

Chemical Safety Data Sheet MSDS / SDS

Cyanamide SDS

Revision Date:2024-04-25 Revision Number:1

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SECTION 1: Identification of the substance/mixture and of the company/undertaking**Product identifier**

Product name: Cyanamide

CAS: 420-04-2

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

Relevant identified uses: For R&D use only. Not for medicinal, household or other use.

Uses advised against: none

Company Identification

Company: Chemicalbook.in

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SECTION 2: Hazards identification**Classification of the substance or mixture**

Acute toxicity - Category 3, Oral

Acute toxicity - Category 3, Dermal

Skin corrosion, Category 1
Serious eye damage, Category 1
Skin sensitization, Category 1
Carcinogenicity, Category 2
Specific target organ toxicity - repeated exposure, Category 2
Hazardous to the aquatic environment, long-term (Chronic) - Category Chronic 3
Reproductive toxicity, Category 2

GHS label elements, including precautionary statements

Pictogram(s)



Signal word

Danger

Hazard statement(s)

H301 Toxic if swallowed
H311 Toxic in contact with skin
H314 Causes severe skin burns and eye damage
H317 May cause an allergic skin reaction
H351 Suspected of causing cancer
H373 May cause damage to organs through prolonged or repeated exposure
H412 Harmful to aquatic life with long lasting effects

Precautionary statement(s)

Prevention

P264 Wash ... thoroughly after handling.
P270 Do not eat, drink or smoke when using this product.
P280 Wear protective gloves/protective clothing/eye protection/face protection/hearing protection/...
P260 Do not breathe dust/fume/gas/mist/vapours/spray.
P261 Avoid breathing dust/fume/gas/mist/vapours/spray.
P272 Contaminated work clothing should not be allowed out of the workplace.
P203 Obtain, read and follow all safety instructions before use.
P273 Avoid release to the environment.

Response

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.
P301+P330+P331 IF SWALLOWED: Rinse mouth. Do NOT induce vomiting.
P363 Wash contaminated clothing before reuse.
P304+P340 IF INHALED: Remove person to fresh air and keep 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.
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.
P362+P364 Take off contaminated clothing and wash it before reuse.
P318 IF exposed or concerned, get medical advice.
P319 Get medical help if you feel unwell.

Storage

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.

Other hazards which do not result in classification

no data available

SECTION 3: Composition/information on ingredients

Substance

Chemical name:	Cyanamide
Common names and synonyms:	Cyanamide
CAS number:	420-04-2
EC number:	206-992-3

Concentration: 100%

SECTION 4: First aid measures

Description of necessary first-aid measures

If inhaled

Fresh air, rest. Seek medical attention if you feel unwell.

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

Rinse mouth. Give one or two glasses of water to drink. Do NOT induce vomiting. Refer for medical attention .

Most important symptoms/effects, acute and delayed

Exposure Routes: inhalation, skin absorption, ingestion, skin and/or eye contact Symptoms: Irritation eyes, skin, respiratory system; eye, skin burns; miosis, salivation, lacrimation (discharge of tears), twitching; Antabuse-like effects Target Organs: Eyes, skin, respiratory system, central nervous system (NIOSH, 2016)

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

Skin decontamination. Skin contamination with either the calcium salt or the free form should be removed by washing with soap and water. Flush eyes with copious amounts of clean water. If skin or eye irritation persists, medical attention should be obtained promptly. Calcium cyanamide

SECTION 5: Firefighting measures

Suitable extinguishing media

Use dry chemical or CO₂ extinguishers. Containers may explode in fire. If material or contaminated runoff enters waterways, notify downstream users or potentially contaminated waters. Notify local health and fire officials and pollution control agencies. From a secure, explosion-proof location, use water spray to cool exposed containers. If cooling streams are ineffective (venting sound

increases in volume and pitch, tank discolors or shows any signs of deforming), withdraw immediately to a secure position ... The only respirators recommended for fire fighting are self-contained breathing apparatuses that have full facepieces and are operated in a pressure-demand or other positive-pressure mode.

Specific hazards arising from the chemical

Excerpt from ERG Guide 154 [Substances - Toxic and/or Corrosive (Non-Combustible)]: Non-combustible, substance itself does not burn but may decompose upon heating to produce corrosive and/or toxic fumes. Some are oxidizers and may ignite combustibles (wood, paper, oil, clothing, etc.). Contact with metals may evolve flammable hydrogen gas. Containers may explode when heated. For electric vehicles or equipment, ERG Guide 147 (lithium ion batteries) or ERG Guide 138 (sodium batteries) should also be consulted. (ERG, 2016)

Special protective actions for fire-fighters

Use carbon dioxide, dry powder, dry sand, water spray. Combat fire from a sheltered position.

SECTION 6: Accidental release measures

Personal precautions, protective equipment and emergency procedures

Personal protection: complete protective clothing including self-contained breathing apparatus. Do NOT let this chemical enter the environment. Vacuum spilled material with specialist equipment. Carefully collect remainder. Then store and dispose of according to local regulations.

Environmental precautions

Personal protection: complete protective clothing including self-contained breathing apparatus. Do NOT let this chemical enter the environment. Vacuum spilled material with specialist equipment. Carefully collect remainder. Then store and dispose of according to local regulations.

Methods and materials for containment and cleaning up

Spill handling: evacuate persons not wearing protective equipment from area of spill or leak until clean-up is complete. Remove all ignition sources. Ventilate area of spill or leak. Collect powdered material in the most convenient and safe manner and deposit in sealed containers. Absorb liquids in vermiculite, dry sand, earth, peat, carbon, or a similar material and deposit in sealed containers. It may be necessary to contain and dispose of this chemical as a hazardous waste. Keep cyanamide out of a confined space, such as a sewer, because of the possibility of an explosion, unless the sewer is designed to prevent the build-up of explosive concentrations. If material or contaminated runoff enters waterways, notify downstream users of potentially contaminated waters. Contact your Department of Environmental Protection or your regional office of the federal EPA for specific

recommendations.

SECTION 7: Handling and storage

Precautions for safe handling

NO open flames. 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.

Conditions for safe storage, including any incompatibilities

Separated from food and feedstuffs and incompatible materials. See Chemical Dangers. Cool. Store at maximum 20 °C, never exceed 30 °C. Dry. Well closed. Keep in a well-ventilated room. Store only if stabilized. See Notes. Store in stainless steel, polyethylene or polypropylene. The commercial 50% solution produced by Degussa AG is stabilized by a special buffer system to a pH between 4.0 and 4.6. Typically, it contains less than 1.5 % dicyandiamide, less than 0.5% urea, and less than 0.1 % thiourea. This solution is stable for at least 3 months if stored at a temperature below 20 deg C. Prolonged storage leads to an increase in the pH and thus to instability of the solution. If a pH of 5.2 has been reached, the product should be used quickly, above pH 5.5 it should be discarded immediately by mixing it with at least the double volume of water. Otherwise, a thermal runaway reaction leading to temperatures above 100 deg C and potential bursting of the container may occur.

SECTION 8: Exposure controls/personal protection

Control parameters

Occupational Exposure limit values

TLV: 2 mg/m³, as TWA.MAK: 0.35 mg/m³, 0.2 ppm; peak limitation category: II(1); skin absorption (H); sensitization of skin (SH); pregnancy risk group: C.EU-OEL: 1 mg/m³, 0.58 ppm as TWA; (skin)

Biological limit values

no data available

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.

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

Eye/face protection

Wear face shield.

Skin protection

Protective gloves. Protective clothing.

Respiratory protection

Use local exhaust or breathing protection.

Thermal hazards

no data available

SECTION 9: Physical and chemical properties and safety characteristics

Physical state:	Solid. Crystalline.
Colour:	Colourless.
Odour:	no data available
Melting point/freezing point:	46.1 °C. Atm. press.:101.325 kPa. Remarks:The mean melting temperature of Cyanamid F1000, with a standard deviation of 0.05.
Boiling point or initial boiling point and boiling range:	Atm. press.:98.3 kPa. Remarks:Cyanamid F1000 decomposed before boiling.
Flammability:	Combustible Solid
Lower and upper explosion limit/flammability limit:	no data available
Flash point:	141°C
Auto-ignition temperature:	no data available
Decomposition temperature:	260°C

pH:	no data available
Kinematic viscosity:	no data available
Solubility:	78 % at 59° F (NIOSH, 2016)
Partition coefficient n-octanol/water:	Pow = 0.19. Temperature:20 °C.;log Pow = -0.72. Temperature:20 °C.
Vapour pressure:	0.51 Pa. Temperature:20 °C. Remarks:0.51 Pa = 68 mm Hg.;1 Pa. Temperature:25 °C. Remarks:1.0 Pa = 133 mm Hg.
Density and/or relative density:	1.23 g/cm ³ . Temperature:20 °C.
Relative vapour density:	1.45 (Air = 1)
Particle characteristics:	no data available

SECTION 10: Stability and reactivity

Reactivity

The substance is a highly reactive compound. May explode on vacuum distillation. The substance may spontaneously polymerize. Dimerizes at temperatures above 40°C with strong heat release. Dimerization is catalyzed by traces of bases. Decomposes on contact with acids, bases or moisture. This produces toxic fumes including ammonia, nitrogen oxides and cyanides. Reacts with acids, strong oxidants and strong reducing agents. This generates explosion and toxic hazard. Attacks metals such as steel, copper and aluminium.

Chemical stability

The storage life is at least 3 months at temperatures below 20 deg C. The product is packed in steel drums with polyethylene liners. The packaging size is limited to 50 kg.

Possibility of hazardous reactions

Cyanamide may burn, but does not readily ignite. CYANAMIDE is the amide of cyanic acid. Non-flammable but combustible (flash point: 140° C). Decomposes on warming above 49° C. Emits toxic fumes of CN⁻ and NO_x when heated to decomposition or on contact with acids or acid fumes (Hazardous Chemicals Desk Reference, p. 353 (1987)). Contact with moisture, acids or bases may

cause a violent reaction at temperatures above about 40° C. Dry solid may polymerize at temperatures above 122° C. Rapid or explosive polymerization may occur during the evaporation of aqueous solutions. Reacts explosively with strong oxidizing agents and strong reducing agents. Attacks various metals (International Chemical Safety Card).

Conditions to avoid

no data available

Incompatible materials

On contact with acid or fumes, it emits toxic fumes of cyanide and nitroxides.

Hazardous decomposition products

When heated to decomposition ... it emits toxic fumes of cyanide and nitroxides.

SECTION 11: Toxicological information

Acute toxicity

Oral: LD50 Rat oral 125 mg/kg

Inhalation: LC50 - rat (male/female) - > 1 mg/L air.

Dermal: LD50 - rabbit (male) - 901 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

Cancer Classification: Group C Possible Human Carcinogen

Reproductive toxicity

no data available

STOT-single exposure

The substance is severely irritating to the eyes and skin. The substance is irritating to the respiratory tract. See Notes.

STOT-repeated exposure

Repeated or prolonged contact may cause skin sensitization. Animal tests show that this substance possibly causes toxicity to human reproduction or development.

Aspiration hazard

A harmful concentration of airborne particles can be reached quickly when dispersed, especially if powdered.

SECTION 12: Ecological information

Toxicity

Toxicity to fish: LC50 - *Lepomis macrochirus* - 43.1 mg/L - 96 h.

Toxicity to daphnia and other aquatic invertebrates: EC50 - *Daphnia magna* - 3.2 mg/L - 48 h.

Toxicity to algae: EC50 - *Pseudokirchneriella subcapitata* (previous names: *Raphidocelis subcapitata*, *Selenastrum capricornutum*) - 6.7 mg/L - 72 h.

Toxicity to microorganisms: TT: toxicity threshold (the concentration of the test substance at which its inhibitory action starts) - *Pseudomonas putida* - 157 mg/L - 19 h.

Persistence and degradability

AEROBIC: Initial concentrations of cyanamide ranging from 6.0 to 9.6 mg/L were found to decrease in three experiments using aerobic continuous-flow soil columns inoculated with activated sewage sludge and varying amounts of supplemental carbon (for example: columns receiving no supplement and columns receiving a supplement of sweet whey had a 10% and a 39.5% decrease,

respectively, in cyanamide concentration between column influent and effluent). However, these results were similar to sterile columns run under the same conditions(1).

Bioaccumulative potential

An estimated BCF of 3.2 was calculated in fish for cyanamide(SRC), using a log Kow of -0.80(1) and a regression-derived equation(2). According to a classification scheme(3), this BCF suggests the potential for bioconcentration in aquatic organisms is low.

Mobility in soil

Using a structure estimation method based on molecular connectivity indices(1), the Koc of cyanamide can be estimated to be 4.7(SRC). The Koc of cyanamide can also be estimated as 7.3(SRC), using a log Kow of -0.82(2) and a regression-derived equation(1). According to a classification scheme(3), these estimated Koc values suggest that cyanamide is expected to have very high mobility in soil.

Other adverse effects

no data available

SECTION 13: Disposal considerations

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

UN Number

ADR/RID: UN2811 (For reference only, please check.)

IMDG: UN2811 (For reference only, please check.)
IATA: UN2811 (For reference only, please check.)

UN Proper Shipping Name

ADR/RID: TOXIC SOLID, ORGANIC, N.O.S. (For reference only, please check.)
IMDG: TOXIC SOLID, ORGANIC, N.O.S. (For reference only, please check.)
IATA: TOXIC SOLID, ORGANIC, N.O.S. (For reference only, please check.)

Transport hazard class(es)

ADR/RID: 6.1 (For reference only, please check.)
IMDG: 6.1 (For reference only, please check.)
IATA: 6.1 (For reference only, please check.)

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.)

Environmental hazards

ADR/RID: No
IMDG: No
IATA: No

Special precautions for user

no data available

Transport in bulk according to IMO instruments

no data available

SECTION 15: Regulatory information

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

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

Not Listed.

New Zealand Inventory of Chemicals (NZIoC)

Listed.

(PICCS)

Not Listed.

Vietnam National Chemical Inventory

Listed.

IECSC)

Listed.

Korea Existing Chemicals List (KECL)

Listed.

SECTION 16: Other information

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

Cyanamide has to be stabilized by pH-buffer against dimerization and decomposition. An added stabilizer or inhibitor can influence the toxicological properties of this substance, consult an expert. Cyanamide that has been stored for a long time or is contaminated, should be diluted with at least three times its volume of water to avoid critical decomposition temperatures being reached. Do NOT take working clothes home. Term cyanamide is also used to designate calcium cyanamide. In combination with even small amounts of alcohol the substance causes effects on cardiovascular and central nervous systems resulting in flushing, palpitation, hypotension and hyperventilation.

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

