



SAFETY DATA SHEET

according to the (US) Hazard Communication Standard (29 CFR 1910.1200)

Revision Date 02/05/2015

Version 1.2

SECTION 1. Identification

Product identifier

Product number	822002
Product name	Crotonic anhydride (mixture of cis and trans isomers) for synthesis
CAS-No.	623-68-7

Relevant identified uses of the substance or mixture and uses advised against

Identified uses	Use restricted under TSCA to research and development or as analytical reagent. Uses regulated under FDA or FIFRA are not affected. Chemical for synthesis
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Details of the supplier of the safety data sheet

Company	EMD Millipore Corporation 290 Concord Road, Billerica, MA 01821, United States of America General Inquiries: +1-978-715-4321 Monday to Friday, 9:00 AM to 4:00 PM Eastern Time (GMT-5)
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Emergency telephone	800-424-9300 CHEMTREC (USA) +1-703-527-3887 CHEMTREC (International) 24 Hours/day; 7 Days/week
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SECTION 2. Hazards identification

GHS Classification

Skin irritation, Category 2, H315
Serious eye damage, Category 1, H318
Specific target organ systemic toxicity - single exposure, Category 3, Respiratory system, H335
For the full text of the H-Statements mentioned in this Section, see Section 16.

GHS-Labeling

Hazard pictograms



Signal Word
Danger

Hazard Statements

H315 Causes skin irritation.
H318 Causes serious eye damage.

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H335 May cause respiratory irritation.

Precautionary Statements

P261 Avoid breathing dust/ fume/ gas/ mist/ vapors/ spray.

P264 Wash skin thoroughly after handling.

P271 Use only outdoors or in a well-ventilated area.

P280 Wear protective gloves/ eye protection/ face protection.

P302 + P352 IF ON SKIN: Wash with plenty of soap and water.

P304 + P340 IF INHALED: Remove victim to fresh air and keep at rest in a position comfortable for breathing.

P305 + P351 + P338 IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.

P310 Immediately call a POISON CENTER or doctor/ physician.

P321 Specific treatment (see supplemental first aid instructions on this label).

P332 + P313 If skin irritation occurs: Get medical advice/ attention.

P362 Take off contaminated clothing and wash before reuse.

P403 + P233 Store in a well-ventilated place. Keep container tightly closed.

P405 Store locked up.

P501 Dispose of contents/ container to an approved waste disposal plant.

Other hazards

None known.

SECTION 3. Composition/information on ingredients

Formula	$(\text{CH}_3\text{CH}=\text{CHCO})_2\text{O}$	$\text{C}_8\text{H}_{10}\text{O}_3$ (Hill)
Molar mass	154.17 g/mol	

Hazardous ingredients

Chemical Name (Concentration)

CAS-No.

cis-crotonic anhydride ($\geq 5\%$ - $< 10\%$)

Exact percentages are being withheld as a trade secret.

SECTION 4. First aid measures

Description of first-aid measures

Inhalation

After inhalation: fresh air. Consult doctor if feeling unwell.

Skin contact

After skin contact: wash off with plenty of water. Remove contaminated clothing.

Eye contact

After eye contact: rinse out with plenty of water. Immediately call in ophthalmologist.

Ingestion

After swallowing: immediately make victim drink water (two glasses at most). Consult a physician.

Never give anything by mouth to an unconscious person.

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Most important symptoms and effects, both acute and delayed

irritant effects, Headache
Risk of serious damage to eyes.

Indication of any immediate medical attention and special treatment needed

No information available.

SECTION 5. Fire-fighting measures

Extinguishing media

Suitable extinguishing media
powder, Carbon dioxide (CO₂), Dry powder

Unsuitable extinguishing media
Water, Foam

Special hazards arising from the substance or mixture

Combustible material, Vapors are heavier than air and may spread along floors.
Development of hazardous combustion gases or vapors possible in the event of fire.
Forms explosive mixtures with air on intense heating.

Advice for firefighters

Special protective equipment for fire-fighters

Stay in danger area only with self-contained breathing apparatus. Prevent skin contact by keeping a safe distance or by wearing suitable protective clothing.

Further information

Cool closed containers exposed to fire with water spray. Prevent fire extinguishing water from contaminating surface water or the ground water system.

SECTION 6. Accidental release measures

Personal precautions, protective equipment and emergency procedures

Advice for non-emergency personnel: Avoid substance contact. Do not breathe vapors, aerosols. Ensure adequate ventilation. Evacuate the danger area, observe emergency procedures, consult an expert.

Advice for emergency responders: Protective equipment see section 8.

Environmental precautions

Do not empty into drains.

Methods and materials for containment and cleaning up

Cover drains. Collect, bind, and pump off spills.
Observe possible material restrictions (see sections 7 and 10).
Take up with liquid-absorbent material (e.g. Chemisorb®). Dispose of properly. Clean up affected area.

SECTION 7. Handling and storage

Precautions for safe handling

Observe label precautions.

Conditions for safe storage, including any incompatibilities

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Tightly closed.

Store at +15°C to +25°C (+59°F to +77°F).

SECTION 8. Exposure controls/personal protection

Exposure limit(s)

Contains no substances with occupational exposure limit values.

Engineering measures

Technical measures and appropriate working operations should be given priority over the use of personal protective equipment.

Individual protection measures

Protective clothing should be selected specifically for the workplace, depending on concentration and quantity of the hazardous substances handled. The chemical resistance of the protective equipment should be inquired at the respective supplier.

Hygiene measures

Immediately change contaminated clothing. Apply skin- protective barrier cream. Wash hands and face after working with substance.

Eye/face protection

Tightly fitting safety goggles

Hand protection

Chemical-resistant, impervious gloves complying with an approved standard should be worn at all times when handling chemical products if a risk assessment indicates this is necessary.

Respiratory protection

required when vapors/aerosols are generated.

Use a properly fitted, air-purifying or air-fed respirator complying with an approved standard if a risk assessment indicates this is necessary. Respirator selection must be based on known or anticipated exposure levels, the hazards of the product and the safe working limits of the selected respirator.

SECTION 9. Physical and chemical properties

Physical state	liquid
Color	yellow
Odor	stinging
Odor Threshold	No information available.
pH	No information available.
Melting point	-20 °C
Boiling point/boiling range	482 °F (250 °C)
Flash point	235 °F (113 °C)
Evaporation rate	No information available.

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Flammability (solid, gas)	No information available.
Lower explosion limit	No information available.
Upper explosion limit	No information available.
Vapor pressure	1 hPa at 77 °F (25 °C)
Relative vapor density	No information available.
Density	1.04 g/cm ³ at 68 °F (20 °C)
Relative density	No information available.
Water solubility	at 68 °F (20 °C) (decomposition)
Partition coefficient: n-octanol/water	log Pow: 0.96 (experimental) Bioaccumulation is not expected.
Autoignition temperature	No information available.
Decomposition temperature	No information available.
Viscosity, dynamic	3 mPa.s at 68 °F (20 °C)
Explosive properties	No information available.
Oxidizing properties	No information available.
Ignition temperature	554 °F (290 °C)

SECTION 10. Stability and reactivity

Reactivity

hydrolyzes
Forms explosive mixtures with air on intense heating.

Chemical stability

The product is chemically stable under standard ambient conditions (room temperature) .

Possibility of hazardous reactions

Water, alkalines, Strong oxidizing agents

Conditions to avoid

Strong heating.
A range from approx. 15 Kelvin below the flash point is to be rated as critical.

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Exposure to moisture.

Incompatible materials

no information available

Hazardous decomposition products

no information available

SECTION 11. Toxicological information

Information on toxicological effects

Likely route of exposure

Inhalation, Eye contact, Skin contact

Acute oral toxicity

LD50 Rat: 2,061 mg/kg

OECD Test Guideline 401

Skin irritation

Rabbit

Result: Irritations

(External MSDS)

Causes skin irritation.

Eye irritation

Rabbit

Result: Irritations

(External MSDS)

Causes serious eye damage.

Specific target organ systemic toxicity - single exposure

May cause respiratory irritation.

Specific target organ systemic toxicity - repeated exposure

The substance or mixture is not classified as specific target organ toxicant, repeated exposure.

Aspiration hazard

Regarding the available data the classification criteria are not fulfilled.

Carcinogenicity

IARC	No ingredient of this product present at levels greater than or equal to 0.1% is identified as probable, possible or confirmed human carcinogen by IARC.
OSHA	No ingredient of this product present at levels greater than or equal to 0.1% is identified as a carcinogen or potential carcinogen by OSHA.
NTP	No ingredient of this product present at levels greater than or equal to 0.1% is identified as a known or anticipated carcinogen by NTP.
ACGIH	No ingredient of this product present at levels greater than or

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equal to 0.1% is identified as a carcinogen or potential carcinogen by ACGIH.

Further information

Decomposition of the substance with tissue moisture., After inhalation: Irritations of the mucous membranes, coughing, and dyspnoea., Possible damages:, Lung edema, The substance has delayed effects., After skin contact: Irritations., In case of eye contact, Risk of serious damage to eyes., If swallowed, Irritations of mucous membranes in the mouth, pharynx, oesophagus and gastrointestinal tract., Systemic effects:, Headache

Other dangerous properties can not be excluded., Handle in accordance with good industrial hygiene and safety practice.

SECTION 12. Ecological information

Ecotoxicity

Toxicity to fish

LC50 Danio rerio (zebra fish): 0.5 - 1 mg/l; 96 h (External MSDS)

Toxicity to bacteria

fermentation tube test EC0 Bacteria: > 2,500 mg/l (External MSDS)

Persistence and degradability

Biodegradability

> 95 %

OECD Test Guideline 302B

OECD Test Guideline 302B

Readily biodegradable.

Bioaccumulative potential

Partition coefficient: n-octanol/water

log Pow: 0.96

(experimental)

Bioaccumulation is not expected.

Mobility in soil

No information available.

Additional ecological information

Discharge into the environment must be avoided.

SECTION 13. Disposal considerations

The information presented only applies to the material as supplied. The identification based on characteristic(s) or listing may not apply if the material has been used or otherwise contaminated. It is the responsibility of the waste generator to determine the toxicity and physical properties of the material generated to determine the proper waste identification and disposal methods in compliance with applicable regulations. Disposal should be in accordance with applicable regional, national and local laws and regulations.

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SECTION 14. Transport information

Land transport (DOT)

UN number

UN 3082

Proper shipping name

ENVIRONMENTALLY HAZARDOUS SUBSTANCE, LIQUID,
N.O.S. (CROTONIC ANHYDRIDE)

Class

9

Packing group

III

Environmentally hazardous

--

Air transport (IATA)

UN number

UN 3082

Proper shipping name

ENVIRONMENTALLY HAZARDOUS SUBSTANCE, LIQUID,
N.O.S. (CROTONIC ANHYDRIDE)

Class

9

Packing group

III

Environmentally hazardous

--

Special precautions for user

no

Sea transport (IMDG)

UN number

UN 3082

Proper shipping name

ENVIRONMENTALLY HAZARDOUS SUBSTANCE, LIQUID,
N.O.S. (CROTONIC ANHYDRIDE)

Class

9

Packing group

III

Environmentally hazardous

--

Special precautions for user

yes

EmS

F-A S-F

SECTION 15. Regulatory information

United States of America

SARA 313

This material does not contain any chemical components with known CAS numbers that exceed the threshold (De Minimis) reporting levels established by SARA Title III, Section 313.

SARA 302

No chemicals in this material are subject to the reporting requirements of SARA Title III, Section 302.

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Clean Water Act

This product does not contain any Hazardous Substances listed under the U.S. CleanWater Act, Section 311, Table 116.4A.

This product does not contain any Hazardous Chemicals listed under the U.S. CleanWater Act, Section 311, Table 117.3.

DEA List I

Not listed

DEA List II

Not listed

US State Regulations

Massachusetts Right To Know

Remarks

No components are subject to the Massachusetts Right to Know Act.

California Prop 65 Components

This product does not contain any chemicals known to the State of California to cause cancer, birth, or any other reproductive defects.

Notification status

TSCA: Not Listed on TSCA inventory. For Research and Development Use only. Not For Manufacturing or Commercial Purposes.

DSL: This product contains one or several components that are not on the Canadian DSL nor NDSL.

KOREA: Not in compliance with the inventory

SECTION 16. Other information

Training advice

Provide adequate information, instruction and training for operators.

Labeling

Hazard pictograms



Signal Word

Danger

Hazard Statements

H315 Causes skin irritation.

H318 Causes serious eye damage.

H335 May cause respiratory irritation.

H400 Very toxic to aquatic life.

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Precautionary Statements

Prevention

P273 Avoid release to the environment.

P280 Wear eye protection.

Response

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.

P313 Get medical advice/ attention.

Full text of H-Statements referred to under sections 2 and 3.

H315	Causes skin irritation.
H318	Causes serious eye damage.
H335	May cause respiratory irritation.

Key or legend to abbreviations and acronyms used in the safety data sheet

Used abbreviations and acronyms can be looked up at www.wikipedia.org.

Revision Date 02/05/2015

The information contained herein is based on the present state of our knowledge. It characterizes the product with regard to appropriate safety precautions. It does not represent a warranty of any product properties and we assume no liability for any loss or injury which may result from the use of this information. Users should conduct their own investigations to determine the suitability of the information.

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