

# SAFETY DATA SHEETS

According to the UN GHS revision 9

Version: 1.0  
Creation Date: July 15, 2019  
Revision Date: July 15, 2019

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## SECTION 1: Identification

### 1.1 GHS Product identifier

**Product name** 4-nitrophenol

### 1.2 Other means of identification

**Product number** -

**Other names** 4-Nitrophenol; p-Nitrophenol; Phenol, 4-nitro-

### 1.3 Recommended use of the chemical and restrictions on use

**Identified uses** Industrial and scientific research use.

**Uses advised against** no data available

### 1.4 Supplier's details

**Company** Shanghai Yien Chemical Technology Co., Ltd  
**Address** Building 6, 28 Yingong Road, Fengxian District, Shanghai  
Chemical Industry Zone, Shanghai, 201400, China  
**Telephone** +86-400-133-2688

### 1.5 Emergency phone number

**Emergency phone number** +86-400-133-2688

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

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## SECTION 2: Hazard identification

### 2.1 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

### 2.2 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/...

**Response**

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.  
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.

**2.3 Other hazards which do not result in classification**

no data available

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**SECTION 3: Composition/information on ingredients**

**3.1 Substances**

Chemical name	Common names and synonyms	CAS number	EC number	Concentration
4-nitrophenol	4-nitrophenol	100-02-7	202-811-7	100%

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**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 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 .

**4.2 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)

**4.3 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

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## **SECTION 5: Fire-fighting measures**

### **5.1 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.

### **5.2 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)

### **5.3 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.

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## **SECTION 6: Accidental release measures**

### **6.1 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.

### **6.2 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.

### **6.3 Methods and materials for containment and cleaning up**

Spill or leak procedures: Shovel into suitable dry container.

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## **SECTION 7: Handling and storage**

### **7.1 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.

### **7.2 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.

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## **SECTION 8: Exposure controls/personal protection**

### **8.1 Control parameters**

#### **Occupational Exposure limit values**

no data available

#### **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 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

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## SECTION 9: Physical and chemical properties and safety characteristics

<b>Physical state</b>	Solid. Crystalline.
<b>Colour</b>	Light yellowish to brown.
<b>Odour</b>	Odorless
<b>Melting point/freezing point</b>	113 - 114 °C.
<b>Boiling point or initial boiling point and boiling range</b>	297 °C.
<b>Flammability</b>	Combustible. Gives off irritating or toxic fumes (or gases) in a fire.
<b>Lower and upper explosion limit/flammability limit</b>	no data available
<b>Flash point</b>	169 °C.
<b>Auto-ignition temperature</b>	510 °C.
<b>Decomposition temperature</b>	at 279°C°C
<b>pH</b>	no data available
<b>Kinematic viscosity</b>	no data available
<b>Solubility</b>	Miscible with water
<b>Partition coefficient n-octanol/water</b>	log Pow = 1.91.
<b>Vapour pressure</b>	0 mm Hg. Temperature:30 °C. Remarks:Corresponding to 0.04 Pa.
<b>Density and/or relative density</b>	1.27 g/cm <sup>3</sup> . Temperature:20 °C.
<b>Relative vapour density</b>	1.244 at 149° F (NTP, 1992) (Relative to Air)
<b>Particle characteristics</b>	no data available

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## SECTION 10: Stability and reactivity

### 10.1 Reactivity

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

### 10.2 Chemical stability

no data available

### 10.3 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].

### 10.4 Conditions to avoid

no data available

### 10.5 Incompatible materials

Mixtures with diethyl phosphite may explode when heated.

### 10.6 Hazardous decomposition products

Decomposes violently @ 279 deg c ...

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## 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.

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## SECTION 12: Ecological information

### 12.1 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

### 12.2 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

### 12.3 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.

### 12.4 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).

### 12.5 Other adverse effects

no data available

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## 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.

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## SECTION 14: Transport information

### 14.1 UN Number

ADR/RID: UN1663 (For reference only, please check.)      IMDG: UN1663 (For reference only, please check.)      IATA: UN1663 (For reference only, please check.)

### 14.2 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.)

### 14.3 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.)

### 14.4 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.)

### 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

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## 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
4-nitrophenol	4-nitrophenol	100-02-7	202-811-7
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.

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## SECTION 16: Other information

### Information on revision

Creation Date      July 15, 2019  
Revision Date      July 15, 2019

## 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](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.

**Any questions regarding this SDS, Please send your inquiry to [sds@xixisys.com](mailto:sds@xixisys.com)**

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*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.*