



# SAFETY DATA SHEETS

According to the UN GHS revision 9

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

## SECTION 1: Identification

### 1.1 GHS Product identifier

**Product name** O-ethyl O-4-nitrophenyl phenylphosphonothioate

### 1.2 Other means of identification

**Product number** -  
**Other names** Santox; (RS)-(O-ethyl O-4-nitrophenyl phenylphosphonothioate); O-ethyl O-(4-nitrophenyl) P-phenylphosphonothioate

### 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).

## SECTION 2: Hazard identification

### 2.1 Classification of the substance or mixture

Acute toxicity - Category 2, Oral  
Acute toxicity - Category 1, Dermal  
Hazardous to the aquatic environment, short-term (Acute) - Category Acute 1  
Hazardous to the aquatic environment, long-term (Chronic) - Category Chronic 1

### 2.2 GHS label elements, including precautionary statements

**Pictogram(s)**



**Signal word** Danger  
**Hazard statement(s)** H300 Fatal if swallowed

	H310 Fatal in contact with skin H410 Very toxic to aquatic life with long lasting effects
<b>Precautionary statement(s)</b>	
<b>Prevention</b>	P264 Wash ... thoroughly after handling. P270 Do not eat, drink or smoke when using this product. P262 Do not get in eyes, on skin, or on clothing. P280 Wear protective gloves/protective clothing/eye protection/face protection/hearing protection/... P273 Avoid release to the environment.
<b>Response</b>	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. P391 Collect spillage.
<b>Storage</b>	P405 Store locked up.
<b>Disposal</b>	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
O-ethyl O-4-nitrophenyl phenylphosphonothioate	O-ethyl O-4-nitrophenyl phenylphosphonothioate	2104-64-5	218-276-8	100%

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## SECTION 4: First-aid measures

### 4.1 Description of necessary first-aid measures

#### If inhaled

Fresh air, rest. Half-upright position. Artificial respiration may be needed. Refer immediately for medical attention.

#### Following skin contact

Remove contaminated clothes. Rinse and then wash skin with water and soap. Refer immediately for medical attention. Wear protective gloves when administering first aid. Put clothes in sealable container. See Notes.

#### Following eye contact

Rinse with plenty of water for several minutes (remove contact lenses if easily possible). Refer immediately for medical attention.

#### Following ingestion

Rinse mouth. Give a slurry of activated charcoal in water to drink. Refer immediately for medical attention.

### 4.2 Most important symptoms/effects, acute and delayed

This material may be fatal if swallowed. It is poisonous if inhaled and extremely hazardous by skin contact. Repeated exposure may, without symptoms, be increasingly hazardous. The estimated fatal oral dose is 0.3 grams for a 150 lb. (70 kg) person. (EPA, 1998)

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

Basic treatment: Establish a patent airway. Suction if necessary. Aggressive airway control may be needed. Watch for signs of respiratory insufficiency and assist ventilations if necessary. Administer oxygen by nonrebreather mask at 10 to 15 L/min. Monitor for pulmonary edema and treat if necessary. Monitor for shock and treat if necessary. Anticipate seizures and treat if necessary. For eye contamination, flush eyes immediately with water. Irrigate each eye continuously with normal saline during transport. Do not use emetics. For ingestion, rinse mouth and administer 5 ml/kg up to 200 ml of water for dilution if the patient can swallow, has a strong gag reflex, and does not drool. Administer activated charcoal. Organophosphates and related compounds

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

### **5.1 Suitable extinguishing media**

Self contained breathing apparatus with a full facepiece operated in pressure demand, or other positive pressure mode /should be used in firefighting/. Parathion

### **5.2 Specific hazards arising from the chemical**

Non-Specific -- Organophosphorus Pesticide, n.o.s.) This material may burn but does not ignite readily. Container may explode in heat of fire. Fire and runoff from fire control water may produce irritating or poisonous gases. Avoid strong oxidizers. Hydrolyzed by alkali. (EPA, 1998)

### **5.3 Special protective actions for fire-fighters**

Use powder, alcohol-resistant foam, water spray, carbon dioxide.

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

### **6.1 Personal precautions, protective equipment and emergency procedures**

Personal protection: complete protective clothing including self-contained breathing apparatus. Do NOT wash away into sewer. Sweep spilled substance into covered containers. If appropriate, moisten first to prevent dusting.

### **6.2 Environmental precautions**

Personal protection: complete protective clothing including self-contained breathing apparatus. Do NOT wash away into sewer. Sweep spilled substance into covered containers. If appropriate, moisten first to prevent dusting.

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

1) Ventilate area of spill. 2) Cover with soda ash, mix and spray with water. Place in container of water and allow to stand for two days, then neutralize with 6 molar hydrogen chloride.

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

### **7.1 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.

### **7.2 Conditions for safe storage, including any incompatibilities**

Separated from strong oxidizers and food and feedstuffs. Well closed. Provision to contain effluent from fire extinguishing. Store in an area without drain or sewer access. Keep away from heat and open flame. Keep container closed. Store at 65-100 deg F.

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

### **8.1 Control parameters**

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

TLV: (inhalable fraction): 0.1 mg/m<sup>3</sup>, as TWA; (skin); A4 (not classifiable as a human carcinogen); BEI issued. MAK: (inhalable fraction): 0.5 mg/m<sup>3</sup>; peak limitation category:

II(2); skin absorption (H)

#### **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 if powder.  
Wear safety spectacles.

#### **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>	Epn is a light yellow crystalline powder with an aromatic odor. Used as an insecticide for cotton and an acaricide. (EPA, 1998)
<b>Colour</b>	Light yellow crystals
<b>Odour</b>	Aromatic odor
<b>Melting point/freezing point</b>	36°C
<b>Boiling point or initial boiling point and boiling range</b>	215 deg C @ 5 mm Hg
<b>Flammability</b>	Noncombustible Solid
<b>Lower and upper explosion limit/flammability limit</b>	no data available
<b>Flash point</b>	2°C
<b>Auto-ignition temperature</b>	no data available
<b>Decomposition temperature</b>	no data available
<b>pH</b>	no data available
<b>Kinematic viscosity</b>	no data available
<b>Solubility</b>	Insoluble (NIOSH, 2016)
<b>Partition coefficient n-octanol/water</b>	log Kow= 4.78
<b>Vapour pressure</b>	1.91E-08mmHg at 25°C
<b>Density and/or relative density</b>	1.27
<b>Relative vapour density</b>	no data available
<b>Particle characteristics</b>	no data available

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## **SECTION 10: Stability and reactivity**

### **10.1 Reactivity**

Decomposes on heating. This produces toxic and corrosive fumes including nitrogen oxides, phosphorus oxides and sulfur oxides. Reacts with strong oxidants strong oxidants. This generates fire and explosion hazard. Decomposes under the influence of bases. This produces p-nitrophenol (see ICSC 0066).

## **10.2 Chemical stability**

Stable in neutral and acidic media but hydrolyzed by alkali to liberate p-nitrophenol.

## **10.3 Possibility of hazardous reactions**

Organophosphates, such as EPN, are susceptible to formation of highly toxic and flammable phosphine gas in the presence of strong reducing agents such as hydrides. Partial oxidation by oxidizing agents may result in the release of toxic phosphorus oxides.

## **10.4 Conditions to avoid**

no data available

## **10.5 Incompatible materials**

Strong oxidizers

## **10.6 Hazardous decomposition products**

The substance decomposes under influence of alkalies (hydrolysis) forming p-nitrophenol

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# **SECTION 11: Toxicological information**

### **Acute toxicity**

- Oral: LD50 Rat (female) oral 8 mg/kg
- Inhalation: LC50 Rat inhalation 160 mg/cu m/1 hr
- Dermal: LD50 Rat male percutaneous 2850 mg/kg

### **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**

A4; Not classifiable as a human carcinogen.

### **Reproductive toxicity**

no data available

### **STOT-single exposure**

The substance is irritating to the eyes and skin. Cholinesterase inhibition. The substance may cause effects on the nervous system. This may result in convulsions and respiratory failure. Exposure could cause unconsciousness and death. The effects may be delayed. Medical observation is indicated.

### **STOT-repeated exposure**

Cholinesterase inhibition. Cumulative effects are possible. See Acute Hazards/Symptoms.

### **Aspiration hazard**

A harmful concentration of airborne particles can be reached quickly.

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## SECTION 12: Ecological information

### 12.1 Toxicity

- Toxicity to fish: no data available
- Toxicity to daphnia and other aquatic invertebrates: no data available
- Toxicity to algae: no data available
- Toxicity to microorganisms: no data available

### 12.2 Persistence and degradability

AEROBIC: EPN, present at 100 mg/l, reached 3% of its theoretical BOD in 4 weeks using an activated sludge inoculum at 30 mg/l and the Japanese MITI test(1). Field dissipation half-lives ranging from 28 to 56 days have been reported(2). The half-life of 14C-labeled EPN in field tests with Dundee silt loam (pH 5.5, organic matter 1.3%) and Keyport silt loam (pH 6.4, organic matter 2.75%) were 2 weeks and 1 month, respectively(3). Greater than 90% of the residual radiolabeled carbon was found in the top 3 inches of soil, after 18 months, indicating no leaching of EPN or its degradation products had occurred(3). Under greenhouse conditions 14C-labeled EPN has a half-life of 5-6 weeks in Fallsington sandy loam soil (pH 5.6, organic matter 1.4%)(3). In a biometer study with Keyport silt loam half-lives were 5 and 6 weeks at 2 and 10 ppm, respectively(3). Breakdown of EPN in soil proceeded primarily through hydrolysis and oxidation to phenylphosphonic acid, followed by further degradation of the phenyl ring to CO<sub>2</sub>(3). Under laboratory conditions, the half-life of 1 ppm EPN in upland soil was 30-90 days and in submerged soil it was 3-15 days(4). In upland soils, degradation products were EPN-oxon, desethyl EPN-oxon, O-ethyl S-methylphenylphosphonothiolate, p-nitrophenol, O-ethyl O-methylphenylphosphonate, O-ethylphenylphosphonate, and phenylphosphonic acid(4).

### 12.3 Bioaccumulative potential

BCF values of 2,346(1), 700(2), 2,100 to 7,700(3), 358 to 1590(4), 1682(5), 495(6) to 1205(7), 929 to 1116(7), 641(7), 376(7) in topmouth gudgeon, pinfish, adult sheepshead minnow, carp, willow shiner, killifish, guppy, goldfish, and white cloud mountain fish, respectively, have been reported. According to a classification scheme(8), these BCF values suggest the potential for bioconcentration in aquatic organisms is high to very high(SRC). Although EPN can be bioconcentrated in aquatic organisms, it is also rapidly depurated(2). Pinfish exposed to 2.4 ug/l EPN, bioconcentrated the compound rapidly, reaching an apparent steady-state in approximately 2 days(2). After a 4-day post-exposure period only 1 out of 4 pinfish had detectable levels of EPN (0.04 g/g) in its tissues and after 8 days EPN was not detected in any fish(2). EPN was applied to sorghum leaves in a terrestrial-aquatic model ecosystem containing salt marsh caterpillars, mosquito larvae, plankton, alga, snails and fish. After 33 days the values for bioaccumulation or ecological magnification in snail and fish were reported as 12,561 and 346, respectively(3).

### 12.4 Mobility in soil

Koc values, measured at concentrations of 0.01, 0.1 and 1.0 ppm EPN, were 1,997 and 706 for a clay loam and a high clay soil, respectively, with a mean of 1,327(1). According to a classification scheme(2), these Koc values suggest that EPN is expected to have low mobility in soil. In field tests with Dundee silt loam (pH 5.5, organic matter 1.3%) and Keyport silt loam (pH 6.4, organic matter 2.75%), greater than 90% of the residual radiolabeled carbon was found in the top 3 inches of soil, after 18 months, indicating no leaching of EPN or its degradation products had occurred(3).

### 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.

## SECTION 14: Transport information

### 14.1 UN Number

ADR/RID: UN3018 (For reference only, please check.)

IMDG: UN3018 (For reference only, please check.)

IATA: UN3018 (For reference only, please check.)

### 14.2 UN Proper Shipping Name

ADR/RID:  
ORGANOPHOSPHORUS  
PESTICIDE, LIQUID,  
TOXIC (For reference only,  
please check.)

IMDG:  
ORGANOPHOSPHORUS  
PESTICIDE, LIQUID,  
TOXIC (For reference only,  
please check.)

IATA:  
ORGANOPHOSPHORUS  
PESTICIDE, LIQUID,  
TOXIC (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: I (For reference only, please check.)

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

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

### 14.5 Environmental hazards

ADR/RID: Yes

IMDG: Yes

IATA: Yes

### 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
O-ethyl O-4-nitrophenyl phenylphosphonothioate	O-ethyl O-4-nitrophenyl phenylphosphonothioate	2104-64-5	218-276-8
European Inventory of Existing Commercial Chemical Substances (EINECS)			Listed.
EC Inventory			Listed.
United States Toxic Substances Control Act (TSCA) Inventory			Not Listed.
China Catalog of Hazardous chemicals 2015			Listed.
New Zealand Inventory of Chemicals (NZIoC)			Not Listed.
Philippines Inventory of Chemicals and Chemical Substances (PICCS)			Not Listed.
Vietnam National Chemical Inventory			Listed.
Chinese Chemical Inventory of Existing Chemical Substances (China IECSC)			Not Listed.
Korea Existing Chemicals List (KECL)			Listed.

## 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. Isolate contaminated clothing by sealing in a bag or other container. Specific treatment is necessary in case of poisoning with this substance; the appropriate means with instructions must be available. Carrier solvents used in commercial formulations may change physical and toxicological properties. Do NOT take working clothes home.

**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.*