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

1.1 Product identifiers

Product name: 2,3,7,8-Tetrachlorodibenzo-p-dioxin solution
Product Number: 48599
Brand: Supelco

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 Inc.
3050 SPRUCE ST
ST. LOUIS MO  63103
UNITED STATES
Telephone: +1 314 771-5765
Fax: +1 800 325-5052

1.4 Emergency telephone

Emergency Phone # : 800-424-9300 CHEMTREC (USA) +1-703-527-3887 CHEMTREC (International) 24 Hours/day; 7 Days/week

SECTION 2: Hazards identification

2.1 Classification of the substance or mixture

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

Flammable liquids (Category 2), H225
Skin irritation (Category 2), H315
Reproductive toxicity (Category 2), H361
Specific target organ toxicity - single exposure (Category 3), Central nervous system, H336
Specific target organ toxicity - repeated exposure (Category 2), Central nervous system, H373
Aspiration hazard (Category 1), H304
Short-term (acute) aquatic hazard (Category 2), H401
Long-term (chronic) aquatic hazard (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

Supelco - 48599
Signal Word | Danger
---|---
**Hazard statement(s)**
H225 | Highly flammable liquid and vapor.
H304 | May be fatal if swallowed and enters airways.
H315 | Causes skin irritation.
H336 | May cause drowsiness or dizziness.
H361 | Suspected of damaging fertility or the unborn child.
H373 | May cause damage to organs (Central nervous system) through prolonged or repeated exposure.
H401 | Toxic to aquatic life.
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.
P210 | Keep away from heat/ sparks/ open flames/ hot surfaces. No smoking.
P233 | Keep container tightly closed.
P240 | Ground/bond container and receiving equipment.
P241 | Use explosion-proof electrical/ ventilating/ lighting/ equipment.
P242 | Use only non-sparking tools.
P243 | Take precautionary measures against static discharge.
P260 | Do not breathe dust/ fume/ gas/ mist/ vapors/ spray.
P264 | Wash skin thoroughly after handling.
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.
P301 + P310 | IF SWALLOWED: Immediately call a POISON CENTER/ doctor.
P303 + P361 + P353 | IF ON SKIN (or hair): Take off immediately all contaminated clothing. Rinse skin with water/ shower.
P304 + P340 + P312 | IF INHALED: Remove person to fresh air and keep comfortable for breathing. Call a POISON CENTER/ doctor if you feel unwell.
P308 + P313 | IF exposed or concerned: Get medical advice/ attention.
P331 | Do NOT induce vomiting.
P332 + P313 | If skin irritation occurs: Get medical advice/ attention.
P362 | Take off contaminated clothing and wash before reuse.
P370 + P378 | In case of fire: Use dry sand, dry chemical or alcohol-resistant foam to extinguish.
P391 | Collect spillage.
P403 + P233 | Store in a well-ventilated place. Keep container tightly closed.
P403 + P235 | Store in a well-ventilated place. Keep cool.
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

**SECTION 3: Composition/information on ingredients**

**3.2 Mixtures**

Synonyms: 2,3,7,8-TCDD
For the full text of the H-Statements mentioned in this Section, see Section 16.

SECTION 4: First aid measures

4.1 Description of first-aid measures

General advice
Show this material safety data sheet to the doctor in attendance.

If inhaled
After inhalation: fresh air. Call in physician.

In case of skin contact
In case of skin contact: Take off immediately all contaminated clothing. Rinse skin with water/ shower. Consult a physician.

In case of eye contact
After eye contact: rinse out with plenty of water. Call in ophthalmologist. Remove contact lenses.

If swallowed

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
SECTION 5: Firefighting measures

5.1 Extinguishing media

Suitable extinguishing media
Foam Carbon dioxide (CO2) Dry powder

Unsuitable extinguishing media
For this substance/mixture no limitations of extinguishing agents are given.

5.2 Special hazards arising from the substance or mixture
Carbon oxides
Mixture with combustible ingredients.
Pay attention to flashback.
Vapors are heavier than air and may spread along floors.
Development of hazardous combustion gases or vapours possible in the event of fire.
Forms explosive mixtures with air at ambient temperatures.

5.3 Advice for firefighters
Stay in danger area only with self-contained breathing apparatus. Prevent skin contact by keeping a safe distance or by wearing suitable protective clothing.

5.4 Further information
Remove container from danger zone and cool with water. Prevent fire extinguishing water from contaminating surface water or the ground water system.

SECTION 6: Accidental release measures

6.1 Personal precautions, protective equipment and emergency procedures
Advice for non-emergency personnel: Do not breathe vapors, aerosols. Avoid substance contact. Ensure adequate ventilation. Keep away from heat and sources of ignition. Evacuate the danger area, observe emergency procedures, consult an expert. For personal protection see section 8.

6.2 Environmental precautions
Do not let product enter drains. Risk of explosion.

6.3 Methods and materials for containment and cleaning up
Cover drains. Collect, bind, and pump off spills. Observe possible material restrictions (see sections 7 and 10). Take up carefully with liquid-absorbent material (e.g. Chemizorb®). Dispose of properly. Clean up affected area.

6.4 Reference to other sections
For disposal see section 13.

SECTION 7: Handling and storage

7.1 Precautions for safe handling

Advice on safe handling
Work under hood. Do not inhale substance/mixture. Avoid generation of vapours/aerosols.

Advice on protection against fire and explosion
Keep away from open flames, hot surfaces and sources of ignition. Take precautionary measures against static discharge.

Hygiene measures
Immediately change contaminated clothing. Apply preventive skin protection. Wash hands and face after working with substance. For precautions see section 2.2.

7.2 Conditions for safe storage, including any incompatibilities

Storage conditions
Keep container tightly closed in a dry and well-ventilated place. Keep away from heat and sources of ignition.

Storage class
Storage class (TRGS 510): 3: Flammable liquids

7.3 Specific end use(s)
Apart from the uses mentioned in section 1.2 no other specific uses are stipulated

SECTION 8: Exposure controls/personal protection

8.1 Control parameters

<table>
<thead>
<tr>
<th>Ingredients with workplace control parameters</th>
</tr>
</thead>
<tbody>
<tr>
<td>Component</td>
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<tr>
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<tr>
<td>Toluene</td>
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<td>Remarks</td>
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</tbody>
</table>

Visual impairment
Female reproductive
Pregnancy loss
2021 Adoption
Substances for which there is a Biological Exposure Index or Indices (see BEI® section)
Not classifiable as a human carcinogen
### Exposure controls

#### Appropriate engineering controls
Immediately change contaminated clothing. Apply preventive skin protection. Wash hands and face after working with substance.

#### Personal protective equipment

**Eye/face protection**
Use equipment for eye protection tested and approved under appropriate government standards such as NIOSH (US) or EN 166(EU). Safety glasses

**Skin protection**
required

**Body Protection**
Flame retardant antistatic protective clothing.

**Respiratory protection**
required when vapours/aerosols are generated.
Our recommendations on filtering respiratory protection are based on the following standards: DIN EN 143, DIN 14387 and other accompanying standards relating to the used respiratory protection system.

**Control of environmental exposure**
Do not let product enter drains. Risk of explosion.

---

### SECTION 9: Physical and chemical properties

#### 9.1 Information on basic physical and chemical properties

**a) Appearance**
Form: liquid
b) Odor
   Color: colorless

   No data available

c) Odor Threshold
   No data available

d) pH
   No data available

e) Melting point/freezing point
   No data available

f) Initial boiling point and boiling range
   No data available

g) Flash point
   4 °C (39 °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) Vapor pressure
   No data available

l) Vapor density
   No data available

m) Density
   No data available

   Relative density
   No data available

n) Water solubility
   No data available

o) Partition coefficient: n-octanol/water
   No data available

p) Autoignition temperature
   No data available

q) Decomposition temperature
   No data available

r) Viscosity
   No data available

s) Explosive properties
   Not classified as explosive.

t) Oxidizing properties
   none

9.2 Other safety information
No data available

SECTION 10: Stability and reactivity

10.1 Reactivity
Vapors may form explosive mixture with air.

10.2 Chemical stability
The product is chemically stable under standard ambient conditions (room temperature).

10.3 Possibility of hazardous reactions
No data available
10.4 Conditions to avoid
Warming.

10.5 Incompatible materials
Strong oxidizing agents

10.6 Hazardous decomposition products
In the event of fire: see section 5

SECTION 11: Toxicological information

11.1 Information on toxicological effects

**Mixture**

**Acute toxicity**
Oral: No data available
Inhalation: No data available
Dermal: No data available

**Skin corrosion/irritation**
Mixture causes skin irritation.

**Serious eye damage/eye irritation**
No data available

**Respiratory or skin sensitization**
No data available

**Germ cell mutagenicity**
No data available

**Carcinogenicity**
IARC: No ingredient of this product present at levels greater than or equal to 0.1% is identified as probable, possible or confirmed human carcinogen by IARC.
NTP: No ingredient 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**
Suspected of damaging the unborn child.
Suspected of damaging fertility.

**Specific target organ toxicity - single exposure**
Mixture may cause drowsiness or dizziness.

**Specific target organ toxicity - repeated exposure**
Mixture may cause damage to organs through prolonged or repeated exposure. - Central nervous system

**Aspiration hazard**
Aspiration hazard, Aspiration may cause pulmonary edema and pneumonitis.

11.2 Additional Information
To the best of our knowledge, the chemical, physical, and toxicological properties have not been thoroughly investigated.
Other dangerous properties can not be excluded.
This substance should be handled with particular care.
Handle in accordance with good industrial hygiene and safety practice.

Stomach - Irregularities - Based on Human Evidence

**Components**

**Toluene**

**Acute toxicity**
- LD50 Oral - Rat - male - 5,580 mg/kg
  (Tested according to Directive 92/69/EEC.)
- LC50 Inhalation - Rat - male and female - 4 h - 25.7 mg/l - vapor
  (OECD Test Guideline 403)
- LD50 Dermal - Rabbit - > 5,000 mg/kg
  Remarks: (ECHA)
  No data available

**Skin corrosion/irritation**
- Skin - Rabbit
  Result: irritating - 4 h
  Remarks: (ECHA)

**Serious eye damage/eye irritation**
- Eyes - Rabbit
  Result: slight irritation
  (OECD Test Guideline 405)

**Respiratory or skin sensitization**
- Maximization Test - Guinea pig
  Result: negative

**Germ cell mutagenicity**
- Test Type: In vitro mammalian cell gene mutation test
- Test system: Mouse lymphoma test
  Result: negative
- Test Type: Ames test
- Test system: S. typhimurium
  Result: negative
- Species: Rat - Bone marrow
  Result: negative
  Remarks: (ECHA)

**Carcinogenicity**
- No data available

**Reproductive toxicity**
- Suspected of damaging the unborn child.

**Specific target organ toxicity - single exposure**
- May cause drowsiness or dizziness. - Central nervous system

**Specific target organ toxicity - repeated exposure**
- May cause damage to organs through prolonged or repeated exposure. - Central nervous system
Aspiration hazard
Aspiration hazard, Aspiration may cause pulmonary edema and pneumonitis.

2,3,7,8-Tetrachlorodibenzo-p-dioxin

Acute toxicity
LD50 Oral - Rat - 0.02 mg/kg
Remarks: (Lit.)
Inhalation: No data available
LD50 Dermal - Rabbit - 0.275 mg/kg
Remarks: (Lit.)
TDLo Dermal - Humans - 0.107 mg/kg
Symptoms: Dermatitis, Swelling of tissue
Remarks: (Lit.)

Skin corrosion/irritation
Skin - Humans
Result: Severe skin irritation

Serious eye damage/eye irritation
Eyes - Rabbit
Result: Moderate eye irritation

Respiratory or skin sensitization
No data available

Germ cell mutagenicity
No data available

Carcinogenicity
May cause cancer. Positive evidence from human epidemiological studies.

Reproductive toxicity
May damage the unborn child.

Specific target organ toxicity - single exposure
Causes damage to organs. - Liver, Skin
Acute dermal toxicity - Dermatitis, Swelling of tissue

Specific target organ toxicity - repeated exposure
No data available

Aspiration hazard
No data available

SECTION 12: Ecological information

12.1 Toxicity
Mixture
No data available

12.2 Persistence and degradability
No data available

12.3 Bioaccumulative potential
No data available
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 Endocrine disrupting properties
No data available

12.7 Other adverse effects
No data available

Components

Toluene
Toxicity to fish: flow-through test LC50 - Oncorhynchus kisutch (coho salmon) - 5.5 mg/l - 96 h
Remarks: (ECHA)

Toxicity to daphnia and other aquatic invertebrates:
EC50 - Ceriodaphnia dubia (water flea) - 3.78 mg/l - 48 h
(US-EPA)

Toxicity to bacteria: static test EC50 - Bacteria - 84 mg/l - 24 h
Remarks: (ECHA)

2,3,7,8-Tetrachlorodibenzo-p-dioxin
Toxicity to fish: LC50 - Oryzias latipes (Orange-red killifish) - 14 mg/l - 72 h

SECTION 13: Disposal considerations

13.1 Waste treatment methods

Product
Waste material must be disposed of in accordance with the national and local regulations. Leave chemicals in original containers. No mixing with other waste. Handle uncleaned containers like the product itself. See www.retrologistik.com for processes regarding the return of chemicals and containers, or contact us there if you have further questions.

SECTION 14: Transport information

DOT (US)
UN number: 1294   Class: 3   Packing group: II
Proper shipping name: Toluene
Reportable Quantity (RQ): 1000 lbs
Poison Inhalation Hazard: No

IMDG
UN number: 1294   Class: 3   Packing group: II   EMS-No: F-E, S-D
Proper shipping name: TOLUENE

Supelco - 48599
IATA
UN number: 1294  Class: 3  Packing group: II
Proper shipping name: Toluene

SECTION 15: Regulatory information

SARA 302 Components
This material does not contain any components with a section 302 EHS TPQ.

SARA 313 Components
The following components are subject to reporting levels established by SARA Title III, Section 313:

<table>
<thead>
<tr>
<th>Component</th>
<th>CAS-No.</th>
<th>Revision Date</th>
</tr>
</thead>
<tbody>
<tr>
<td>Toluene</td>
<td>108-88-3</td>
<td>2007-07-01</td>
</tr>
</tbody>
</table>

SARA 311/312 Hazards
Fire Hazard, Acute Health Hazard, Chronic Health Hazard

Massachusetts Right To Know Components
No components are subject to the Massachusetts Right to Know Act.

SECTION 16: Other information

Further information
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. Sigma-Aldrich Corporation and its Affiliates shall not be held liable for any damage resulting from handling or from contact with the above product. See www.sigma-aldrich.com and/or the reverse side of invoice or packing slip for additional terms and conditions of sale.

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