



Material Safety Data Sheet

Section I – Product and Company Identification

Product Name:

PARA XYLENE

Synonyms: 1,4- Dimethy benzene, P-Dimethyl benzene, P- methyl toluene, P-Xylol, P-XYLENE

Chemical Family: Hydrocarbons Aromatic

Formula: C₈-H₁₀

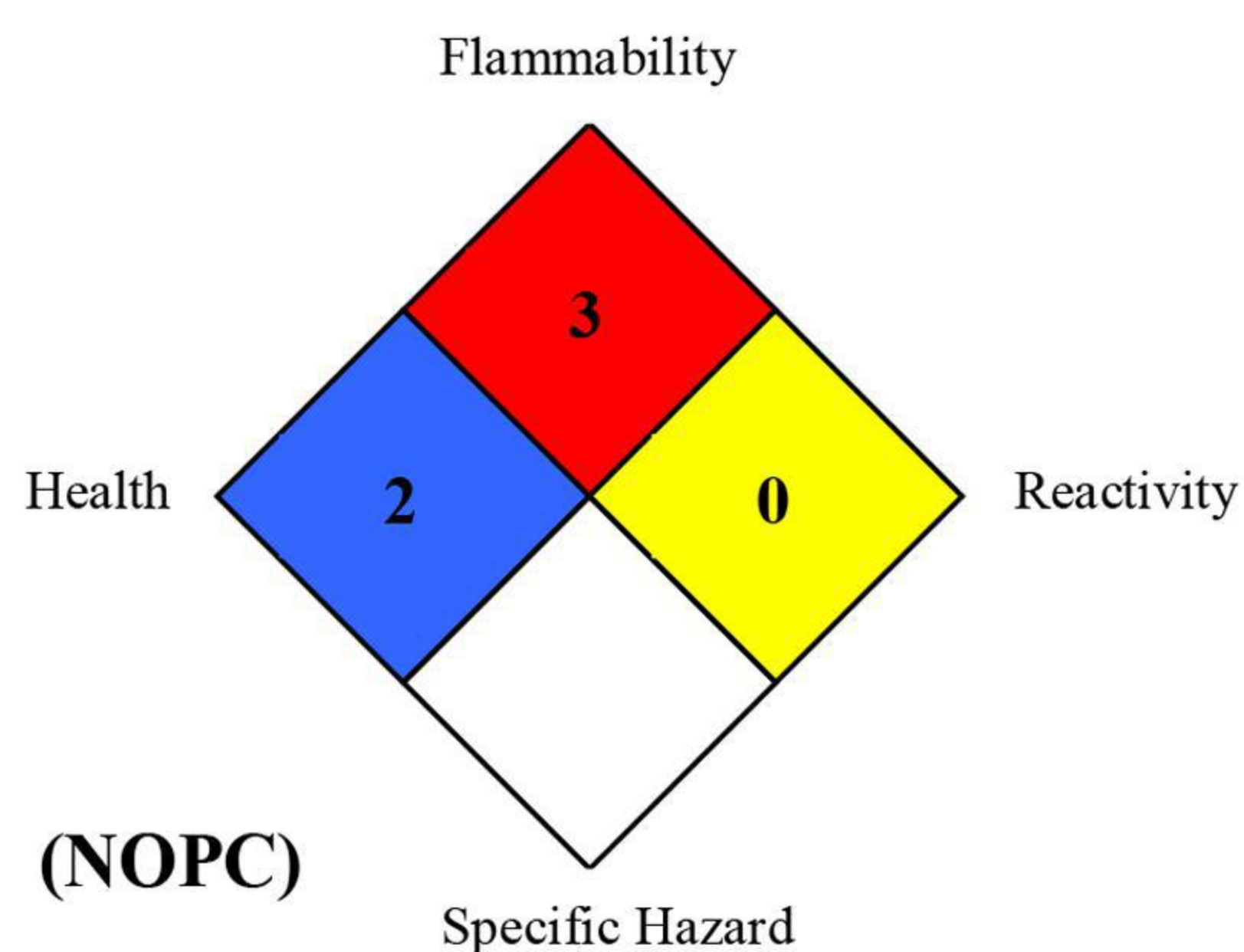
Manufacturer: BORZUYEH PETROCHEMICAL COMPANY (NOPC)

PARS ENERGY ECONOMICAL SPECIAL ZONE – BUSHEHR – IRAN

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Section II – Composition / Information on Ingredients

Component Information:

Name	CAS #	% W
Para Xylene	106-42-3	>99

Section III – Hazard Identification

Appearance: Colorless to Yellow liquid. Flash Point: -11 deg C.



Odor: distinct odor

Danger! *Extremely flammable liquid and vapor. Vapor may cause flash fire. Harmful if swallowed, inhaled, or absorbed through the skin. Causes eye, skin, and respiratory tract irritation. Contains benzene. Benzene can cause cancer. Aspiration hazard if swallowed. Can enter lungs and cause damage. May cause blood abnormalities. May cause central nervous system effects.*

Target Organs: Blood, central nervous system, respiratory system, eyes, bone marrow, immune system, skin.

Potential Health Effects:

Eye Contact

Causes eye irritation.

Skin Contact

Causes skin irritation, blisters. Harmful if absorbed through the skin. Prolonged and/or repeated contact may cause defeating of the skin and dermatitis.

Ingestion

May cause central nervous system depression, characterized by excitement, followed by headache, dizziness, drowsiness, and nausea. Advanced stages may cause collapse, unconsciousness, coma and possible death due to respiratory failure. May cause effects similar to those for inhalation exposure. Aspiration of material into the lungs may cause chemical pneumonitis, which may be fatal.

Inhalation

Causes respiratory tract irritation. May cause drowsiness, unconsciousness, and central nervous system depression. Exposure may lead to irreversible bone marrow injury. Exposure may lead to aplastic anemia. Potential symptoms of overexposure by inhalation are dizziness, headache, vomiting, visual disturbances, staggering gait, hilarity, fatigue, and other symptoms of CNS depression.

Chronic

May cause bone marrow abnormalities with damage to blood forming tissues. May cause anemia and other blood cell abnormalities. Chronic exposure to benzene has been associated with an increased incidence of leukemia and multiple myeloma (tumor composed of cells of the type normally found in the bone marrow). Immunodepressive effects have been reported. This substance has caused adverse reproductive and fetal effects in laboratory animals.

Section IV – First Aid Measures

Eyes Contact

In case of contact, immediately flush eyes with plenty of water for at least 15 minutes. Get medical aid.

Skin Contact

In case of contact, flush skin with plenty of water. Remove contaminated clothing and shoes. Get medical aid if irritation develops and persists. Wash clothing before reuse.

Ingestion

Potential for aspiration if swallowed. Get medical aid immediately. Do not induce vomiting unless directed to do so by medical personnel. Never give anything by mouth to an unconscious person. If vomiting occurs naturally, have victim lean forward.

Inhalation

If inhaled, remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical aid.

Notes to Physician

Treat symptomatically and supportively.



Section V – Fire Fighting Measures

General Information

As in any fire, wear a self-contained breathing apparatus in pressure-demand, MSHA/NIOSH (approved or equivalent), and full protective gear. Use water spray to keep fire-exposed containers cool. Extremely flammable liquid and vapor. Vapor may cause flash fire. Approach fire from upwind to avoid hazardous vapors and toxic decomposition products. Vapors are heavier than air and may travel to a source of ignition and flash back. Vapors can spread along the ground and collect in low or confined areas. This liquid floats on water and may travel to a source of ignition and spread fire. May accumulate static electricity.

Extinguishing Media

Use water spray, dry chemical, carbon dioxide, or appropriate foam.

Flash Point : 27 C (81C)

Auto ignition Temperature : 528 deg C (982 deg F)

Lower Explosion Limits : 1.1 %

Upper Explosion Limits : 7.0 %

Flammability class (osha) : IC

NFPA Rating : (estimated) Health: 2; Flammability: 3; Instability: 0

Section VI – Accidental Release Measures

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.

WATER RELEASE :

Cover with absorbent sheets, spill-control pads or pillows. Apply detergents, soaps, alcohols or another surface active agent. Collect with absorbent into suitable container. Absorb with activated carbon. Remove trapped material with suction hoses. Collect spilled material using mechanical equipment. 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).

Section VII – Handling and Storage

Store and handle in accordance with all current regulations and standards. Subject to storage regulation : U.S. OSHA 29 CFR 1910.106. Grounding and bonding required. Protect from physical damage. Store outside or in a detached building. Store with flammable liquids. Keep separated from incompatible substances.

**Section VIII – Exposure Controls/ Personal Protection****Exposure Limits:**

100 ppm (435 mg/m³) OSHA TWA

150 ppm (651 mg/m³) OSHA STEL (vacated by 58 FR 35338, Jun,30, 1993)

100 ppm ACGIH STEL

100 ppm (435 mg/m³) NOISH recommended TWA 10 hour(s)

150 ppm (655 mg/m³) NOISH recommended STEL

440 mg/m³ (100 ml/m³) DFG MAK (peak limitation category-II, 1) (skin)

100 ppm (441 mg/m³) UK OES TWA (skin)

150 ppm (662 mg/m³) UK OES STEL (skin)

Measurement method: charcoal tube; carbon disulfide; gas chromatography with flame ionization detection NOISH IV # 1501 aromatic hydrocarbons.

Ventilation: provide local exhaust ventilation system. Ventilation equipment should be explosion resistant if explosive concentrations of material are present. Ensure compliance with applicable exposure limits.

Eye protection: wear splash resistant safety goggles. Provide an emergency eye wash fountain and quick drench shower in the immediate work area.

Clothing: wear appropriate chemical resistant clothing.

Gloves: wear appropriate chemical resistant gloves.

Respirator: the following respirators and maximum use concentrations are drawn from NOISH and /or OSHA.

900 ppm

Any chemical cartridge respirator with organic vapor cartridge(s).

Any powered, air purifying with organic vapor cartridge(s).

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 concentrations or immediately dangerous to life or health any supplied air respirator with full facepiece and operated in a pressure demand or other positive pressure mode in combination with separate escape supply.

Any self contained breathing apparatus with a full facepiece.

Section IX – Physical and Chemical Properties



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Physical state: liquid

Appearance: clear

Color: colorless

Odor: sweet odor

Molecular weight: 106.17

Molecular formula: C₈-H₁₀

Boiling point: 280 F (138 C)

Freezing point: 55 F (13 C)

Vapor pressure: 8.6 mmHg @ 25 C

Vapor density (air=1): 3.7

Specific Gravity (Water =1): 0.8611

Water solubility: insoluble

PH: not available

Volatility: Not available

Odor threshold: 0.47 ppm

Evaporation rate: 0.7 (butyl acetate=1)

Coefficient of water / oil distribution: not available

Solvent solubility:

Soluble: alcohol, ether, benzene, acetone, organic solvents

Section X – Stability and Reactivity

Reactivity: stable at normal temperatures and pressure.

Conditions to avoid: avoid heat, flames, sparks and other source of ignition.

Containers may rupture or explode if exposed to heat keep out of water supplied and sewers.

Incompatibilities: acids, combustible materials; oxidizing materials.

P-xylene:

Acetic acid + air: possible explosion in liquid phase oxidation of p-xylene 1,3 dichloro-5, 5-dimethyl-2, 4-imidazolidione: possible explosion.

NITRIC ACID: Intense reaction.

Hazardous decomposition:

Thermal decompositional products: oxides of carbon

Polymerization: will not polymerize

Section XI – Toxicological Information

Toxicity data:

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5 mg/kg oral-rat LD50, 4550 PPM/4 hour(s) inhalation rat LC 50; 3810 mg/kg intraperitoneal rat LD50 15 gm/m³ inhalation mouse LCLO; 2450 ul/kg intraperitoneal mouse LD50;>8350 ppm/4 hours inhalation guinea pig LC;2 gm/kg intraperitoneal mammal LDLO;5 mg/kg subcutaneous mammle LDLO carcinogen status: IARC; human inadequate evidence animal inadequate evidence animal inadequate evidence group 3 ACGH: A4 not classifiable as a human carcinogen local effects: irritant: inhalation, skin, eye

Acute toxicity level:

Moderately toxic: inhalation, ingestion

Target organs: central nervous system

Reproductive effects data: 3000 mg/m³ inhalation rat TCLO/24 hours 9-10 day pregnant female continuous; 150 mg/m³ inhalation rat TCLO/24 hour 7-14 day pregnant female continuous; 7 gm/m³ inhalation rat 7-16 day pregnant female continuous 12 mg/kg oral mouse TDLO 12-15 day pregnant female continuous; 500 mg/m³ inhalation mouse TCLO/12 hours 6-15 day pregnant female continuous; 1 mg/m³ inhalation rabbit TCLO/24 hour 7-20 day pregnant female continuous.

Additional data: alcohol may enhance the toxic effects. Stimulants such as epinephrine may induce ventricular fibrillation.

Health effects:**Inhalation:****Acute exposure:**

Xylene: irritation of the upper respiratory tract may at 200 ppm exposure to higher concentrations may cause more severe irritation and initial central nervous system excitation followed by depression. Signs and symptoms may include respiratory difficulty and substernal pain transient euphoria and emotional lability, headache, nausea, vomiting, anorexia abdominal pain; dizziness, drowsiness, ataxia and staggering. There may be salivation, slurred speech, blurred vision, nystagmus, tinnitus tremors, confusion and flushing of the face and a feeling of increased body heat. In severe exposure there may be stupor anesthesia unconsciousness and coma which may be punctuated by episodes of neuroirritability but rarely frank convulsions except in terminal asphyxia. Liver and kidney damage may occur but are usually mild and transient. A group of subjects who inhaled 12.3 umol/L of xylene while exercising became significantly impaired on 3 neuropsychological tests. Exposure of 3 painters to approximately 10000 ppm for 18.5 hours resulted in 1 death from pulmonary edema and petechial brain hemorrhage. Both survivors were unconscious for 19-24 hours and experienced retrograde amnesia hypothermia and lung congestion. Renal and hepatic impairment also developed. Complete recovery took 15 day. High concentrations may cause death from sudden ventricular fibrillation but more frequently



death occurs from respiratory arrest.

Chronic exposure:

Xylene: repeated or prolonged inhalation of vapors above 200 ppm may cause nausea vomiting, abdominal pain and anorexia. Other common complaints include headache, fatigue lassitude, irritability, breathing difficulties and flatulence. Effects on the nervous system may result in excitation followed by depression parenthesis tremors apprehension impaired memory insomnia vertigo and tinnitus. Effects on reaction time manual coordination body balance and EEG occurred with repeated exposure to 90 ppm of m-xylene. Sweetish taste in the mouth dry nose and throat strong thirst mucosal hemorrhage and anemia have been reported. Effects on the liver kidney cardiovascular system and the bone marrow have also been reported although the latter has been questioned. Exposure of rabbits to 1150 ppm for 40-55 days resulted in a reversible decrease in the red and white cell count and an increase in the platelets. One case of an apparent epileptiform seizure following a relatively brief exposure has occurred. Women may develop menstrual disorders such as menorrhagia or metrorrhagia infertility and pathological pregnancy conditions including toxicosis danger of miscarriage and hemorrhaging during delivery. Repeated exposure of pregnant mice rats rabbits to the individual or the mixed isomers has resulted in maternal effects and effects on fertility on the embryo or fetus and specific developmental abnormalities. Included among these effects are fetal death fetotoxicity pre-and post implantation mortality abortion craniofacial and musculoskeletal abnormalities and extra embryonic structures.

Skin contact:**Acute exposure:**

Xylene: liquid xylene is a defatting agent and may cause a burning sensation drying vasodilation erythema and possibly blistering. The liquid is readily absorbed through intact or broken skin at a rate of approximately 4-10 mg/cm²/huour but systematic effects have not been reported.

Chronic exposure:

Xylene: repeated or prolonged contact may cause defatting of the skin with drying erythema cracking thickening and blistering. Repeated application of 95% xylene to rabbit skin caused moderate to marked irritation with erythema and moderate necrosis. One case of allergic contact urticaria has been reported.

Eye contact:**Acute exposure:**

Xylene: 200 ppm has caused conjunction irritation in humans at higher concentration irritation may be severe. Vapor exposure has also caused tearing and photophobia. An accidental splash in the human eye caused transient superficial damage with rapid recovery



although reversible corneal burns have also been reported.

Chronic exposure:

Xylene; repeated or prolonged exposure to high vapor concentrations may cause a burning sensation conjunctiva and blurred vision reversible vacuolar epithelial keratopathy has been reported in some workers.

Ingestion:**Acute exposure:**

Xylene: lung damage may occur if aspirated into the lungs and may be fatal. Symptoms may include coughing difficulty breathing cyanosis and pulmonary edema. May cause a burning sensation in the mouth and stomach salivation severe gastrointestinal distress with nausea and vomiting possibly hematemesis and toxic effects including signs of central nervous system depression and other symptoms as in acute inhalation including ventricular fibrillation and liver and kidney injury. Ingestion of small quantities of 90% xylene plus toluene produced urinary dextrose and urobilinogen excretion with toxic hepatitis which was reversible in 20 days. A dose of 15-30 milliliters (about ½-1 ounce) is the expected human lethal dose.

Chronic exposure:

Xylene: no data available on the ortho isomer. Repeated ingestion of the mixed meta or para isomers by pregnant mice resulted in effects on fertility on the embryo or fetus or specific developmental abnormalities. Included among these effects were fetotoxicity, litter size craniofacial and musculoskeletal system abnormalities and post implantation mortality.

Section XII – Ecological Information**Ecotoxicity data:**

Fish toxicity: 8800 ug/L 96 hours LC50 (mortality) guppy (poecilia reticulata)

Invertebrate toxicity: 3600 ug/L 24 hours EC50 (immobilization) water flea (daphnia magna)

Algal toxicity: 4400 ug/L 8 hours EC50 (growth) green algae (Selenastrum capricornutum)

Section XIII – Disposal Considerations

Subject to disposal regulation: U.S EPA 40 CFR 262 hazardous waste number (s): U239.
dispose in accordance with all applicable regulations.

Section XIV – Transportation Information

U.S DOT 49 CFR 172.101:

Proper shipping name: xylene

ID number: UN1307

Hazard class: OR DIVISION :3



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Packing Group : II

Labeling requirements: flammable liquid

Packing authorizations:

Exception: 49CFR 173.150

Non-bulk packaging: 49CFR 173.202

Bulk packaging : 49 CFR 173.242

Quantity limitations:

Passenger aircraft or railcar: 5L

Cargo aircraft only: 60 L

Canadian transportation of dangerous goods: no classification assigned

Land transport ADR/RID

Substance name: xylene

UN number: UN1307

ADR/RID class: 3

Item number: 31(c)

Warning sign/label: 3

Hazard ID number: 30

Air transport IATA/ICAO :

Proper shipping name: xylene

UN/ID number: UN1307

IATA/ICAO class: 3

Packaging group: II

Label: flammable liquid

Maritime transport IMDG: no classification assigned

Section XV – Regulatory Information

U.S regulations:

Cercla section 102a/103 hazardous substance (40CFR 302.4):

P-xylene: 100 LBS RQ

Sara title III section 302 extremely hazardous substances (40 CFR 355.30): not regulated

Sara title III section 304 extremely hazardous substances (40CFR 355.40): not regulated

Sara title III sara section 311/312 hazardous categories (40CFR 370.21):

Acute: Yes

Chronic: No

Fire: yes

Reactive: No



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Sudden release: No

Sara title III section 313 (40 CFR 372.65): P-xylene

OSHA process safety (29 CFR 1910.119): not regulated

State regulations:

California proposition 65: not regulated

Canadian regulations:

Whims classification: not determined

European regulations:

EC classification (assigned):

Flammable

XN harmful

XI irritant

EC classification may be inconsistent independently researched data.

Danger/hazard symbol:

XN harmful

EC risk and safety phrases:

R 10 flammable

R 20/21 harmful by inhalation and in contact with skin

R 38 irritating to skin

S 2 keep out of reach children

S 25 avoid contact with eyes

Concentration limits:

$C \geq 20\%$ xn R 20/21-38

$12.5\% \leq C < 20\%$ xn R 20/21

German regulations:

Water hazards class (WGK):

State of classification: VwVwS

Classification under hazard to water: 2

National inventory status:

U.S inventory (TSCA): listed on inventory

TSCA 12(b) export notification: not listed

Section XVI – Other Information

MSDS summary of changes

Section 11 toxicological information

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