

Safety Data Sheet

File version: 1

Dioxane, 100%(v/v)

SDS Date: 29 Nov 2016

SECTION 1: PRODUCT AND COMPANY IDENTIFICATION

PRODUCT NAME: 100%(v/v) 1,4-Dioxane
SYNONYMS: 1,4-Dioxacyclohexane
p-Dioxane
Diethylene oxide
PRODUCT CODES: 1008171
1008172
MANUFACTURER: Rigaku Reagents
ADDRESS: 9009 New Trails Drive
The Woodlands, TX 77381
USA
PHONE: +1 (281) 362-2300
EMAIL: ReagentOrders@Rigaku.com

CHEMICAL NAME: 1,4-Dioxane
CHEMICAL FORMULA: C₄H₈O₂

PREPARED BY: Rigaku Reagents

SECTION 1 NOTES:**SECTION 2: HAZARDS IDENTIFICATION****EMERGENCY OVERVIEW:**

OSHA HAZARDS: Flammable liquid, target organ effect, irritant, carcinogen, may form explosive peroxides.

TARGET ORGANS: Liver, kidney, central nervous system

GHS CLASSIFICATION:

Flammable liquids (Category 2)
Acute toxicity, Oral (Category 5)
Acute toxicity, Inhalation (Category 5)
Eye irritation (Category 2A)
Carcinogenicity (Category 2)
Specific target organ toxicity - single exposure (Category 3)
Chronic aquatic toxicity (Category 4)

GHS LABEL ELEMENTS, INCLUDING PRECAUTIONARY STATEMENTS

Signal word: Danger

Hazard statement(s):

H225 Highly flammable liquid and vapor.
H303 + H333 May be harmful if swallowed or if inhaled.
H319 Causes serious eye irritation.
H335 May cause respiratory irritation.
H351 Suspected of causing cancer.
H413 May cause long lasting harmful effects to aquatic life.

Precautionary statement(s):

P210 Keep away from heat/sparks/open flames/hot surfaces. - No smoking.
P261 Avoid breathing dust/ fume/ gas/ mist/ vapors/ spray.
P281 Use personal protective equipment as required.
P305 + P351 + P338 IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.

POTENTIAL HEALTH EFFECTS:

EYES: Causes eye irritation.

SKIN: May be harmful if absorbed through skin. Causes skin irritation.

INGESTION: May be harmful if swallowed.

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INHALATION: May be harmful if inhaled. Causes respiratory tract irritation.

SECTION 2 NOTES:**SECTION 3: COMPOSITION/INFORMATION ON INGREDIENTS****INGREDIENTS:** 1,4-Dioxane

<u>1,4-DIOXANE:</u>		
<u>CAS NO.</u>	<u>% WT</u>	<u>% VOL</u>
123-91-1		100%
	<u>ppm</u>	<u>mg/m3</u>
OSHA PEL-TWA:	25	90
OSHA PEL STEL :		
ACGIH TLV-TWA:	20	
ACGIH TLV STEL:		

SECTION 3 NOTES:**SECTION 4: FIRST AID MEASURES**

EYES: Flush eyes with water as a precaution.

SKIN: Wash off with soap and plenty of water. Consult a physician.

INGESTION: Do NOT induce vomiting. Never give anything by mouth to an unconscious person. Rinse mouth with water. Consult a physician.

INHALATION: If breathed in, move person into fresh air. If not breathing, give artificial respiration. Consult a physician.

SECTION 4 NOTES:**SECTION 5: FIRE-FIGHTING MEASURES****FLASH POINT:**

F: 54 °
C: 12 °

AUTOIGNITION TEMPERATURE:

F: No data available
C: No data available

NFPA HAZARD CLASSIFICATION

HEALTH: 2 FLAMMABILITY: 3 REACTIVITY: 0

HMIS HAZARD CLASSIFICATION

HEALTH: 2 FLAMMABILITY: 3 REACTIVITY: 0

EXTINGUISHING MEDIA: Use water spray, alcohol-resistant foam, dry chemical or carbon dioxide.

HAZARDOUS DECOMPOSITION PRODUCTS: Hazardous decomposition products formed under fire conditions. - Carbon oxides

SECTION 5 NOTES: Flammable in the presence of a source of ignition when the temperature is above the flash point. Keep away from heat/sparks/open flame/hot surface. No smoking.

SECTION 6: ACCIDENTAL RELEASE MEASURES

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PERSONAL PRECAUTIONS: Use personal protective equipment. Avoid breathing vapors, mist or gas. Ensure adequate ventilation. Remove all sources of ignition. Evacuate personnel to safe areas. Beware of vapors accumulating to form explosive concentrations. Vapors can accumulate in low areas.

ENVIRONMENTAL PRECAUTIONS: Prevent further leakage or spillage if safe to do so. Do not let product enter drains. Discharge into the environment must be avoided.

METHODS AND MATERIALS FOR CONTAINMENT AND CLEANING UP: Contain spillage, and then collect with an electrically protected vacuum cleaner or by wet-brushing and place in container for disposal according to local regulations

SECTION 6 NOTES:

SECTION 7: HANDLING AND STORAGE

HANDLING AND STORAGE: Avoid contact with skin and eyes. Avoid inhalation of vapor or mist. Use explosion-proof equipment. Keep away from sources of ignition - No smoking. Take measures to prevent the buildup of electrostatic charge. Keep container tightly closed in a dry and well-ventilated place. Containers which are opened must be carefully resealed and kept upright to prevent leakage.

SECTION 7 NOTES:

SECTION 8: EXPOSURE CONTROLS/PERSONAL PROTECTION

RESPIRATORY PROTECTION: Where risk assessment shows air-purifying respirators are appropriate use a full-face respirator with multi-purpose combination (US) or type ABEK (EN 14387) respirator cartridges as a backup to engineering controls. If the respirator is the sole means of protection, use a full-face supplied air respirator. Use respirators and components tested and approved under appropriate government standards such as NIOSH (US) or CEN (EU).

EYE PROTECTION: Face shield and safety glasses Use equipment for eye protection tested and approved under appropriate government standards such as NIOSH (US) or EN 166(EU).

SKIN PROTECTION: Handle with gloves. Gloves must be inspected prior to use. Use proper glove removal technique (without touching glove's outer surface) to avoid skin contact with this product. Dispose of contaminated gloves after use in accordance with applicable laws and good laboratory practices. Wash and dry hands. Complete suit protecting against chemicals, Flame retardant antistatic protective clothing, the type of protective equipment must be selected according to the concentration and amount of the dangerous substance at the specific workplace.

WORK HYGIENIC PRACTICES: Handle in accordance with good industrial hygiene and safety practice. Wash hands before breaks and at the end of workday.

SECTION 8 NOTES:

SECTION 9: PHYSICAL AND CHEMICAL PROPERTIES

APPEARANCE: clear, colorless

PHYSICAL STATE: liquid, clear

pH AS SUPPLIED: No data available

pH (Other): 6.0-8

BOILING POINT:

F: 212 - 216 °

C: 100 - 102 °

FREEZING POINT:

F: 50 - 54 °

C: 10 - 12 °

VAPOR PRESSURE (mmHg): 27 mmHg

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F: 68 °

C: 20 °

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VAPOR DENSITY (AIR = 1): 3.04**SPECIFIC GRAVITY (H2O = 1):** 1.034

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F: 77 °

C: 25 °

EVAPORATION RATE: No data available**SOLUBILITY IN WATER:** completely miscible**VISCOSITY:** No data available

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F: No data available

C: No data available

SECTION 9 NOTES:

SECTION 10: STABILITY AND REACTIVITY

STABILITY: Stable under recommended storage conditions. Vapors may form explosive mixture with air.**CONDITIONS TO AVOID (STABILITY):** Heat, flames and sparks. Extremes of temperature and direct sunlight.**INCOMPATIBILITY (MATERIAL TO AVOID):** Oxygen, oxidizing agents, halogens, reducing agents, perchlorates, trimethylaluminum**HAZARDOUS DECOMPOSITION OR BY-PRODUCTS:** Hazardous decomposition products formed under fire conditions. - Carbon oxides
Other decomposition products - no data available**SECTION 10 NOTES:**

SECTION 11: TOXICOLOGICAL INFORMATION

ACUTE TOXICITY:**ORAL LD50:** Rat - 4,200 mg/kg**INHALATION LC50:** Rat - 2 h - 46,000 mg/m³; Remarks: Sense Organs and Special Senses (Nose, Eye, Ear, and Taste): Eye: Other.**DERMAL LD50:** Rabbit - 7,858 mg/kg**SKIN CORROSION/IRRITATION:****HUMAN:** Chronic exposure causes drying effect on the skin and eczema.**RABBIT:** No skin irritation**SERIOUS EYE DAMAGE/EYE IRRITATION:****RABBIT:** Irritating to eyes.**RESPIRATORY OR SKIN SENSITIZATION:** No data available.**GERM CELL MUTAGENICITY:** Laboratory experiments have shown mutagenic effects.**CARCINOGENICITY:****IARC:** 2B - Group 2B: Possibly carcinogenic to humans (1,4-Dioxane)**NTP:** Reasonably anticipated to be a human carcinogen (1,4-Dioxane)**OSHA:** No component of this product present at levels greater than or equal to 0.1% is identified as a carcinogen or potential carcinogen by OSHA.**REPRODUCTIVE TOXICITY:** No data available**SECTION 11 NOTES:**

SECTION 12: ECOLOGICAL INFORMATION

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TOXICITY:**TOXICITY TO FISH:** LC50 - Pimephales promelas (fathead minnow) - 985 mg/l - 96 h**TOXICITY TO DAPHNIA AND OTHER AQUATIC INVERTEBRATES:** EC50 - Daphnia magna (Water flea) - 8,450 mg/l - 24 h**TOXICITY TO ALGAE:** EC50 - Desmodesmus subspicatus (green algae) - > 500 mg/l - 72 h**PERSISTENCE AND DEGRADABILITY:** Biodegradability Result: < 5 % - Not readily biodegradable.**BIOACCUMULATIVE POTENTIAL:** Does not bioaccumulate**MOBILITY IN SOIL**

No data available

PBT AND vPvB ASSESSMENT

No data available

SECTION 12 NOTES: An environmental hazard cannot be excluded in the event of unprofessional handling or disposal.**SECTION 13: DISPOSAL CONSIDERATIONS****PRODUCT:** Burn in a chemical incinerator equipped with an afterburner and scrubber but exert extra care in igniting as this material is highly flammable. Offer surplus and non-recyclable solutions to a licensed disposal company. Contact a licensed professional waste disposal service to dispose of this material.**CONTAMINATED PACKAGING:** Dispose of as unused product.**SECTION 14: TRANSPORT INFORMATION****U.S. DEPARTMENT OF TRANSPORTATION**

PROPER SHIPPING NAME:	Dioxane
HAZARD CLASS:	3
ID NUMBER:	1165
PACKING GROUP:	II
MARINE POLLUTANT:	No
POISON INHALATION HAZARD:	No

WATER TRANSPORTATION

PROPER SHIPPING NAME:	DIOXANE
HAZARD CLASS:	3
ID NUMBER:	1165
PACKING GROUP:	II EMS-No: F-E, S-D
MARINE POLLUTANT:	No

AIR TRANSPORTATION

PROPER SHIPPING NAME:	Dioxane
HAZARD CLASS:	3
ID NUMBER:	1165
PACKING GROUP:	II

SECTION 14 NOTES:**SECTION 15: REGULATORY INFORMATION****OSHA HAZARDS:** Flammable liquid, target organ effect, irritant, carcinogen, may form explosive peroxides. flammable liquid, carcinogen, target organ effect, irritant**SARA 302 COMPONENTS:** No chemicals in this material are subject to the reporting requirements of SARA Title III, Section 302.**SARA 313 COMPONENTS:**

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

	CAS-No.
1,4-Dioxane	123-91-1

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SARA 311/312 HAZARDS: Fire hazard, acute health hazard, chronic health hazard**MASSACHUSETTS RIGHT TO KNOW COMPONENTS:**

	<u>CAS-No.</u>
1,4-Dioxane	123-91-1

PENNSYLVANIA RIGHT TO KNOW COMPONENTS:

	<u>CAS-No.</u>
1,4-Dioxane	123-91-1

NEW JERSEY RIGHT TO KNOW COMPONENTS:

	<u>CAS-No.</u>
1,4-Dioxane	123-91-1

CALIFORNIA PROP. 65 COMPONENTS: WARNING! This product contains a chemical known to the State of California to cause cancer.

	<u>CAS-No.</u>
1,4-Dioxane	123-91-1

SECTION 15 NOTES:

SECTION 16: OTHER INFORMATION

DISCLAIMER: The above information is believed to be correct but does not necessarily include all information and should be used only as a guide. The information in this document is based on our current knowledge and applies to the product with regard to appropriate safety precautions. This document does not represent any guarantee of the properties of the product. Rigaku Reagents will not be held liable for any damage resulting from handling or contact with the above product.