1. IDENTIFICATION OF THE SUBSTANCE/PREPARATION AND THE COMPANY/ UNDERTAKING

Identification of the substance or preparation:	**Toluene**
Country of origin:	**Iran (Islamic Republic of Iran)**
CAS Number:	**108-88-3**
Synonyms:	**BENZENE, METHYL-; METHYLBENZENE; 1-METHYLBENZENE;METHYLBENZOL; PHENYLMETHANE; METHANE, PHENYL-; METHACIDE;TOLUOT; ANTISAL 1A; RCRA U220; CP 25; CP 25 (SOLVENT); METHYL BENZENE; TOULENE; STCC 4909305; UN 1294; C7H8; OHS23590; RTECS ,XS5250000**
Company/undertaking identification	**National Petrochemical Company** **Iran Petrochemical Commercial Company (IPCC)**
Manufacturer subcontractor:	**None**
Emergency phone number:	**00982188881735**
Contact email:	**msds@petrochem-ir.net**
Fax:	**00982188839511**
Association/Organization:	**None**
Use of the substance/Preparation:	**Toluene is a leading petrochemical building block, ranking forth in importance behind ethylene, benzene and propylene .toluene is also valued as a solvent and an octane improver in gasoline .it is used to produce benzene, benzoic acid, p-xylene, caprolactam, phenol/acetone and TDI.**

2. COMPOSITION/INFORMATION ON INGREDIENTS

Hazardous substances:	**Toluene : NFPA RATINGS (SCALE 0-4):** **HEALTH=2 FIRE=3 REACTIVITY=0** **EC CLASSIFICATION (ASSIGNED):** **F Highly Flammable ,Xn Harmful 11-20** **EMERGENCY OVERVIEW: COLOR: colorless** **PHYSICAL FORM: liquid, ODOR: distinct odor** **MAJOR HEALTH HAZARDS: respiratory tract irritation, skin irritation, eye irritation,** **central nervous system depression, never damage** **PHYSICAL HAZARDS: Flammable liquid and vapor. Vapor may cause flash fire.** **Electrostatic charges may be generated by flow, agitation, etc.**
Hazardous label(s):	**POISON! DANGER! HARMFUL OR FATAL IF SWALLOWED. HIGHLY FLAMMABLE.**
Toxicological characteristics:	**POISON! DANGER! HARMFUL OR FATAL IF SWALLOWED.**

	HARMFUL IF INHALED OR ABSORBED THROUGH SKIN. VAPOR HARMFUL. FLAMMABLE LIQUID AND VAPOR. MAY AFFECT LIVER, KIDNEYS, BLOOD SYSTEM, OR CENTRAL NERVOUS SYSTEM. CAUSES IRRITATION TO SKIN, EYES AND RESPIRATORY TRACT.
Substances present at a concentration below the minimum danger:	**Not available**
	(Total non aromatics , benzene , ethyl benzene , xylene ,styrene) : max 2% WT
Other component:	**(Total non aromatics , benzene , ethyl benzene , xylene ,styrene) : max 2% WT**

3. IDENTIFICATION OF HAZARDS

Risk phrases:	**F Symbol** **XN** **R11 Highly Flammable** **R20 Harmful by inhalation** **R38 irritating to skin** **UN Hazard Class: 3** **UN Pack Group: II**
Skin contact:	**SHORT TERM EXPOSURE: irritation** **LONGE TERM EXPOSURE: same as effects reported in short term exposure**
Inhalation :	**SHORT TERM EXPOSURE: irritation, metallic taste, nausea, headache, drowsiness, and symptoms of drunkenness.** **LONGE TERM EXPOSURE: chest pain, irregular heartbeat, never damage, kidney dotage, blood disorders, brain damage and reproductive effects**
Eye contact:	**Causes eye irritation.** **SHORT TERM EXPOSURE: irritation** **LONGE TERM EXPOSURE: same as effects reported in short term exposure**
If swallowed:	**SHORT TERM EXPOSURE: same as effects reported in short term inhalation, aspiration hazard** **LONGE TERM EXPOSURE: reproductive effects.**
Other information:	**Inhalation of high concentration may cause central nervous system effects characterized by headache, depression, lassitude, transit memory loss.**

4. FIRST AID MEASURES

As a general rule, in case of doubt or if symptoms persist, always call a doctor
NEVER induce swallowing in an unconscious person.

Skin contact :	**Take off contaminated clothing and shoes. Wash immediately with plenty of water at least 15 minutes. Get medical attention. An eye wash fountain،safety shower and general washing facility must be available to work area.**
In case of exposure by inhalation:	**Remove to fresh air. Give artificial respiration if not breathing. IF breathing is difficult give Oxygen. Get medical aid.**
In case of splashes or contact with eyes:	**Immediately flush eyes with plenty of water for at least 15 minutes. Then get immediate medical attention.**
In case of swallowing:	**Potential for aspiration if swallowed.**
Note of physician:	**If swallowed, do NOT induce vomiting Get immediate medical attention.**
Note of physician:	**For ingestion, consider gastric lavage**

5. FIRE FIGHTING MEASURES

Flammable class:	**Severe fire hazard. The vapor is heavier than Air. Vapors or gases may ignite at distant ignition sources and flash back. Vapor/air mixtures are explosive. Electrostatic discharges may be generated by flow or agitation resulting in ignition or explosion. FLASH POINT: 39 °F (4 °C) (CC) LOWER FLAMMABLE LIMIT: 1.2% UPPER FLAMMABLE LIMIT: 7.1% AUTOIGNITION: 896 °F (480 °C) FLAMMABILITY CLASS (OSHA): IB**
Suitable extinguishing media:	**Regular dry chemical, carbon dioxide, water, regular foam. Large fires: Use regular foam or flood with fine water spray. Use water spray to cool fire-exposed containers .water run off can cause environmental damage .DIKE AND COLLECT WATER USED TO FIGHT FIRE.**
Fire fighting :	**Move container from fire area if it can be done without risk. Cool containers with water spray until**

	well after the fire is out. Stay away from the ends of tanks. For fires in cargo or storage area: Cool containers with water from unmanned hose holder or monitor nozzles until well after fire is out. If this is impossible then take the following precautions: Keep unnecessary people away, isolate hazard area and deny entry. Let the fire burn. Withdraw immediately in case of rising sound from venting safety device or any discoloration of tanks due to fire. For tank, rail cal or tank truck: Evacuation radius: 800 meter (1/2 mile). Water may be ineffective.
Special exposure hazards arising from the substance or preparation itself, combustion products, resulting gases:	**Mono oxide carbon and dioxide carbon**
Special protective equipment for fire fighting :	**Firefighters should wear full bunker gear, including a positive pressure self-contained breathing apparatus. Wear chemical goggles and gloves**
Other information:	**Not available**

6. ACCIDENTAL RELEASE MEASURES

Personal precautions:	**Use proper protective equipment as indicated in section 5**
Environmental precautions:	**Remove or shut off all sources of ignition. Remove mechanically or contain on an absorbent material such as dry sand or earth .keep out of sewers and waterways.**
Methods for cleaning up and disposal:	**Absorb spill with inert material (e.g. vermiculite, sand or earth), then place in suitable container. Remove all sources of ignition. Provide ventilation. A vapor suppressing foam may be used to reduce vapors. Water spray may reduce vapor but may not prevent ignition in closed spaces.**
Other information:	**AIR RELEASE:** **Reduce vapors with water spray.** **Stay upwind and keep out of low areas.** **SOIL RELEASE:** **Dig holding area such as lagoon, pond or pit for containment. Dike for later disposal. Absorb with sand or other non-combustible material. Collect with absorbent into suitable container.** **WATER RELEASE:** **Absorb with activated carbon. Collect spilled material using mechanical equipment. Cover with absorbent sheets, spill-control pads of pillows. Apply detergents, soaps, alcohols or another surface**

active agent. Remove trapped material with suction hoses. Subject to California safe drinking water and toxic enforcement act of 1986 (proposition 65). Keep out of water supplies and sewers.
Occupational Release:
Avoid heat, flames, sparks and other sources of ignition. Stop leak if possible without personal risk. Reduce vapors with water spray. Small spills absorb with sand or other noncombustible material. Collect spilled material in appropriate container for disposal. Large spills:
Dike for later disposal. Remove sources of ignition. Keep unnecessary people away, isolate hazard area and deny entry. Notify local emergency planning committee and state emergency response commission for release greater than or equal to RQ (U.S. Sara section 304). If release occurs in the U.S. and is reportable under CERCLA section.103, notify the national response center at (800) 424-8802 (USA) or (202) 426-2675 (USA).

7. HANDLING AND STORAGE

The regulations relating to storage premises apply to workshop where the product is handled:

Handling:	**Protect against physical damage. Store in a cool, dry well-ventilated location, away from any area where the fire hazard may be acute. Outside or detached storage is preferred. Separate from incompatibles. Containers should be bonded and grounded for transfers to avoid static sparks. Storage and use areas should be No Smoking areas. Use non-sparking type tools and equipment, including explosion proof ventilation. Containers of this material may be hazardous when empty since they retain product residues (vapors, liquid); observe all warnings and precautions listed for the product.**
Storage:	**Keep container closed when not in use. Keep away from ignition sources such as heat, sparks, or open flames. Keep container closed. Use with adequate ventilation.**
Other information:	**Store and handle in accordance with all current regulations and standards. Subject to storage regulations: U.S. OSHA 29 CFR**

1910.106 protect from physical damage. Store outside or in a detached building. Store with flammable liquids. Keep separated from incompatible substances. Grounding and bonding required. Store in a tightly closed container. Store in a cool, dry place.

Observe all federal, state and local regulations when storing and handling this substance. Store away from incompatible substances.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Exposure limit values:	**Exposure Limits:** **Toluene:** **200ppm OSHA TWA** **300ppm OSHA ceiling** **500ppm OSHA peak 10 minute(s)** **100ppm (377 mg/m3) OSHA TWA (vacated by 58 FR 35338, June 30, 1993)** **150ppm (565 mg/m3) OSHA STEL (vacated by 58 FR 35338, June 30, 1993)** **100ppm (377 mg/m3) NIOSH recommended TWA 10 hour(s)** **150ppm (565 mg/m3) NIOSH recommended STEL** **190 mg/m3 (50 ml/m3) DFG MAK 4 times/shift** **50ppm (191 mg/m3) UK OES TWA** **150ppm (574 mg/m3) UK OES STEL** **50ppm(188mg/m3) ACGIH TWA (Skin)** **Measurement method: Charcoal tube; Carbon disulfide; Gas chromatography with flame Ionization detection; NIOSH III # 1500, Hydrocarbons.**
Exposure controls:	**Provide local exhaust ventilation system. Ventilations of material are present. Ensure compliance with applicable exposure limits.**
Personal protective equipment:	**As blow**
Eye protection:	**Wear splash resistant safety goggles. Provide an emergency eye wash fountain and quick drench Shower in the immediate work area.**
Respiratory protection:	**The following respirators and maximum use concentrations are drawn from NIOSH and/or OSHA. 500 ppm Any chemical cartridge respirator with organic vapor cartridge(s).** **Any powered, air-purifying respirator with organic vapor cartridge(s).**

	Any air-purifying respirator with a full face piece and an organic vapor canister. **Any supplied-air respirator.** **Any self-contained breathing apparatus with a full facepiece.** **Escape-** **Any air-purifying respirator with a full facepiece and an organic vapor canister.** **Any appropriate escape-type, self-contained breathing apparatus. For Unknown concentration or immediately dangerous to life of health.** **Any supplied – air respirator with full facepiece and operated in a pressure-demand or other Positive-pressure mode combination with a separate escape supply.** **Any self-contained breathing apparatus with a full facepiece.**
Hand protection:	**Wear appropriate chemical resistant gloves.**
Skin and body protection:	**Wear appropriate chemical resistant clothing.**
Health measures:	**Not available**
Environmental exposure controls:	**Not available**

9. PHYSICAL AND CHEMICAL PROPERTIES

General information:	**Toluene (liquid)**
Appearance (at 20°C):	**Appearance: clear**
Colour:	**Colorless liquid**
Odour:	**distinct odor**
Odor threshold:	**10-15 ppm**
PH (at 20°C):	**Not available**
Boiling point/range(°C):	**111°C (232°F)**
Freezing point (°C):	**-95°C (-139°F)**
Flash point (°C):	**4°C (39°F)**
Flammability:	**Highly flammable**
Auto-ignition temperature(°C):	**480 °C (896°F)**
Explosive properties:	**LOWER FLAMMABLE LIMIT: 1.2%** **UPPER FLAMMABLE LIMIT: 7.1%**
Vapour pressure (at 20°C):	**22 mmHg**
Vapour Density (air =1):	**3.14**
Specific gravity (water = 1): 0.8669	**0.8669**
Solubility (at 20°C):	**water solubility: 0.05%** **Soluble: alcohol, ether, benzene, chloroform, ligroin, acetic acid, carbon disulfide, acetone**

Volatility:	**100%**
Evaporation rate:	**2.24 (buty1 acetate = 1)**
Other information:	**Molecular weight: 92.14**

10. STABILITY AND REACTIVITY

Stability:	**Stable at normal temperatures and pressure Will not polymerize.**
Conditions to avoid:	**Avoid heat, flames, sparks and other sources of ignition. Containers may rupture of explode if exposed to heat keep out to of water supplies and sewers.**
Material to avoid:	**Halogens, combustible materials, acids, oxidizing materials, metal salts. Toluene:Allyl chloride + dichloroethyl aluminum or ethyl aluminum sesquichloride: Possible explosion. Bromine trifluoride (SOLID): violent reaction. 1, 3-Dichloro-5, 5-Dimethyl-2, 4-Imidazolididione: explosive reaction. Dinitrogen tetra fluoride: forms explosive mixture. Mineral acids (strong): Incompatible. Nitric acid: Vigorous reaction. Nitric acid + sulfuric acid: Violent decomposition possible. Nitrogen tetroxide: Explosive reaction. Oxidizers (strong): Fire and explosion hazard. Plastics, rubber, and coatings: May be attacked Silver perchlorate: Forms shock-sensitive mixture. Sulfur dichloride: Violent reaction greatly accelerated in the presence of iron or ferric chloride. Sulfuric acid: Exothermic reaction. Tetranitromethane: Forms explosive mixture. Uranium hexafluoride: Violent reaction. Hazardous decomposition: Thermal decomposition products: Oxides of carbon, hydrocarbons Polymerization: Will not polymerize.**
Hazardous decomposition products:	**Oxides of carbon, hydrocarbons**

11. TOXICOLOGICAL INFORMATION

Acute toxicity:

Sub chronic – chronic toxicity:
Sensibilization:
Carcinogenicity:
Reproductive effects:
Human experience:
Other information:

Toluene:
Irritation data:
300 ppm eyes-human; 435 mg skin-rabbit mild; 500mg skin-rabbit-oderate; 2o mg/24 hour(s) skin-rabbit moderate; 870 ug eyes-rabbit mild; 2-g/24 hour(s) eyes-rabbit server; 100mg/30 second(s) rinsed eyes-rabbit mild.
Toxicity data:
50mg/kg cral-human LDLO; 200ppm inhalation-human TCLO; 100ppm inhalation –man TCLO;636 mg/kg oral-rat LD50; 49 gm/m3/4 hour (s) inhalation-rat LC50; 1332 mg/kg intraperitoneal –rat LD50; 1960 mg/kg intravenous-rat LD50; mg/kg unreported-rat LD50;6900 mg/kg unreported-rat LD50 400 ppm/24 hour(s) inhalation-mouse LC50;59 mg/kg intraperitoneal-mouse LD50; 2250 mg/kg subcutaneous-mouse LD50; 2gm/kg unreported-mouse LD50; 55000 ppm/40 minute(s) inhalation-rabbit LCLO; 14100 ul/kg skin-rabbit LD50; 130 mg/kg intravenous-rabbit LDLO; 1600 ppm inhalation-guinea pig LCLO; 500 mg/kg intraperitoneal-guinea pig LD50; 920 mg/kg subcutaneous-frog LDLo; 4 gm/kg oral – mammal LD50; 30 gm/m3 inhalation –mammal LC50; 1750 mg/kg intraperitoneal-mammal LDLo; 42380 mg/kg/49 day(s) intermittent oral – rat TDLO; 27645 mg/kg/3 week(s) intermittent oral-rat TDLo; 162 gm/kg/13 week(s) intermittent oral-rat TDLo; 1600 ppm/20 hour(s)-7 day(s) intermittent inhalation-rat TCLO; 12000 ppm/10 minute(s) week(s)-8 week(s) intermittent inhalation-rat TCLO; 300 ppm/6 hour(s) –2 year(s) intermittent inhalation-rat TCLo; 2500 ppm/6/5 hour (s)-15 week(s) intermittent inhalation-rat TCLo; 1500 ppm/6 hour(s)-26 week(s) intermittent inhalation –rat TCLo; 320 ppm/24 hour(s) – 30 day(s) continuous inhalation – rat TCLo; 10500 mg/kg/7 day(s) intermittent subcutaneous-rat TDLo; 300 mg/m3/5 hour(s) – 21day (S) intermittent inhalation-rat TCLO; 2200 ppm/8 hour (s)-23 week(s) intermittent inhalation-rat TCLo; 11058 ug/kg/30 day(s) intermittent intraperitoneal-rat TDLo; 227

gm/kg/13 week(s) intermittent oral-mouse TDLo; 2940 mg/kg/4 week(s) continuous oral-mouse TDLo; 12000 ppm/10 minute(s)-8 week(s) intermittent inhalation –mouse TCLo; 1250 ppm/6 hour(s)-14 week(s) intermittent inhalation-mouse Tclo; 1000 ppm/6 hour(s) –20 day(s) intermittent inhalation-mouse TCLo; 8400 mg/kg/14 day(s) intermittent oral-mouse TDLo; 50mg/m3/4 hour(s)-26 week(s) intermittent inhalation-rabbit TCLo
Carcinogen status: IARC: IARC: Human inadequate evidence, animal inadequate evidence, group3; ACGIH:A4-not classifiable as a human carcinogen.
Local Effects:
Irritant: inhalation, skin, eye
Acute toxicity level:
Moderately toxic: ingestion
Slightly toxic: inhalation, dermal absorption
Target organs: nervous system
Mutagenic data:
Unscheduled and synthesis – scherichia coli 1 pph; unscheduled dna synthesis – other microorganisms 1 pph 15 minute(s) – continuous; sex chromosome loss and non disjunction –
Drosoohila melanogaster oral 1 pph; other mutation test systems – grasshopper inhalation 20 pph
16 hour(s); DNA damage – rat liver 30 umol/L; cytogenetic analysis – rat inhalation 5400 ug/m3 16 week (s)- intermittent; cytogenetic analysis – rat subcutaneous 9600 mg/kg 12 day(s) – intermittent; mictonucleus test – mouse oral 200 mg/kg; micronucleus test – mouse intraperitoneal 433 ug/kg 24 hour(s)
Reproductive effects data:
7280 mg/kg oral-rat TDLo 6-19 day(s) pregnant female continuous; 1500 mg/m3 inhalation-rat TCLo/24 hour(s) 1-8 day(s) pregnant female continuous; 1000 mg/m3 inhalation-rat TCLo/24 hour(s) 7-14 day(s) pregnant female continuous 2000 ppm inhalation – rat TCLo/6 hour (s) 7-17 day (s) pregnant female continuous; 800mg/m3 inhalation-rat TCLo/6 hour(s) 14-20 day(s) pregnant female continuous; 1200 ppm inhalation-rat TCLo/6 hour(s) 9-12 day(s) pregnant female continuous; 9 gm/kg oral-mouse TDLo 6 -15 day (s) pregnant female continuous; 15 gm/kg oral-mouse TDLo 6-15 day(s) pregnant

female continuous; 30 gm/kg oral-mouse TDLo 6-15 day(s) pregnant female continous; 500 mg/m3 inhalation-mouse TCLo/24 hour(s) 6-13 day(s) pregnant female continuous; 1000 ppm inhalation-mouse TCLo/6 hour(s) 2-17 day(s) pregnant female continuous; 400 ppm inhalation-mouse TCLo/7 hour(s) 7-16 day(s) pregnant female continuous; 200ppm inhalation-mouse TCLo/7 hour(s) 7-16 day(s) pregnant female continuous; 1 gm/m3 inhalation-rabbit TCLo/24 hour (s) 7-20 day(S) pregnant female continuous; 100ppm inhalation-rabbit TDLo/6 hour(s) 6-18 day (s) pregnant female continuous; 800mg/m3 inhalation-hamster TCLo/6hour(s) 6-11 day(s) pregnant female continuous.

Additional Data:

Alcohol may enhance the toxic effects. Stimulants such as epinephrine may induce ventricular fibrillation. The metabolism of other solvents may be inhibited resulting in a potentiation of toxic effects of those chemicals. Uptake is directly proportional to the amount of body fat. Blood levels may be cumulative when exposure is extended.

Health Effects:

Inhalation:

Acute Exposure:

Toluene: Odor detection may be insufficient for warning due to olfactory fatigue. Exposure to 100 ppm may cause irritation. 200-600 ppm for up to 8 hours caused fatigue, weakness, confusion, headache, nausea, impaired coordination and reaction time, paresthesias of the skin, euphoria, dizziness, and dilated pupils. 800ppm caused rapid irritation, nasal mucous secretion, metallic taste, drowsiness, and impaired balance. After effects including nervousness, muscular fatigue, and insomnia lasted for several days. A worker found unconscious after exposure to high vapor concentrations for 18 hours developed hepatic and renal damage with myoglobinuria. Recovery was complete within 6 months. Hematological effects occur rarely with exposure to high concentrations. Death may be due to respiratory failure or ventricular fibrillation.

Chronic Exposure:

Toluene: Prolonged or repeated exposure may cause mucous membrane irritation, vomiting, insomnia, nosebleeds, chest pains, euphoria,

headache, vertigo, nausea, anorexia, momentary loss of memory, loss of coordination and impairment of reaction time, tinnitus, impaired speech, Vision, and/or hearing, alcohol intolerance, and petechiae and abnormal bleeding. Bone marrow hypoplasia and leukopenia have been reported occasionally, but may be due to benzene contamination.
Examination of workers exposed to 100-1100 ppm revealed hepatomegaly, mild mactocytosis, moderate erythropenia, and absolute lymphocytosis but no leukopenia. Other workers exposed to toluene fumes developed leukopenia and especially neutropenia. Within 6 months, they showed decreased prothrombin level and increased coagulation time. Periodontal effects were also noted.
Volunteers exposed to 200 ppm for 6 hours/day for 2 days showed a significant increase in heart rate. Cardiac sensitization may occur and may result in cardiac arrest due to ventricular fibrillation. Repeated inhalation to the point of euphoria has caused irreversible encephalopathy with cerebellar ataxia, rhythmic limb movements, disequilibrium, bizarre behavior, emotional liability, optic atrophy, and diffuse cerebral atrophy. Other neuropsychiatry effects may include dizziness, syncope paresthesias, peripheral neuropathy, hallucinations, lethargy, and coma.
Intentional sniffing can produce renal tubular defects with metabolic acidosis, electrolyte Abnormalities and potassium loss. Severe muscle weakness leading to limb paralysis and cardiac arrhythmias may result from the hypokalemia; however, sensory function and tendon reflexes are not impaired. Gastrointestinal effects may include abdominal pain, nausea, vomiting, and hematemesis. Chromosome changes were observed in some workers up two years after cessation of exposure to toluene. Women occupationally exposed to toluene and other varnish colvents have reported menstrual disorders, underweight offspring who did not nurse well and fetal asphyxia. One case study indicated toluene apparently crossed the placenta and created cerebella damage in an unborn infant. Dysmenorrheal has been reported in women occupationally exposed to toluene levels of 60-100 ppm. Reproductive

effects have also been reported in animals.
Skin Contact:
Acute exposure:
Toluene: Contact with the liquid may cause irritation. Vapors may cause drying. Skin absorption does occur, but it is generally too slow to produce signs of acute systemic toxicity.
Chronic Exposure:
Toluene: prolonged or repeated contact with the liquid may cause defatting of the skin with a dry fissured dermatitis. Repeated application to rabbit skin produced slight to moderate irritation and slight necrosis. Topical application of 10 gm/kg produced an increase in plasmic and lymphoid reticular cells in bone marrow of rate, while 1 gm/kg had no effect.
Eye Contact:
Acute exposure:
Toluene: liquid may cause irritation and corneal burns if not promptly removed. Concentrations around 300-800 ppm may cause notice irritatior and lacrimation. Corneal lesions and very fine vacuoles have been reported in workers exposed to a solvent containing toluene. The lesions subsided following several days of non-exposure. Similar lesions have been produce in cats following exposure to toluene.
Chronic Exposure:
Toluene: prolonged or repeated contact with the liquid may cause defatting of the skin with a dry fissured dermatitis. Repeated application to rabbit skin produced slight to moderate irritation and slight necrosis. Topical application of 10 gm/kg produced an increase in plasmic and lymphoid reticular cells in bone marrow of rate, while 1 gm/kg had no effect.
Eye Contact:
Acute exposure:
Toluene: liquid may cause irritation and corneal burns if not promptly removed. Concentrations around 300-800 ppm may cause notice irritatior and lacrimation. Corneal lesions and very fine vacuoles have been reported in workers exposed to a solvent containing toluene. The lesions subsided following several days of non-exposure. Similar lesions have been produce in cats following exposure to toluene.
Chronic Exposure:
Toluene: repeated of prolonged contact with irritants may cause conjunctivitis.

Ingestion:
Acute exposure:
Toluene: May cause a burning sensation in the epigastrium and abdominal spasms. Systemic effects may occur as described in acute inhalation. Aspiration of the liquid into the lungs may cause coughing, gagging, distress, acute hemorrhagic pneumonitis, and rapidly developing pulmonary edema. The approximate lethal dose in humans is 15-30 ml.
Chronic Exposure:
Toluene: No effects were reported in rate fed up to 590 mg/kg/day for 193 days. Administration to animals during gestation produced significant embryolethality and an increase in cleft palate in offspring.

12. ECOLOGICAL INFORMATION

Ecotoxicity:	**Fish toxicity: 8110 ug/L 96 hour(s) LC50 (mortality) coho salmon, silver salmor (Oncorhynchus kisutch)** **Invertebrate toxicity: 6000 ug/L 48 hour(s) EC50 (immobilization) water flea (daphnia magna)** **Algal toxicity: 9400 ug/L 8 hour(s) EC50 EC50 (growth) green algate (selenastrum capricormutum)**
Bioaccumulative potential:	**Bioconcentration: 1716 ug/L6 hour(s) BCF (residue)water flea (daphnia magna)1.5 ug/L**
Mobility:	**Bioconcentration: 1716 ug/L6 hour(s) BCF (residue) water flea (daphnia magna) 1.5 ug/L** **From soil, substance evaporates and it is microbial biodegraded.**
Persistence and degradability:	**From soil, substance evaporates and it is microbial biodegraded.** **In water substance volatilizes and biodegrades.** **Photo chemically produced hydroxyl radicals degrade substance.**
Other adverse effects:	**Not available**

13. DISPOSAL CONSIDERATIONS

Disposal of product:	**Subject to disposal regulations: U.S. EPA 40 CFR 262. Hazardous waste number(s): U220.dispose in accordance with all applicable regulations.** **Disposal must be in accordance with applicable federal, state, or local regulations .residues and**

	spilled material are hazardous waste due to ignitability.
Disposal of packaging:	**The container for this product can present explosion or fire hazards, even when emptied! TO avoid risk of injury, do not cut, punctuate, or weld on or near this container .Since the emptied containers retain product residue, follow label warnings even after container is emptied.**

14. TRANSPORT INFORMATION

	Substance name: toluene
Land transport:	**Un number: UN1294** **ADR/RID class: 3** **Item number: 3(b)** **Warning sign/label: 3** **Hazard ID number: 33**
Maritime transport:	**Correct technical name: methylbenzene** **UN/ID number: UN1294** **IMDG class: 3.2** **Packaging group: II** **EMS No.: 3-07** **MFAG table No.: 310** **Marine pollutant: N**
Air transport:	**Correct technical name: toluene** **UN/ID number: UN1294** **IATA/ICAO class: 3** **Packaging group: II** **Label: flammable liquid**

15. REGULATORY INFORMATION

	U. S. Regulations:
Hazardous label(s):	**TSCA inventory status: Y** **TSCA 12(b) export notification: Not listed.** **Cercla section 103 (40CFR 302.4) : Y** **Toluene: 1000 LBS RQ** **SAPA section 302 (40CFR355.30): N** **SAPA section 304 (40CFR355.40): N** **SAPA section 313 (40CFR372.65): Y** **Toluene** **Sara hazard categories, sara sections 311/312 (40CFR370.21) :** **ACUTE:Y** **CHRONIC: Y** **FIRE: Y**

REACTIVE: N
Sudden release: N
OSHA process safety (29CFR1910.119) :N
State regulations:
California proposition 65:Y
Known to the state of California to cause the following:
Toluene
Developmental toxicity (Jan 01,1991)
European Regulations:
EC number (EINECS): 203-625-9
EC risk and safety phrases:
S 2 Keep out of reach of children.
S 16 Keep away from sources of ignition – No smoking.S 25 Avoid contact with eyes.
S 29 Do not empty into drains 33 Take precautionary measures against static discharges. Concentration Limits: C>=12.5% Xn R 20
German Regulations:
Water hazard class (WGK): 2 (Official German Classification)

Safety phrases:

S 2 Keep out of reach of children.
S 16 Keep away from sources of ignition – No smoking.S 25 Avoid contact with eyes.
S 29 Do not empty into drains.
S 33 Take precautionary measures against static discharges.

Risk phrases:

R11 Highly flammable
R 20 Harmful by inhalation

16. OTHER INFORMATION

None

The contents and format of this MSDS are in accordance with EEC Commission Directive 2001/58/EC

Disclaimer of liability:

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