# SAFETY DATA SHEET

Updated on 26/09/2024

## 1. Material Identification

**Product Name** : Ethyl methacrylate
**Catalog Number** : io-2373
**CAS Number** : 97-63-2
**Identified uses** : Laboratory chemicals, manufacture of chemical compounds
**Company** : Ionz

**>> R&D Use only**

## 2. Hazards Identification

### GHS Classification:

Flammable liquid ( category 2 )
Acute toxicity, oral (Category 3)
Acute toxicity, dermal (Category 3)
Acute toxicity, inhalation (Category 3)
Specific target organ toxicity, single exposure (Category 1)

**Note**

>> Pictograms displayed are for > 99.9% (1177 of 1178) of reports that indicate hazard statements. This chemical does not meet GHS hazard criteria for < 0.1% (1 of 1178) of reports.

**Pictogram(s)**

**GHS Hazard Statements**

>> H225 (> 99.9%): Highly Flammable liquid and vapor [Danger Flammable liquids]

>> H315 (> 99.9%): Causes skin irritation [Warning Skin corrosion/irritation]

>> H317 (> 99.9%): May cause an allergic skin reaction [Warning Sensitization, Skin]

>> H319 (99.8%): Causes serious eye irritation [Warning Serious eye damage/eye irritation]

>> H335 (> 99.9%): May cause respiratory irritation [Warning Specific target organ toxicity, single exposure; Respiratory tract irritation]

**Precautionary Statement Codes**

>> P210, P233, P240, P241, P242, P243, P261, P264, P264+P265, P271, P272, P280, P302+P352, P303+P361+P353, P304+P340, P305+P351+P338, P319, P321, P332+P317, P333+P317, P337+P317, P362+P364, P370+P378, P403+P233, P403+P235, P405, and P501

**NFPA 704 Diamond**


**NFPA Health Rating**

>> 2 - Materials that, under emergency conditions, can cause temporary incapacitation or residual injury.

**NFPA Fire Rating**

>> 3 - Liquids and solids that can be ignited under almost all ambient temperature conditions. Materials produce hazardous atmospheres with air under almost all ambient temperatures or, though unaffected by ambient temperatures, are readily ignited under almost all conditions.

**NFPA Instability Rating**

>> 2 - Materials that readily undergo violent chemical changes at elevated temperatures and pressures.

### Health Hazards:

>> Inhalation may cause irritation of the mucous membrane. Ingestion causes irritation of mouth and stomach. Contact with liquid irritates eyes and skin. (USCG, 1999)

>> Behavior in Fire: Sealed containers may rupture explosively if hot. Heat can cause a violent polymerization reaction with rapid release of energy. Vapors are heavier than air and can travel to a source of ignition and flash back. (USCG, 1999)

>> Highly flammable. Vapour/air mixtures are explosive.

## 3. Composition/Information On Ingredients

**Chemical name** : Ethyl methacrylate
**CAS Number** : 97-63-2
**Molecular Formula** : C6H10O2
**Molecular Weight** : 114.1400 g/mol

## 4. First Aid Measures

### First Aid:

>> EYES: First check the victim for contact lenses and remove if present. Flush victim's eyes with water or normal saline solution for 20 to 30 minutes while simultaneously calling a hospital or poison control center. Do not put any ointments, oils, or medication in the victim's eyes without specific instructions from a physician. IMMEDIATELY transport the victim after flushing eyes to a hospital even if no symptoms (such as redness or irritation) develop.

>> SKIN: IMMEDIATELY flood affected skin with water while removing and isolating all contaminated clothing. Gently wash all affected skin areas thoroughly with soap and water. If symptoms such as redness or irritation develop, IMMEDIATELY call a physician and be prepared to transport the victim to a hospital for treatment.

>> INHALATION: IMMEDIATELY leave the contaminated area; take deep breaths of fresh air. If symptoms (such as wheezing, coughing, shortness of breath, or burning in the mouth, throat, or chest) develop, call a physician and be prepared to transport the victim to a hospital. Provide proper respiratory protection to rescuers entering an unknown atmosphere. Whenever possible, Self-Contained Breathing Apparatus (SCBA) should be used; if not available, use a level of protection greater than or equal to that advised under Protective Clothing.

>> INGESTION: DO NOT INDUCE VOMITING. If the victim is conscious and not convulsing, give 1 or 2 glasses of water to dilute the chemical and IMMEDIATELY call a hospital or poison control center. Be prepared to transport the victim to a hospital if advised by a physician. If the victim is convulsing or unconscious, do not give anything by mouth, ensure that the victim's airway is open and lay the victim on his/her side with the head lower than the body. DO NOT INDUCE VOMITING. IMMEDIATELY transport the victim to a hospital. (NTP, 1992)

**First Aid Measures**

**Inhalation First Aid**

>> Fresh air, rest. Refer for medical attention.

**Skin First Aid**

>> Remove contaminated clothes. Rinse and then wash skin with water and soap. Refer for medical attention .

**Eye First Aid**

>> First rinse with plenty of water for several minutes (remove contact lenses if easily possible), then refer for medical attention.

**Ingestion First Aid**

>> Rinse mouth. Give one or two glasses of water to drink. Do NOT induce vomiting. Refer for medical attention .

## 5. Fire Fighting Measures

>> Vapors are heavier than air and can travel back to a source of ignition and flash back.

>> Excerpt from ERG Guide 130 [Flammable Liquids (Water-Immiscible / Noxious); polymerization hazard]:

>> CAUTION: The majority of these products have a very low flash point. Use of water spray when fighting fire may be inefficient.

>> SMALL FIRE: Dry chemical, CO2, water spray or regular foam. If regular foam is ineffective or unavailable, use alcohol-resistant foam.

>> LARGE FIRE: Water spray, fog or regular foam. If regular foam is ineffective or unavailable, use alcohol-resistant foam. Avoid aiming straight or solid streams directly onto the product. If it can be done safely, move undamaged containers away from the area around the fire.

>> FIRE INVOLVING TANKS, RAIL TANK CARS OR HIGHWAY TANKS: Fight fire from maximum distance or use unmanned master stream devices or monitor nozzles. Cool containers with flooding quantities of water until well after fire is out. Withdraw immediately in case of rising sound from venting safety devices or discoloration of tank. ALWAYS stay away from tanks in direct contact with flames. For massive fire, use unmanned master stream devices or monitor nozzles; if this is impossible, withdraw from area and let fire burn. (ERG, 2024)

>> Use powder, AFFF, foam, carbon dioxide. In case of fire: keep drums, etc., cool by spraying with water.

## 6. Accidental Release Measures

### Isolation and Evacuation:

Isolation and evacuation measures to take when a large amount of this chemical is accidentally released in an emergency.

>> Excerpt from ERG Guide 130 [Flammable Liquids (Water-Immiscible / Noxious); polymerization hazard]:

>> IMMEDIATE PRECAUTIONARY MEASURE: Isolate spill or leak area for at least 50 meters (150 feet) in all directions.

>> LARGE SPILL: Consider initial downwind evacuation for at least 300 meters (1000 feet).

>> FIRE: If tank, rail tank car or highway tank is involved in a fire, ISOLATE for 800 meters (1/2 mile) in all directions; also, consider initial evacuation for 800 meters (1/2 mile) in all directions. (ERG, 2024)

### Spillage Disposal:

Methods for containment and safety measures to protect workers dealing with a spillage of this chemical.

>> Remove all ignition sources. Evacuate danger area! Consult an expert! Personal protection: chemical protection suit and filter respirator for organic gases and vapours adapted to the airborne concentration of the substance. Ventilation. Collect leaking liquid in sealable containers. Absorb remaining liquid in sand or inert absorbent. Then store and dispose of according to local regulations.

## 7. Handling And Storage

### Safe Storage:

>> Fireproof. Separated from strong oxidants. Cool. Keep in the dark. Store only if stabilized.

### Storage Conditions:

>> Before entering confined space where this chemical may be present, check to make sure that an explosive concentration does not exist. Store in tightly closed containers in a cool, well ventilated area away from oxidizers (such as perchlorates, peroxides, permanganates, chlorates, and nitrates). Sources of ignition, such as smoking and open flames, are prohibited where ethyl methacrylate is handled, used, or stored. Metal containers involving the transfer of 5 gallons or more of ethyl methacrylate should be grounded and bonded. Drums must be equipped with self-closing

valves, pressure vacuum bungs, and flame arresters. Use only nonsparking tools and equipment, especially when opening and closing containers of ethyl methacrylate.

## 8. Exposure Control/ Personal Protection

### Inhalation Risk:

>> No indication can be given about the rate at which a harmful concentration of this substance in the air is reached on evaporation at 20 °C.

### Effects of Short Term Exposure:

>> Lachrymation. The substance is irritating to the eyes, skin and respiratory tract.

### Effects of Long Term Exposure:

>> Repeated or prolonged contact may cause skin sensitization.

**Fire Prevention**

>> NO open flames, NO sparks and NO smoking. NO contact with strong oxidizing agents. Closed system, ventilation, explosion-proof electrical equipment and lighting. Do NOT use compressed air for filling, discharging, or handling.

**Exposure Prevention**

>> AVOID ALL CONTACT!

**Inhalation Prevention**

>> Use ventilation. Use local exhaust or breathing protection.

**Skin Prevention**

>> Protective clothing. Protective gloves.

**Eye Prevention**

>> Wear safety goggles or eye protection in combination with breathing protection.

**Ingestion Prevention**

>> Do not eat, drink, or smoke during work.

## 9. Physical And Chemical Properties

**Molecular Weight:**

>> 114.14

**Exact Mass:**

>> 114.068079557

**Physical Description:**

>> Ethyl methacrylate appears as a colorless moderately toxic liquid with an acrid odor. Flash point of 70 °F. Boiling point 278 °F. Vapors irritate the eyes and respiratory system. Less dense than water. Not soluble in water. Used to make polymers and other chemicals.

>> COLOURLESS LIQUID WITH CHARACTERISTIC ODOUR.

**Color/Form:**

>> Colorless, liquid

**Odor:**

>> Acrid odor

**Boiling Point:**

>> 243 °F at 760 mmHg (NTP, 1992)

>> 117 °C

**Melting Point:**

>> -103 °F (NTP, 1992)

>> -75 °C

**Flash Point:**

>> 60 °F (NTP, 1992)

>> 20 °C o.c.

**Solubility:**

>> 5 to 10 mg/mL at 68 °F (NTP, 1992)

>> Solubility in water: poor

**Density:**

>> 0.9151 at 68 °F (USCG, 1999) - Less dense than water; will float

>> Relative density (water = 1): 0.91

**Vapor Density:**

>> 3.94 (NTP, 1992) - Heavier than air; will sink (Relative to Air)

>> Relative vapor density (air = 1): 3.9

**Vapor Pressure:**

>> 14 mmHg at 36 °F ; 26.2 mmHg at 73 °F; 67.0 mmHg at 118 °F (NTP, 1992)

>> Vapor pressure, kPa at 20 °C: 2

**LogP:**

>> log Kow = 1.94

>> 1.94

**Autoignition Temperature:**

>> 740 °F (USCG, 1999)

>> 450 °C

**Decomposition:**

>> When heated to decomposition, it emits acrid smoke and irritating fumes.

**Viscosity:**

>> 0.92 mPa (cP)

**Heat of Combustion:**

>> -7.040 cal/g (-294X10+5 J/kg; 12.670 Btu/lb)

**Heat of Vaporization:**

>> 96 cal/g (4.0X10+5 J/kg; 170 Btu/lb)

**Polymerization:**

Polymerization is a process of reacting monomer molecules together in a chemical reaction to form polymer chains or three-dimensional networks.

>> Heat can cause a violent polymerization reaction with rapid release of energy.

**Refractive Index:**

>> Index of refraction: 1.4147 at 20 °C/D

## 10. Stability And Reactivity

>> Highly flammable. A very dangerous fire and explosion hazard. Not soluble in water.

>> Highly Flammable

>> Polymerizable

## 11. Toxicological Information

**EPA Provisional Peer-Reviewed Toxicity Values:**

This section provides the EPA Provisional Peer-Reviewed Toxicity Values (PPRTVs) and links of related assessment documents.

**Chemical Substance**

>> Ethyl Methacrylate

**Reference Concentration (RfC), Chronic**

>> 3 x 10^-1 mg/m^3

**Reference Concentration (RfC), Subchronic**

>> 3 mg/m^3

**PPRTV Assessment**

>> PDF Document

**Weight-Of-Evidence (WOE)**

>> Inadequate information to assess carcinogenic potential

**Last Revision**

>> 2010

**USGS Health-Based Screening Levels for Evaluating Water-Quality:**

This section provides the USGS Health-Based Screening Levels for Evaluating Water-Quality data.

**Chemical**

>> Ethyl methacrylate

**Reference**

>> Smith, C.D. and Nowell, L.H., 2024. Health-Based Screening Levels for evaluating water-quality data (3rd ed.). DOI:10.5066/F71C1TWP

**Exposure Routes:**

>> The substance can be absorbed into the body by inhalation of its vapour.

**Inhalation Exposure**

>> Sore throat. Cough.

**Skin Exposure**

>> Redness. Pain.

**Eye Exposure**

>> Watering of the eyes. Redness. Pain.

**Ingestion Exposure**

>> Vomiting. Abdominal pain. Diarrhoea. Nausea.

**Adverse Effects:**

An adverse effect is an undesired harmful effect resulting from a medical treatment or other intervention.

>> Neurotoxin - Other CNS neurotoxin

>> Lacrimator (Lachrymator) - A substance that irritates the eyes and induces the flow of tears.

>> Skin Sensitizer - An agent that can induce an allergic reaction in the skin.

>> Asthma - Reversible bronchoconstriction (narrowing of bronchioles) initiated by the inhalation of irritating or allergenic agents.

**Toxicity Data:**

>> LC50 (rat) = 8,300 ppm/4h

**Antidote and Emergency Treatment:**

>> Immediate first aid: Ensure that adequate decontamination has been carried out. If patient is not breathing, start artificial respiration, preferably with a demand-valve resuscitator, bag-valve-mask device, or pocket mask, as trained. Perform CPR as necessary. Immediately flush contaminated eyes with gently flowing water. Do not induce vomiting. If vomiting occurs, lean patient forward or place on left side (head-down position, if possible) to maintain an open airway

and prevent aspiration. Keep patient quiet and maintain normal body temperature. Obtain medical attention. /Esters and related compounds/

**Human Toxicity Excerpts:**

>> /HUMAN EXPOSURE STUDIES/ ... In 542 dermatitis patients given covered patch tests with 1% EMA or 1% nBMA in petrolatum, one individual responded to EMA and another to both EMA and nBMA ... No reactions were seen in 22 contact dermatitis patients given 24-hr covered patch tests with esters within the category at a concentration of 1% in petrolatum ... The contact dermatitis of many of the tested individuals was attributed to (meth)acrylate exposure ... The prevalence of positive clinical challenge responses /was reported/ in dental clinicians that had been referred with dermatitis and suspected of having allergy to (meth)acrylates as 1.2% (51/4221) for MMA, 0.7% (16/2323) for EMA and 0.3% (1/347) for BMA ... The prevalence in a similar, pre-selected clinical cohort /was reported/ as 0.8% (9/1161) for MMA and 0.3% (2/625) for EMA ... The prevalence of positive clinical challenge tests in patients referred with dermatitis with previous contact with (meth)acrylates was reported as 4.8% (17/352) for MMA, 4.4% (11/246) for EMA and 0.6% (2/331) for BMA ... Cross-reactivity with common acrylates (i.e. between methacrylates and acrylates) has not been observed ... and methacrylic acid, the common hydrolysis product for these methacrylate esters, is not a contact allergen ... /Short chain alkyl-methacrylate esters/

**Non-Human Toxicity Excerpts:**

>> /LABORATORY ANIMALS: Acute Exposure/ ... Groups of 10 rats (strain and sex unknown) were administered Ethyl Methacrylate via stomach tube at doses ranging from 12.70 to 18.14 g/kg. The LD50 was between 12.70 and 14.51 g/kg. Two to 4 minutes following administration, the rats had an increased rate of respiration with lacrimation. After 15 to 40 minutes, they had motor weakness and their respiration decreased and breathing was irregular and labored. The frequency of defecation and urination were increased, blood was present in the urine, and reflex activity disappeared. The animals died in coma 1 to 1.5 hours following dosing. At necropsy, lesions were found primarily in the respiratory system. The lungs, trachea, and bronchi were markedly congested and edematous. The lungs were also spotted with areas of hemorrhage and emphysema. The thymus was swollen and congested. In the heart, the ventricles were well contracted and the auricles were dilated and filled with dark clotted blood. Blood was found in the dilated abdominal vessels. The greatly distended urinary bladder often contained bloody fluid, and the mucosa had areas of hemorrhage, necrosis, and detachment. Congestion of the intestine and acute inflammation of the mucosa were also evident ...

**Human Toxicity Values:**

Quantitative human toxicity values (e.g., lethal dose) for this compound.

>> The estimated human fatal dose may be about 5.4 g/kg.

**Non-Human Toxicity Values:**

>> LD50 Rabbit dermal >9.1 g/kg

## 12. Ecological Information

**Resident Soil (mg/kg)**

>> 1.80e+03

**Industrial Soil (mg/kg)**

>> 7.60e+03

**Resident Air (ug/m3)**

>> 3.10e+02

**Industrial Air (ug/m3)**

>> 1.30e+03

**Tapwater (ug/L)**

>> 6.30e+02

**MCL (ug/L)**

>> 2.00e+00

**Risk-based SSL (mg/kg)**

>> 1.50e-01

**Chronic Inhalation Reference Concentration (mg/m3)**

>> 3.00e-01

**Volatile**

>> Volatile

**Mutagen**

>> Mutagen

**Fraction of Contaminant Absorbed in Gastrointestinal Tract**

>> 1

**Soil Saturation Concentration (mg/kg)**

>> 1.10e+03

## 13. Disposal Considerations

**Spillage Disposal**

>> Remove all ignition sources. Evacuate danger area! Consult an expert! Personal protection: chemical protection suit and filter respirator for organic gases and vapours adapted to the airborne concentration of the substance. Ventilation. Collect leaking liquid in sealable containers. Absorb remaining liquid in sand or inert absorbent. Then store and dispose of according to local regulations.

**Disposal Methods**

>> Generators of waste (equal to or greater than 100 kg/mo) containing this contaminant, EPA hazardous waste number U118, must conform with USEPA regulations in storage, transportation, treatment and disposal of waste.

>> A good candidate for fluidized bed incineration at a temperature range of 450 to 980 °C and residence times of seconds for liquids and gases, and longer for solids. A good candidate for rotary kiln incineration at a temperature range of 820 to 1,600 °C and residence times of seconds for liquids and gases, and hours for solids.

## 14. Transport Information

**DOT**

Ethyl methacrylate
3
UN Pack Group: II
Reportable Quantity of 1000 lb or 454 kg

**IATA**

Ethyl methacrylate
3,
UN Pack Group: II

## 15. Regulatory Information

### TSCA Requirements:

This section provides information on requirements concerning this chemical under the Toxic Substances Control Act (TSCA) of 1976. TSCA provides EPA with authority to require reporting, record-keeping and testing requirements, and restrictions relating to chemical substances and/or mixtures. Certain substances are generally excluded from TSCA, including, among others, food, drugs, cosmetics and pesticides.

>> All persons who manufacture (including import or manufacture as a byproduct) or process or intend to manufacture or process one or more of the substances in paragraph c of this section, other than as an impurity, after July 29, 1988, to the end of the reimbursement period shall submit letters of intent to conduct testing, submit study plans, conduct tests, and submit data, or submit exemption applications for those substances they manufacture or process, or intend to manufacture or process, as specified in this section, subpart A of this part, and parts 790 and 792 of this chapter for single-phase rulemaking. Ethyl methacrylate is included on this list. Required testing: hydrolysis.

**Regulatory Information**

**The Australian Inventory of Industrial Chemicals**

>> Chemical: 2-Propenoic acid, 2-methyl-, ethyl ester, homopolymer

**The Australian Inventory of Industrial Chemicals**

>> Chemical: 2-Propenoic acid, 2-methyl-, ethyl ester

**REACH Registered Substance**

>> Status: Active Update: 24-03-2023 https://echa.europa.eu/registration-dossier/-/registered-dossier/13871

**New Zealand EPA Inventory of Chemical Status**

>> 2-Propenoic acid, 2-methyl-, ethyl ester, homopolymer: Does not have an individual approval but may be used under an appropriate group standard

**New Zealand EPA Inventory of Chemical Status**

>> 2-Propenoic acid, 2-methyl-, ethyl ester: HSNO Approval: HSR001044 Approved with controls

## 16. Other Information

### Toxic Combustion Products:

Toxic products (e.g., gases and vapors) produced from the combustion of this chemical.

>> Poisonous and acid fumes including acrylic acid, acrolein are produced in fire.

**Other Safety Information**

**Chemical Assessment**

>> IMAP assessments - 2-Propenoic acid, 2-methyl-, ethyl ester, homopolymer: Human health tier I assessment

>> IMAP assessments - 2-Propenoic acid, 2-methyl-, ethyl ester, homopolymer: Environment tier I assessment

"The information provided is believed to be accurate but is not comprehensive and should be used as a reference. It reflects our current knowledge and is intended for safety guidance related to the product. This document does not constitute a warranty of the product's properties. Ionz is not responsible for any damages resulting from handling or contact with the product incorrectly."