Section 1: Chemical Product

2,4-Toluene diisocyanate
2,6-Toluene diisocyanate

Chemical Formula: C9H6N2O2

Section 2: Composition and Information on Ingredients

CAS No. 26471-62-5 Mixed isomers
2,4-Toluene diisocyanate 80%
CAS No. 91-08-7 2,6-TDI
2,6-Toluene diisocyanate 20%

Section 3: Hazards Identification

Potential Acute Health Effects:
Extremely hazardous in case of ingestion. Very hazardous in case of skin contact (irritant), of eye contact (irritant), of inhalation. Hazardous in case of skin contact (permeator). Slightly hazardous in case of skin contact (corrosive). Severe over-exposure can result in death. Inflammation of the eye is characterized by redness, watering, and itching. Skin inflammation is characterized by itching, scaling, reddening, or, occasionally, blistering.
Potential Chronic Health Effects:
CARCINOGENIC EFFECTS: Classified 2 (Reasonably anticipated.) by NTP.
MUTAGENIC EFFECTS: Not available.
TERATOGENIC EFFECTS: Not available.
DEVELOPMENTAL TOXICITY: Not available.
The substance is toxic to lungs, the nervous system, liver, mucous membranes. Repeated or prolonged exposure to the substance can produce target organs damage. Repeated exposure to an highly toxic material may produce general deterioration of health by an accumulation in one or many human organs.

Section 4: First Aid Measures

Eye Contact:
Check for and remove any contact lenses. Do not use an eye ointment. Seek medical attention.
Skin Contact:
After contact with skin, wash immediately with plenty of water. Gently and thoroughly wash the contaminated skin with running water and non-abrasive soap. Be particularly careful to clean folds, crevices, creases and groin. Cover the irritated skin with an emollient. If irritation persists, seek medical attention. Wash contaminated clothing before reusing.
Serious Skin Contact:
Wash with a disinfectant soap and cover the contaminated skin with an anti-bacterial cream. Seek immediate medical attention.
Inhalation:
Allow the victim to rest in a well ventilated area. Seek immediate medical attention.
Serious Inhalation:
Evacuate the victim to a safe area as soon as possible. Loosen tight clothing such as a collar, tie, belt or Waistband. If breathing is difficult, administer oxygen. If the victim is not breathing, perform mouth-to-mouth resuscitation.

WARNING: It may be hazardous to the person providing aid to give mouth-to-mouth resuscitation when the inhaled material is toxic, infectious or corrosive. Seek immediate medical attention.
Ingestion:
Do not induce vomiting. Examine the lips and mouth to ascertain whether the tissues are damaged, a possible indication that the toxic material was ingested; the absence of such signs, however, is not conclusive. Loosen tight clothing such as a collar, tie, belt or waistband. If the victim is not breathing, perform mouth-to-mouth resuscitation. Seek immediate medical attention.
Serious Ingestion: Not available.

Section 5: Fire and Explosion Data

Flammability of the Product: May be combustible at high temperature.
Auto-Ignition Temperature: 620°C (1148°F)
Flash Points: CLOSED CUP: 127°C (260.6°F). OPEN CUP: 135°C (275°F).
Flammable Limits: LOWER: 0.9% UPPER: 9.5%
Products of Combustion: These products are carbon oxides (CO, CO2), nitrogen oxides (NO, NO2...).
Fire Hazards in Presence of Various Substances: Slightly flammable to flammable in presence of oxidizing materials.
Explosion Hazards in Presence of Various Substances:
Risks of explosion of the product in presence of mechanical impact: Not available.
Risks of explosion of the product in presence of static discharge: Not available.
Slightly explosive to explosive in presence of oxidizing materials.
Fire Fighting Media and Instructions:
SMALL FIRE: Use DRY chemical powder.
LARGE FIRE: Use water spray, fog or foam. Do not use water jet.
Special Remarks on Fire Hazards: Not available.
Special Remarks on Explosion Hazards: Not available.

Section 6: Accidental Release Measures

Small Spill:
Absorb with an inert material and put the spilled material in an appropriate waste disposal.
Large Spill:
If the product is in its solid form:
Use a shovel to put the material into a waste disposal container.
If the product is in its liquid form:
Absorb with an inert material and put the spilled material in an appropriate waste disposal.
Be careful that the product is not present at a concentration level above TLV. Check TLV on the MSDS.

Section 7: Handling and Storage

Precautions:
Keep locked up Keep container dry. Keep away from heat. Keep away from sources of ignition. Empty containers pose a fire risk, evaporate the residue under a fume hood. Ground all equipment containing material.
Do not ingest. Do not breathe gas/fumes/vapour/spray. Never add water to this product In case of insufficient ventilation, wear suitable respiratory equipment If ingested, seek medical advice immediately and show the container or the label. Avoid contact with skin and eyes Keep away from incompatibles such as moisture.

Storage:
Keep container dry. Keep in a cool place. Ground all equipment containing material. Keep container tightly closed. Keep in a cool, well-ventilated place. Highly toxic or infectious materials should be stored in a separate locked safety storage cabinet or room.

Section 8: Exposure Controls/Personal Protection

Engineering Controls:
Provide exhaust ventilation or other engineering controls to keep the airborne concentrations of vapors below their respective threshold limit value. Ensure that eyewash stations and safety showers are proximal to the work-station location.
Personal Protection:
Splash goggles. Lab coat. Vapor respirator. Be sure to use an approved/certified respirator or equivalent. Gloves.
Personal Protection in Case of a Large Spill:
Splash goggles. Full suit. Vapor respirator. Boots. Gloves. A self contained breathing apparatus should be used to avoid inhalation of the product. Suggested protective clothing might not be sufficient; consult a specialist BEFORE handling this product.
Exposure Limits:
TWA: 0.02 (ppm)
TWA: 0.14 (mg/m3)

Section 9: Physical and Chemical Properties

Appearance: liquid Clear, colorless to slightly yellow.
Odor: pungent odor
Odor Threshold: 0.4 - 2.14 ppm Odor is not an adequate warning of potentially hazardous ambient air concentrations.
pH: Not applicable.
Boiling Point/Boiling Range: 250 °C (482 °F) @ 750 mm Hg
Freezing Point/Melting Point: ~ 13.5 - 14.5 °C (56.3 - 58.1 °F)
Flash Point: ~ 132 °C (269.6 °F) (COC)
Auto-ignition: > 620 °C (1,148 °F)
Flammability:
Lower Flammable Limit: 0.9 vol%
Upper Flammable Limit: 9.5 vol%
Explosive Properties: No Data Available.
Oxidizing Properties: No Data Available.
Vapor Pressure: ~ 0.003 kPa @ 25 °C (77 °F)
Evaporation Rate: No Data Available.
Relative Density: 1.2 @ 20 °C (68 °F)
Relative Vapor Density: 6 (Air = 1.0)
Viscosity: 3.0 mPa.s @ 25 °C (77 °F)
Solubility (Water): Reacts.
Partition Coefficient (Kow): Log Kow = 3.4 - 3.6

Section 10: Stability and Reactivity Data

Stability: The product is stable.
Instability Temperature: Not available.
Conditions of Instability: Not available.
Incompatibility with various substances: Highly reactive with moisture.
Corrosivity: Non-corrosive in presence of glass.
Special Remarks on Reactivity: Not available.
Special Remarks on Corrosivity: Not available.
Polymerization: Yes.

Section 11: Toxicological Information

This information represents two isomeric compounds, 2,4-toluene diisocyanate and 2,6-toluene diisocyanate, as well as mixtures of these two isomers in various proportions. Unless otherwise stated, the health effects presented in this section apply to both isomers.
Toluene-2,4-Diisocyanate 584-84-9
Acute Toxicity - Lethal Doses:
LC50 (Inhl) rat ~ 66 PPM 1 HOUR
rat ~ 45PPM 4 HOUR
LD50 (Oral) rat 4130 - 5110 MG/KG BWT
LD50 (Skin) Rabbit > 9400 MG/KG BWT
Acute Toxicity - Effects
Ingestion: Ingestion may result in irritation of the mouth and digestive tract. Gastroenteritis may result with any or all of the following
Symptoms: nausea, vomiting, diarrhea, headache. May cause damage to the stomach.
Skin Contact: Minimal hazard by skin contact; however contact with skin causes skin irritation and may cause skin and respiratory sensitization. Irritation.
Skin: Moderate skin irritant.
Eye: Severe eye irritant. Severe irritation may result in corneal opacity, redness, inflammation of the iris and swelling of the conjuctiva.
Sensitization: Respiratory sensitizer. May cause respiratory sensitization following dermal or inhalation exposure. This material may cause sensitization by skin contact.
Target Organ Effects: Skin. Eye. Lung. Respiratory system. Gastrointestinal tract.
Repeated Dose Toxicity: TDI administered repeatedly to laboratory animals at doses of 300 mg/kg bwt (oral) caused injury to the stomach, small intestine, lungs, and trachea. Repeated exposure at 0.24 ppm (inhalation) caused injury to the respiratory tract (nasal passages, trachea, larynx, bronchi, and lungs; at 0.08 ppm, local nasal effects (rhinitis) were present. Serious risk to health after prolonged exposure.
Reproductive Effects: No adverse effect on reproductive performance was observed in male and female rats exposed to TDI by inhalation at concentrations up to 0.30 ppm over two generations.
Developmental Effects: TDI is not teratogenic in rats exposed by inhalation during pregnancy at concentrations up to 0.50 ppm. Maternal toxicity and minimal fetotoxicity occurred at 0.50 ppm. Post-natal toxicity evident by reduced body weight was observed in offspring
of rats repeatedly exposed by inhalation to 0.08 ppm TDI before mating, during pregnancy, and during lactation.
Genetic Toxicity: Inconsistent evidence of mutagenic activity in test systems in vitro. No increase in micronuclei or unscheduled DNA synthesis in rodents after in vivo exposure.
Carcinogenicity: No increase in tumors in rats or mice after long-term exposure via inhalation at concentrations up to 0.15 ppm. Long-term ingestion of doses of 60 mg/kg bwt and greater caused increases in tumors in rats and mice. Rats exhibited an increased incidence in subcutaneous fibromas

and fibrosarcomas, mammary gland fibroadenomas, pancreatic acinar-cell and islet-cell adenomas, and neoplastic liver nodules and mice showed increases in the incidence of hemangiomas and hemangiosarcomas and hepatocellular adenomas. Human studies of occupational exposure to isocyanates have not found a strong association or consistent pattern of cancer. Based upon animal ingestion studies, TDI has been classified by NTP as reasonably anticipated to be a carcinogen, by IARC as a Group 2B - possibly carcinogenic to humans, and as a potential
occupational carcinogen by NIOSH.
Toluene-2,6-Diisocyanate 91-08-7
Irritation:
Skin: Moderate skin irritant. Skin sensitizer.
Eye: Severe eye irritant. Severe irritation may result in corneal opacity, redness, inflammation of the iris and swelling of the conjunctiva.

Section 12: Ecological Information

Ecotoxicity: Not available.
BOD5 and COD: Not available.
Products of Biodegradation:
Possibly hazardous short term degradation products are not likely. However, long term degradation products may arise.
Toxicity of the Products of Biodegradation: The products of degradation are more toxic.
Special Remarks on the Products of Biodegradation: Not available.

Section 13: Disposal Considerations

Waste Disposal:
Contaminated product, soil, water, container residues and spill cleanup materials may be hazardous wastes under applicable local, state or international regulations due to toxicity. Use registered transporters. Decontaminate containers thoroughly before reuse/disposal. Incinerate concentrated liquids in compliance with local, state or international regulations. Do not treat biologically; may poison/upset plant biomass. Consider permitted contractor for off site treatment/disposal. Comply with applicable local, state or international regulations concerning solid or hazardous waste
disposal and/or container disposal.

Section 14: Transport Information

DOT Classification: CLASS 6.1: Poisonous material.
Identification: Toluene diisocyanate : UN2078 PG: II
Special Provisions for Transport: Not available.

Section 15: Other Regulatory Information

Other Regulations:
OSHA: Hazardous by definition of Hazard Communication Standard (29 CFR 1910.1200).
Other Classifications:
DSCL (EEC):
R26- Very toxic by inhalation.
R38- Irritating to skin.
R41- Risk of serious damage to eyes.
R45- May cause cancer.

National Fire Protection Association (U.S.A.):
Health: 3
Flammability: 1
Reactivity: 2
Specific hazard:
Protective Equipment:
Gloves.
Lab coat.
Vapor respirator. Be sure to use an approved/certified respirator or equivalent. Wear appropriate respirator when ventilation is inadequate.
Splash goggles.

Section 16: Other Information

References: Not available.
Other Special Considerations: Not available.

The information above is believed to be accurate and represents the best information currently available to us. However, we make no warranty of merchantability or any other warranty, express or implied, with respect to such information, and we assume no liability resulting from its use. Users should make their own investigations to determine the suitability of the information for their particular purposes.