



## SAFETY DATA SHEET

GHS classification in accordance with the OSHA Hazard Communication Standard (29 CFR 1910.1200) (OSHA HCS)

### SECTION 1. IDENTIFICATION

Product name : 1,4-Dioxane (stabilized with BHT)  
Product code : D0860

#### Manufacturer or supplier's details

Company name of supplier : TCI America  
Address : 9211 N. Harborside Street Portland, OR 97203 U.S.A.  
Telephone : +1-800-4238616/+1-503-2831681  
Telefax : +1-888-5201075/+1-503-2831987  
E-mail address : sales-US@TCIchemicals.com

Chemical Emergencies: TCI America (8:00am - 5:00pm) PST +1-503-2867624

Transportation Emergencies: Chemtrec 24-Hour +1-800-4249300 (U.S.A.)/+1-703-5273887 (International)

#### Recommended use of the chemical and restrictions on use

Recommended use : Use as laboratory reagent

### SECTION 2. HAZARDS IDENTIFICATION

#### GHS classification in accordance with the OSHA Hazard Communication Standard (29 CFR 1910.1200)

Flammable liquids : Category 2  
Acute toxicity (Inhalation) : Category 4  
Skin irritation : Category 2  
Eye irritation : Category 2A  
Carcinogenicity : Category 1B  
Specific target organ toxicity - single exposure : Category 1 (Central nervous system)  
Specific target organ toxicity - single exposure : Category 3 (Respiratory system)  
Specific target organ toxicity - repeated exposure : Category 1 (Liver, Kidney, Central nervous system)  
Specific target organ toxicity - repeated exposure : Category 2 (Respiratory system)

#### GHS label elements

Hazard pictograms :



Signal Word : Danger

Hazard Statements :  
H225 Highly flammable liquid and vapor.  
H315 Causes skin irritation.  
H319 Causes serious eye irritation.  
H332 Harmful if inhaled.  
H335 May cause respiratory irritation.  
H350 May cause cancer.  
H370 Causes damage to organs (Central nervous system).  
H372 Causes damage to organs (Liver, Kidney, Central nervous system) through prolonged or repeated exposure.  
H373 May cause damage to organs (Respiratory system) through prolonged or repeated exposure.

Precautionary Statements : **Prevention:**

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 mist or vapors.  
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.  
P280 Wear protective gloves/ protective clothing/ eye protection/ face protection.

**Response:**

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.  
P305 + P351 + P338 IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.  
P307 + P311 IF exposed: Call a POISON CENTER or doctor/ physician.  
P332 + P313 If skin irritation occurs: Get medical advice/ attention.  
P337 + P313 If eye irritation persists: 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.

**Storage:**

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.

**Disposal:**

P501 Dispose of contents/ container to an approved waste disposal plant.

**Other hazards**

None known.

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**SECTION 3. COMPOSITION/INFORMATION ON INGREDIENTS**

Substance / Mixture : Substance

**Components**

| Chemical name | CAS RN   | Concentration (% w/w) |
|---------------|----------|-----------------------|
| 1,4-Dioxane   | 123-91-1 | >= 90 - <= 100        |

Actual concentration is withheld as a trade secret

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**SECTION 4. FIRST AID MEASURES**

If inhaled : Remove person to fresh air and keep comfortable for breathing. Call a POISON CENTER or doctor/ physician.  
In case of skin contact : Take off all contaminated clothing immediately. If on skin, rinse well with water. Call a POISON CENTER or doctor/ physician.  
In case of eye contact : Rinse with plenty of water. If easy to do, remove contact lens, if worn. Call a POISON CENTER or doctor/ physician.  
If swallowed : Call a POISON CENTER or doctor/ physician. Rinse mouth.  
Most important symptoms and effects, both acute and delayed : None known.

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**SECTION 5. FIRE-FIGHTING MEASURES**

Suitable extinguishing media : Dry powder, Foam, Water spray, Carbon dioxide (CO2)  
Specific hazards during fire fighting : Take care as it may decompose upon combustion or in high temperatures to generate poisonous fume.

- Specific extinguishing methods : Use extinguishing measures that are appropriate to local circumstances and the surrounding environment. Immediately evacuate personnel to safe areas. Remove undamaged containers from fire area if it is safe to do so.
- Special protective equipment for fire-fighters : Use personal protective equipment.

## SECTION 6. ACCIDENTAL RELEASE MEASURES

- Personal precautions, protective equipment and emergency procedures : Wear suitable protective equipment. Keep people away from and up-wind of spill/leak. Ensure adequate ventilation. Entry to non-involved personnel should be controlled around the leakage area by roping off, etc.
- Environmental precautions : Prevent product from entering drains.
- Methods and materials for containment and cleaning up : Collect as much of the spill as possible with a suitable absorbent material.

## SECTION 7. HANDLING AND STORAGE

- Technical measures : Prevent generation of vapor or mist. Take precautionary measures against static discharge. Use explosion-proof equipment.
- Local/Total ventilation : Ensure adequate ventilation. Handle product only in closed system or provide appropriate exhaust ventilation at machinery. Use a local exhaust ventilation.
- Advice on safe handling : Avoid contact with skin, eyes and clothing. Wear personal protective equipment. Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking. Wash hands and face thoroughly after handling. Confirm in advance if peroxides exist when operations involving heating such as distillation are carried out.
- Conditions for safe storage : Keep container tightly closed. Store in a cool and shaded area. Keep in a well-ventilated place. Use explosion-proof equipment. Store locked up.

## SECTION 8. EXPOSURE CONTROLS/PERSONAL PROTECTION

### Ingredients with workplace control parameters

| Components  | CAS RN   | Value type<br>(Form of exposure) | Control parameters<br>/ Permissible concentration | Basis     |
|-------------|----------|----------------------------------|---------------------------------------------------|-----------|
| 1,4-Dioxane | 123-91-1 | TWA                              | 20 ppm                                            | ACGIH     |
|             |          | C                                | 1 ppm<br>3.6 mg/m <sup>3</sup>                    | NIOSH REL |
|             |          | TWA                              | 100 ppm<br>360 mg/m <sup>3</sup>                  | OSHA Z-1  |
|             |          | TWA                              | 25 ppm<br>90 mg/m <sup>3</sup>                    | OSHA P0   |

- Engineering measures : Install a closed system or local exhaust. Also install safety shower and eye bath.

### Personal protective equipment

- Respiratory protection : Gas mask, Self-contained breathing apparatus
- Hand protection : Impervious gloves
- Eye protection : Safety glasses, Safety goggles, Face-shield
- Skin and body protection : Impervious protective clothing

\*Use personal protective equipment (PPE) approved under appropriate government standards and follow local and national regulations.

## SECTION 9. PHYSICAL AND CHEMICAL PROPERTIES

- Appearance : liquid
- Color : colorless
- Odor : No data available
- Odor Threshold : 24 ppm
- pH : No data available
- Melting point/freezing point : 52 °F / 11 °C
- Boiling point/boiling range : 214 °F / 101 °C

|                                                  |                                           |
|--------------------------------------------------|-------------------------------------------|
| Flash point                                      | : 54 °F / 12 °C                           |
| Flammability (solid, gas)                        | : No data available                       |
| Upper explosion limit / Upper flammability limit | : 22.5 %(V)                               |
| Lower explosion limit / Lower flammability limit | : 2 %(V)                                  |
| Vapor pressure                                   | : 4.1 kPa (68 °F / 20 °C)                 |
| Relative vapor density                           | : 3.0                                     |
| Relative density                                 | : 1.04                                    |
| Solubility(ies)                                  |                                           |
| Water solubility                                 | : completely miscible                     |
| Solubility in other solvents                     | : No data available                       |
| Partition coefficient: n-octanol/water           | : -0.27                                   |
| Autoignition temperature                         | : 356 °F / 180 °C                         |
| Decomposition temperature                        | : No data available                       |
| Viscosity                                        |                                           |
| Viscosity, dynamic                               | : No data available                       |
| Viscosity, kinematic                             | : 0.59 mm <sup>2</sup> /s (59 °F / 15 °C) |
| Molecular weight                                 | : 88.11 g/mol                             |

## SECTION 10. STABILITY AND REACTIVITY

|                                    |                                                                        |
|------------------------------------|------------------------------------------------------------------------|
| Reactivity                         | : No data available                                                    |
| Chemical stability                 | : Stable under normal conditions.                                      |
| Possibility of hazardous reactions | : Reacts with air to form peroxides.                                   |
| Conditions to avoid                | : Electrical spark Open flame Electrostatic discharge Exposure to air. |
| Incompatible materials             | : Oxidizing agents, Reducing agents, Strong acids                      |
| Hazardous decomposition products   | : Carbon monoxide, Carbon dioxide (CO <sub>2</sub> )                   |

## SECTION 11. TOXICOLOGICAL INFORMATION

### Acute toxicity

|                           |                                                                                   |
|---------------------------|-----------------------------------------------------------------------------------|
| Acute oral toxicity       | : LD50 (Rat): 4,200 mg/kg                                                         |
| Acute inhalation toxicity | : LC50 (Rat): 46 g/m <sup>3</sup><br>Exposure time: 2 h<br>Test atmosphere: vapor |
| Acute dermal toxicity     | : LD50 (Rabbit): 7,828 mg/kg                                                      |

### Skin corrosion/irritation

|        |                   |
|--------|-------------------|
| Result | : Skin irritation |
|--------|-------------------|

### Serious eye damage/eye irritation

|        |                  |
|--------|------------------|
| Result | : Eye irritation |
|--------|------------------|

### Respiratory or skin sensitization

|  |                             |
|--|-----------------------------|
|  | : No information available. |
|--|-----------------------------|

### Germ cell mutagenicity

|  |                             |
|--|-----------------------------|
|  | : No information available. |
|--|-----------------------------|

### Carcinogenicity

|                              |                                                                   |
|------------------------------|-------------------------------------------------------------------|
| Carcinogenicity - Assessment | : Presumed to have carcinogenic potential for humans              |
| <b>IARC</b>                  | Group 2B: Possibly carcinogenic to humans<br>1,4-Dioxane 123-91-1 |

### OSHA

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

### NTP

Reasonably anticipated to be a human carcinogen  
1,4-Dioxane 123-91-1

### Reproductive toxicity

#### STOT-single exposure

|               |                            |
|---------------|----------------------------|
| Target Organs | : Central nervous system   |
| Assessment    | : Causes damage to organs. |

|            |                                     |
|------------|-------------------------------------|
| Assessment | : May cause respiratory irritation. |
|------------|-------------------------------------|

#### STOT-repeated exposure

|                          |                                                                                                              |
|--------------------------|--------------------------------------------------------------------------------------------------------------|
| Target Organs Assessment | : Liver, Kidney, Central nervous system<br>: Causes damage to organs through prolonged or repeated exposure. |
| Target Organs Assessment | : Respiratory system<br>: May cause damage to organs through prolonged or repeated exposure.                 |
| Repeated dose toxicity   | : No information available.                                                                                  |
| Aspiration toxicity      | : No information available.                                                                                  |
| RTECS No.                | : JG8225000 (1,4-Dioxane)                                                                                    |

## SECTION 12. ECOLOGICAL INFORMATION

### Ecotoxicity

|                                                     |                                                                                               |
|-----------------------------------------------------|-----------------------------------------------------------------------------------------------|
| Toxicity to fish                                    | : LC50 ( <i>Oryzias latipes</i> (Japanese medaka)): > 100 mg/l<br>Exposure time: 96 h         |
| Toxicity to daphnia and other aquatic invertebrates | : EC50 ( <i>Daphnia magna</i> (Water flea)): > 1,000 mg/l<br>Exposure time: 48 h              |
| Toxicity to algae/aquatic plants                    | : EC50 ( <i>Selenastrum capricornutum</i> (green algae)): > 1,000 mg/l<br>Exposure time: 72 h |

### Persistence and degradability

|                  |                               |
|------------------|-------------------------------|
| Biodegradability | : 0 % (by BOD), 1.0 % (by GC) |
|------------------|-------------------------------|

### Bioaccumulative potential

|                               |                            |
|-------------------------------|----------------------------|
| Bioconcentration factor (BCF) | : 0.2 - 0.6 (conc. 10 ppm) |
|-------------------------------|----------------------------|

### Mobility in soil

|                                               |           |
|-----------------------------------------------|-----------|
| Distribution among environmental compartments | : Koc: 29 |
|-----------------------------------------------|-----------|

### Other adverse effects

#### Product:

|                           |                                                                                                                                                                                                                                                                                                                  |
|---------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Ozone-Depletion Potential | : Regulation: 40 CFR Protection of Environment; Part 82 Protection of Stratospheric Ozone - CAA Section 602 Class I Substances<br>Remarks: This product neither contains, nor was manufactured with a Class I or Class II ODS as defined by the U.S. Clean Air Act Section 602 (40 CFR 82, Subpt. A, App.A + B). |
|---------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|

## SECTION 13. DISPOSAL CONSIDERATIONS

### Disposal methods

|                        |                                                                                                                                                                    |
|------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Waste from residues    | : Disposal in accordance with local and national regulations. Take precautions against ignition or explode. Entrust disposal to a licensed waste disposal company. |
| Contaminated packaging | : Disposal in accordance with local and national regulations. Before disposal of used container, remove contents completely.                                       |

## SECTION 14. TRANSPORT INFORMATION

### International Regulations

#### IATA-DGR

|                      |           |
|----------------------|-----------|
| UN/ID No.            | : UN 1165 |
| Proper shipping name | : Dioxane |
| Class                | : 3       |
| Packing group        | : II      |

#### IMDG-Code

|                      |           |
|----------------------|-----------|
| UN number            | : UN 1165 |
| Proper shipping name | : DIOXANE |

Class : 3  
Packing group : II  
EmS Code : F-E, S-D  
Marine pollutant : no

**Transport in bulk according to Annex II of MARPOL 73/78 and the IBC Code**

Not applicable for product as supplied.

**Domestic regulation****49 CFR**

UN/ID/NA number : UN 1165  
Proper shipping name : Dioxane  
Class : 3  
Packing group : II  
ERG Code : 127  
Marine pollutant : no

**Special precautions for user**

The transport classification(s) provided herein are for informational purposes only, and solely based upon the properties of the unpackaged material as it is described within this Safety Data Sheet. Transportation classifications may vary by mode of transportation, package sizes, and variations in regional or country regulations.

**SECTION 15. REGULATORY INFORMATION****CERCLA Reportable Quantity**

| Components  | CAS RN   | Component RQ<br>(lbs) | Calculated product RQ<br>(lbs) |
|-------------|----------|-----------------------|--------------------------------|
| 1,4-Dioxane | 123-91-1 | 100                   | 101                            |

**SARA 304 Extremely Hazardous Substances Reportable Quantity**

This material does not contain any components with a section 304 EHS RQ.

**SARA 302 Extremely Hazardous Substances Threshold Planning Quantity**

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

**SARA 311/312 Hazards** : No SARA Hazards

**SARA 313** : The following components are subject to reporting levels established by SARA Title III, Section 313:  
1,4-Dioxane 123-91-1 >= 90 - <= 100 %

**Clean Air Act**

This product neither contains, nor was manufactured with a Class I or Class II ODS as defined by the U.S. Clean Air Act Section 602 (40 CFR 82, Subpt. A, App.A + B).

The following chemical(s) are listed as HAP under the U.S. Clean Air Act, Section 112 (40 CFR 61):

1,4-Dioxane 123-91-1 >= 90 - <= 100 %

This product does not contain any chemicals listed under the U.S. Clean Air Act Section 112(r) for Accidental Release Prevention (40 CFR 68.130, Subpart F).

The following chemical(s) are listed under the U.S. Clean Air Act Section 111 SOCM I Intermediate or Final VOC's (40 CFR 60.489):

1,4-Dioxane 123-91-1 >= 90 - <= 100 %

**Clean Water Act**

This product does not contain any Hazardous Substances listed under the U.S. CleanWater Act, Section 311, Table 116.4A.

This product does not contain any Hazardous Chemicals listed under the U.S. CleanWater Act, Section 311, Table 117.3.

This product does not contain any toxic pollutants listed under the U.S. Clean Water Act Section 307

This product does not contain any priority pollutants related to the U.S. Clean Water Act

**US State Regulations****Massachusetts Right To Know**

1,4-Dioxane 123-91-1

**Pennsylvania Right To Know**

1,4-Dioxane 123-91-1

**Maine Chemicals of High Concern**

Product does not contain any listed chemicals

**Vermont Chemicals of High Concern**

1,4-Dioxane 123-91-1

**Washington Chemicals of High Concern**

1,4-Dioxane 123-91-1

**California Prop. 65**

WARNING: This product can expose you to chemicals including 1,4-Dioxane, which is/are known to the State of California to cause cancer. For more information go to [www.P65Warnings.ca.gov](http://www.P65Warnings.ca.gov).

**California List of Hazardous Substances**

1,4-Dioxane 123-91-1

**California Permissible Exposure Limits for Chemical Contaminants**

1,4-Dioxane 123-91-1

**TSCA list**

No substances are subject to a Significant New Use Rule.

No substances are subject to TSCA 12(b) export notification requirements.

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**SECTION 16. OTHER INFORMATION**

Revision Date : 10/08/2024

This SDS was prepared sincerely based on the information obtained, however, any warranty shall not be given regarding the data contained and the assessment of hazards and toxicity. Prior to use, please investigate not only the hazards and toxicity information but also the laws and regulations of the organization, area and country where the products are to be used, which shall be given the first priority. The products are supposed to be used promptly after purchase in consideration of safety. Some new information or amendments may be added afterwards. If the products are to be used far behind the expected time of use or you have any questions, please feel free to contact us. The stated cautions are for normal handling only. In case of special handling operations, sufficient care should be taken, in addition to the safety measures suitable for the given situation. All chemical products should be treated with the recognition of "having unknown hazards and toxicity", which differ greatly depending on the conditions and handling when in use and/or the conditions and duration of storage. The products must be handled only by those who are familiar with specialized knowledge and have experience or under the guidance of those specialists throughout use from opening to storage and disposal. Safe usage conditions shall be set up on each user's own responsibility.