data available.

### 3. Composition/Information on Ingredients

Hazardous Components (Chemical Name)	CAS #	Concentration	EC#	Risk Phrases	RTECS #
1. Trichloroacetic acid	76-03-9	66.667 %	200-927-2	R35-50/53	AJ7875000
2. Water	7732-18-5	33.333 %	231-791-2	No phrases apply.	ZC0110000

### 4. First Aid Measures

**Emergency and First Aid Procedures:**

If inhaled, remove to fresh air. If not breathing, give artificial respiration or give oxygen by trained personnel. Get immediate medical attention.

If swallowed, wash out mouth with water provided person is conscious. Never give anything by mouth to an unconscious person. Get medical attention. Do NOT induce vomiting unless directed to do so by medical personnel.

In case of contact with eyes, hold eyelids apart and flush eyes with plenty of water for at least 20 minutes. Have eyes examined and tested by medical personnel.

In case of skin contact, immediately wash skin with soap and plenty of water for at least 20 minutes. Remove contaminated clothing. Get medical attention if symptoms occur. Wash clothing before reuse.

### 5. Fire Fighting Measures

<b>Flash Pt:</b>	No data.	
<b>Explosive Limits:</b>	LEL: No data.	UEL: No data.
<b>Autoignition Pt:</b>	No data available.	
<b>Fire Fighting Instructions:</b>	As in any fire, wear self-contained breathing apparatus pressure-demand (NIOSH approved or equivalent), and full protective gear to prevent contact with skin and eyes.	
<b>Flammable Properties and Hazards:</b>	No data available.	
<b>Hazardous Combustion Products:</b>	No data available.	
<b>Suitable Extinguishing Media:</b>	Use alcohol-resistant foam, carbon dioxide, water, or dry chemical spray. Use water spray to cool fire-exposed containers.	
<b>Unsuitable Extinguishing Media:</b>	A solid water stream may be inefficient.	

### 6. Accidental Release Measures

<b>Steps To Be Taken In Case Material Is Released Or Spilled:</b>	Avoid release into the environment. Avoid breathing vapors and provide adequate ventilation. As conditions warrant, wear a NIOSH approved self-contained breathing apparatus, or respirator, and appropriate personal protection (rubber boots, safety goggles, and heavy rubber gloves). Absorb spill with inert material (e.g. dry sand or earth), then place in a chemical waste container.
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### 7. Handling and Storage

<b>Hazard Label Information:</b>	Avoid contact with skin and eyes. Do not reuse this container. Use with adequate ventilation. Wash thoroughly after handling.
<b>Precautions To Be Taken in Handling:</b>	Avoid breathing (dust, vapor, mist, gas). Avoid prolonged or repeated exposure.
<b>Precautions To Be Taken in Storing:</b>	Keep tightly closed. Store at correct temperature.

### 8. Exposure Controls/Personal Protection

Hazardous Components (Chemical Name)	CAS #	OSHA PEL	ACGIH TLV	Other Limits
1. Trichloroacetic acid	76-03-9	No data.	1 ppm	No data.
2. Water	7732-18-5	No data.	No data.	No data.

<b>Protective Equipment Summary - Hazard Label Information:</b>	Compatible chemical-resistant gloves    Eye wash station in work area    Lab coat    Safety glasses    Safety shower in work area    Vent Hood
<b>Respiratory Equipment (Specify Type):</b>	NIOSH approved respirator, as conditions warrant.
<b>Eye Protection:</b>	Safety glasses
<b>Protective Gloves:</b>	Compatible chemical-resistant gloves
<b>Other Protective Clothing:</b>	Lab coat
<b>Engineering Controls (Ventilation etc.):</b>	Use process enclosures, local exhaust ventilation, or other engineering controls to control airborne levels below recommended exposure limits.
<b>Work/Hygienic/Maintenance Practices:</b>	Do not take internally. Facilities storing or utilizing this material should be equipped with an eyewash facility and a safety shower. Wash thoroughly after handling.

### 9. Physical and Chemical Properties

**Physical States:** [ ] Gas [ X ] Liquid [ ] Solid

**Melting Point:** No data.

**Boiling Point:** No data.

**Autoignition Pt:** No data.

**Flash Pt:** No data.

**Specific Gravity (Water = 1):** No data.

**Vapor Pressure (vs. Air or mm Hg):** No data.

**Vapor Density (vs. Air = 1):** No data.

**Evaporation Rate:** No data.

**Solubility in Water:** No data.

**Percent Volatile:** No data.

**Appearance and Odor:** No data available.

### 10. Stability and Reactivity

**Stability:** Unstable [ ] Stable [ X ]

**Conditions To Avoid - Instability:** heat

**Incompatibility - Materials To Avoid:** aluminum  
amines  
iron  
strong bases  
strong oxidizing agents  
zinc

**Hazardous Decomposition Or Byproducts:** carbon dioxide  
carbon monoxide  
hydrogen chloride gas  
Trichloroacetic acid decomposes above 200° C forming HCl, CO and Phosgene.

**Possibility of Hazardous Reactions:** Will occur [ ] Will not occur [ X ]

**Conditions To Avoid - Hazardous Reactions:** No data available.

### 11. Toxicological Information

The toxicological effects of this product have not been thoroughly studied.

Trichloroacetic acid - Toxicity Data: Oral LD50 (rat): 3,320 mg/kg; Irritation Data: Eyes (rabbit): 3,500 µg (5s) severe;

**Chronic Toxicological Effects:** Only select Registry of Toxic Effects of Chemical Substances (RTECS) data is presented here. See actual entry in RTECS for complete information.  
Trichloroacetic acid RTECS Number: AJ7875000

**Carcinogenicity/Other Information:** IARC: Group 3: Not classifiable as to its carcinogenicity to humans (Trichloroacetic acid)

Hazardous Components (Chemical Name)	CAS #	NTP	IARC	ACGIH	OSHA
1. Trichloroacetic acid	76-03-9	n.a.	n.a.	A3	n.a.
2. Water	7732-18-5	n.a.	n.a.	n.a.	n.a.

### 12. Ecological Information

Avoid release into the environment.  
Runoff from fire control or dilution water may cause pollution.



# MATERIAL SAFETY DATA SHEET

## Protein Carbonyl TCA Solution

### 13. Disposal Considerations

**Waste Disposal Method:** Dispose in accordance with local, state, and federal regulations.

### 14. Transport Information

#### LAND TRANSPORT (US DOT)

**DOT Proper Shipping Name** Trichloroacetic acid solution  
**DOT Hazard Class:** 8  
**DOT Hazard Label:** CORROSIVE  
**UN/NA Number:** 2564  
**Packing Group:** II

#### LAND TRANSPORT (European ADR/RID)

**ADR/RID Shipping Name** Trichloroacetic acid solution  
**UN Number:** 2564  
**Hazard Class:** 8 - CORROSIVE  
**Packing Group:** II

#### AIR TRANSPORT (ICAO/IATA)

**ICAO/IATA Shipping Name** Trichloroacetic acid solution  
**UN Number:** 2564  
**Hazard Class:** 8 - CORROSIVE  
**Packing Group:** II  
**IATA Classification:** 8

**Additional Transport Information:** Transport in accordance with local, state, and federal regulations.

### 15. Regulatory Information

**European Community Hazard Symbol codes** C: Corrosive; N: Dangerous for the environment

#### European Community Risk and Safety Phrases

- R35 - Causes severe burns.  
R50/53 - Very toxic to aquatic organisms, may cause long-term adverse effects in the aquatic environment.  
S24/25 - Avoid contact with skin and eyes.  
S26 - In case of contact with eyes, rinse immediately with plenty of water and seek medical advice.  
S36/37/39 - Wear suitable protective clothing, gloves and eye/face protection.  
S45 - In case of accident or if you feel unwell, seek medical advice immediately (show the label whenever possible.)  
S61 - Avoid release to the environment. Refer to special instructions / safety data sheets.

#### US EPA SARA Title III

Hazardous Components (Chemical Name)	CAS #	Sec.302 (EHS)	Sec.304 RQ	Sec.313 (TRI)	Sec.110
1. Trichloroacetic acid	76-03-9	No	No	No	No
2. Water	7732-18-5	No	No	No	No

#### Other US EPA or State Lists

Hazardous Components (Chemical Name)	CAS #	CAA HAP,ODC	CWA NPDES	TSCA	CA PROP.65
1. Trichloroacetic acid	76-03-9	No	No	Inventory	No
2. Water	7732-18-5	No	No	Inventory	No

**Regulatory Information Statement:** This SDS was prepared in accordance with Regulation (EC) No.1272/2008 and European Directive 67/548/EEC as amended.



## 16. Other Information

### Company Policy or Disclaimer

For research use only, not for human or veterinary use.

DISCLAIMER: This information is believed to be accurate and represents the best information currently available to us. However, we make no warranty of merchantability or any other warranty, express or implied, with respect to such information, and we assume no liability resulting from its use. Users should make their own investigations to determine the suitability of the information for their particular purposes.

**N.A.=Not available, N.P.=Not applicable, N.D.=Not determined, N.E.=Not established, N.R.=Not required**



# MATERIAL SAFETY DATA SHEET

## Protein Carbonyl Guanidine Hydrochloride

Page: 2  
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 Revision: 02/04/2011  
 Supercedes Revision: 05/11/2009

**Autoignition Pt:** No data available.

**Fire Fighting Instructions:** As in any fire, wear self-contained breathing apparatus pressure-demand (NIOSH approved or equivalent), and full protective gear to prevent contact with skin and eyes.

**Flammable Properties and Hazards:** No data available.

**Hazardous Combustion Products:** No data available.

**Suitable Extinguishing Media:** Use alcohol-resistant foam, carbon dioxide, water, or dry chemical spray.  
Use water spray to cool fire-exposed containers.

**Unsuitable Extinguishing Media:** A solid water stream may be inefficient.

### 6. Accidental Release Measures

**Steps To Be Taken In Case Material Is Released Or Spilled:** Avoid release into the environment.  
Avoid breathing vapors and provide adequate ventilation.  
As conditions warrant, wear a NIOSH approved self-contained breathing apparatus, or respirator, and appropriate personal protection (rubber boots, safety goggles, and heavy rubber gloves).  
Absorb spill with inert material (e.g. dry sand or earth), then place in a chemical waste container.

### 7. Handling and Storage

**Hazard Label Information:** Avoid contact with skin and eyes. Do not reuse this container. Use with adequate ventilation.  
Wash thoroughly after handling

**Precautions To Be Taken in Handling:** Avoid breathing (dust, vapor, mist, gas).  
Avoid prolonged or repeated exposure.

**Precautions To Be Taken in Storing:** Keep tightly closed.  
Store at correct temperature.

### 8. Exposure Controls/Personal Protection

Hazardous Components (Chemical Name)	CAS #	OSHA PEL	ACGIH TLV	Other Limits
1. Guanidinium chloride	50-01-1	No data.	No data.	No data.
2. Water	7732-18-5	No data.	No data.	No data.

**Protective Equipment Summary - Hazard Label Information:** Compatible chemical-resistant gloves Eye wash station in work area Lab coat Safety glasses Safety shower in work area Vent Hood

**Respiratory Equipment (Specify Type):** NIOSH approved respirator, as conditions warrant.

**Eye Protection:** Safety glasses

**Protective Gloves:** Compatible chemical-resistant gloves

**Other Protective Clothing:** Lab coat

**Engineering Controls (Ventilation etc.):** Use process enclosures, local exhaust ventilation, or other engineering controls to control airborne levels below recommended exposure limits.

**Work/Hygienic/Maintenance Practices:** Do not take internally.  
Facilities storing or utilizing this material should be equipped with an eyewash facility and a safety shower.  
Wash thoroughly after handling.

### 9. Physical and Chemical Properties

**Physical States:** [ ] Gas [ X ] Liquid [ ] Solid

**Melting Point:** No data.

**Boiling Point:** No data.

**Autoignition Pt:** No data.

**Flash Pt:** No data.

**MATERIAL SAFETY DATA SHEET**  
**Protein Carbonyl Guanidine Hydrochloride**

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Supercedes Revision: 05/11/2009

**Specific Gravity (Water = 1):** No data.  
**Vapor Pressure (vs. Air or mm Hg):** No data.  
**Vapor Density (vs. Air = 1):** No data.  
**Evaporation Rate (vs Butyl Acetate=1):** No data.  
**Solubility in Water:** No data.  
**Percent Volatile:** No data.  
**Appearance and Odor:** No data available.

### 10. Stability and Reactivity

**Stability:** Unstable [ ] Stable [ X ]  
**Conditions To Avoid - Instability:** No data available.  
**Incompatibility - Materials To Avoid:** strong oxidizing agents  
**Hazardous Decomposition Or Byproducts:** carbon dioxide  
carbon monoxide  
hydrogen chloride gas  
nitrogen oxides  
**Possibility of Hazardous Reactions:** Will occur [ ] Will not occur [ X ]  
**Conditions To Avoid - Hazardous Reactions:** No data available.

### 11. Toxicological Information

The toxicological effects of this product have not been thoroughly studied.

Guanidine Hydrochloride - Toxicity Data: Oral LD50 (mouse): 571 mg/kg; Oral LD50 (rat): 475 mg/kg; Irritation Data: Skin (rabbit) 500 mg (24h) severe; Eyes (rabbit): 81.4 mg (continuous) moderate;

**Chronic Toxicological Effects:** Only select Registry of Toxic Effects of Chemical Substances (RTECS) data is presented here. See actual entry in RTECS for complete information.  
Guanidine Hydrochloride RTECS Number: MF4300000

**Carcinogenicity/Other Information:** No data available.

**Carcinogenicity:** NTP? No IARC Monographs? No OSHA Regulated? No

### 12. Ecological Information

Avoid release into the environment.  
Runoff from fire control or dilution water may cause pollution.

### 13. Disposal Considerations

**Waste Disposal Method:** Dispose in accordance with local, state, and federal regulations.

### 14. Transport Information

**LAND TRANSPORT (US DOT)**

**DOT Proper Shipping Name** Not dangerous goods.

**LAND TRANSPORT (European ADR/RID)**

**ADR/RID Shipping Name** Not dangerous goods.

**AIR TRANSPORT (ICAO/IATA)**

**ICAO/IATA Shipping Name** Not dangerous goods.

**Additional Transport Information:** Transport in accordance with local, state, and federal regulations.

**MATERIAL SAFETY DATA SHEET**  
**Protein Carbonyl Guanidine Hydrochloride**

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**15. Regulatory Information**

**European Community Hazard Symbol codes** Xn: Harmful

**European Community Risk and Safety Phrases**

- R22 - Harmful if swallowed.
- R36/38 - Irritating to eyes and skin.
- S24/25 - Avoid contact with skin and eyes.
- S26 - In case of contact with eyes, rinse immediately with plenty of water and seek medical advice.
- S37/39 - Wear suitable gloves and eye/face protection.

**US EPA SARA Title III**

Hazardous Components (Chemical Name)	CAS #	Sec.302 (EHS)	Sec.304 RQ	Sec.313 (TRI)	Sec.110
1. Guanidinium chloride	50-01-1	No	No	No	No
2. Water	7732-18-5	No	No	No	No

**US EPA CAA, CWA, TSCA**

Hazardous Components (Chemical Name)	CAS #	EPA CAA	EPA CWA NPDES	EPA TSCA	HPV/LPV
1. Guanidinium chloride	50-01-1	HAP, ODC ()	No	Inventory	
2. Water	7732-18-5	HAP, ODC ()	No	Inventory	

**16. Other Information**

**Company Policy or Disclaimer**

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**N.A.=Not available, N.P.=Not applicable, N.D.=Not determined, N.E.=Not established, N.R.=Not required**

# MATERIAL SAFETY DATA SHEET

## Protein Carbonyl Ethanol

Page: 1

Cayman Chemical Company  
1180 E. Ellsworth Rd.  
Ann Arbor, MI 48108

Printed: 02/04/2011  
Revision: 02/04/2011  
Supersedes Revision: 05/11/2009  
Date Created: 03/11/2005

### 1. Product and Company Identification

**Product Code:** 10005849  
**Product Name:** Protein Carbonyl Ethanol  
**Manufacturer Information**  
**Company Name:** Cayman Chemical Company  
**Emergency Contact:** Cayman Chemical Company (800)364-9897  
**Information:** Cayman Chemical Company (734)971-3335  
**Synonyms:** No data available.

### 2. Hazards Identification

**Emergency Overview:** Highly Flammable.  
Avoid contact and inhalation.  
Target Organ(s): blood, central nervous system, eyes, liver, reproductive system, respiratory system, skin.

**Route(s) of Entry:** Inhalation? Yes Skin? Yes Eyes? Yes Ingestion? Yes Other: Injection

**Potential Health Effects (Acute and Chronic):** Material may be irritating to the mucous membranes and upper respiratory tract.  
May be harmful by inhalation, ingestion, or skin absorption.  
May cause eye, skin, or respiratory system irritation.

**LD 50 / LC 50:** Please refer to Section 11.

**Signs and Symptoms Of Exposure:** Irritating to eyes, skin, nose; may cause headache, drowsiness, lassitude (weakness, exhaustion), narcosis; cough; liver damage; anemia; reproductive, teratogenic effects.  
To the best of our knowledge, the toxicological properties have not been thoroughly investigated.

**Medical Conditions Generally Aggravated By Exposure:** No data available.

### 3. Composition/Information on Ingredients

Hazardous Components (Chemical Name)	CAS #	Concentration	EC#	RTECS #
1. Ethyl alcohol	64-17-5	100.0 %	200-578-6	KQ6300000

### 4. First Aid Measures

**Emergency and First Aid Procedures:** If inhaled, remove to fresh air. If not breathing, give artificial respiration or give oxygen by trained personnel. Get immediate medical attention.  
If swallowed, wash out mouth with water provided person is conscious. Never give anything by mouth to an unconscious person. Get medical attention. Do NOT induce vomiting unless directed to do so by medical personnel.  
In case of contact with eyes, hold eyelids apart and flush eyes with plenty of water for at least 20 minutes. Have eyes examined and tested by medical personnel.  
In case of skin contact, immediately wash skin with soap and plenty of water for at least 20 minutes. Remove contaminated clothing. Get medical attention if symptoms occur. Wash clothing before reuse.

### 5. Fire Fighting Measures

**Flash Pt:** 14.00 C Method Used: Closed Cup

<b>Explosive Limits:</b>	LEL: 3.3% at 25.0 C UEL: 19% at 25.0 C
<b>Autoignition Pt:</b>	363.00 C
<b>Fire Fighting Instructions:</b>	As in any fire, wear self-contained breathing apparatus pressure-demand (NIOSH approved or equivalent), and full protective gear to prevent contact with skin and eyes. Note: Flammable
<b>Flammable Properties and Hazards:</b>	Can release vapors that form explosive mixtures at temperatures at or above the flashpoint. Container explosion may occur under fire conditions. Emits toxic fumes under fire conditions. Sensitive to static discharge. Vapors can travel to a source of ignition and flash back.
<b>Hazardous Combustion Products:</b>	No data available.
<b>Suitable Extinguishing Media:</b>	Use alcohol-resistant foam, carbon dioxide, water, or dry chemical spray. Use water spray to cool fire-exposed containers.
<b>Unsuitable Extinguishing Media:</b>	A solid water stream may be inefficient.

**6. Accidental Release Measures**

<b>Steps To Be Taken In Case Material Is Released Or Spilled:</b>	Avoid release into the environment. Avoid breathing vapors and provide adequate ventilation. Remove all sources of ignition. As conditions warrant, wear a NIOSH approved self-contained breathing apparatus, or respirator, and appropriate personal protection (rubber boots, safety goggles, and heavy rubber gloves). Absorb spill with inert material (e.g. dry sand or earth), then place in a chemical waste container.
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**7. Handling and Storage**

<b>Hazard Label Information:</b>	Avoid contact with skin and eyes. Do not reuse this container. Use with adequate ventilation. Wash thoroughly after handling
<b>Precautions To Be Taken in Handling:</b>	Avoid breathing (dust, vapor, mist, gas). Avoid prolonged or repeated exposure. Keep away from sources of ignition. Prevent the build up of electrostatic charge.
<b>Precautions To Be Taken in Storing:</b>	Keep away from heat, sparks, and flame. Keep tightly closed. Store at correct temperature.
<b>Other Precautions:</b>	Hygroscopic.

**8. Exposure Controls/Personal Protection**

Hazardous Components (Chemical Name)	CAS #	OSHA PEL	ACGIH TLV	Other Limits
1. Ethyl alcohol	64-17-5	1000 ppm	1000 ppm	No data.

<b>Protective Equipment Summary - Hazard Label Information:</b>	Compatible chemical-resistant gloves Safety glasses Eye wash station in work area Safety shower in work area Lab coat Safety Vent Hood
<b>Respiratory Equipment (Specify Type):</b>	NIOSH approved respirator, as conditions warrant.
<b>Eye Protection:</b>	Safety glasses
<b>Protective Gloves:</b>	Compatible chemical-resistant gloves
<b>Other Protective Clothing:</b>	Lab coat
<b>Engineering Controls (Ventilation etc.):</b>	Use process enclosures, local exhaust ventilation, or other engineering controls to control airborne levels below recommended exposure limits.
<b>Work/Hygienic/Maintenance Practices:</b>	Do not take internally. Facilities storing or utilizing this material should be equipped with an eyewash facility and a safety shower. Wash thoroughly after handling.

### 9. Physical and Chemical Properties

**Physical States:** [ ] Gas [ X ] Liquid [ ] Solid  
**Melting Point:** No data.  
**Boiling Point:** No data.  
**Autoignition Pt:** 363.00 C  
**Flash Pt:** 14.00 C Method Used: Closed Cup  
**Explosive Limits:** LEL: 3.3% at 25.0 C UEL: 19% at 25.0 C  
**Specific Gravity (Water = 1):** No data.  
**Vapor Pressure (vs. Air or mm Hg):** 43 MM\_HG at 20.0 C  
**Vapor Density (vs. Air = 1):** No data.  
**Evaporation Rate (vs Butyl Acetate=1):** No data.  
**Solubility in Water:** No data.  
**Percent Volatile:** No data.  
**Appearance and Odor:** No data available.

### 10. Stability and Reactivity

**Stability:** Unstable [ ] Stable [ X ]  
**Conditions To Avoid - Instability:** heat, flames and sparks  
**Incompatibility - Materials To Avoid:** alkali metals  
ammonia  
peroxides  
strong oxidizing agents  
**Hazardous Decomposition Or Byproducts:** carbon dioxide  
carbon monoxide  
**Possibility of Hazardous Reactions:** Will occur [ ] Will not occur [ X ]  
**Conditions To Avoid - Hazardous Reactions:** No data available.

### 11. Toxicological Information

The toxicological effects of this product have not been thoroughly studied.

Ethanol - Toxicity Data: Oral LD50 (rat): 7,060 mg/kg; Inhalation LC50 (rat): 20,000 ppm (10h); Irritation Data: Eyes (rabbit): 500 mg (24h) mild; Skin (rabbit) 20mg (24h) moderate;

**Chronic Toxicological Effects:** Only select Registry of Toxic Effects of Chemical Substances (RTECS) data is presented here. See actual entry in RTECS for complete information.  
Ethanol RTECS Number: KQ6300000

**Carcinogenicity/Other Information:** No data available.

**Carcinogenicity:** NTP? No IARC Monographs? No OSHA Regulated? No

### 12. Ecological Information

Avoid release into the environment.  
Runoff from fire control or dilution water may cause pollution.

### 13. Disposal Considerations

**Waste Disposal Method:** Dispose in accordance with local, state, and federal regulations.

# MATERIAL SAFETY DATA SHEET

## Protein Carbonyl Ethanol

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 Printed: 02/04/2011  
 Revision: 02/04/2011  
 Supersedes Revision: 05/11/2009

### 14. Transport Information

**LAND TRANSPORT (US DOT)**

**DOT Proper Shipping Name** Ethyl Alcohol  
**DOT Hazard Class:** 3  
**DOT Hazard Label:** FLAMMABLE LIQUID  
**UN/NA Number:** 1170  
**Packing Group:** II

**LAND TRANSPORT (European ADR/RID)**

**ADR/RID Shipping Name** Ethyl Alcohol  
**UN Number:** 1170  
**Packing Group:** II

**AIR TRANSPORT (ICAO/IATA)**

**ICAO/IATA Shipping Name** Ethyl Alcohol  
**UN Number:** 1170  
**Packing Group:** II  
**IATA Classification:** 3

**Additional Transport Information:** Transport in accordance with local, state, and federal regulations.

### 15. Regulatory Information

**European Community Hazard Symbol codes** F: Highly Flammable

**European Community Risk and Safety Phrases**

- R11 - Highly flammable.
- S7 - Keep container tightly closed.
- S16 - Keep away from sources of ignition.
- S24/25 - Avoid contact with skin and eyes.
- S37/39 - Wear suitable gloves and eye/face protection.

**US EPA SARA Title III**

Hazardous Components (Chemical Name)	CAS #	Sec.302 (EHS)	Sec.304 RQ	Sec.313 (TRI)	Sec.110
1. Ethyl alcohol	64-17-5	No	No	No	No

**US EPA CAA, CWA, TSCA**

Hazardous Components (Chemical Name)	CAS #	EPA CAA	EPA CWA NPDES	EPA TSCA	HPV/LPV
1. Ethyl alcohol	64-17-5	HAP, ODC ()	No	Inventory	

### 16. Other Information

**Company Policy or Disclaimer**

For research use only, not for human or veterinary use.

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# MATERIAL SAFETY DATA SHEET

## Protein Carbonyl Ethyl Acetate

Page: 1

Cayman Chemical Company  
1180 E. Ellsworth Rd.  
Ann Arbor, MI 48108

Printed: 02/04/2011  
Revision: 02/04/2011  
Supersedes Revision: 05/11/2009  
Date Created: 03/10/2005

### 1. Product and Company Identification

**Product Code:** 10005850  
**Product Name:** Protein Carbonyl Ethyl Acetate  
**Manufacturer Information**  
**Company Name:** Cayman Chemical Company  
**Emergency Contact:** Cayman Chemical Company (800)364-9897  
**Information:** Cayman Chemical Company (734)971-3335  
**Synonyms:** No data available.

### 2. Hazards Identification

**Emergency Overview:** Highly Flammable.  
Irritant.  
Target Organ(s): eyes, respiratory system, skin.

**Route(s) of Entry:** Inhalation? Yes Skin? Yes Eyes? Yes Ingestion? Yes Other: Injection

**Potential Health Effects (Acute and Chronic):** Harmful if swallowed or inhaled.  
Irritating to eyes, respiratory system and skin.  
May be harmful by skin absorption.  
Material is irritating to the mucous membranes and upper respiratory tract.  
Repeated exposure may cause skin dryness or cracking.

**LD 50 / LC 50:** Please refer to Section 11.

**Signs and Symptoms Of Exposure:** Exposure may cause: Dizziness, drowsiness, CNS depression, and narcosis.  
To the best of our knowledge, the toxicological properties have not been thoroughly investigated.

**Medical Conditions Generally Aggravated By Exposure:** Persons with pre-existing skin disorders or eye problems or impaired liver, kidney, or respiratory function may be more susceptible to the effects of the substance.

### 3. Composition/Information on Ingredients

Hazardous Components (Chemical Name)	CAS #	Concentration	EC#	RTECS #
1. Acetic acid, Ethyl ester	141-78-6	100.0 %	205-500-4	AH5425000

### 4. First Aid Measures

**Emergency and First Aid Procedures:**

If inhaled, remove to fresh air. If not breathing, give artificial respiration or give oxygen by trained personnel. Get immediate medical attention.

If swallowed, wash out mouth with water provided person is conscious. Never give anything by mouth to an unconscious person. Get medical attention. Do NOT induce vomiting unless directed to do so by medical personnel.

In case of contact with eyes, hold eyelids apart and flush eyes with plenty of water for at least 20 minutes. Have eyes examined and tested by medical personnel.

In case of skin contact, immediately wash skin with soap and plenty of water for at least 20 minutes. Remove contaminated clothing. Get medical attention if symptoms occur. Wash clothing before reuse.

**Protein Carbonyl Ethyl Acetate**

**5. Fire Fighting Measures**

**Flash Pt:** -3.00 C Method Used: Closed Cup

**Explosive Limits:** LEL: 2% at 25.0 C UEL: 11.5% at 25.0 C

**Autoignition Pt:** 427.00 C

**Fire Fighting Instructions:** As in any fire, wear self-contained breathing apparatus pressure-demand (NIOSH approved or equivalent), and full protective gear to prevent contact with skin and eyes.  
Note: Flammable

**Flammable Properties and Hazards:** Can release vapors that form explosive mixtures at temperatures at or above the flashpoint.  
Container explosion may occur under fire conditions.  
Emits toxic fumes under fire conditions.  
Sensitive to static discharge.  
Vapors can travel to a source of ignition and flash back.

**Hazardous Combustion Products:** No data available.

**Suitable Extinguishing Media:** Use alcohol-resistant foam, carbon dioxide, water, or dry chemical spray.  
Use water spray to cool fire-exposed containers.

**Unsuitable Extinguishing Media:** A solid water stream may be inefficient.

**6. Accidental Release Measures**

**Steps To Be Taken In Case Material Is Released Or Spilled:** Avoid release into the environment.  
Avoid breathing vapors and provide adequate ventilation.  
Remove all sources of ignition.  
As conditions warrant, wear a NIOSH approved self-contained breathing apparatus, or respirator, and appropriate personal protection (rubber boots, safety goggles, and heavy rubber gloves).  
Absorb spill with inert material (e.g. dry sand or earth), then place in a chemical waste container.

**7. Handling and Storage**

**Hazard Label Information:** Avoid contact with skin and eyes. Do not reuse this container. Use with adequate ventilation.  
Wash thoroughly after handling

**Precautions To Be Taken in Handling:** Avoid breathing (dust, vapor, mist, gas).  
Avoid prolonged or repeated exposure.  
Keep away from sources of ignition.  
Prevent the build up of electrostatic charge.

**Precautions To Be Taken in Storing:** Keep away from heat, sparks, and flame.  
Keep tightly closed.  
Store at correct temperature.

**8. Exposure Controls/Personal Protection**

Hazardous Components (Chemical Name)	CAS #	OSHA PEL	ACGIH TLV	Other Limits
1. Acetic acid, Ethyl ester	141-78-6	400 ppm	400 ppm	No data.

**Protective Equipment Summary - Hazard Label Information:** Compatible chemical-resistant gloves Eye wash station in work area Lab coat Safety glasses Safety shower in work area Vent Hood

**Respiratory Equipment (Specify Type):** NIOSH approved respirator, as conditions warrant.

**Eye Protection:** Safety glasses

**Protective Gloves:** Compatible chemical-resistant gloves

**Other Protective Clothing:** Lab coat

**Engineering Controls (Ventilation etc.):** Use process enclosures, local exhaust ventilation, or other engineering controls to control airborne levels below recommended exposure limits.

**Work/Hygienic/Maintenance Practices:** Do not take internally.  
Facilities storing or utilizing this material should be equipped with an eyewash facility and a safety shower.  
Wash thoroughly after handling.

# MATERIAL SAFETY DATA SHEET

## Protein Carbonyl Ethyl Acetate

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Printed: 02/04/2011

Revision: 02/04/2011

Supercedes Revision: 05/11/2009

### 9. Physical and Chemical Properties

<b>Physical States:</b>	[ ] Gas [ X ] Liquid [ ] Solid
<b>Melting Point:</b>	No data.
<b>Boiling Point:</b>	No data.
<b>Autoignition Pt:</b>	427.00 C
<b>Flash Pt:</b>	-3.00 C Method Used: Closed Cup
<b>Explosive Limits:</b>	LEL: 2% at 25.0 C UEL: 11.5% at 25.0 C
<b>Specific Gravity (Water = 1):</b>	No data.
<b>Vapor Pressure (vs. Air or mm Hg):</b>	76 MM_HG at 20.0 C
<b>Vapor Density (vs. Air = 1):</b>	No data.
<b>Evaporation Rate (vs Butyl Acetate=1):</b>	No data.
<b>Solubility in Water:</b>	No data.
<b>Percent Volatile:</b>	No data.
<b>Appearance and Odor:</b>	No data available.

### 10. Stability and Reactivity

<b>Stability:</b>	Unstable [ ] Stable [ X ]
<b>Conditions To Avoid - Instability:</b>	heat, flames and sparks
<b>Incompatibility - Materials To Avoid:</b>	acids alkalis nitrates strong oxidizing agents
<b>Hazardous Decomposition Or Byproducts:</b>	carbon dioxide carbon monoxide
<b>Possibility of Hazardous Reactions:</b>	Will occur [ ] Will not occur [ X ]
<b>Conditions To Avoid - Hazardous Reactions:</b>	No data available.

### 11. Toxicological Information

The toxicological effects of this product have not been thoroughly studied.

Ethyl Acetate - Toxicity Data: Oral LD50 (rat): 5,620 mg/kg; Dermal LD50 (rabbit): > 20 mL/kg; Inhalation LD50 (rat): 200 gm/m3;

**Chronic Toxicological Effects:** Only select Registry of Toxic Effects of Chemical Substances (RTECS) data is presented here. See actual entry in RTECS for complete information.  
Ethyl Acetate RTECS Number: AH5425000

**Carcinogenicity/Other Information:** No data available.

**Carcinogenicity:** NTP? No IARC Monographs? No OSHA Regulated? No

### 12. Ecological Information

Avoid release into the environment.

Runoff from fire control or dilution water may cause pollution.

### 13. Disposal Considerations

**Waste Disposal Method:** Dispose in accordance with local, state, and federal regulations.

# MATERIAL SAFETY DATA SHEET

## Protein Carbonyl Ethyl Acetate

Page: 4  
 Printed: 02/04/2011  
 Revision: 02/04/2011  
 Supercedes Revision: 05/11/2009

### 14. Transport Information

**LAND TRANSPORT (US DOT)**

**DOT Proper Shipping Name** Ethyl Acetate  
**DOT Hazard Class:** 3  
**DOT Hazard Label:** FLAMMABLE LIQUID  
**UN/NA Number:** 1173  
**Packing Group:** II

**LAND TRANSPORT (European ADR/RID)**

**ADR/RID Shipping Name** Ethyl Acetate  
**UN Number:** 1173  
**Packing Group:** II

**AIR TRANSPORT (ICAO/IATA)**

**ICAO/IATA Shipping Name** Ethyl Acetate  
**UN Number:** 1173  
**Packing Group:** II  
**IATA Classification:** 3

**Additional Transport Information:** Transport in accordance with local, state, and federal regulations.

### 15. Regulatory Information

**European Community Hazard Symbol codes** F: Highly Flammable; Xi: Irritant

**European Community Risk and Safety Phrases**

- R11 - Highly flammable.
- R36 - Irritating to eyes.
- R66 - Repeated exposure may cause skin dryness or cracking
- R67 - Vapours may cause drowsiness and dizziness
- S16 - Keep away from sources of ignition.
- S26 - In case of contact with eyes, rinse immediately with plenty of water and seek medical advice.
- S33 - Take precautionary measures against static discharges.

**US EPA SARA Title III**

Hazardous Components (Chemical Name)	CAS #	Sec.302 (EHS)	Sec.304 RQ	Sec.313 (TRI)	Sec.110
1. Acetic acid, Ethyl ester	141-78-6	No	Yes 5000 LB	No	No

**US EPA CAA, CWA, TSCA**

Hazardous Components (Chemical Name)	CAS #	EPA CAA	EPA CWA NPDES	EPA TSCA	HPV/LPV
1. Acetic acid, Ethyl ester	141-78-6	HAP, ODC ()	No	Inventory	

### 16. Other Information

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