# Chemical Safety Data Sheet MSDS / SDS

## Dimethoate 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: Dimethoate

CAS: 60-51-5

### 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 4, Oral
Acute toxicity - Category 4, Dermal

### GHS label elements, including precautionary statements

Pictogram(s)

Signal word Warning

### Hazard statement(s)

H302 Harmful if swallowed
H312 Harmful in contact with skin

### 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

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.

### 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.

### Other hazards which do not result in classification

no data available

## SECTION 3: Composition/information on ingredients

**Substance**

| | |
|---|---|
| Chemical name: | Dimethoate |
| Common names and synonyms: | Dimethoate |
| CAS number: | 60-51-5 |
| EC number: | 200-480-3 |
| 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 skin with plenty of water or shower. 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**

Induce vomiting (ONLY IN CONSCIOUS PERSONS!). Rest. Refer for medical attention .

**Most important symptoms/effects, acute and delayed**

Very toxic; the probable oral lethal dose in humans is between 50-500 mg/kg, or between 1 teaspoon and 1 ounce for a 70 kg (150 lb.) person. Dimethoate is a cholinesterase inhibitor, meaning it affects the central nervous system. Death is due to respiratory arrest arising from failure of respiratory center, paralysis of respiratory muscles, intense bronchoconstriction or all three. (EPA, 1998)

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

Antidote for acute dimethoate poisoning: 1. Adults: After cyanosis is overcome, use atropine sulfate, 2-4 mg iv. Repeat doses at 5-

to 10-min intervals until signs of atropinization appear. Maintain for 24 hr or longer if necessary. 2. Children: Atropine sulfate in proportion to body weight: approx 0.05 mg/kg. 3. Support atropine treatment with 2-PAM (pralidoxime chloride) ... Adult dose: 1 g, slowly, intravenously; Infants: 0.25 g, slowly intravenously ... contraindicated are morphine, aminophylline, theophylline, phenothiazine tranquilizers, and barbiturates. from table

## SECTION 5: Firefighting measures

### Suitable extinguishing media

Dry chemicals, carbon dioxide for small fires. Water spray or foam for larger fires.

### Specific hazards arising from the chemical

As with other organophosphorus pesticides, container may explode in heat of fire. The temperature of storage should not exceed 70-80F. Keep away from sources of heat, flames, or spark-generating equipment. Unstable in alkaline solution. Hydrolyzed by aqueous alkali. Stable in aqueous solutions. The compound is stable for 2 years under environmental conditions if stored in undamaged, original containers. (EPA, 1998)

### Special protective actions for fire-fighters

Use water spray, powder, carbon dioxide.

## SECTION 6: Accidental release measures

### Personal precautions, protective equipment and emergency procedures

Do NOT wash away into sewer. 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. Personal protection: chemical protection suit including self-contained breathing apparatus.

### Environmental precautions

Do NOT wash away into sewer. 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. Personal protection: chemical protection suit including self-contained breathing apparatus.

### Methods and materials for containment and cleaning up

Use of granular, activated carbon in the adsorption of pesticides from wastewater is presented. Dimethoate was one of the

compounds studied.

## 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. Keep in a well-ventilated room.The biological activity remains practically unvaried for 2 yr under environmental conditions, provided stored in unopened and undamaged original containers, in shaded, cool, well-aired places, inaccessible to animals & unauthorized persons. Recommended temp < 25 deg C/77 deg F. Crystals may form in formulations stored at < 32 deg F/0 deg C. Stable a minimum of 1 yr at < 25-30 deg C/77-86 deg F. Stack containers to permit air circulation at bottom & inside of piles. Do not contaminate food, feed products.

## SECTION 8: Exposure controls/personal protection

### Control parameters

### Occupational Exposure limit values

| Component | Dimethoate | | | |
|---|---|---|---|---|
| CAS No. | 60-51-5 | | | |
| | Limit value - Eight hours | | Limit value - Short term | |
| | ppm | $mg/m^3$ | ppm | $mg/m^3$ |
| People's Republic of China | ? | 1 | ? | ? |
| | Remarks | | | |

### 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 safety goggles or face shield.

**Skin protection**

Protective gloves. Protective clothing.

**Respiratory protection**

Use ventilation (not if powder).

**Thermal hazards**

no data available

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

| | |
|---|---|
| Physical state: | Dimethoate is a white crystalline solid, with a camphor-like odor, white to grayish crystals for technical product. This material is a contact and systemic organophosphate insecticide effective against a broad range of insects and mites when applied on a wide range of crops. It has not been produced in the U.S. since 1982. (EPA, 1998) |
| Colour: | White crystalline solid |
| Odour: | CAMPHOR-LIKE ODOR |
| Melting point/freezing point: | 52-52.5°C |
| Boiling point or initial boiling point and boiling range: | 107°C (0.05 torr) |
| Flammability: | Combustible. Liquid formulations containing organic solvents may be flammable. Gives off irritating or toxic fumes (or gases) in a fire. |
| Lower and upper explosion limit/flammability limit: | no data available |
| Flash point: | 107°C |

| | |
|---|---|
| Auto-ignition temperature: | no data available |
| Decomposition temperature: | no data available |
| pH: | no data available |
| Kinematic viscosity: | no data available |
| Solubility: | 1 to 10 mg/mL at 75° F (NTP, 1992) |
| Partition coefficient n-octanol/water: | log Kow = 0.78 |
| Vapour pressure: | 8.5e-06 mm Hg at 77° F (EPA, 1998) |
| Density and/or relative density: | 1.281 |
| Relative vapour density: | no data available |
| Particle characteristics: | no data available |

## SECTION 10: Stability and reactivity

### Reactivity

Decomposes on heating. This produces toxic fumes including nitrogen oxides, phosphorus oxides and sulfur oxides.

### Chemical stability

The biological activity remains practically unvaried for 2 yr under environmental conditions, provided stored in unopened and undamaged original containers, in shaded, cool, well-aired places. ... Crystals may form in formulations stored at < 32 deg F/0 deg C. Stable a minimum of 1 yr at < 25-30 deg C/77-86 deg F.

### Possibility of hazardous reactions

DIMETHOATE is incompatible with alkaline preparations. It is slightly corrosive to iron. It is incompatible with sulfur based formulations. (NTP, 1992). Organophosphates 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.

### Conditions to avoid

no data available

### Incompatible materials

Dimethoate may decompose violently at temperatures >60 deg C due to catalytic effects. However, it is not considered to be an explosive.

### Hazardous decomposition products

When heated to decomposition it emits very toxic fumes of /nitrogen, phosphorous, and sulfur oxides/.

## SECTION 11: Toxicological information

### Acute toxicity

Oral: LD50 Rat female oral 240-336 mg/kg technical material From table

Inhalation: LC50 Rat inhalation >1.553 mg/L/4 hr /formulated as EC 400 g/L//

Dermal: LD50 Rat percutaneous > 800 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

Cancer Classification: Group C Possible Human Carcinogen

### Reproductive toxicity

no data available

### STOT-single exposure

The substance may cause effects on the nervous system at high levels. Cholinesterase inhibition. Exposure could cause death. The effects may be delayed. Medical observation is indicated.

### STOT-repeated exposure

Repeated or prolonged contact with skin may cause dermatitis. Cholinesterase inhibition. Cumulative effects are possible. See Acute Hazards/Symptoms. Animal tests show that this substance possibly causes toxic effects upon human reproduction.

### Aspiration hazard

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

## SECTION 12: Ecological information

### Toxicity

Toxicity to fish: LC50 Lepomis macrochirus (Bluegill, weight 0.3 g) 6.0 mg/L/96 hr; temp 24 deg C. Static bioassay without aeration, pH 7.2-7.5, water hardness 40-50 mg/L as calcium carbonate and alkalinity of 30-35 mg/L. /Technical, 97.4%

Toxicity to daphnia and other aquatic invertebrates: LC50 Daphnia magna (Water flea) 2.50 mg/L/48 hr /from table; Conditions of bioassay not specified

Toxicity to algae: no data available

Toxicity to microorganisms: no data available

### Persistence and degradability

AEROBIC: The concn of dimethoate left (initial concn 10 ppb) after various times in raw water from Little Miami river at pH 7.3-8.0 was 10 ppb after 1 hr, 10 ppb after 1 wk, 8.5 ppb after 2 wks, 7.5 ppb after 4wks, and 5.0 ppb after 8 wks(1). Biodegradation may

play a minor role in the disappearance of dimethoate in the river water; no experiments were conducted with sterilized river water(1). Half-lives of 171, 173 and 219 days were given for river water, filtered river water and sea water, respectively at 6 deg C, and 43, 29 and 36 days at 22 deg C(2). Percent degradation in chehalis clay loam soil in 2 wk, non-sterile, 77%, autoclaved, 18%, irradiated, 20%(3). Half-lives in soil in June-July averaged 11 days, and less than 2% of applied dimethoate residue detected after 10 months(3). Dimethoate half-lives in soil from Zhejiang Province, China were given as 5.1 and 7.1 days in 1989 and 1990, respectively(4). Dimethoate was given a half-life of 7 days(5-7) and 11 days(8) in an unspecified field soil sample. In laboratory experiments at 20-30 deg C half-lives for degradation were 28.9 and 36.7 days(3). However, dimethoate degraded faster when incubated for 30 days in samples of autoclaved sand, sandy clay loam, loam, and clay soils than in similarly treated nonsterile soils(9). Biodegradation appears to depend on the soil type and the microorganisms present in the soil(9). A half-life of 122 days has been observed in soil(10) which also suggests that biodegradation of dimethoate can be slow. In moist soils, dimethoate is readily oxidized to dimethoxon(11), but the role of microbial degradation on the removal of dimethoate from the environment is uncertain(12). Recovery of dimethoate incubated with enrichment cultures using raw sewage: 0 days, 54 ppm; 0.5 days, 54 ppm; 1 day, 52.5 ppm; 6 days, 22.4 ppm; 9 days, 13.5 ppm; 12 days, not detected(13). Using an initial concn of 100 mg/L dimethoate, 0-17 %Theoretical BOD was observed after a 4 week period in a biodegradation screening test using 30 mg/L sludge(14). Dimethoate has been reported to have an aerobic half-life of 2.2 days(15).

### Bioaccumulative potential

After a 6 week period in a flow through system at 25 deg C, BCF ranges of 1.1-2.4 and 2.7-6 were determined in carp (Cyprinus carpio) using initial concns of 1 and 0.1 mg/L dimethoate, respectively(1). According to a classification scheme(3), these BCFs suggest the potential for bioconcentration in aquatic organisms is low(SRC). Bioconcentration of dimethoate in Mytillus galloprovincialis after 92 hours exposure at concentrations of 3.2, 5.6, 10, 32 and 56 ug/L was 1.0, 1.1, 1.4, 2.0 and 3.1 ug/g, respectively(3). Bioconcentration of dimethoate in Venus gallina after 92 hours exposure at concentrations of 5.6, 10 and 32 ug/L was 2.2, 2.3 and 3.1 ug/g, respectively(3).

### Mobility in soil

The Koc values for dimethoate were measured to be 18 and 36 in a clay loam soil and clay soil, respectively(1). In other studies, the Koc was measured to be 5.2(2), 50(3) and 17(4) in unspecified soils. The Pesticide Properties Database lists the experimental Koc value for dimethoate as 20(5). According to a suggested classification scheme(6), these Koc values suggest that dimethoate will have very high mobility in soil. Average dimethoate losses due to leaching of various soil columns with the equivalent of 2.5 cm of rain ranged from 39.6% (clay) to 78.6% (sand)(7). In four soils containing less than 1% organic content, the soil TLC Rf values ranged from 0.89 to 0.97(8). The soil TLC Rf values in two other soils (0.35-1.05% OC) was 0.40-0.50 and was not affected by pH or salt concentration changes(9). Of 7 values sited in literature the mean Kd is 0.45(10). Kds were given for soil A (2.4 % clay, 0.8% silt, 96.4% sand, 2.1% organic material, pH 5.3) and soil B (13.4 % clay, 10.8% silt, 75% sand, 1.5% organic material, pH 6.4) as 0.08 and 0.05, respectively(11).

### 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: UN2783 (For reference only, please check.)
IMDG: UN2783 (For reference only, please check.)
IATA: UN2783 (For reference only, please check.)

### UN Proper Shipping Name

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

### 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.)

### 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: No
IMDG: No
IATA: No

**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**

Listed.

**China Catalog of Hazardous chemicals 2015**

Not Listed.

**New Zealand Inventory of Chemicals (NZIoC)**

Listed.

**(PICCS)**

Listed.

**Vietnam National Chemical Inventory**

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**

Other melting points: 43-45°C (technical grade).Depending on the degree of exposure, periodic medical examination is indicated.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 solvent(s) also consult the card(s) (ICSC) of the solvent(s).Carrier solvents used in commercial formulations may change physical and toxicological properties.