

SAFETY DATA SHEETS

According to the UN GHS revision 9

Version: 1.2
Creation Date: July 15, 2019
Revision Date: August 08, 2025

SECTION 1: Identification

1.1 GHS Product identifier

Product name Acrylonitrile

1.2 Other means of identification

Product number CCPD101096

Other names Acrylonitrile; 2-propenenitrile; 1-Methylethenylamine

1.3 Recommended use of the chemical and restrictions on use

Identified uses For laboratory and Industrial use only.

Uses advised against no data available

1.4 Supplier's details

Company CATO Research Chemicals Inc.

Address 3/F,Building B,No.179 BASIGO, Guangpu Rd East,Huangpu Dist,Guangzhou

Telephone +86-20-81960175

1.5 Emergency phone number

Emergency phone number +86-20-81960175

Service hours 'Monday to Friday, 9am-5pm (Standard time zone: UTC/GMT +8 hours).

SECTION 2: Hazard identification

2.1 Classification of the substance or mixture

Flammable liquids, Category 2

Acute toxicity - Category 3, Oral

Acute toxicity - Category 3, Dermal

Skin irritation, Category 2

Serious eye damage, Category 1

Skin sensitization, Category 1

Acute toxicity - Category 3, Inhalation

Specific target organ toxicity – single exposure, Category 3

Carcinogenicity, Category 1B

Hazardous to the aquatic environment, long-term (Chronic) - Category Chronic 2

2.2 GHS label elements, including precautionary statements

Pictogram(s)



Signal word

Danger

Hazard statement(s)

H225 Highly flammable liquid and vapour

H301 Toxic if swallowed

H311 Toxic in contact with skin

H315 Causes skin irritation

H318 Causes serious eye damage

H317 May cause an allergic skin reaction

H331 Toxic if inhaled

H335 May cause respiratory irritation

H350 May cause cancer

H411 Toxic to aquatic life with long lasting effects

Precautionary statement(s)

Prevention

P210 Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking.
P233 Keep container tightly closed.
P240 Ground and bond container and receiving equipment.
P241 Use explosion-proof [electrical/ventilating/lighting/...] equipment.
P242 Use non-sparking tools.
P243 Take action to prevent static discharges.
P280 Wear protective gloves/protective clothing/eye protection/face protection/hearing protection/...
P264 Wash ... thoroughly after handling.
P270 Do not eat, drink or smoke when using this product.
P261 Avoid breathing dust/fume/gas/mist/vapours/spray.
P272 Contaminated work clothing should not be allowed out of the workplace.
P271 Use only outdoors or in a well-ventilated area.
P203 Obtain, read and follow all safety instructions before use.
P273 Avoid release to the environment.

Response

P303+P361+P353 IF ON SKIN (or hair): Take off immediately all contaminated clothing. Rinse affected areas with water [or shower].
P370+P378 In case of fire: Use ... to extinguish.
P301+P316 IF SWALLOWED: Get emergency medical help immediately.
P321 Specific treatment (see ... on this label).
P330 Rinse mouth.
P302+P352 IF ON SKIN: Wash with plenty of water/...
P316 Get emergency medical help immediately.
P361+P364 Take off immediately all contaminated clothing and wash it before reuse.
P332+P317 If skin irritation occurs: Get medical help.
P362+P364 Take off contaminated clothing and wash it before reuse.
P305+P354+P338 IF IN EYES: Immediately rinse with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
P317 Get medical help.
P333+P317 If skin irritation or rash occurs: Get medical help.
P304+P340 IF INHALED: Remove person to fresh air and keep comfortable for breathing.
P319 Get medical help if you feel unwell.
P318 IF exposed or concerned, get medical advice.
P391 Collect spillage.

Storage

P403+P235 Store in a well-ventilated place. Keep cool.
P405 Store locked up.

Disposal

P501 Dispose of contents/container to an appropriate treatment and disposal facility in accordance with applicable laws and regulations, and product characteristics at time of disposal.

2.3 Other hazards which do not result in classification

no data available

SECTION 3: Composition/information on ingredients

3.1 Substances

Chemical name	Common names and synonyms	CAS number	EC number	Concentration
Acrylonitrile	Acrylonitrile	107-13-1	203-466-5	100%

SECTION 4: First-aid measures

4.1 Description of necessary first-aid measures

If inhaled

Fresh air, rest. Refer for medical attention. See Notes.

Following skin contact

First rinse with plenty of water for at least 15 minutes, then remove contaminated clothes and rinse again. Refer for medical attention .

Following eye contact

First rinse with plenty of water for several minutes (remove contact lenses if easily possible), then refer for medical attention.

Following ingestion

Rinse mouth. Give a slurry of activated charcoal in water to drink. Induce vomiting (ONLY IN CONSCIOUS PERSONS!). Refer for medical attention .

4.2 Most important symptoms/effects, acute and delayed

It is classified as very toxic. Probable oral lethal dose for human is 50-500 mg/kg (between 1 teaspoon and 1 oz.) for a 70 kg (150 lb.) person. Irritant skin dose -- 500 mg. Toxic concentrations have been reported at 16 ppm/20 min. Acute toxicity is similar to that due to cyanide poisoning, and the level of cyanide ion in blood is related to the level of poisoning. Inhalation or ingestion results in collapse and death due to tissue anoxia (lack of oxygen) and cardiac arrest (heart failure). (EPA, 1998)

4.3 Indication of immediate medical attention and special treatment needed, if necessary

Severe acute inhalations should be treated like cyanide poisoning. The first priority is to establish adequate ventilation (100% oxygen) and circulation, since cyanide antidotes are theoretically useful but clinically unproven in acrylonitrile poisoning.

SECTION 5: Fire-fighting measures

5.1 Suitable extinguishing media

Approach fire from upwind to avoid hazardous vapors and toxic decomposition products. Use water spray, dry chemical, "alcohol resistant" foam, or carbon dioxide. Use water spray to keep fire-exposed containers cool. Fight fire from protected location or maximum possible distance.

5.2 Specific hazards arising from the chemical

Materials are too dangerous to health to expose fire fighters. A few whiffs of vapor could cause death or vapor or liquid could be fatal on penetrating the fire fighter's normal full protective clothing. The normal full protective clothing and breathing apparatus available to the average fire department will not provide adequate protection against inhalation or skin contact with these materials. Explosion hazard is moderate. It is flammable and explosive at normal room temperatures. Can react violently with strong acids, amines, strong alkalis. Vapors may travel considerable distance to source of ignition and flash back. Dilute solutions are also hazardous (flash point of a solution of 2 percent in water is 70F). When heated or burned, toxic hydrogen cyanide gas and oxides of nitrogen are formed. Avoid strong acids, amines, alkalis. Incompatible with strong oxidizers (especially bromine) copper and copper alloys. Unstable, moderate hazard is possible when it is exposed to flames, strong acids, amines and alkalis. May polymerize spontaneously in the container, particularly in absence of oxygen or on exposure to visible light. If polymerization occurs in containers, there is a possibility of violent rupture. (EPA, 1998)

5.3 Special protective actions for fire-fighters

Use water spray, powder, alcohol-resistant foam, carbon dioxide. In case of fire: keep drums, etc., cool by spraying with water.

SECTION 6: Accidental release measures

6.1 Personal precautions, protective equipment and emergency procedures

Evacuate danger area! Consult an expert! Personal protection: chemical protection suit including self-contained breathing apparatus. Ventilation. Do NOT wash away into sewer. Do NOT let this chemical enter the environment. Collect leaking and spilled liquid in covered containers as far as possible. Absorb remaining liquid in sand or inert absorbent. Then store and dispose of according to local regulations.

6.2 Environmental precautions

Evacuate danger area! Consult an expert! Personal protection: chemical protection suit including self-contained breathing apparatus. Ventilation. Do NOT wash away into sewer. Do NOT let this chemical enter the environment. Collect leaking and spilled liquid in covered containers as far as possible. Absorb remaining liquid in sand or inert absorbent. Then store and dispose of according to local regulations.

6.3 Methods and materials for containment and cleaning up

Remove solutions containing acrylonitrile by vacuum cleaning to prevent an increase in airborne concentrations.

SECTION 7: Handling and storage

7.1 Precautions for safe handling

NO open flames, NO sparks and NO smoking. NO contact with strong bases or strong acids. Closed system, ventilation, explosion-proof electrical equipment and lighting. Use non-sparking handtools. Handling in a well ventilated place. Wear suitable protective clothing. Avoid contact with skin and eyes. Avoid formation of dust and aerosols. Use non-sparking tools. Prevent fire caused by electrostatic discharge steam.

7.2 Conditions for safe storage, including any incompatibilities

Fireproof. Separated from strong oxidants, strong bases and food and feedstuffs. Cool. Keep in the dark. Ventilation along the floor. Store only if stabilized. PRECAUTIONS FOR "CARCINOGENS": Storage site should be as close as practical to lab in which carcinogens are to be used, so that only small quantities required for ... expt need to be carried. Carcinogens should be kept in only one section of cupboard, an explosion-proof refrigerator or freezer (depending on chemico-physical properties ...) that bears appropriate label. An inventory ... should be kept, showing quantity of carcinogen & date it was acquired ... Facilities for dispensing ... should be contiguous to storage area. Chemical Carcinogens

SECTION 8: Exposure controls/personal protection

8.1 Control parameters

Occupational Exposure limit values

TLV: 2 ppm as TWA; (skin); A3 (confirmed animal carcinogen with unknown relevance to humans). MAK: carcinogen category: 2; sensitization of skin (SH); skin absorption (H)

Biological limit values

no data available

8.2 Appropriate engineering controls

Ensure adequate ventilation. Handle in accordance with good industrial hygiene and safety practice. Set up emergency exits and the risk-

elimination area.

8.3 Individual protection measures, such as personal protective equipment (PPE)

Eye/face protection

Wear safety goggles or eye protection in combination with breathing protection.

Skin protection

Protective gloves. Protective clothing.

Respiratory protection

Use closed system or ventilation.

Thermal hazards

no data available

SECTION 9: Physical and chemical properties and safety characteristics

Physical state	Liquid. Liquid.
Colour	Clear and colourless.
Odour	PRACTICALLY ODORLESS, OR WITH A VERY SLIGHT ODOR OF PEACH KERNELS
Melting point/freezing point	-83.5 °C. Atm. press.: Ca. 1 013 hPa.
Boiling point or initial boiling point and boiling range	77.3 °C. Atm. press.: Ca. 1 013 hPa.
Flammability	Class IB Flammable Liquid: Fl.P. below 73°F and BP at or above 100°F.
Lower and upper explosion limit/flammability limit	Lower flammable limit: 3.0% by volume; Upper flammable limit: 17% by volume
Flash point	0 °C. Atm. press.: 1 013 hPa.
Auto-ignition temperature	481 °C. Atm. press.: 1 013 hPa.
Decomposition temperature	no data available
pH	pH = 6.0-7.5 (5% aqueous solution)
Kinematic viscosity	dynamic viscosity (in mPa s) = 0.34. Temperature: 25.0 °C.
Solubility	10 to 50 mg/mL at 70.9° F (NTP, 1992)
Partition coefficient n-octanol/water	Pow = >= 1.02 - <= 1.05. Temperature: 21 °C. Remarks: Mean partition coefficient: 1.04.
Vapour pressure	11.5 kPa. Temperature: 20 °C.
Density and/or relative density	0.8 g/cm³. Temperature: 25 °C.
Relative vapour density	1.83 (vs air)
Particle characteristics	no data available

SECTION 10: Stability and reactivity

10.1 Reactivity

NIOSH considers acrylonitrile to be a potential occupational carcinogen. [85 ppm]

The substance polymerizes due to heating and under the influence of light and bases. This generates fire or explosion hazard. Decomposes on heating. This produces toxic fumes including hydrogen cyanide and nitrogen oxides. Reacts violently with strong acids and strong oxidants. Attacks plastics and rubber.

10.2 Chemical stability

no data available

10.3 Possibility of hazardous reactions

Highly ignitable and flammable. The vapour is heavier than air and may travel along the ground; distant ignition possible. ACRYLONITRILE produces poisonous hydrogen cyanide gas on contact with strong acids or when heated to decomposition. Reacts violently with strong oxidizing agents (dibenzoyl peroxide, di-tert-butylperoxide, bromine) [Sax, 9th ed., p. 61]. Rapidly ignites in air and forms explosive mixtures with air. Polymerizes violently in the presence of strong bases or acids. Underwent a runaway reaction culminating in an explosion on contact with a small amount of bromine or solid silver nitrate [Bretherick, 5th ed., 1995, p. 404].

10.4 Conditions to avoid

no data available

10.5 Incompatible materials

Strong oxidizers, acids and alkalis; bromine; amines. [Note: Unless inhibited (usually with methylhydroquinone) may polymerize spontaneously or when heated or in presence of strong alkali. Attacks copper.]

10.6 Hazardous decomposition products

When burned may decompose to free cyanide.

SECTION 11: Toxicological information

Acute toxicity

- Oral: LD50 - rat (female) - 95.1 mg/kg bw.
- Inhalation: LC50 Rat inhalation 425 ppm/4 hr
- Dermal: no data available

Skin corrosion/irritation

no data available

Serious eye damage/irritation

no data available

Respiratory or skin sensitization

no data available

Germ cell mutagenicity

no data available

Carcinogenicity

NTP: Reasonably anticipated to be a human carcinogen

Reproductive toxicity

No information is available on the reproductive or developmental effects of acrylonitrile in humans. Fetal malformations (including short tail, missing vertebrae, short trunk, omphalocele, and hemivertebra) have been reported in rats exposed to acrylonitrile by inhalation. In mice orally exposed to acrylonitrile, degenerative changes in testicular tubules and decreased sperm count were observed.

STOT-single exposure

The substance and the vapour are irritating to the eyes, skin and respiratory tract. The substance may cause effects on the central nervous system. Exposure far above the OEL could cause death. The effects may be delayed. See Notes. Medical observation is indicated.

STOT-repeated exposure

Repeated or prolonged contact may cause skin sensitization. The substance may have effects on the central nervous system and liver. This substance is possibly carcinogenic to humans.

Aspiration hazard

A harmful contamination of the air can be reached very quickly on evaporation of this substance at 20°C.

SECTION 12: Ecological information

12.1 Toxicity

- Toxicity to fish: LC50 - *Oryzias latipes* - 5.1 mg/L - 96 h.
- Toxicity to daphnia and other aquatic invertebrates: EC50 - *Daphnia magna* - 2.5 mg/L - 48 h.
- Toxicity to algae: EC50 - *Pseudokirchneriella subcapitata* (previous names: *Raphidocelis subcapitata*, *Selenastrum capricornutum*) - 10 mg/L - 72 h.
- Toxicity to microorganisms: average removal rate per hour - activated sludge, industrial - 0.007 g/-VSS - 1 h.

12.2 Persistence and degradability

AEROBIC: Biodegradation of acrylonitrile has been demonstrated in wastewater, activated sludge, and various microbial cultures free from other living organisms(1). Enzyme-catalyzed hydrolysis of nitriles, such as acetonitrile, has been shown to proceed by two distinct routes(2,3); a nitrilase transforms the nitriles directly into acids plus ammonium ion, or a nitrile hydratase forms the amide which is hydrolyzed to acid plus ammonium ion by amidase(2,3). Acrylonitrile concentrations of 5 and 10 ppm in wastewater were completely degraded within 7 days in static-culture flask screening studies(4). In studies using activated sludge inocula, >95% degradation of acrylonitrile and >70% of theoretical BOD removal was reported after 21 days of acclimation in a screening study(5). In a waste water treatment plant, 30% of theoretical BOD removal of acrylonitrile was reported after 10 days(6). Using a bench-scale continuous flow reactor, >99% degradation of acrylonitrile and 30% of theoretical BOD removal was reported(7). Other studies, report 0 and 38% of theoretical BOD removal after 5 and 20 days respectively(8). Acrylonitrile completely degraded in Mississippi river water in 6 days(9) and degraded completely in 20 days in another study using river water, requiring less time for degradation with acclimation(10). In river water, 65% theoretical BOD was removed in 5 days after 27 days acclimation(11). At concn up to 100 ppm, complete degradation of 14C-acrylonitrile occurred in <2 days in a Londo soil(1). Greater than 50% of the radioactivity was recovered as 14C-carbon dioxide following 6 days of incubation. Transient formation of acrylamide and acrylic acid as intermediates of degradation were observed(1). Similar results were obtained in studies conducted with Tappan loam and sand(1). Acclimation of the microorganisms was required before degradation of 100 ppm acrylonitrile in sand(1). Degradation of higher concentration (500 and 1,000 ppm in Londo soil) was relatively slow and may be due to inhibitory effects of the parent compound(1).

12.3 Bioaccumulative potential

A whole body BCF of 48 was determined for bluegills exposed to acrylonitrile for 28 days (or until equilibrium was obtained) in a flowing water system(1). According to a classification scheme(2), this BCF suggests the potential for bioconcentration in aquatic organisms is moderate(SRC).

12.4 Mobility in soil

Using a structure estimation method based on molecular connectivity indices(1), the Koc of acrylonitrile can be estimated to be 9(SRC). The Koc of acrylonitrile can be estimated as 29(SRC), using a log Kow of 0.25(2) and a regression-derived equation(1). According to a classification scheme(3), these estimated Koc values suggest that acrylonitrile is expected to have very high mobility in soil.

12.5 Other adverse effects

no data available

SECTION 13: Disposal considerations

13.1 Disposal methods

Product

The material can be disposed of by removal to a licensed chemical destruction plant or by controlled incineration with flue gas scrubbing. Do not contaminate water, foodstuffs, feed or seed by storage or disposal. Do not discharge to sewer systems.

Contaminated packaging

Containers can be triply rinsed (or equivalent) and offered for recycling or reconditioning. Alternatively, the packaging can be punctured to make it unusable for other purposes and then be disposed of in a sanitary landfill. Controlled incineration with flue gas scrubbing is possible for combustible packaging materials.

SECTION 14: Transport information

14.1 UN Number

ADR/RID: UN1093 (For reference only, please check.) IMDG: UN1093 (For reference only, please check.) IATA: UN1093 (For reference only, please check.)

14.2 UN Proper Shipping Name

ADR/RID: ACRYLONITRILE, STABILIZED (For reference only, please check.) IMDG: ACRYLONITRILE, STABILIZED (For reference only, please check.) IATA: ACRYLONITRILE, STABILIZED (For reference only, please check.)

14.3 Transport hazard class(es)

ADR/RID: 3 (For reference only, please check.) IMDG: 3 (For reference only, please check.) IATA: 3 (For reference only, please check.)

14.4 Packing group, if applicable

ADR/RID: I (For reference only, please check.) IMDG: I (For reference only, please check.) IATA: I (For reference only, please check.)

14.5 Environmental hazards

ADR/RID: Yes IMDG: Yes IATA: Yes

14.6 Special precautions for user

no data available

14.7 Transport in bulk according to IMO instruments

no data available

SECTION 15: Regulatory information

15.1 Safety, health and environmental regulations specific for the product in question

Chemical name	Common names and synonyms	CAS number	EC number
Acrylonitrile	Acrylonitrile	107-13-1	203-466-5
European Inventory of Existing Commercial Chemical Substances (EINECS)			Listed.
EC Inventory			Listed.
United States Toxic Substances Control Act (TSCA) Inventory			Listed.
China Catalog of Hazardous chemicals 2015			Listed.
New Zealand Inventory of Chemicals (NZIoC)			Listed.
Philippines Inventory of Chemicals and Chemical Substances (PICCS)			Listed.
Vietnam National Chemical Inventory			Listed.
Chinese Chemical Inventory of Existing Chemical Substances (China IECSC)			Listed.
Korea Existing Chemicals List (KECL)			Listed.

SECTION 16: Other information

Information on revision

Creation Date July 15, 2019
Revision Date August 08, 2025

Abbreviations and acronyms

- CAS: Chemical Abstracts Service
- ADR: European Agreement concerning the International Carriage of Dangerous Goods by Road
- RID: Regulation concerning the International Carriage of Dangerous Goods by Rail
- IMDG: International Maritime Dangerous Goods
- IATA: International Air Transportation Association
- TWA: Time Weighted Average

- STEL: Short term exposure limit
- LC50: Lethal Concentration 50%
- LD50: Lethal Dose 50%
- EC50: Effective Concentration 50%

References

- IPCS - The International Chemical Safety Cards (ICSC), website: <http://www.ilo.org/dyn/icsc/showcard.home>
- HSDB - Hazardous Substances Data Bank, website: <https://toxnet.nlm.nih.gov/newtoxnet/hsdb.htm>
- IARC - International Agency for Research on Cancer, website: <http://www.iarc.fr/>
- eChemPortal - The Global Portal to Information on Chemical Substances by OECD, website: http://www.echemportal.org/echemportal/index?pageID=0&request_locale=en
- CAMEO Chemicals, website: <http://cameochemicals.noaa.gov/search/simple>
- ChemIDplus, website: <http://chem.sis.nlm.nih.gov/chemidplus/chemidlite.jsp>
- ERG - Emergency Response Guidebook by U.S. Department of Transportation, website: <http://www.phmsa.dot.gov/hazmat/library/erg>
- Germany GESTIS-database on hazard substance, website: <http://www.dguv.de/ifa/gestis/gestis-stoffdatenbank/index-2.jsp>
- ECHA - European Chemicals Agency, website: <https://echa.europa.eu/>

Other Information

Depending on the degree of exposure, periodic medical examination is suggested. Exposure to the substance will result in cyanide formation. See ICSC 0671. Specific treatment is necessary in case of poisoning with this substance; the appropriate means with instructions must be available. The odour warning when the exposure limit value is exceeded is insufficient. Rinse contaminated clothing with plenty of water because of fire hazard.

Any questions regarding this SDS, Please send your inquiry to info@cato-chem.com

Disclaimer: The above information is believed to be correct but does not purport to be all inclusive and shall be used only as a guide. The information in this document is based on the present state of our knowledge and is applicable to the product with regard to appropriate safety precautions. It does not represent any guarantee of the properties of the product. We as supplier shall not be held liable for any damage resulting from handling or from contact with the above product.