Chemical Safety Data Sheet MSDS / SDS

Parathion 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: Parathion

CAS: 56-38-2

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

Address: 5 vasavi Layout Basaveswara Nilayam Pragathi Nagar Hyderabad, India -500090

Telephone: +91 9550333722

SECTION 2: Hazards identification

Classification of the substance or mixture

Acute toxicity - Category 2, Oral
Acute toxicity - Category 3, Dermal

Acute toxicity - Category 2, Inhalation
Specific target organ toxicity – repeated exposure, Category 1
Hazardous to the aquatic environment, short-term (Acute) - Category Acute 1
Hazardous to the aquatic environment, long-term (Chronic) - Category Chronic 1

GHS label elements, including precautionary statements

Pictogram(s)

Signal word Danger

Hazard statement(s)

H300 Fatal if swallowed
H311 Toxic in contact with skin
H330 Fatal if inhaled
H372 Causes damage to organs through prolonged or repeated exposure
H410 Very toxic to aquatic life with long lasting effects

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/...
P260 Do not breathe dust/fume/gas/mist/vapours/spray.
P271 Use only outdoors or in a well-ventilated area.
P284 [In case of inadequate ventilation] wear respiratory protection.
P273 Avoid release to the environment.

Response

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.
P304+P340 IF INHALED: Remove person to fresh air and keep comfortable for breathing.
P320 Specific treatment is urgent (see ... on this label).

P319 Get medical help if you feel unwell.
P391 Collect spillage.

Storage

P405 Store locked up.
P403+P233 Store in a well-ventilated place. Keep container tightly closed.

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:	Parathion
Common names and synonyms:	Parathion
CAS number:	56-38-2
EC number:	200-271-7
Concentration:	100%

SECTION 4: First aid measures

Description of necessary first-aid measures

If inhaled

Fresh air, rest. Artificial respiration may be needed. 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

Give a slurry of activated charcoal in water to drink. Refer for medical attention . See Notes.

Most important symptoms/effects, acute and delayed

This material is extremely toxic; the probable oral lethal dose is 5-50 mg/kg, or between 7 drops and 1 teaspoonful for a 150-lb. person. As little as 1 drop can endanger life if splashed in the eye. Toxicity is highest by inhalation. People at special risk are those with a history of glaucoma, cardiovascular disease, hepatic disease, renal disease, or central nervous system abnormalities. (EPA, 1998)

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

A comatose patient who is diaphoretic, has pinpoint pupils and the odor of an insecticide on clothing or breath, and is noted to have muscle fasciculations represents the classic presentation of organophosphate poisoning. ... Specific steps in management include the following. 1. Decontamination. ... 2 Airway. Establish an airway if necessary. ... 3. Respiratory Status. Respiratory distress, in fact, is commonly found in these patients from multiple causes. ... 4. Cardiac Monitoring. ... 5. Cholinesterase Level. ... 6. Pralidoxime. Pralidoxime is the treatment of choice for organophosphate poisoning and should be used for nearly all patients with clinically significant organophosphate poisoning, particularly whose patients with muscular fasciculations and weakness. ... 7. Atropine. Atropine is the physiologic antidote for organophosphate poisoning. A trial dose of atropine should be instituted on clinical ground when one suspects organophosphate intoxication. Organophosphate poisoning

SECTION 5: Firefighting measures

Suitable extinguishing media

Do not extinguish fire unless flow can be stopped. Use water in flooding quantities as fog. Solid streams of water may be ineffective.

Specific hazards arising from the chemical

When heated to decomposition, it can emit toxic fumes of oxides of nitrogen, phosphorus, and sulfur. High pressure hoses may scatter material from broken containers. Containers may explode when heated. Stable in distilled water and in acid solution. Store below 77-86F. It slowly decomposes in air and hydrolyzes in the presence of alkaline material. Containers may explode when heated. (EPA, 1998)

Special protective actions for fire-fighters

Use water spray, dry powder, 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

Evacuate danger area! Consult an expert! Personal protection: chemical protection suit including self-contained breathing apparatus. Do NOT let this chemical enter the environment. Collect leaking liquid in sealable containers. Treat remaining liquid with an alkaline substance. Absorb remaining liquid in sand or inert absorbent. Then store and dispose of according to local regulations.

Environmental precautions

Evacuate danger area! Consult an expert! Personal protection: chemical protection suit including self-contained breathing apparatus. Do NOT let this chemical enter the environment. Collect leaking liquid in sealable containers. Treat remaining liquid with an alkaline substance. Absorb remaining liquid in sand or inert absorbent. Then store and dispose of according to local regulations.

Methods and materials for containment and cleaning up

1. ventilate area of spill or leak. 2. collect for reclamation, or absorb in vermiculite, dry sand, earth, or a similar material.

SECTION 7: Handling and storage

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.

Conditions for safe storage, including any incompatibilities

Provision to contain effluent from fire extinguishing. Separated from strong oxidants and food and feedstuffs. Well closed. Keep in a well-ventilated room.All parathion containers shall be protected from ... corrosion, mechanical damage, and sources of ignition. ... Outdoor storage facilities shall be located at least 20 feet from any dwellings, or a populated area and shall be equipped with a sprinkler system, where feasible.

SECTION 8: Exposure controls/personal protection

Control parameters

Occupational Exposure limit values

TLV: 0.05 mg/m3, as TWA; (skin); A4 (not classifiable as a human carcinogen); BEI issued.MAK: (inhalable fraction): 0.1 mg/m3; peak limitation category: II(8); skin absorption (H); pregnancy risk group: D

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 face shield or eye protection in combination with breathing protection.

Skin protection

Protective gloves. Protective clothing.

Respiratory protection

Use ventilation, local exhaust or breathing protection.

Thermal hazards

no data available

SECTION 9: Physical and chemical properties and safety characteristics

Physical state:	Parathion is a deep brown to yellow liquid with a faint odor of garlic. It is an organic phosphate insecticide which acts as an inhibitor of cholinesterase, and as such it is highly toxic by all routes of exposure. It may be found as a liquid or as a dry mixture where the liquid is absorbed onto a dry carrier.
Colour:	The pure material is a yellowish liquid at temperatures above 6 deg C

Odour:	Usually has a faint odor
Melting point/freezing point:	6.1°C
Boiling point or initial boiling point and boiling range:	375°C
Flammability:	Class IIIB Combustible Liquid: Fl.P. at or above 200°F.
Lower and upper explosion limit/flammability limit:	no data available
Flash point:	173.5°C
Auto-ignition temperature:	no data available
Decomposition temperature:	no data available
pH:	no data available
Kinematic viscosity:	15.30 CENTIPOISE AT 25 DEG C
Solubility:	less than 1 mg/mL at 73° F (NTP, 1992)
Partition coefficient n-octanol/water:	Log Kow= 3.83
Vapour pressure:	3.78e-05 mm Hg at 68° F (EPA, 1998)
Density and/or relative density:	1.26
Relative vapour density:	no data available
Particle characteristics:	no data available

SECTION 10: Stability and reactivity

Reactivity

Decomposes above 200°C . This produces toxic gases including carbon monoxide, nitrogen oxides, phosphorous oxides and sulfur oxides. Reacts with strong oxidants. Attacks some forms of plastic, rubber and coatings.

Chemical stability

Stable in distilled water in acid soln; hydrolyzed in presence of alkaline material & slowly decomp in air.

Possibility of hazardous reactions

NOT HIGHLY FLAMMABLELight-yellow liquid, it turns solid at 6° C, a deadly poison by all routes. Organic phosphate insecticide, acts as an inhibitor of cholinesterase. Violent reaction when used as solvent to dissolve endrin. When heated to decomposition it emits very toxic fumes of oxides of sulfur, phosphorus, and nitrogen [Lewis, 3rd ed., 1993, p. 984].

Conditions to avoid

no data available

Incompatible materials

Strong oxidizers, alkaline materials.

Hazardous decomposition products

Toxic gases and vapors (such as carbon monoxide, oxides of nitrogen, phosphorus, and sulfur) may be released when parathion ... /undergoes decomposition/.

SECTION 11: Toxicological information

Acute toxicity

Oral: LD50 Rat oral 2 mg/kg

Inhalation: no data available

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

Classification of carcinogenicity: 1) evidence in humans: no adequate data; 2) evidence in animals: limited. Overall summary evaluation of carcinogenic risk to humans is Group 3: The agent is not classifiable as to its carcinogenicity to humans. From table

Reproductive toxicity

No information is available on reproductive effects of parathion in humans; however, methyl parathion, a closely related compound, has been linked with human birth defects. A reduced number of offspring and decreased fetal weight have been reported in rats exposed to parathion by injection, but no malformations were observed. High postnatal mortality was also observed in an animal study.

STOT-single exposure

The substance may cause effects on the nervous system. This may result in convulsions, respiratory failure and muscle weakness. Cholinesterase inhibition. Exposure could cause 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

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

SECTION 12: Ecological information

Toxicity

Toxicity to fish: no data available

Toxicity to daphnia and other aquatic invertebrates: EC50 Immobilization Daphnia magna 0.8 ug/l/50 hr. /Conditions of bioassay not specified

Toxicity to algae: no data available

Toxicity to microorganisms: no data available

Persistence and degradability

Parathion biodegrades in acclimated natural waters within several weeks(1,2). 5 ppm of parathion completely degraded within 2 weeks in acclimated water from Holland Marsh, a vegetable growing area in Ontario, being almost quantitatively converted to aminoparathion; only 10% degradation occurred in 16 weeks when the water was sterilized(1). In the waters of the Little Miami River, OH, a small stream which receives domestic and industrial waste as well as farm runoff, 50% of parathion (10 ppb) degraded in 1 week and none could be detected after 4 weeks(2). Surface water of varying salinity (0 to 28 ppt), collected from the Mississippi Sound estuary system degraded parathion with a 45-day half-life at 30 deg C which was independent of salinity(3). Both chemical and the biological action of marine plankton were responsible(4). When the water was filtered to remove the plankton, the half-life at 27 deg C increased from 41 to 56 days(4). Parathion (1.4 to 28 ppm) degradation in soil with 3 different moisture contents increased with parathion concentration and moisture content(5). The percentage of parathion degraded after 11 days ranged from 96% at high concentration and moisture levels to 20% at low concentrations and moisture levels(5). Further degradation was very slow and the degradation was never complete(5). One reference claims that residues of parathion persisted for >16 yr but the level of application was extremely high(6). After 8 weeks of incubation in an organic and a mineral soil, <2 and 6%, respectively, of the 1 ppm parathion applied remained; in sterilized controls 80 and 95% remained(7). The half-life of parathion (10 ppm) in a sandy loam and organic soil was <1 and 1.5 weeks with only 5% remaining after 3 and 10 weeks, respectively(9). A lag period of approximately 2 weeks occurred when 0.1 and 1 ppm parathion was incubated in Willamette clay loam at moisture levels of 50% field capacity; half-lives were 16 and 26 weeks, respectively(11). Metabolic pathways involve both oxidative and reductive reactions(9). The primary oxidative pathway involves an initial hydrolysis to p-nitrophenol and diethylthiophosphoric acid(9). A second oxidative pathway involves oxidation to paraoxon(9). Under low oxygen conditions reduction to aminoparathion occurs(9). When parathion (500 ppm) is incubated in flooded alluvial soil, 43% remained after 6 days and 0.09% after 12 days(12). The parathion is reduced to aminoparathion under these anaerobic conditions. Amendation of the soil with rice straw increases the rate of degradation(12). In parallel experiments in which parathion was incubated for 30 min in soil suspensions of 5, 30-day flooded (anaerobic) soils and aerobic soils, no degradation occurred in the aerobic soils, while 35 to 68% degradation occurred in the anaerobic soils. The most reduced soils effected the most rapid degradation(13). After repeated application of parathion to flooded soils the degradation pathway shifts from reduction to hydrolysis(14). Parathion is more persistent in flooded saline soils than non-saline soils; degradation was completed in 20 days in a non saline soil and the degradation rate decreased with salinity in 5 soils, ranging from 10 to 50% in 20 days(15). Parathion is degraded in activated sludge treatment plants. With adequate aeration, high levels of parathion wastes were destroyed within 7-10 days in a treatment plant(8). Parathion is destroyed during composting

agricultural wastes(10).

Bioaccumulative potential

Although no specific data are available on possible bioaccumulation or biomagnification of parathion ... phys, chem, & biol properties make it unlikely that these phenomena will occur in food chains or food webs.

Mobility in soil

Parathion had a mobility 0.01 compared to that of water in a French soil(2) and ranked 36 and 40 in a ranking of 41 pesticides by attenuation factor and retardation factor respectively, in 2 sandy soils(5). Some reported Koc values are: 674 (average for 8 Israeli soils) and 1538 (average for 4 Israeli sediments)(1); 10454 for 4 soils(3); 314 to 15860 for unspecified number of soils(4); 2000 average(6); 1310 to 4490 in 6 soils from India(7); 4800(8); 965 to 1700 in 4 soil types with percent organic carbon ranging from 0.41 to 43.7%(9); 1600 to 6200 for 4 Israeli soils(11); 602 to 805 in 5 sterilized Iowa soils(12). The fraction of parathion leached from soil by 10 successive 200 ml applications of water to a soil column was 1.24 and 4.36 for an organic soil and sand, respectively(9). Only a small fraction of parathion adsorbed to a sandy loam, 10%, was found to undergo diffusion (diffusion constant in soil with highest moisture content 0.03 sq cm/day)(10). In soil columns of Nacodoches clay subsoil, parathion leached to 60 inches when 230 inches of rainfall was simulated, while in Houston black clay, 1725 inches of rain were required to produce leaching to 60 inches(13). In field studies, little leaching occurred in 16 yr after 4 annual applications of parathion despite 42 inches of precipitation per year(13). Little parathion was found below 9 inches, 6 yr after 30,000 to 95,000 ppm was applied to the soil(14). In a 15-yr study of residues in a light sand soil, no parathion was found below 8 inches(13). In an 8 mo persistence test under experimental conditions with 20 cm of simulated rain, no parathion was found below 1 inch. In cases where small amounts of parathion penetrated into the soil, it was believed to be the result of the movement of particulate or microparticulate matter containing sorbed parathion(13). In a field study involving the application of parathion to a peach orchard providing watershed for a 2.7 acre pond, no residue was found below 6 inches and there appeared to be little desorption of the insecticide from the bottom sediment of the pond(15). According to a classification scheme(16), these Koc values suggest that parathion is expected to have moderate to no mobility in soil.

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: UN2784 (For reference only, please check.)
IMDG: UN2784 (For reference only, please check.)
IATA: UN2784 (For reference only, please check.)

UN Proper Shipping Name

ADR/RID: ORGANOPHOSPHORUS PESTICIDE, LIQUID, FLAMMABLE, TOXIC, flash point less than 23 °C (For reference only, please check.)
IMDG: ORGANOPHOSPHORUS PESTICIDE, LIQUID, FLAMMABLE, TOXIC, flash point less than 23 °C (For reference only, please check.)
IATA: ORGANOPHOSPHORUS PESTICIDE, LIQUID, FLAMMABLE, TOXIC, flash point less than 23 °C (For reference only, please check.)

Transport hazard class(es)

ADR/RID: 3 (For reference only, please check.)
IMDG: 3 (For reference only, please check.)
IATA: 3 (For reference only, please check.)

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.)

Environmental hazards

ADR/RID: Yes
IMDG: Yes
IATA: Yes

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

Not Listed.

China Catalog of Hazardous chemicals 2015

Listed.

New Zealand Inventory of Chemicals (NZIoC)

Not Listed.

(PICCS)

Listed.

Vietnam National Chemical Inventory

Not 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.If the substance is formulated with solvents also consult the ICSCs of these materials.Carrier solvents used in commercial formulations may change physical and toxicological properties.The odour warning when the exposure limit value is exceeded is insufficient.Do NOT take working clothes home.