Chemical Safety Data Sheet MSDS / SDS

Nitrilotriacetic acid SDS

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

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

Product identifier

Product name: Nitrilotriacetic acid

CAS: 139-13-9

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

Carcinogenicity, Category 2

GHS label elements, including precautionary statements

Pictogram(s)

Signal word Warning

Hazard statement(s)

H319 Causes serious eye irritation
H351 Suspected of causing cancer

Precautionary statement(s)

Prevention

P203 Obtain, read and follow all safety instructions before use.
P280 Wear protective gloves/protective clothing/eye protection/face protection/hearing protection/...

Response

P318 IF exposed or concerned, get medical advice.

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:	Nitrilotriacetic acid
Common names and synonyms:	Nitrilotriacetic acid

CAS number:	139-13-9
EC number:	205-355-7
Concentration:	100%

SECTION 4: First aid measures

Description of necessary first-aid measures

If inhaled

Fresh air, rest.

Following skin contact

Remove contaminated clothes. Rinse and then wash skin with water and soap.

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.

Most important symptoms/effects, acute and delayed

Toxicity and health hazard of these compounds are low. Contact with eyes causes irritation. (USCG, 1999)

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

Immediate first aid: Ensure that adequate decontamination has been carried out. If patient is not breathing, start artificial respiration, preferably with a demand-valve resuscitator, bag-valve-mask device, or pocket mask, as trained. Perform CPR as necessary. Immediately flush contaminated eyes with gently flowing water. Do not induce vomiting. If vomiting occurs, lean patient forward or place on left side (head-down position, if possible) to maintain an open airway and prevent aspiration. Keep patient quiet and maintain normal body temperature. Obtain medical attention. Organic acids and related compounds

SECTION 5: Firefighting measures

Suitable extinguishing media

This chemical is a combustible solid. Use dry chemical, carbon dioxide, water spray, or alcohol foam extinguishers.

Specific hazards arising from the chemical

Flash point data for this chemical are not available; however, it is probably combustible. (NTP, 1992)

Special protective actions for fire-fighters

In case of fire in the surroundings, use appropriate extinguishing media.

SECTION 6: Accidental release measures

Personal precautions, protective equipment and emergency procedures

Personal protection: particulate filter respirator adapted to the airborne concentration of the substance. Do NOT let this chemical enter the environment. Sweep spilled substance into covered containers. If appropriate, moisten first to prevent dusting. Carefully collect remainder. Then store and dispose of according to local regulations.

Environmental precautions

Personal protection: particulate filter respirator adapted to the airborne concentration of the substance. Do NOT let this chemical enter the environment. Sweep spilled substance into covered containers. If appropriate, moisten first to prevent dusting. Carefully collect remainder. Then store and dispose of according to local regulations.

Methods and materials for containment and cleaning up

This study used acidity, ethylenediaminetetracetic acid and nitrilotriacetic acid treatment processes to explore the removal efficiencies of heavy metals from urban and industrial sludges. The results indicate that the optimum treatment efficiencies of heavy metals extraction from sludge are related to the species of heavy metals in sludge, dosage of extractants and the reaction time. The removal efficiency of a three stage countercurrent process was higher than those of single stage processes... The cost of the acid treatment process per unit weight of heavy metal extracted was lowest in conditions of high heavy metal concentrations, but the ethylenedinitrilotetraacetic process was the cheapest with low heavy metal concentrations.

SECTION 7: Handling and storage

Precautions for safe handling

NO open flames. Closed system, dust explosion-proof electrical equipment and lighting. Prevent deposition of dust. 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 strong oxidants and strong bases. Well closed.Store in a refrigerator or in a cool, dry place.

SECTION 8: Exposure controls/personal protection

Control parameters

Occupational Exposure limit values

MAK: carcinogen category: 3A

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 safety goggles.

Skin protection

Protective gloves.

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. Flakes.
Colour:	White.
Odour:	no data available
Melting point/freezing point:	242 °C. Atm. press.: Ca. 1 atm.
Boiling point or initial boiling point and boiling range:	429 °C. Atm. press.: Ca. 1 atm.
Flammability:	Combustible under specific conditions. Gives off irritating or toxic fumes (or gases) in a fire.
Lower and upper explosion limit/flammability limit:	no data available
Flash point:	255 °C. Atm. press.: Ca. 1 atm.
Auto-ignition temperature:	no data available
Decomposition temperature:	242°C
pH:	pH of saturated aqueous solution = 2.3
Kinematic viscosity:	no data available
Solubility:	less than 0.1 mg/mL at 73° F (NTP, 1992)
Partition coefficient n-octanol/water:	log Pow = -3.81. Temperature: 25 °C. Remarks: QSAR.
Vapour pressure:	Ca. 0 Pa. Temperature: 25 °C. Remarks: Modified Grain Method.
Density and/or relative density:	> 1 g/cm3. Temperature: 25 °C.

Relative vapour density:	no data available
Particle characteristics:	no data available

SECTION 10: Stability and reactivity

Reactivity

Decomposes on burning. This produces toxic and irritating fumes including nitrogen oxides. The solution in water is a weak acid. Reacts with strong bases and strong oxidants.

Chemical stability

no data available

Possibility of hazardous reactions

Dust explosion possible if in powder or granular form, mixed with air.NITRILOTRIACETIC ACID is incompatible with strong oxidizers, aluminum, copper, copper alloy and nickel. It is also incompatible with strong bases. (NTP, 1992)

Conditions to avoid

no data available

Incompatible materials

Violent reaction with strong bases.

Hazardous decomposition products

When heated to decomposition it emits toxic fumes of /nitrogen oxides/.

SECTION 11: Toxicological information

Acute toxicity

Oral: LD50 - rat - 1 580 mg/kg bw. Remarks:Effect level expressed as the acid.

Inhalation: LC0 - rat - > 3.7 mg/L air.

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

Evaluation: There is inadequate evidence in humans for the carcinogenicity of nitrilotriacetic acid and its salts. There is sufficient evidence in experimental animals for the carcinogenicity of nitrilotriacetic acid and its sodium salts. Overall evaluation: Nitrilotriacetic acid and its salts are possibly carcinogenic in humans (Group 2B).

Reproductive toxicity

no data available

STOT-single exposure

The substance is irritating to the eyes, skin and respiratory tract.

STOT-repeated exposure

This substance is possibly carcinogenic to humans.

Aspiration hazard

No indication can be given about the rate at which a harmful concentration of this substance in the air is reached on evaporation

at 20°C.

SECTION 12: Ecological information

Toxicity

Toxicity to fish: LC50 - Pimephales promelas - 85 mg/L - 96 h.

Toxicity to daphnia and other aquatic invertebrates: EC50 - Gammarus sp. - 73 mg/L - 96 h.

Toxicity to algae: NOEC - Selenastrum capricomutum, Scenedesmus subspiratus, Chlorella vulgaris - 3.7 mg/L - 5 d.

Toxicity to microorganisms: EC5 - Chilomonas paramaecium - > 400 mg/L - 72 h.

Persistence and degradability

AEROBIC: In a river die-away study using Ruhr River water from Germany, nitrilotriacetic acid biodegradation rate constants of 0.30/day (25 deg C) and 0.07/day (2 deg C) were measured which correspond to respective half-lives of 2.3 and 9.9 days(1). In a die-away test Ohio River water, 100% degradation was observed after 12-14 days of incubation which included an 8-10 day lag period(2). In aerobic die-away tests using Detroit and Meramec River water, 100% degradation was observed after 3-15 days of incubation(3). In river die-away tests using river water from both upstream and downstream of the Heath, OH treatment plant, 100% degradation occurred within 10 days in the downstream water and within 16 days in the upstream water(4). In die-away tests using freshwater-sediment from Hamilton Harbor, Lake Erie, 100% degradation occurred in 3-11 days of incubation at input concentrations of 1-12 ppm(5). In CO2 evolution tests using river water inocula from various sites (Fukushima, Japan; Perkinsville, IN; Brantford, Ontario; Cincinnati, OH) located downstream from treatment plants and low concentrations of nitrilotriacetic acid (0.001-1 ppm), rate constants ranging from 0.12 to 1.28/day were measured which correspond to half-lives of 0.54 to 5.8 days(6). Nitrilotriacetic acid was rapidly degraded in river die-away studies using Grand River (Ontario, Can) water and Ohio River water(7); half-lives in the Grand River water ranged from 0.34-0.64 days while the Ohio River water had a 15-day CO2 evolution of 90%(7). Mineralization of nitrilotriacetic acid in Cayuga Lake water (Ithaca, NY) was 90% or greater in 20 days of incubation at concentrations of 1 ug/mL and 10 ng/mL(8); however, at 0.1 ng/L, mineralization was much slower (about 15% in 60 days)(8).

Bioaccumulative potential

BCFs of <9 to 24 and 109 were measured in carp (Cyprinus carpio) exposed for 28 days at nitrilotriacetic acid concentrations of 3 and 0.3 mg/L, respectively(1). According to a classification scheme(2), these BCFs suggest the potential for bioconcentration in aquatic organisms is low to moderate(SRC).

Mobility in soil

The Koc of nitrilotriacetic acid is estimated as <286(SRC), using a measured Kd value of <10 in a creek sediment containing 3.5% organic carbon(1). According to a classification scheme(2), this Koc suggests that nitrilotriacetic acid is expected to have high to

moderate mobility in soil(SRC). Soil Rf values of 0.33-0.41 that were measured by thin-layer chromatography also suggest moderate to high soil mobility of nitrilotriacetic acid(3). Nitrilotriacetic acid had a reported Kd of 0.3 giving a half-life of 5 days(4). The pKa1 of nitrilotriacetic acid is 3.03(5), indicating that this compound will exist almost entirely in anion form in the environment and anions generally do not adsorb more strongly to soils containing organic carbon and clay than their neutral counterparts(6).

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: Not dangerous goods. (For reference only, please check.)
IMDG: Not dangerous goods. (For reference only, please check.)
IATA: Not dangerous goods. (For reference only, please check.)

UN Proper Shipping Name

ADR/RID: Not dangerous goods. (For reference only, please check.)
IMDG: Not dangerous goods. (For reference only, please check.)
IATA: Not dangerous goods. (For reference only, please check.)

Transport hazard class(es)

ADR/RID: Not dangerous goods. (For reference only, please check.)
IMDG: Not dangerous goods. (For reference only, please check.)
IATA: Not dangerous goods. (For reference only, please check.)

Packing group, if applicable

ADR/RID: Not dangerous goods. (For reference only, please check.)
IMDG: Not dangerous goods. (For reference only, please check.)
IATA: Not dangerous goods. (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)

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/