

Chemical Safety Data Sheet MSDS / SDS

4-nitrophenol 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: 4-nitrophenol

CAS: 100-02-7

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 4, Oral

Acute toxicity - Category 4, Dermal

Acute toxicity - Category 4, Inhalation
Specific target organ toxicity - repeated exposure, Category 2

GHS label elements, including precautionary statements

Pictogram(s)



Signal word

Warning

Hazard statement(s)

H302 Harmful if swallowed
H312 Harmful in contact with skin
H332 Harmful if inhaled
H373 May cause damage to organs through prolonged or repeated exposure

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/...
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

P301+P317 IF SWALLOWED: Get medical help.
P330 Rinse mouth.
P302+P352 IF ON SKIN: Wash with plenty of water/...
P317 Get medical help.
P321 Specific treatment (see ... on this label).
P362+P364 Take off contaminated clothing and wash it before reuse.
P304+P340 IF INHALED: Remove person to fresh air and keep comfortable for breathing.
P319 Get medical help if you feel unwell.

Storage

none

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: 4-nitrophenol

Common names and synonyms: 4-nitrophenol

CAS number: 100-02-7

EC number: 202-811-7

Concentration: 100%

SECTION 4: First aid measures

Description of necessary first-aid measures

If inhaled

Fresh air, rest. Refer for medical attention.

Following skin contact

Remove contaminated clothes. Rinse and then wash skin with water and soap. 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. Rest. Refer for medical attention .

Most important symptoms/effects, acute and delayed

Inhalation or ingestion causes headache, drowsiness, nausea, and blue color in lips, ears, and fingernails (cyanosis). Contact with eyes or skin causes irritation; can be absorbed through skin to give same symptoms as for inhalation. (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. Dinitrophenol and Related Compounds

SECTION 5: Firefighting measures

Suitable extinguishing media

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

Specific hazards arising from the chemical

Special Hazards of Combustion Products: Toxic oxides of nitrogen and fumes of unburned material may form in fires. Behavior in Fire: Decomposes violently at 279°C and will burn even in absence of air. (USCG, 1999)

Special protective actions for fire-fighters

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

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 sealable 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 sealable 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

Spill or leak procedures: Shovel into suitable dry container.

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 combustible substances, reducing agents and food and feedstuffs. Well closed.... KEEP ALL FLAMMABLES AWAY FROM AREA WHERE OXIDIZING AGENTS ARE STORED. ... AREA ... KEPT COOL & VENTILATED, & SHOULD BE FIREPROOFED.

SECTION 8: Exposure controls/personal protection

Control parameters

Occupational Exposure limit values

no data available

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 spectacles, face shield or eye protection in combination with breathing protection.

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

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| Physical state: | Solid. Crystalline. |
| Colour: | Light yellowish to brown. |
| Odour: | Odorless |
| Melting point/freezing point: | 113 - 114 °C. |
| Boiling point or initial boiling point and boiling range: | 297 °C. |
| Flammability: | Combustible. Gives off irritating or toxic fumes (or gases) in a fire. |
| Lower and upper explosion limit/flammability limit: | no data available |
| Flash point: | 169 °C. |
| Auto-ignition temperature: | 510 °C. |
| Decomposition temperature: | at 279°C°C |

| | |
|--|---|
| pH: | no data available |
| Kinematic viscosity: | no data available |
| Solubility: | Miscible with water |
| Partition coefficient n-octanol/water: | log Pow = 1.91. |
| Vapour pressure: | 0 mm Hg. Temperature:30 °C. Remarks:Corresponding to 0.04 Pa. |
| Density and/or relative density: | 1.27 g/cm ³ . Temperature:20 °C. |
| Relative vapour density: | 1.244 at 149° F (NTP, 1992) (Relative to Air) |
| Particle characteristics: | no data available |

SECTION 10: Stability and reactivity

Reactivity

May explode on heating. Decomposes on heating. This produces toxic fumes including nitrogen oxides. Mixtures with potassium hydroxide are explosive.

Chemical stability

no data available

Possibility of hazardous reactions

Will burn even in absence of air. Dust explosion possible if in powder or granular form, mixed with air. 4-NITROPHENOL is a slightly yellow, crystalline material, moderately toxic. Mixtures with diethyl phosphite may explode when heated. Decomposes exothermally, emits toxic fumes of oxides of nitrogen [Lewis, 3rd ed., 1993, p. 941]. Decomposes violently at 279°C and will burn even in absence of air (USCG, 1999). Solid mixtures of the nitrophenol and potassium hydroxide (1:1.5 mol) readily deflagrate [Bretherick, 5th Ed., 1995].

Conditions to avoid

no data available

Incompatible materials

Mixtures with diethyl phosphite may explode when heated.

Hazardous decomposition products

Decomposes violently @ 279 deg c ...

SECTION 11: Toxicological information

Acute toxicity

Oral: LD50 Rat (male) oral 191 mg/kg (95% confidence limits 131-303 mg/kg)

Inhalation: LD50 Rat inhalation > 4.7 mg/L/4 hours

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

Cancer Classification: Group D Not Classifiable as to Human Carcinogenicity

Reproductive toxicity

No information is available on the reproductive or developmental effects of 4-nitrophenol in humans. One animal study reported no histological alterations in the testes and epididymides in mice exposed to 4-nitrophenol by inhalation, while in another study no changes were observed in the reproductive index of pregnant mice given 4-nitrophenol by gavage (placing the chemical experimentally in the stomach).

STOT-single exposure

The substance is irritating to the eyes, skin and respiratory tract. The substance may cause effects on the blood. This may result in the formation of methaemoglobin. The effects may be delayed. Medical observation is indicated.

STOT-repeated exposure

Repeated or prolonged contact may cause skin sensitization.

Aspiration hazard

Evaporation at 20°C is negligible; a harmful concentration of airborne particles can, however, be reached quickly when dispersed.

SECTION 12: Ecological information

Toxicity

Toxicity to fish: LC50; Species: *Lepomis macrochirus* (bluegill); Conditions: static, unmeasured; Concentration: 8,280 ug/L for 24 hr

Toxicity to daphnia and other aquatic invertebrates: LC50 - *Daphnia magna* - 24 mg/L - 24 h.

Toxicity to algae: EC50 - *Chlorella vulgaris* - 6.97 mg/L - 6 h.

Toxicity to microorganisms: no data available

Persistence and degradability

PURE CULTURE: *Pseudomonas* strains capable of mineralizing 2,4-dichlorophenol and p-nitrophenol (PNP) in culture media were isolated from soil. A *Pseudomonas* able to mineralize 5.0 ug p-nitrophenol/mL in culture did not mineralize the compound in sterile or nonsterile lake water. The bacterium destroyed p-nitrophenol in sterile sewage and enhanced p-nitrophenol mineralization in nonsterile sewage. When added to the surface of sterile soil, the bacterium mineralized little of the p-nitrophenol present at 5.0 ug/g, but it was active if mixed well with the sterile soil. [Goldstein RM et al; *Appl Environ Microbiol* 50 (4): 977-83 (1985)] Full text: PMC291779

Bioaccumulative potential

BCF values of 2.5 to 7.8 were measured for carp (*Carprinus carpio*) exposed to 0.02 ppm and 0.2 ppm 4-nitrophenol over a 6-8 week incubation period(1). The BCF value of 4-nitrophenol was reported as 79 in fathead minnows(2) and 58 in golden orfe(3). According to a classification scheme(4), these BCF values suggest bioconcentration in aquatic organisms is low to moderate.

Mobility in soil

The sorption of benzoic acid, nitrobenzene, 4-nitrophenol, 2,4-dichlorophenoxyacetic acid, and naphthalene was determined for 10 Danish soils in laboratory studies(1); measured equilibrium isotherms were of nonlinear Freundlich type for nearly all combinations of soil test compounds(1); adsorption was significantly correlated with the organic carbon content of the soils tested(1); Koc values in the 10 soils ranged from 56 to 530 with an average Koc 210(1); no significant correlations with pH and cation exchange capacity were observed(1). The Koc of 4-nitrophenol was reported as 55 in Brookston clay loam(2) and a log Koc of 1.7 was reported in a second study(3). The increasing content of copper in two Chinese soils was shown to limit 4-nitrophenol adsorption(4). In sorption studies using peat, 4-nitrophenol had measured Koc values of 96 (when 4-nitrophenol was in the neutral state) and 16 (when 4-nitrophenol existed as anionic species)(5). Using a reference soil from Germany, 4-nitrophenol had Koc value of 148 in a soil column leaching test(6). A Koc of 26 was measured in one sediment sample from China(7). A median literature Koc value of 234 (log Koc = 2.37) has been reported for 4-nitrophenol which can be used to develop QSAR estimations(8). According to a classification scheme(9), a median Koc value of 234 suggests that 4-nitrophenol is expected to have moderate mobility in soil. However, the experimental Koc range extends from 16 to over 500 suggesting a range of very high mobility to low mobility(SRC). The pKa of 4-nitrophenol is 7.15(10), indicating that this compound will exist partially 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(11).

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: UN1663 (For reference only, please check.)

IMDG: UN1663 (For reference only, please check.)

IATA: UN1663 (For reference only, please check.)

UN Proper Shipping Name

ADR/RID: NITROPHENOLS (o-, m-, p-) (For reference only, please check.)

IMDG: NITROPHENOLS (o-, m-, p-) (For reference only, please check.)

IATA: NITROPHENOLS (o-, m-, p-) (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: III (For reference only, please check.)

IMDG: III (For reference only, please check.)

IATA: III (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

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/>

Other Information

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

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