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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 Perfluoro-n-(13C9)nonanoic acid

1.2 Other means of identification

Product number LCEM502154
Other names -

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
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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
Acute toxicity - Category 3, Inhalation
Specific target organ toxicity – single exposure, Category 1

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
H331 Toxic if inhaled
H370 Causes damage to organs

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. P271 Use only outdoors or in a well-ventilated area. P260 Do not breathe dust/fume/gas/mist/vapours/spray.
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. P304+P340 IF INHALED: Remove person to fresh air and keep comfortable for breathing. P308+P316 IF exposed or concerned: Get emergency medical help immediately.
Storage	P403+P235 Store in a well-ventilated place. Keep cool. P405 Store locked up. P403+P233 Store in a well-ventilated place. Keep container tightly closed.
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
Methanol	Methanol	67-56-1	200-659-6	100%

SECTION 4: First-aid measures

4.1 Description of necessary first-aid measures

If inhaled

Fresh air, rest. Refer for medical attention.

Following skin contact

Remove contaminated clothes. Rinse skin with plenty of water or shower. 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

Induce vomiting (ONLY IN CONSCIOUS PERSONS!). Refer for medical attention .

4.2 Most important symptoms/effects, acute and delayed

Exposure to excessive vapor causes eye irritation, head- ache, fatigue and drowsiness. High concentrations can produce central nervous system depression and optic nerve damage. 50,000 ppm will probably cause death in 1 to 2 hrs. Can be absorbed through skin. Swallowing may cause death or eye damage. (USCG, 1999)

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

Treatment thresholds for methanol poisoning are based on case reports and published opinion. Most guidelines recommend treatment for a methanol level > or = 20 mg/dL in a nonacidotic patient. No supportive data have been offered nor has the time of the exposure been addressed. For instance, no distinction has been drawn between a methanol level drawn 1 hr vs. 24 hr from ingestion. ...All published cases of methanol poisoning /were analyzed/ to determine the applicability of the 20 mg/dL threshold in a nonacidotic patient, specifically those arriving early for care (within 6 hr) with a peak or near-peak blood methanol concentration. ...Dating to 1879, 372 articles in 18 languages were abstracted using a standard format; 329 articles (2433 patients) involved methanol poisoning, and 70 articles (173 patients) met inclusion criteria. Only 22 of these patients presented for care within 6 hr of ingestion with an early methanol level. All but 1

patient was treated with an inhibitor of alcohol dehydrogenase (ADH). A clear acidosis developed only with a methanol level > or = 126 mg/dL. The patient that did not receive an ADH inhibitor was an infant with an elevated early methanol level (46 mg/dL) that was given folate alone and never became acidotic. Intra and inter-rater reliability were 0.95. Nearly all reports of methanol poisoning involve acidotic patients far removed from ingestion. The small amount of data regarding patients arriving early show that 126 mg/dL is the lowest early blood methanol level ever clearly associated with acidosis. Contrary to conventional teaching, there are case reports of acidosis after only a few hours of ingestion. The data are insufficient to apply 20 mg/dL as a treatment threshold in a nonacidotic patient arriving early for care.

SECTION 5: Fire-fighting measures

5.1 Suitable extinguishing media

If material on fire or involved in fire: Do not extinguish fire unless flow can be stopped. Use water in flooding quantities as fog. Solid streams of water may be ineffective. Cool all containers with flooding quantities or water. Apply water from as far a distance as possible. Use "alcohol" foam, dry chemical or carbon dioxide.

5.2 Specific hazards arising from the chemical

Behavior in Fire: Containers may explode. (USCG, 1999)

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! Remove all ignition sources. Ventilation. Personal protection: complete protective clothing including self-contained breathing apparatus. Do NOT wash away into sewer. Collect leaking and spilled liquid in covered containers as far as possible. Absorb remaining liquid in sand or inert absorbent. Wash away remainder with plenty of water. Store and dispose of according to local regulations.

6.2 Environmental precautions

Personal protection: chemical protection suit including self-contained breathing apparatus. Evacuate danger area! Ventilation. Collect leaking and spilled liquid in sealable containers as far as possible. Wash away remainder with plenty of water. Remove vapour with fine water spray.

6.3 Methods and materials for containment and cleaning up

General Spill Actions: Stop or reduce discharge of material if this can be done without risk. Eliminate all sources of ignition. Avoid skin contact and inhalation. A fluorocarbon water foam can be applied to the spill to diminish vapor and fire hazard. Hycar and carbopol, which are absorbent materials, have shown possible applicability for vapor suppression and/or containment of methanol in spill situations. Leaking containers should be removed to the outdoors or to an isolated, well-ventilated area and the contents transferred to other suitable containers. The following materials are recommended for plugging leaks of methanol: polyester (eg Glad bag), imid polyester (eg brown-in-bag), stafoam urethane foam, sea-going epoxy putty, and MSA urethane.

SECTION 7: Handling and storage

7.1 Precautions for safe handling

NO open flames, NO sparks and NO smoking. NO contact with incompatible substances. Closed system, ventilation, explosion-proof electrical equipment and lighting. Do NOT use compressed air for filling, discharging, or handling. 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 and food and feedstuffs. Cool.When large amounts of methanol are stored in enclosed 14 Methanol spaces, monitoring by means of lower explosion limit monitors is desirable.

SECTION 8: Exposure controls/personal protection

8.1 Control parameters

Occupational Exposure limit values

TLV: 200 ppm as TWA; 250 ppm as STEL; (skin); BEI issued.EU-OEL: 260 mg/m3, 200 ppm as TWA; (skin).MAK: 130 mg/m3, 100 ppm; peak limitation category: II(2); skin absorption (H); pregnancy risk group: C

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 face shield or eye protection in combination with breathing protection.

Skin protection

Protective gloves. Protective clothing.

Respiratory protection

Use ventilation. Use local exhaust or breathing protection.

Thermal hazards

no data available

SECTION 9: Physical and chemical properties and safety characteristics

Physical state	Liquid.
Colour	Colourless.
Odour	Alcoholic odor; pungent odor when crude
Melting point/freezing point	-97.8 °C.
Boiling point or initial boiling point and boiling range	64.7 °C. Atm. press.: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: 6.0% by volume; Upper flammable limit: 36% by volume
Flash point	9.7 °C. Atm. press.:1 013 hPa.
Auto-ignition temperature	455 °C. Atm. press.:1 013 hPa.
Decomposition temperature	no data available
pH	no data available
Kinematic viscosity	dynamic viscosity (in mPa s) = > 0.544 - < 0.59. Temperature:25.0°C.
Solubility	Miscible with water
Partition coefficient n-octanol/water	log Pow = -0.77. Remarks:No data available for Temp and pH.
Vapour pressure	169.27 hPa. Temperature:25 °C.
Density and/or relative density	0.79 - 0.8 g/cm³. Temperature:20 °C.
Relative vapour density	1.11 (vs air)
Particle characteristics	no data available

SECTION 10: Stability and reactivity

10.1 Reactivity

Reacts violently with oxidants. This generates fire and explosion hazard.

10.2 Chemical stability

no data available

10.3 Possibility of hazardous reactions

Dangerous fire hazard when exposed to heat, flame or oxidizers.The vapour mixes well with air, explosive mixtures are easily formed.METHANOL reacts violently with acetyl bromide [Merck 11th ed. 1989]. Mixtures with concentrated sulfuric acid and concentrated hydrogen peroxide can cause explosions. Reacts with hypochlorous acid either in water solution or mixed water/carbon tetrachloride solution to give methyl hypochlorite, which decomposes in the cold and may explode on exposure to sunlight or heat. Gives the same product with chlorine. Can react explosively with isocyanates under basic conditions. The presence of an inert solvent mitigates this reaction [Wischmeyer 1969]. A violent exothermic reaction occurred between methyl alcohol and bromine in a mixing cylinder [MCA Case History 1863. 1972]. A flask of anhydrous lead perchlorate dissolved in methanol exploded when it was disturbed [J. Am. Chem. Soc. 52:2391. 1930]. P4O6 reacts violently with methanol. (Thorpe, T. E. et al., J. Chem. Soc., 1890, 57, 569-573). Ethanol or methanol can ignite on contact with a platinum-black catalyst. (Urben 1794).

10.4 Conditions to avoid

no data available

10.5 Incompatible materials

Distillation of mixtures with C1-C3 alcohols gives highly explosive alkyl perchlorates. Barium perchlorate

10.6 Hazardous decomposition products

When heated to decomposition it emits acrid smoke and irritating fumes.

SECTION 11: Toxicological information

Acute toxicity

- Oral: LD0 - rat - >= 2 528 mg/kg bw. Remarks:Application as 50% aqueous solution.
- Inhalation: LC50 - cat - 43.68 mg/L air.
- Dermal: LD50 - rabbit - 17 100 mg/kg bw.

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

no data available

Reproductive toxicity

No information is available on the reproductive or developmental effects of methanol in humans. Developmental effects have been observed in the offspring of rats and mice exposed to methanol by inhalation. These included skeletal, cardiovascular, urinary system, and central nervous system (CNS) malformations in rats and increased resorptions and skeletal and CNS malformations in mice.

STOT-single exposure

The substance is irritating to the eyes, skin and respiratory tract. The substance may cause effects on the central nervous system. This may result in loss of consciousness. Exposure could cause blindness and death. The effects may be delayed. Medical observation is indicated.

STOT-repeated exposure

Repeated or prolonged contact with skin may cause dermatitis. The substance may have effects on the central nervous system. This may result in persistent or recurring headaches and impaired vision.

Aspiration hazard

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

SECTION 12: Ecological information

12.1 Toxicity

- Toxicity to fish: LC50 - Lepomis macrochirus - 15 400 mg/L - 96 h.
- Toxicity to daphnia and other aquatic invertebrates: EC50 - Daphnia magna - 18 260 mg/L - 96 h.
- Toxicity to algae: EC50 - Pseudokirchneriella subcapitata (previous names: Raphidocelis subcapitata, Selenastrum capricornutum) - ca. 22 000 mg/L - 96 h.
- Toxicity to microorganisms: IC50 - activated sludge from domestic and industrial sewage treatment plants - > 1 000 mg/L - 3 h.

12.2 Persistence and degradability

AEROBIC: The half-life for methanol applied to a sandy loam from Mississippi (68% sand, 23.4% silt, 8.6% clay, 0.94% organic carbon, pH 4.8) was 3.2 days. The half-life of methanol applied to a sandy silt loam from Texas (61.5% sand, 31.1% silt, 7.4% clay, 3.28% organic carbon, pH 7.8) was 1 day. The moisture content of each soil was maintained at approximately 80% of its field capacity over the 64 day incubation period, and the half-lives did not account for any potential volatilization loss(1).

12.3 Bioaccumulative potential

Fish (golden ide (Leuciscus idus melanotus)) exposed to 0.05 mg/L of methanol for three days in an aquatic tank had measured BCF values of less than 10(1). According to a classification scheme(2), this BCF suggests the potential for bioconcentration in aquatic organisms is low(SRC).

12.4 Mobility in soil

The measured Koc for methanol is reported to be 2.75(1). According to a classification scheme(2), this estimated Koc value suggests that methanol is expected to have very high mobility in soil(SRC).

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: UN1230 (For reference only, please check.) IMDG: UN1230 (For reference only, please check.) IATA: UN1230 (For reference only, please check.)

14.2 UN Proper Shipping Name

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

14.5 Environmental hazards

ADR/RID: No IMDG: No IATA: No

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
Methanol	Methanol	67-56-1	200-659-6
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/

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Other Information

Burns with nonluminous bluish flame.Depending on the degree of exposure, periodic medical examination is suggested.Specific treatment may be necessary in case of poisoning with this substance; the appropriate means with instructions should be available.

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

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