

## Chemical Safety Data Sheet MSDS / SDS

**2,4,5-Trichlorophenoxyacetic acid**

Revision Date:2024-12-21 Revision Number:1

**SECTION 1: Identification of the substance/mixture and of the company/undertaking****Product identifier**

Product name : 2,4,5-Trichlorophenoxyacetic acid  
CBnumber : CB6263140  
CAS : 93-76-5  
EINECS Number : 202-273-3  
Synonyms : 2,4,5-T,2,4,5-TRICHLOROPHENOXYACETIC ACID

**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  
Address : Building 1, Huihuang International, Shangdi 10th Street, Haidian District, Beijing  
Telephone : 400-158-6606

**SECTION 2: Hazards identification****Classification of the substance or mixture**

Acute toxicity - Category 4, Oral  
Skin irritation, Category 2  
Eye irritation, Category 2  
Specific target organ toxicity – single exposure, Category 3  
Hazardous to the aquatic environment, short-term (Acute) - Category Acute 1  
Hazardous to the aquatic environment, long-term (Chronic) - Category Chronic 1

**Label elements****Pictogram(s)**

☐☐

Signal word : Danger

**Hazard statement(s)**

H225 Highly Flammable liquid and vapour  
H302 Harmful if swallowed  
H312 Harmful in contact with skin

H315 Causes skin irritation

H319 Causes serious eye irritation

H332 Harmful if inhaled

H335 May cause respiratory irritation

H410 Very toxic to aquatic life with long lasting effects

#### **Precautionary statement(s)**

P210 Keep away from heat/sparks/open flames/hot surfaces. — No smoking.

P261 Avoid breathing dust/fume/gas/mist/vapours/spray.

P273 Avoid release to the environment.

P280 Wear protective gloves/protective clothing/eye protection/face protection.

P305+P351+P338 IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do.

Continuerinsing.

P501 Dispose of contents/container to.....

#### **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.

P273 Avoid release to the environment.

#### **Response**

P301+P317 IF SWALLOWED: Get medical help.

P330 Rinse mouth.

P302+P352 IF ON SKIN: Wash with plenty of water/...

P321 Specific treatment (see ... on this label).

P332+P317 If skin irritation occurs: Get medical help.

P362+P364 Take off contaminated clothing and wash it before reuse.

P305+P351+P338 IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.

P304+P340 IF INHALED: Remove person to fresh air and keep comfortable for breathing.

P319 Get medical help if you feel unwell.

P391 Collect spillage.

#### **Storage**

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

P405 Store locked up.

#### **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**

no data available

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## SECTION 3: Composition/information on ingredients

## Substance

|              |   |
|--------------|---|
| Product name | : 2,4,5-Trichlorophenoxyacetic acid         |
| Synonyms     | : 2,4,5-T,2,4,5-TRICHLOROPHENOXYACETIC ACID |
| CAS          | : 93-76-5                                   |
| EC number    | : 202-273-3                                 |
| MF           | : C8H5Cl3O3                                 |
| MW           | : 255.48                                    |

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## SECTION 4: First aid measures

### Description of first aid measures

#### If inhaled

Fresh air, rest.

#### Following skin contact

Remove contaminated clothes. Rinse and then wash skin with water and soap.

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

### Most important symptoms and effects, both acute and delayed

Overexposure to dust by inhalation or ingestion may cause fatigue, nausea, vomiting, lowered blood pressure, convulsions, coma. Dust may irritate eyes and skin. (USCG, 1999)

### Indication of any immediate medical attention and special treatment needed

#### Absorption, Distribution and Excretion

2,4,5-T given orally to ... volunteers in doses of 100-150 mg was readily absorbed and gradually eliminated from blood plasma, showing first-order elimination rate; more than 80% of dose was excreted in urine in intact form within 72 hr. Daily urinary excretion ... in exposed workers was found to range from 0.5-3.6 mg/day in 11/21 samples.

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## SECTION 5: Firefighting measures

### Extinguishing media

Wear/ self-contained breathing apparatus with a full facepiece operated in pressure-demand or other positive pressure mode /when fighting fire/.

### Specific Hazards Arising from the Chemical

Special Hazards of Combustion Products: Toxic hydrogen chloride and phosgene gases may be formed. (USCG, 1999)

### Advice for firefighters

Use water spray, powder.

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## 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 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 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**

1. ventilate area of spill. 2. collect spilled material in the most convenient and safe manner and deposit in sealed containers for reclamation, or for disposal in a secured sanitary landfill. liquid containing 2,4,5-t should be absorbed in vermiculite, dry sand, earth, or a similar material.

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## 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 food and feedstuffs. Store in an area without drain or sewer access. DO NOT STORE NEAR OTHER AGROCHEMICALS OR SEEDS. DO NOT STORE IN FREEZING TEMPERATURES.

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## SECTION 8: Exposure controls/personal protection

### **Control parameters**

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

TLV: 10 mg/m<sup>3</sup>, as TWA; A4 (not classifiable as a human carcinogen).MAK: (inhalable fraction): 2 mg/m<sup>3</sup>; peak limitation category: II(2); skin absorption (H); pregnancy risk group: C

#### **Biological limit values**

no data available

### **Exposure 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**

#### **Eye/face protection**

Wear safety goggles.

#### Skin protection

Protective gloves.

#### Respiratory protection

Use local exhaust or breathing protection.

#### Thermal hazards

no data available

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## SECTION 9: Physical and chemical properties

### Information on basic physicochemical properties

|  |   |
|--|---|
| Physical state   | crystalline   |
| Colour   | off-white to yellow   |
| Odour  | Odorless  |
| Melting point/freezing point                             | 154-158°C   |
| Boiling point or initial boiling point and boiling range | 376.3°C   |
| Flammability   | Combustible Solid, but burns with difficulty.   |
| Lower and upper explosion limit/flammability limit       | no data available   |
| Flash point  | 181.4°C   |
| Auto-ignition temperature                                | no data available   |
| Decomposition temperature                                | no data available   |
| pH   | no data available   |
| Kinematic viscosity                                      | no data available   |
| Solubility   | Soluble in ethanol (548.2 mg/L), ether (243.2 mg/L), heptane (400 mg/L), xylenes (6.8 g/L), methanol (496 g/L), toluene (7.32 g/L) (quoted, Keith and Walters, 1992). |
| Partition coefficient n-octanol/water                    | log Kow= 4  |
| Vapour pressure  | 6.46 at 25 °C (Lewis, 1989)   |
| Density and/or relative density                          | 1.592   |
| Relative vapour density                                  | no data available   |
| Particle characteristics                                 | no data available   |

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## SECTION 10: Stability and reactivity

### Reactivity

Decomposes on heating and on burning. This produces toxic and corrosive gases including phosgene (see ICSC 0007) and hydrogen chloride (see ICSC 0163). The solution in water is a weak acid.

### Chemical stability

Stable @ its melting-point

### **Possibility of hazardous reactions**

Material does not burn or burns with difficulty. 2,4,5-TRICHLOROPHENOXYACETIC ACID is a weak acid. Reacts with organic and inorganic bases to form water-soluble salts and with alcohols to form esters. Incompatible with strong oxidizing agents and strong bases. Can corrode metals, especially if moist. May harm painted surfaces (NTP, 1992).

### **Conditions to avoid**

no data available

### **Incompatible materials**

STABILITY: This chemical is stable under normal laboratory conditions. It is stable in aqueous solution at pH 5-9. Solutions of this chemical in water, DMSO, 95% ethanol or acetone should be stable for 24 hours under normal laboratory conditions. REACTIVITY: This chemical forms water-soluble salts with alkali metals and amines. It reacts with organic and inorganic bases to form salts and with alcohols to form esters. It is incompatible with strong oxidizing agents and strong bases. It can be corrosive to common metals. It may be deleterious to painted surfaces. Precipitation occurs with hard water in the absence of sequestering agents. (NTP, 1992)

### **Hazardous decomposition products**

Toxic gases and vapors /which include/: hydrogen chloride and carbon monoxide.

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## **SECTION 11: Toxicological information**

### **Acute toxicity**

- Oral: LD50 Mouse oral 389 mg/kg
- Inhalation: no data available
- Dermal: LD50 Rat percutaneous > 5000 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**

Classification of carcinogenicity: 1) evidence in humans: limited; Overall summary evaluation of carcinogenic risk to humans is Group 2B: The agent is possibly carcinogenic to humans. Chlorophenoxy herbicides; From table

### **Reproductive toxicity**

no data available

### **STOT-single exposure**

The substance is irritating to the eyes and respiratory tract.

### **STOT-repeated exposure**

Animal tests show that this substance possibly causes toxicity to human reproduction or development.

### **Aspiration hazard**

A harmful concentration of airborne particles can be reached quickly on spraying or when dispersed, especially if powdered.

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## **SECTION 12: Ecological information**

### **Toxicity**

Toxicity to fish: LC50 *Lepomis macrochirus* (bluegill) 0.50 mg/l/48 hr /Conditions of bioassay not specified

Toxicity to daphnia and other aquatic invertebrates: no data available

Toxicity to algae: no data available

Toxicity to microorganisms: no data available

### **Persistence and degradability**

Aerobic degradation of 10 µg 2,4,5-T of soil was 5-35% in unsterilized tropical clay and silty clay soils and <1% in sterilized soils after 4 months incubation(1). In Vietnamese soils, 64-69% aerobic degradation of 1 ppm 2,4,5-T occurred in 49 days, 74-96% aerobic degradation of 15 ppm 2,4,5-T occurred in 168 days and no degradation was observed in sterilized soils(2). The primary degradation product of 2,4,5-T in aqueous and soil systems is 2,4,5-trichlorophenol(3). Aerobic metabolism of 2,4,5-T leads to formation of 2,4,5-trichlorophenol and 3,5-dichlorocatechol which may further degrade to 4-chlorocatechol or *cis,cis*-2,4-dichloromuconic acid, 2-chloro-4-carboxy-methylene-but-2-enolide, chlorosuccinic acid and succinic acid(2). Degradation under anaerobic conditions has led to the formation of di- and monochlorophenols and 2,5-dichlorophenoxyacetic acid(4,5). Anaerobic degradation occurs much more slowly than aerobic degradation(6).

### **Bioaccumulative potential**

The bioconcentration factor (BCF) of 2,4,5-T in static ecosystem tests has been measured to be 23-25 in fish(1,2). Under flowing water conditions its estimated BCF in fish is 43(1). Based on these BCF values, bioconcentration in aquatic organisms should not be significant.

### **Mobility in soil**

Measured soil adsorption coefficient (*K*<sub>oc</sub>) values for 2,4,5-T in various soils are as follows: 86-sand, 186-whole soil, 204-fines, 205-coarse clay, 206-coarse silt and 280-medium silt(1). Measured soil TLC R<sub>f</sub> values are as follows: 0.17-muck, 0.48-clay, 0.54-silt clay loam and 0.73-0.89-sandy loam(2). These *K*<sub>oc</sub> and R<sub>f</sub> values indicate that 2,4,5-T mobility in soil should vary from highly mobile in sandy soil to moderately mobile in clay and silt loams to slightly mobile in muck (3,4). Humic acids found in almost all water and soil systems have been shown to strongly adsorb 2,4,5-T from solution(5), and the tendency of 2,4,5-T to adsorb to soil has been observed to increase with increasing organic content in soil(6). When 11.2 kg/ha 2,4,5-T was applied to a large field lysimeter, 96-99% of the undegraded herbicide remained 0-10 cm deep and 0.33-3.7% remained between 10 to 30 cm deep after 2-3 winters(7). Up to 8 weeks following application of 1 g/cm<sup>2</sup> 2,4,5-T, 86-98% of the undegraded 2,4,5-T applied to arable land remained within the top 30 cm of the soil layer and 84-100% remained within the top 10 cm of forest soil(8).

### **Other adverse effects**

no data available

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## 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.

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## SECTION 14: Transport information

### UN Number

ADR/RID: UN3077 (For reference only, please check.)

IMDG: UN3077 (For reference only, please check.)

IATA: UN3077 (For reference only, please check.)

### UN Proper Shipping Name

ADR/RID: ENVIRONMENTALLY HAZARDOUS SUBSTANCE, SOLID, N.O.S. (For reference only, please check.)

IMDG: ENVIRONMENTALLY HAZARDOUS SUBSTANCE, SOLID, N.O.S. (For reference only, please check.)

IATA: ENVIRONMENTALLY HAZARDOUS SUBSTANCE, SOLID, N.O.S. (For reference only, please check.)

### Transport hazard class(es)

ADR/RID: 9 (For reference only, please check.)

IMDG: 9 (For reference only, please check.)

IATA: 9 (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: Yes

IMDG: Yes

IATA: Yes

### Special precautions for user

no data available

### Transport in bulk according to IMO instruments



no data available

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## 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

Not Listed.

#### Vietnam National Chemical Inventory

Not Listed.

#### IECSC

Not Listed.

#### Korea Existing Chemicals List (KECL)

Listed.

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## 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](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**

Temperature of decomposition is unknown in the literature. Commercial products may contain toxic dioxin (see ICSC 1467 2,3,7,8-TCDD). 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 recommendations on this card also apply to salts of 2,4,5-Trichlorophenoxyacetic acid.

#### **Disclaimer:**

The information in this MSDS is only applicable to the specified product, unless otherwise specified, it is not applicable to the mixture of this product and other substances. This MSDS only provides information on the safety of the product for those who have received the appropriate professional training for the user of the product. Users of this MSDS must make independent judgments on the applicability of this SDS. The authors of this MSDS will not be held responsible for any harm caused by the use of this MSDS.