

### 1. PRODUCT AND COMPANY IDENTIFICATION

#### 1.1 Product identifiers

Product name : Parathion

Product Number : 45607

Brand : Sigma-Aldrich

Index-No. : 015-034-00-1

CAS-No. : 56-38-2

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

Identified uses : Laboratory chemicals, Synthesis of substances

#### 1.3 Details of the supplier of the safety data sheet

Company : Sigma-Aldrich  
3050 Spruce Street  
SAINT LOUIS MO 63103  
USA

Telephone : +1 800-325-5832

Fax : +1 800-325-5052

#### 1.4 Emergency telephone number

Emergency Phone # : +1-703-527-3887 (CHEMTREC)

### 2. HAZARDS IDENTIFICATION

#### 2.1 Classification of the substance or mixture

##### GHS Classification in accordance with 29 CFR 1910 (OSHA HCS)

Acute toxicity, Oral (Category 1), H300

Acute toxicity, Inhalation (Category 1), H330

Acute toxicity, Dermal (Category 1), H310

Carcinogenicity (Category 2), H351

Specific target organ toxicity - repeated exposure, Oral (Category 1), H372

Acute aquatic toxicity (Category 1), H400

Chronic aquatic toxicity (Category 1), H410

For the full text of the H-Statements mentioned in this Section, see Section 16.

#### 2.2 GHS Label elements, including precautionary statements

Pictogram



Signal word

Danger

Hazard statement(s)

H300 + H310 + H330 : Fatal if swallowed, in contact with skin or if inhaled.

H351 : Suspected of causing cancer.

H372 : Causes damage to organs through prolonged or repeated exposure if swallowed.

H410 : Very toxic to aquatic life with long lasting effects.

Precautionary statement(s)

P201 : Obtain special instructions before use.

P202	Do not handle until all safety precautions have been read and understood.
P260	Do not breathe dust/ fume/ gas/ mist/ vapours/ spray.
P262	Do not get in eyes, on skin, or on clothing.
P264	Wash skin thoroughly after handling.
P270	Do not eat, drink or smoke when using this product.
P271	Use only outdoors or in a well-ventilated area.
P273	Avoid release to the environment.
P280	Wear protective gloves/ protective clothing/ eye protection/ face protection.
P284	Wear respiratory protection.
P301 + P310 + P330	IF SWALLOWED: Immediately call a POISON CENTER/doctor. Rinse mouth.
P302 + P350 + P310	IF ON SKIN: Gently wash with plenty of soap and water. Immediately call a POISON CENTER or doctor/ physician.
P304 + P340 + P310	IF INHALED: Remove person to fresh air and keep comfortable for breathing. Immediately call a POISON CENTER/doctor.
P308 + P313	IF exposed or concerned: Get medical advice/ attention.
P362	Take off contaminated clothing and wash before reuse.
P391	Collect spillage.
P403 + P233	Store in a well-ventilated place. Keep container tightly closed.
P405	Store locked up.
P501	Dispose of contents/ container to an approved waste disposal plant.

### 2.3 Hazards not otherwise classified (HNOC) or not covered by GHS - none

## 3. COMPOSITION/INFORMATION ON INGREDIENTS

### 3.1 Substances

Synonyms	:	Parathion-ethyl Ethylparathione O,O-Diethyl O-(4-nitrophenyl) phosphorothioate
Formula	:	C <sub>10</sub> H <sub>14</sub> NO <sub>5</sub> PS
Molecular weight	:	291.26 g/mol
CAS-No.	:	56-38-2
EC-No.	:	200-271-7
Index-No.	:	015-034-00-1

#### Hazardous components

Component	Classification	Concentration
<b>Parathion</b>	Acute Tox. 1; Carc. 2; STOT RE 1; Aquatic Acute 1; Aquatic Chronic 1; H300 + H310 + H330, H351, H372, H410	90 - 100 %

For the full text of the H-Statements mentioned in this Section, see Section 16.

## 4. FIRST AID MEASURES

### 4.1 Description of first aid measures

#### General advice

Consult a physician. Show this safety data sheet to the doctor in attendance. Move out of dangerous area.

#### If inhaled

If breathed in, move person into fresh air. If not breathing, give artificial respiration. Consult a physician.

#### In case of skin contact

Wash off with soap and plenty of water. Take victim immediately to hospital. Consult a physician.

**In case of eye contact**

Rinse thoroughly with plenty of water for at least 15 minutes and consult a physician.

**If swallowed**

Never give anything by mouth to an unconscious person. Rinse mouth with water. Consult a physician.

**4.2 Most important symptoms and effects, both acute and delayed**

The most important known symptoms and effects are described in the labelling (see section 2.2) and/or in section 11

**4.3 Indication of any immediate medical attention and special treatment needed**

No data available

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**5. FIREFIGHTING MEASURES****5.1 Extinguishing media****Suitable extinguishing media**

Use water spray, alcohol-resistant foam, dry chemical or carbon dioxide.

**5.2 Special hazards arising from the substance or mixture**

No data available

**5.3 Advice for firefighters**

Wear self-contained breathing apparatus for firefighting if necessary.

**5.4 Further information**

No data available

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**6. ACCIDENTAL RELEASE MEASURES****6.1 Personal precautions, protective equipment and emergency procedures**

Wear respiratory protection. Avoid breathing vapours, mist or gas. Ensure adequate ventilation. Evacuate personnel to safe areas.

For personal protection see section 8.

**6.2 Environmental precautions**

Prevent further leakage or spillage if safe to do so. Do not let product enter drains. Discharge into the environment must be avoided.

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

Soak up with inert absorbent material and dispose of as hazardous waste. Keep in suitable, closed containers for disposal.

**6.4 Reference to other sections**

For disposal see section 13.

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**7. HANDLING AND STORAGE****7.1 Precautions for safe handling**

Avoid contact with skin and eyes. Avoid inhalation of vapour or mist.

For precautions see section 2.2.

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

Keep container tightly closed in a dry and well-ventilated place. Containers which are opened must be carefully resealed and kept upright to prevent leakage.

Recommended storage temperature 2 - 8 °C

Storage class (TRGS 510): 6.1B: Non-combustible, acute toxic Cat. 1 and 2 / very toxic hazardous materials

**7.3 Specific end use(s)**

Apart from the uses mentioned in section 1.2 no other specific uses are stipulated

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**8. EXPOSURE CONTROLS/PERSONAL PROTECTION****8.1 Control parameters****Components with workplace control parameters**

Component	CAS-No.	Value	Control parameters	Basis
Parathion	56-38-2	TWA	0.1 mg/m <sup>3</sup>	USA. Occupational Exposure Limits (OSHA) - Table Z-1 Limits for Air Contaminants
	Remarks	Skin designation		
		TWA	0.05 mg/m <sup>3</sup>	USA. ACGIH Threshold Limit Values (TLV)
		Cholinesterase inhibition Substances for which there is a Biological Exposure Index or Indices (see BEI® section) Not classifiable as a human carcinogen Danger of cutaneous absorption		
		TWA	0.05 mg/m <sup>3</sup>	USA. NIOSH Recommended Exposure Limits
		Potential for dermal absorption		
		PEL	0.1 mg/m <sup>3</sup>	California permissible exposure limits for chemical contaminants (Title 8, Article 107)
		Skin		

#### Biological occupational exposure limits

Component	CAS-No.	Parameters	Value	Biological specimen	Basis
	-	Total p-nitrophenol	0.5mg/g Creatinine	Urine	ACGIH - Biological Exposure Indices (BEI)
	Remarks	End of shift (As soon as possible after exposure ceases)			
		Cholinesterase activity	70% of an individual's baseline	In red cells	ACGIH - Biological Exposure Indices (BEI)
		Discretionary (At any time)			

## 8.2 Exposure controls

### Appropriate engineering controls

Avoid contact with skin, eyes and clothing. Wash hands before breaks and immediately after handling the product.

### Personal protective equipment

#### Eye/face protection

Face shield and safety glasses Use equipment for eye protection tested and approved under appropriate government standards such as NIOSH (US) or EN 166(EU).

#### Skin protection

Handle with gloves. Gloves must be inspected prior to use. Use proper glove removal technique (without touching glove's outer surface) to avoid skin contact with this product. Dispose of contaminated gloves after use in accordance with applicable laws and good laboratory practices. Wash and dry hands.

#### Body Protection

Complete suit protecting against chemicals, The type of protective equipment must be selected according to the concentration and amount of the dangerous substance at the specific workplace.

#### Respiratory protection

Where risk assessment shows air-purifying respirators are appropriate use a full-face respirator with multi-purpose combination (US) or type ABEK (EN 14387) respirator cartridges as a backup to engineering controls. If the respirator is the sole means of protection, use a full-face supplied air respirator. Use respirators and components tested and approved under appropriate government standards such as NIOSH (US) or CEN (EU).

#### Control of environmental exposure

Prevent further leakage or spillage if safe to do so. Do not let product enter drains. Discharge into the environment must be avoided.

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## 9. PHYSICAL AND CHEMICAL PROPERTIES

### 9.1 Information on basic physical and chemical properties

a) Appearance	Form: liquid
b) Odour	No data available
c) Odour Threshold	No data available
d) pH	No data available
e) Melting point/freezing point	No data available
f) Initial boiling point and boiling range	157 - 162 °C (315 - 324 °F) at 0.8 hPa (0.6 mmHg)
g) Flash point	120 °C (248 °F) - closed cup
h) Evaporation rate	No data available
i) Flammability (solid, gas)	No data available
j) Upper/lower flammability or explosive limits	No data available
k) Vapour pressure	< 1 hPa (< 1 mmHg) at 25 °C (77 °F)
l) Vapour density	No data available
m) Relative density	1.270 g/cm <sup>3</sup>
n) Water solubility	insoluble
o) Partition coefficient: n-octanol/water	log Pow: 3.8
p) Auto-ignition temperature	No data available
q) Decomposition temperature	No data available
r) Viscosity	No data available
s) Explosive properties	No data available
t) Oxidizing properties	No data available

### 9.2 Other safety information

No data available

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## 10. STABILITY AND REACTIVITY

### 10.1 Reactivity

No data available

### 10.2 Chemical stability

Stable under recommended storage conditions.

### 10.3 Possibility of hazardous reactions

No data available

### 10.4 Conditions to avoid

No data available

### 10.5 Incompatible materials

Bases

### 10.6 Hazardous decomposition products

Hazardous decomposition products formed under fire conditions. - Sulphur oxides, Phosphorous oxides

Hazardous decomposition products formed under fire conditions. - Nature of decomposition products not known.

Hazardous decomposition products formed under fire conditions. - Carbon oxides, Nitrogen oxides (NOx), Sulphur oxides, Oxides of phosphorus  
Other decomposition products - No data available  
In the event of fire: see section 5

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## 11. TOXICOLOGICAL INFORMATION

### 11.1 Information on toxicological effects

#### Acute toxicity

LD50 Oral - Rat - 2 mg/kg

Remarks: Biochemical:Enzyme inhibition, induction, or change in blood or tissue levelsTrue cholinesterase.

LC50 Inhalation - Rat - 4 h - 84 mg/m<sup>3</sup>

Remarks: Behavioral:Tremor. Behavioral:Convulsions or effect on seizure threshold. Lungs, Thorax, or Respiration:Dyspnea.

LD50 Dermal - Rat - 6.8 mg/kg

Remarks: Behavioral:Tremor. Behavioral:Convulsions or effect on seizure threshold. Behavioral:Excitement.

LD50 Intramuscular - Mouse - 7.200 mg/kg

LD50 Intraperitoneal - Rat - 2 mg/kg

LD50 Intraperitoneal - Mouse - 3 mg/kg

Remarks: Biochemical:Enzyme inhibition, induction, or change in blood or tissue levelsTrue cholinesterase.

LD50 Intraperitoneal - Cat - 3 mg/kg

Remarks: Behavioral:Somnolence (general depressed activity). Behavioral:Tremor. Respiratory disorder

LD50 Intraperitoneal - Dog - 12 mg/kg

Remarks: Behavioral:Somnolence (general depressed activity). Behavioral:Tremor. Respiratory disorder

LD50 Intraperitoneal - Guinea pig - 12 mg/kg

LD50 Intratracheal - Rat - 6.200 mg/kg

LD50 Intramuscular - Rat - 6 mg/kg

LD50 Intraperitoneal - Chicken - 2.500 mg/kg

LDLO Intratracheal - Human - 0.714 mg/kg

LD50 Intravenous - Rat - 3.800 mg/kg

Remarks: Biochemical:Enzyme inhibition, induction, or change in blood or tissue levels: Other esterases.

LD50 Intravenous - Mouse - 13 mg/kg

LD50 Intravenous - Cat - 3 mg/kg

Remarks: Sense Organs and Special Senses (Nose, Eye, Ear, and Taste):Eye:Lacrimation. Behavioral:Ataxia. Lungs, Thorax, or Respiration:Respiratory stimulation.

LD50 Intravenous - Dog - 12 mg/kg

Remarks: Sense Organs and Special Senses (Nose, Eye, Ear, and Taste):Eye:Lacrimation. Behavioral:Ataxia. Lungs, Thorax, or Respiration:Respiratory stimulation.

Parenteral: Peripheral Nerve and Sensation:Flaccid paralysis without anesthesia (usually neuromuscular blockage). Behavioral:Altered sleep time (including change in righting reflex). Lungs, Thorax, or Respiration:Other changes.

LD50 Subcutaneous - Rabbit - 30 mg/kg

Remarks: Sense Organs and Special Senses (Nose, Eye, Ear, and Taste):Eye:Lacrimation. Behavioral:Muscle contraction or spasticity. Biochemical:Enzyme inhibition, induction, or change in blood or tissue levelsTrue cholinesterase.

LD50 Subcutaneous - Rat - 9 mg/kg

Remarks: Sense Organs and Special Senses (Nose, Eye, Ear, and Taste):Eye:Lacrimation. Behavioral:Muscle contraction or spasticity. Biochemical:Enzyme inhibition, induction, or change in blood or tissue levelsTrue cholinesterase.

LD50 Subcutaneous - Mouse - 10 mg/kg

LD50 Subcutaneous - Guinea pig - 10 mg/kg

Remarks: Sense Organs and Special Senses (Nose, Eye, Ear, and Taste):Eye:Lacrimation. Behavioral:Muscle contraction or spasticity. Biochemical:Enzyme inhibition, induction, or change in blood or tissue levelsTrue cholinesterase.

**Skin corrosion/irritation**

Skin - Rabbit

Result: Mild skin irritation

**Serious eye damage/eye irritation**

Eyes - Rabbit

Result: Mild eye irritation

**Respiratory or skin sensitisation**

No data available

**Germ cell mutagenicity**

Rat

Result: negative

Unscheduled DNA synthesis

Human

Result: negative

Cytogenetic analysis

Hamster

ovary

Sister chromatid exchange

Ames test

Result: Not mutagenic in Ames Test

Human

lymphocyte

Sister chromatid exchange

Human

fibroblast

Unscheduled DNA synthesis

Rat

DNA damage

Mouse

DNA damage

**Carcinogenicity**

Carcinogenicity - Rat - Oral

Tumorigenic:Equivocal tumorigenic agent by RTECS criteria. Endocrine:Adrenal cortex tumors.

IARC: 2B - Group 2B: Possibly carcinogenic to humans (Parathion)

NTP: No component of this product present at levels greater than or equal to 0.1% is identified as a known or anticipated carcinogen by NTP.

OSHA: No component of this product present at levels greater than or equal to 0.1% is on OSHA's list of regulated carcinogens.

**Reproductive toxicity**

No data available

Reproductive toxicity - Rat - Oral

Maternal Effects: Uterus, cervix, vagina.

Reproductive toxicity - Rat - Oral

Effects on Newborn: Biochemical and metabolic. Effects on Newborn: Other postnatal measures or effects.

No data available

Developmental Toxicity - Rat - Intraperitoneal  
Effects on Embryo or Fetus: Extra embryonic structures (e.g., placenta, umbilical cord). Maternal Effects: Other effects.

Developmental Toxicity - Rat - Subcutaneous  
Effects on Embryo or Fetus: Fetal death.

Developmental Toxicity - Rat - Intraperitoneal  
Effects on Embryo or Fetus: Fetotoxicity (except death, e.g., stunted fetus).

**Specific target organ toxicity - single exposure**

No data available

**Specific target organ toxicity - repeated exposure**

Ingestion - Causes damage to organs through prolonged or repeated exposure.

**Aspiration hazard**

No data available

**Additional Information**

RTECS: TF4550000

Cholinesterase inhibitors can cause heavy salivation and secretion in the lungs, lachrymation, blurred vision, involuntary defecation, diarrhea, tremor, ataxia, sweating, hypothermia, lowered heart rate, and/or a fall in blood pressure as a result of their action at cholinergic nerve sites., Absorption into the body leads to the formation of methemoglobin which in sufficient concentration causes cyanosis. Onset may be delayed 2 to 4 hours or longer., Salivation, Coma., Tremors, Incoordination., Blurred vision, Lowered blood pressure, Diarrhoea, Headache, Nausea, Vomiting, Dizziness, Drowsiness, Confusion., Weakness, Unconsciousness, Palpitation, Anorexia., Cough, chest pain, Difficulty in breathing, Ataxia., Convulsions, sweating, Muscle cramps/spasms., Change in pupil size.

Stomach - Irregularities - Based on Human Evidence

Stomach - Irregularities - Based on Human Evidence

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## 12. ECOLOGICAL INFORMATION

### 12.1 Toxicity

Toxicity to fish LC50 - *Lepomis macrochirus* (Bluegill) - 0.03 mg/l - 96.0 h

Toxicity to daphnia and other aquatic invertebrates EC50 - *Daphnia magna* (Water flea) - 0.002 mg/l - 48 h

Toxicity to algae EC50 - *Pseudokirchneriella subcapitata* (green algae) - 3.6 mg/l - 72 h

### 12.2 Persistence and degradability

### 12.3 Bioaccumulative potential

Bioaccumulation Pimephales promelas (fathead minnow) - 260 d  
- 24.6 µg/l

Bioconcentration factor (BCF): 115

### 12.4 Mobility in soil

No data available

### 12.5 Results of PBT and vPvB assessment

PBT/vPvB assessment not available as chemical safety assessment not required/not conducted

### 12.6 Other adverse effects

An environmental hazard cannot be excluded in the event of unprofessional handling or disposal.  
Very toxic to aquatic life with long lasting effects.

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## 13. DISPOSAL CONSIDERATIONS

### 13.1 Waste treatment methods

**Product**

Offer surplus and non-recyclable solutions to a licensed disposal company. Contact a licensed professional waste disposal service to dispose of this material. Dissolve or mix the material with a combustible solvent and burn in a chemical incinerator equipped with an afterburner and scrubber.



**Contaminated packaging**  
Dispose of as unused product.

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#### 14. TRANSPORT INFORMATION

##### DOT (US)

UN number: 3278      Class: 6.1      Packing group: I  
Proper shipping name: Organophosphorus compound, liquid, toxic, n.o.s. (Parathion)  
Reportable Quantity (RQ): 10 lbs Marine pollutant: yes  
Poison Inhalation Hazard: No

##### IMDG

UN number: 3278      Class: 6.1      Packing group: I      EMS-No: F-A, S-A  
Proper shipping name: ORGANOPHOSPHORUS COMPOUND, LIQUID, TOXIC, N.O.S. (Parathion)  
Marine pollutant: yes

##### IATA

UN number: 3278      Class: 6.1      Packing group: I  
Proper shipping name: Organophosphorus compound, liquid, toxic, n.o.s. (Parathion)

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#### 15. REGULATORY INFORMATION

##### SARA 302 Components

The following components are subject to reporting levels established by SARA Title III, Section 302:

	CAS-No.	Revision Date
Parathion	56-38-2	2008-11-03

##### SARA 313 Components

This material does not contain any chemical components with known CAS numbers that exceed the threshold (De Minimis) reporting levels established by SARA Title III, Section 313.

##### SARA 311/312 Hazards

Acute Health Hazard, Chronic Health Hazard

##### Massachusetts Right To Know Components

	CAS-No.	Revision Date
Parathion	56-38-2	2008-11-03

##### Pennsylvania Right To Know Components

	CAS-No.	Revision Date
Parathion	56-38-2	2008-11-03

	CAS-No.	Revision Date
Parathion	56-38-2	2008-11-03

##### New Jersey Right To Know Components

	CAS-No.	Revision Date
Parathion	56-38-2	2008-11-03

##### California Prop. 65 Components

	CAS-No.	Revision Date
WARNING! This product contains a chemical known to the State of California to cause cancer. Parathion	56-38-2	2016-05-20

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#### 16. OTHER INFORMATION

##### Full text of H-Statements referred to under sections 2 and 3.

Acute Tox.	Acute toxicity
Aquatic Acute	Acute aquatic toxicity
Aquatic Chronic	Chronic aquatic toxicity
Carc.	Carcinogenicity
H300	Fatal if swallowed.

H300 + H310 + H330 Fatal if swallowed, in contact with skin or if inhaled.  
H310 Fatal in contact with skin.  
H330 Fatal if inhaled.  
H351 Suspected of causing cancer.

**HMIS Rating**

Health hazard: 4  
Chronic Health Hazard: \*  
Flammability: 1  
Physical Hazard 0

**NFPA Rating**

Health hazard: 4  
Fire Hazard: 1  
Reactivity Hazard: 0

**Further information**

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**Preparation Information**

Sigma-Aldrich Corporation  
Product Safety – Americas Region  
1-800-521-8956

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Revision Date: 03/13/2018

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