Safety Data Sheet PETROLEUM CRUDE OIL

SDS no. ZV2J7RAA • Version 1.0 • Date of issue: 2024-06-25

SECTION 1: Identification

GHS Product identifier

Product name	PETROLEUM CRUDE OIL

Other means of identification

Name	Product Code
PETROLEUM CRUDE (Crude Oil) TG	PT088

Recommended use of the chemical and restrictions on use

Production of various hydrocarbon gases (ethane, propane, butane), naphtha of several grades, gasoline, kerosene, fuel oils, gas oil, lubricating oils, paraffin wax and ashphalt by cracking and distillation. From the hydrocarbon gases, ethylene, propylene and butylene are produced, from which alcohols, ethylene glycols, monomers for a wide range of plastics, elastomers and pharmaceuticals are produced. Production of benzene, toluene, phenol, xylene and biosynthetically produced proteins.

Supplier's details

Name	ChemSupply Australia Pty Ltd
Address	38-50 Bedford Street 5013 Gillman South Australia Australia
Telephone	08 8440 2000
email	www.chemsupply.com.au

Emergency phone number

CHEMCALL 1800 127 406 (Australia) / +64-4-917-9888 (International)

SECTION 2: Hazard identification

General hazard statement

Dangerous goods of Class 3 (Flammable Liquid) are incompatible in a placard load with any of the following:
Class 1, Class 2.1, if both the Class 3 and Class 2.1 dangerous goods are in bulk, Class 2.3, Class 4.2, Class 5, Class 6, if the Class 3 dangerous goods are nitromethane, Class 7.

Classification of the substance or mixture

GHS classification in accordance with: UN GHS revision 7

- Aspiration hazard, Cat. 1
- Flammable liquids, Cat. 1
- Germ cell mutagenicity, Cat. 1

- Carcinogenicity, Cat. 1B
- Toxic to reproduction, Cat. 2

GHS label elements, including precautionary statements

Pictograms

Signal word **Danger**

Hazard statement(s)

H224	Extremely flammable liquid and vapor
H304	May be fatal if swallowed and enters airways
H340	May cause genetic defects
H350	May cause cancer
H361	Suspected of damaging fertility or the unborn child

Precautionary statement(s)

P201	Obtain special instructions before use.
P202	Do not handle until all safety precautions have been read and understood.
P210	Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking.
P233	Keep container tightly closed.
P240	Ground and bond container and receiving equipment.
P241	Use explosion-proof [electrical/ventilating/lighting/...] equipment.
P242	Use non-sparking tools.
P243	Take action to prevent static discharges.
P280	Wear protective gloves/protective clothing/eye protection/face protection.
P301+P310	IF SWALLOWED: Immediately call a POISON CENTER/doctor/physcian
P303+P361+P353	IF ON SKIN (or hair): Take off immediately all contaminated clothing. Rinse skin with water [or shower].
P308+P313	IF exposed or concerned: Get medical advice/attention.
P331	Do NOT induce vomiting.
P370+P378	In case of fire: Use agents recommended in Section 5 of SDS for extinction
P403+P235	Store in a well-ventilated place. Keep cool.
P405	Store locked up.
P501	Dispose of contents/container to an approved waste disposal facility

SECTION 3: Composition/information on ingredients

Mixtures

Information on Composition: A highly complex mixture of paraffinic, cycloparaffinic (naphthenic) and aromatic hydrocarbons, containing a low percentage of sulfur and trace amounts of nitrogen and oxygen compounds.

Components

Component	CAS no.	Concentration
Petroleum (EC no.: 232-298-5; Index no.: 649-049-00-5)	**8002-05-9**	**<= 100 % (weight)**
CLASSIFICATIONS: Carcinogenicity, Cat. 1B. HAZARDS: H350 - May cause cancer [route].		
Solvent naphtha (petroleum), light aliph (EC no.: 265-192-2; Index no.: 649-267-00-0)	**64742-89-8**	**2 - 8 % (weight)**
CLASSIFICATIONS: Carcinogenicity, Cat. 1B; Germ cell mutagenicity, Cat. 1B; Aspiration hazard, Cat. 1. HAZARDS: H304 - May be fatal if swallowed and enters airways; H340 - May cause genetic defects [route]; H350 - May cause cancer [route].		
PENTANE (EC no.: 203-692-4; Index no.: 601-006-00-1)	**109-66-0**	**1 - 6 % (weight)**

CLASSIFICATIONS: Flammable liquids, Cat. 2; Aspiration hazard, Cat. 1; Specific target organ toxicity following single exposure, Cat. 3; Hazardous to the aquatic environment, long-term (chronic), Cat. 2. HAZARDS: H225 - Highly flammable liquid and vapor; H304 - May be fatal if swallowed and enters airways; H336 - May cause drowsiness or dizziness; H411 - Toxic to aquatic life with long lasting effects.		
Benzene (EC no.: 200-753-7; Index no.: 601-020-00-8)	**71-43-2**	**0.1 - 5 % (weight)**
CLASSIFICATIONS: Carcinogenicity, Cat. 1A; Flammable liquids, Cat. 2; Germ cell mutagenicity, Cat. 1B; Aspiration hazard, Cat. 1; Specific target organ toxicity following repeated exposure, Cat. 1; Skin corrosion/irritation, Cat. 2; Serious eye damage/eye irritation, Cat. 2A. HAZARDS: H225 - Highly flammable liquid and vapor; H304 - May be fatal if swallowed and enters airways; H315 - Causes skin irritation; H319 - Causes serious eye irritation; H340 - May cause genetic defects [route]; H350 - May cause cancer [route]; H372 - Causes damage to organs [organs] through prolonged or repeated exposure [route].		
N-HEXANE (EC no.: 203-777-6; Index no.: 601-037-00-0)	**110-54-3**	**1 - 5 % (weight)**
CLASSIFICATIONS: Flammable liquids, Cat. 2; Toxic to reproduction, Cat. 2; Aspiration hazard, Cat. 1; Specific target organ toxicity following single exposure, Cat. 3; Specific target organ toxicity following repeated exposure, Cat. 2; Skin corrosion/irritation, Cat. 2; Hazardous to the aquatic environment, long-term (chronic), Cat. 2. HAZARDS: H225 - Highly flammable liquid and vapor; H304 - May be fatal if swallowed and enters airways; H315 - Causes skin irritation; H336 - May cause drowsiness or dizziness; H361f - ; H373 - May cause damage to organs [organs] through prolonged or repeated exposure [route]; H411 - Toxic to aquatic life with long lasting effects. [SCLs/M-factors/ATEs]: STOT RE 2; H373: C ≥ 5 %		
OCTANE (EC no.: 203-892-1; Index no.: 601-009-00-8)	**111-65-9**	**1 - 5 % (weight)**
CLASSIFICATIONS: Flammable liquids, Cat. 2; Aspiration hazard, Cat. 1; Skin corrosion/irritation, Cat. 2; Specific target organ toxicity following single exposure, Cat. 3; Hazardous to the aquatic environment, short-term (acute), Cat. 1; Hazardous to the aquatic environment, long-term (chronic), Cat. 1. HAZARDS: H225 - Highly flammable liquid and vapor; H304 - May be fatal if swallowed and enters airways; H315 - Causes skin irritation; H336 - May cause drowsiness or dizziness; H400 - Very toxic to aquatic life; H410 - Very toxic to aquatic life with long lasting effects.		
Heptane (EC no.: 205-563-8; Index no.: 601-008-00-2)	**142-82-5**	**1 - 5 % (weight)**
CLASSIFICATIONS: Flammable liquids, Cat. 2; Aspiration hazard, Cat. 1; Skin corrosion/irritation, Cat. 2; Specific target organ toxicity following single exposure, Cat. 3; Hazardous to the aquatic environment, short-term (acute), Cat. 1; Hazardous to the aquatic environment, long-term (chronic), Cat. 1. HAZARDS: H225 - Highly flammable liquid and vapor; H304 - May be fatal if swallowed and enters airways; H315 - Causes skin irritation; H336 - May cause drowsiness or dizziness; H400 - Very toxic to aquatic life; H410 - Very toxic to aquatic life with long lasting effects.		
N-NONANE (EC no.: 203-913-4)	**111-84-2**	**1 - 4 % (weight)**
CLASSIFICATIONS: Aspiration hazard, Cat. 1; Flammable liquids, Cat. 3; Hazardous to the aquatic environment, long-term (chronic), Cat. 1; Serious eye damage/eye irritation, Cat. 2A; Skin corrosion/irritation, Cat. 2; Specific target organ toxicity following single exposure, Cat. 3. HAZARDS: H226 - Flammable liquid and vapor; H304 - May be fatal if swallowed and enters airways; H315 - Causes skin irritation; H319 - Causes serious eye irritation; H335 - May cause respiratory irritation; H336 - May cause drowsiness or dizziness; H410 - Very toxic to aquatic life with long lasting effects.		
METHYLCYCLOHEXANE (EC no.: 203-624-3; Index no.: 601-018-00-7)	**108-87-2**	**1 - 4 % (weight)**
CLASSIFICATIONS: Flammable liquids, Cat. 2; Aspiration hazard, Cat. 1; Specific target organ toxicity following single exposure, Cat. 3; Skin corrosion/irritation, Cat. 2; Hazardous to the aquatic environment, long-term (chronic), Cat. 2. HAZARDS: H225 - Highly flammable liquid and vapor; H304 - May be fatal if swallowed and enters airways; H315 - Causes skin irritation; H336 - May cause drowsiness or dizziness; H411 - Toxic to aquatic life with long lasting effects.		
Cyclohexane (EC no.: 203-806-2; Index no.: 601-017-00-1)	**110-82-7**	**0.5 - 4 % (weight)**
CLASSIFICATIONS: Flammable liquids, Cat. 2; Aspiration hazard, Cat. 1; Specific target organ toxicity following single exposure, Cat. 3; Skin corrosion/irritation, Cat. 2; Hazardous to the aquatic environment, short-term (acute), Cat. 1; Hazardous to the aquatic environment, long-term (chronic), Cat. 1. HAZARDS: H225 - Highly flammable liquid and vapor; H304 - May be fatal if swallowed and enters airways; H315 - Causes skin irritation; H336 - May cause drowsiness or dizziness; H400 - Very toxic to aquatic life; H410 - Very toxic to aquatic life with long lasting effects.		
XYLENES (MIXED) (EC no.: 215-535-7; Index no.: 601-022-00-9)	**1330-20-7**	**1 - 3 % (weight)**
CLASSIFICATIONS: Flammable liquids, Cat. 3; Acute toxicity, inhalation, Cat. 4; Acute toxicity, dermal, Cat. 4; Skin corrosion/irritation, Cat. 2. HAZARDS: H226 - Flammable liquid and vapor; H312 - Harmful in contact with skin; H315 - Causes skin irritation; H332 - Harmful if inhaled. [SCLs/M-factors/ATEs]: *		
HYDROGEN SULFIDE (EC no.: 231-977-3; Index no.: 016-001-00-4)	**7783-06-4**	**0.1 - 3 % (weight)**
CLASSIFICATIONS: Flammable gases, Cat. 1; Fail: No text found to return.; Hazardous to the aquatic environment, short-term (acute), Cat. 1. HAZARDS: H220 - Extremely flammable gas; H330 - Fatal if inhaled; H400 - Very toxic to aquatic life.		
ETHYLBENZENE (EC no.: 202-849-4; Index no.: 601-023-00-4)	**100-41-4**	**1 - 3 % (weight)**
CLASSIFICATIONS: Acute toxicity, inhalation, Cat. 4; Specific target organ toxicity following repeated exposure, Cat. 2; Flammable liquids, Cat. 2; Aspiration hazard, Cat. 1. HAZARDS: H225 - Highly flammable liquid and vapor; H304 - May be fatal if swallowed and enters airways; H332 - Harmful if inhaled; H373 - May cause damage to organs [organs] through prolonged or repeated exposure [route].		
Sulfur (EC no.: 231-722-6; Index no.: 016-094-00-1)	**7704-34-9**	**0.1 - 3 % (weight)**
CLASSIFICATIONS: Skin corrosion/irritation, Cat. 2. HAZARDS: H315 - Causes skin irritation.		
Toluene (EC no.: 203-625-9; Index no.: 601-021-00-3)	**108-88-3**	**1 - 2 % (weight)**
CLASSIFICATIONS: Flammable liquids, Cat. 2; Toxic to reproduction, Cat. 2; Aspiration hazard, Cat. 1; Specific target organ toxicity following single exposure, Cat. 3; Specific target organ toxicity following repeated exposure, Cat. 2; Skin corrosion/irritation, Cat. 2. HAZARDS: H225 - Highly flammable liquid and vapor; H304 - May be fatal if swallowed and enters airways; H315 - Causes skin irritation; H336 - May cause drowsiness or dizziness; H361d - ; H373 - May cause damage to organs [organs] through prolonged or repeated exposure [route].		

SECTION 4: First-aid measures

Description of necessary first-aid measures

General advice — First Aid Facilities: Maintain eyewash fountain and drench facilities in work area.

If inhaled	If inhaled, remove from contaminated area to fresh air immediately. Apply artificial respiration if not breathing. If breathing is difficult, give oxygen. Immediately obtain medical aid if cough or other symptoms appear.
In case of skin contact	Wash with plenty of soap and water. If irritation occurs seek medical advice. Remove contaminated clothing
In case of eye contact	Immediately irrigate with copious quantity of water for at least 15 minutes. Eyelids to be held open. In all cases of eye contamination it is a sensible precaution to seek medical advice.
If swallowed	Rinse mouth thoroughly with water immediately, repeat until all traces of product have been removed. DO NOT INDUCE VOMITING. Seek immediate medical advice.

Most important symptoms/effects, acute and delayed
The most important known symptoms and effects are described in the labelling (see section 2.2) and/or in section 11

Indication of immediate medical attention and special treatment needed, if necessary
For advice in an emergency, contact a Poisons Information Centre (Phone Australia 131 126) or a doctor at once.

SECTION 5: Fire-fighting measures

Suitable extinguishing media
Caution: Use of water spray when fighting fire may be inefficient.
Small fire: Use foam, dry chemical, CO2 or water spray.
Large fire: Use foam, fog or water spray - Do NOT use water jets.
If safe to do so, move undamaged containers from the fire area. Cool containers with flooding quantities of water until well after the fire is out. Avoid getting water inside the containers.

Specific hazards arising from the chemical
HIGHLY FLAMMABLE: These products have a low flash point. Will be easily ignited by heat, sparks or flames. Vapours will form explosive mixtures with air. Vapours will travel to source of ignition and flash back. Most vapours are heavier than air and will collect in low or confined areas (drains, basements, tanks). Many liquids are lighter than water. Containers may explode when heated. Fire will produce irritating, poisonous and/or corrosive gases. Vapours from run-off may create an explosion hazard.

Special protective actions for fire-fighters
SCBA and structural firefighter's uniform may provide limited protection. Fully encapsulating, gas-tight suits should be worn for maximum protection.

SECTION 6: Accidental release measures

Personal precautions, protective equipment and emergency procedures
Avoid inhalation, contact with skin, eyes and clothing. Evacuate the area of all non-essential personnel.
Wear protective clothing specified for normal operations (see Section 8)

Methods and materials for containment and cleaning up
Eliminate all ignition sources (no smoking, flares, sparks or flame) within at least 50m. All equipment in handling this product must be earthed. Do NOT touch or walk through this product. Stop leak if safe to do so. Prevent entry into waterways, drains, confined areas.
Vapour suppressing foam may be used to control vapours. Water spray may be used to knock down or divert vapours.
Absorb spill with earth, sand or other non-combustible material. Use clean, non-sparking tools to collect material and place it in loosely-covered metal or plastic containers for later disposal.
SEEK EXPERT ADVICE ON HANDLING AND DISPOSAL.

SECTION 7: Handling and storage

Precautions for safe handling
Store in well ventilated area. Store away from sources of heat or ignition. Store away from combustible materials. Store away from oxidizing agents. Keep containers closed at all times.

Conditions for safe storage, including any incompatibilities
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 8: Exposure controls/personal protection

Control parameters

CAS: 109-66-0 (EC: 203-692-4)
PENTANE
AU/SWA: 600 ppm; 1770 mg/m3 TWA inhalation

CAS: 110-54-3 (EC: 203-777-6)
N-HEXANE
AU/SWA: 20 ppm; 72 mg/m3 inhalation

CAS: 111-65-9 (EC: 203-892-1)
OCTANE
AU/SWA: 300 ppm; 1400 mg/m3 TWA inhalation

CAS: 111-84-2
N-NONANE
AU/SWA (Australia): 200 ppm; 1050 mg/m3 TWA inhalation

CAS: 142-82-5 (EC: 205-563-8)
Heptane
AU/SWA: 400 ppm; 1640 mg/m3 inhalation

CAS: 71-43-2
Benzene
AU/SWA (Australia): 1 ppm; 3.2 mg/m3 TWA inhalation;

Appropriate engineering controls
Provide sufficient ventilation to ensure that the working environment is below the TWA (time weighted average). Where vapours or mists are generated, particularly in enclosed areas, and natural ventilation is inadequate, a flame proof exhaust ventilation system is required. Refer to AS 1940-The storage and handling of flammable and combustible liquids and AS 2430-Explosive gas atmospheres for further information concerning ventilation requirements.

Individual protection measures, such as personal protective equipment (PPE)

Eye/face protection
The use of a face shield, chemical goggles or safety glasses with side shield protection as appropriate. Must comply with Australian Standards AS 1337 and be selected and used in accordance with AS 1336.

Skin protection
Clean impervious clothing should be worn. Clothing for protection against chemicals should comply with AS 3765 Clothing for Protection Against Hazardous Chemicals.

Hand Protection: Ensure hand protection complies with AS 2161, Occupational protective gloves - Selection, use and maintenance.

Body protection

Clean clothing or protective clothing should be worn, preferably with an apron. Clothing for protection against chemicals should comply with AS 3765 Clothing for Protection Against Hazardous Chemicals.

Respiratory protection
Where ventilation is not adequate, respiratory protection may be required. Avoid breathing vapours or mists. Select and use respirators in accordance with AS 1716 - Respiratory Protective Devices and be selected in accordance with AS 1715 - Selection, Use and Maintenance of Respiratory Protective Devices. When mists or vapours exceed the exposure standards then the use of the following is recommended: Approved respirator with organic vapour and dust/mist filters. Filter capacity and respirator type depends on exposure levels.

SECTION 9: Physical and chemical properties

Basic physical and chemical properties

Physical state	Liquid
Appearance	Viscous dark-brown to black liquid.
Color	No data available.
Odor	Unpleasant, sulfurous odour.
Odor threshold	No data available.
Melting point/freezing point	No data available.
Boiling point or initial boiling point and boiling range	65 - 100 °C
Flammability	Flammable liquid.
Lower and upper explosion limit/flammability limit	Flammable Limits - Lower: 0.4 Vol% Flammable Limits - Upper: 8 Vol%
Flash point	-40 to 60°C
Explosive properties	No data available.
Auto-ignition temperature	260 °C
Decomposition temperature	No data available.
Oxidizing properties	No data available.
pH	No data available.
Kinematic viscosity	No data available.
Solubility	Solubility in Water: Insoluble. Solubility in Organic Solvents: Soluble in benzene, chloroform and ether. Very slightly soluble in alcohol.
Partition coefficient n-octanol/water (log value)	No data available.
Vapor pressure	No data available.
Evaporation rate	No data available.
Density and/or relative density	Specific Gravity: 0.62 - 0.76; Density: 0.8 - 1 g/cm^3
Relative vapor density	No data available.
Particle characteristics	No data available.

Supplemental information regarding physical hazard classes
No data available.

Further safety characteristics (supplemental)
Other Information: Refractive index: 1.388

SECTION 10: Stability and reactivity

Reactivity
Stable under normal conditions of storage and handling.

Risk of ignition. Vapours may form explosive mixtures with air

Chemical stability
Stable under recommended storage conditions.

Possibility of hazardous reactions
Hazardous Polymerization: Will not occur.

Conditions to avoid
Heat, flames, ignition sources and incompatibles.

Incompatible materials
Strong oxidizing agents, (eg. peroxides, dichromates, permanganates, chlorates, nitrates, chlorine), strong acids, strong alkalis and halogens.

Hazardous decomposition products
Oxides of carbon and sulfur, hydrogen sulfide, aldehydes, aromatic, other hydrocarbons.

SECTION 11: Toxicological information

Information on toxicological effects

Acute toxicity
Ingestion: Chemicals under this CAS description are expected to have low acute toxicity based on results from animal tests for several light and heavy crude oils following oral exposure.
The chemical could have the potential to cause chemical pneumonitis if aspirated.

Inhalation: May be harmful by inhalation. Vapours may cause drowsiness and dizziness.

// ----- From the Suggestion report (04/10/2024, 2:23 PM) ----- //
The ATE (dermal) of the mixture is: 1594.2 mg/kg bw

// ----- From the Suggestion report (04/10/2024, 2:23 PM) ----- //
The ATE (gas inhalation) of the mixture is: 3191.49 ppmV

// ----- From the Suggestion report (04/10/2024, 2:23 PM) ----- //
The ATE (oral) of the mixture is: 166.67 mg/kg bw

Skin corrosion/irritation
Based on the available data, chemicals under this CAS description are expected to be slightly to moderately irritating to the skin.
Chemicals under this CAS description caused drying of the skin following repeated exposure.

Serious eye damage/irritation
Based on the available data, chemicals under this CAS description are expected to be, at most, slightly irritating to the eye.

Respiratory or skin sensitization
Based on the available data, chemicals under this CAS description are not expected to be skin sensitisers.

Germ cell mutagenicity
Germ Cell Mutagenicity: Category 1

Carcinogenicity
Carcinogenicity: Category 1

Reproductive toxicity
Toxic to Reproduction: Category 2

Specific target organ toxicity (STOT) - single exposure
May cause drowsiness or dizziness

Specific target organ toxicity (STOT) - repeated exposure
No data available.

Aspiration hazard
Aspiration Hazard: Category 1

Additional information
Chronic Effects: Toxic: danger of serious damage to health by prolonged exposure through inhalation, in contact with skin and if swallowed. Repeated exposure may cause skin drying and cracking.

N-NONANE: *TOXICITY:
typ. dose mode specie amount units other
LC50 ihl rat 3200 ppm/4H
LD50 ivn mus 218 mg/kg

*AQTX/TLM96: Not available

*SAX TOXICITY EVALUATION:
THR: Poison by intravenous route. Mildly toxic by inhalation. Irritating to the respiratory tract. Narcotic in high concentrations.

*CARCINOGENICITY: Not available

*MUTATION DATA: Not available

*TERATOGENICITY: Not available

*STANDARDS, REGULATIONS & RECOMMENDATIONS:
OSHA: Federal Register (1/19/89)
Final Limit: PEL-TWA 200 ppm [015,545,610]
ACGIH: TLV-TWA 200 ppm [015,415,421,610]
NIOSH Criteria Document: None
NFPA Hazard Rating: Health (H): 0
Flammability (F): 3
Reactivity (R): 0
H0: Materials which on exposure under fire conditions would offer no hazard beyond that of ordinary combustible material (see NFPA for details).
F3: Materials which can be ignited under almost all normal temperature conditions (see NFPA for details).
R0: Materials which are normally stable even under fire exposure conditions and which are not reactive with water (see NFPA for details).

*OTHER TOXICITY DATA:
Standards and Regulations: DOT-IMO: Flammable or Combustible liquid; Label: Flammable liquid
Status: EPA TSCA Chemical Inventory, 1986
EPA TSCA Test Submission (TSCATS) Data Base, September 1989

Benzene: *TOXICITY:
typ. dose mode specie amount units other
LCLo ihl hmn 2 pph/5M
LCLo ihl hmn 2000 ppm/5M
TCLo ihl man 150 ppm/1Y-I
TCLo ihl hmn 100 ppm
LCLo ihl hmn 65 mg/m3/5Y
LDLo unr man 194 mg/kg
LD50 orl rat 3306 mg/kg
LC50 ihl rat 10000 ppm/7H
LD50 ipr rat 2890 ug/kg
LD50 orl mus 4700 mg/kg
LC50 ihl mus 9980 ppm
LD50 ipr mus 340 mg/kg
LDLo orl dog 2000 mg/kg
LCLo ihl dog 146000 mg/m3
LCLo ihl cat 170000 mg/m3
LCLo ihl rbt 45000 ppm/30M
LDLo ivn rbt 88 mg/kg
LDLo ipr gpg 527 mg/kg
LDLo scu frg 1400 mg/kg
LCLo ihl mam 20000 ppm/5M
LDLo ipr mam 1500 mg/kg
LDLo orl man 50 mg/kg

*SAX TOXICITY EVALUATION:
THR: A human poison by inhalation. An experimental poison by skin contact, intraperitoneal, intravenous and possibly other routes. Moderately toxic by ingestion and subcutaneous routes. A severe eye and moderate skin irritant. Human systemic effects by inhalation and ingestion. An experimental carcinogen, neoplastigen, tumorigen and teratogen. Other experimental animal reproductive effects. Human mutagenic data. A narcotic. In industry, inhalation is the primary route of chronic benzene poisoning. Poisoning by skin contact has been reported. Recent (1987) research indicates that effects are seen at less than 1 ppm. Exposures needed to be reduced to 0.1 ppm before no toxic effects were observed. Elimination is chiefly through the lungs. A common air contaminant.
Poisoning occurs most commonly via inhalation of the vapor, although benzene can penetrate the skin and cause poisoning. Locally, benzene has a comparatively strong irritating effect. Exposure to high concentrations of the vapor (3000 ppm or higher) may result from failure of equipment or spillage. Such exposure, while rare in industry, may cause acute poisoning, characterized by the narcotic action of benzene on the central nervous system. The anesthetic action of benzene is similar to that of other anesthetic gases, consisting of a preliminary stage of excitation followed by depression and if exposure is continued, death through respiratory failure. The chronic, rather than the acute form, of benzene poisoning is important in industry. It is a recognized leukemogen.
There is no specific blood picture occurring in cases of chronic benzol poisoning. For the worker, repeated blood examinations are necessary, including hemoglobin determinations, white and red cell counts and differential smears. Where a worker shows a progressive drop in either red or white cells, or where the white count remains low, 5000/mm3 or the red count <4.0 million/mm3, on two successive monthly examinations, he

should be immediately removed from benzene exposure. Elimination is chiefly through the lungs, when fresh air is breathed. The portion that is absorbed is oxidized, and the oxidation products are combined with sulfuric and glucuronic acids and eliminated in the urine. This may be used as a diagnostic sign. Benzene has a definite cumulative action, and exposure to a relatively high concentration is not serious from the point of view of causing damage to the blood-forming system, provided the exposure is not repeated.

*CARCINOGENICITY:
Tumorigenic Data:
TCLo: ihl-man 200 mg/m3/78W-I
TCLo: ihl-hmn 10 ppm/8H/10Y-I
TDLo: orl-rat 52 gm/kg/52W-I
TCLo: ihl-rat 1200 ppm/6H/10W-I
TDLo: orl-mus 18250 mg/kg/2Y-C
TCLo: ihl-mus 300 ppm/6H/16W-I
TDLo: skn-mus 1200 gm/kg/49W-I
TDLo: scu-mus 600 mg/kg/17W-I
TDLo: par-mus 670 mg/kg/19W-I
TC : ihl-hmn 150 ppm/15M/8Y-I
TD : orl-rat 52 gm/kg/1Y-I
TD : orl-rat 10 gm/kg/52W-I
TC : ihl-man 600 mg/m3/4Y-I
TC : ihl-man 150 ppm/11Y-I
TC : ihl-mus 1200 ppm/6H/10W-I
TDLo: ipr-mus 1200 mg/kg/8W-I
TD : orl-mus 2400 mg/kg/8W-I
TC : ihl-hmn 8 ppb/4W-I
TC : ihl-hmn 10 mg/m3/11Y-I
TC : ihl-mus 300 ppm/6H/16W-I
Review: IARC Cancer Review: Human Sufficient Evidence
IARC Cancer Review: Animal Sufficient Evidence
IARC human carcinogen (Group 1) [015,395,610]
ACGIH suspected human carcinogen [015,415,421,610]
OSHA cancer hazard [015,327,610]
Status: NTP Carcinogenesis Studies (Gavage); Clear Evidence: Male and Female Rat, Male and Female Mouse [015,620]
NTP human carcinogen [610]
NTP Fourth Annual Report on Carcinogens, 1984
EPA Carcinogen Assessment Group [610]

*MUTATION DATA:

test lowest dose	test lowest dose
dns-rat:lvr 1 mmol/L	dni-hmn:leu 2200 umol/L
cyt-rat-ihl 300 mg/m3/16W-I	cyt-hmn:leu 1 mmol/L/72H
mnt-mus-orl 40 mg/kg	cyt-rbt-scu 8400 mg/kg
oms-rat:lvr 1 mmol/L	cyt-hmn:lym 1 mg/L
sce-hmn:lym 200 umol/L	otr-mus:fbr 150 gm/L
cyt-mus-ihl 3000 ppm	otr-ham:emb 100 ug/L
dni-rat-ihl 400 ppm	cyt-rat-scu 12 gm/kg/12D-I
mnt-mus-scu 440 mg/kg	cyt-hmn-ihl 125 ppm/1Y
mnt-mus-ipr 264 mg/kg/24H	dni-mus-orl 20 gm/kg
sce-mus-ihl 10 ppm/6H	cyt-mus-orl 20 mg/kg

cyt-mus-ipr 264 mg/kg/3D-C | dlt-mus-orl 1 mg/kg
dlt-mus-ipr 5 mg/kg | dni-rbt-scu 2 gm/kg
cyt-hmn-unr 10 ppm/4W | oms-rat-scu 1 gm/L
sce-mus-ipr 5 gm/kg | oms-grh-ihl 14 pph/16H
oms-rat:bmr 1 mmol/L | oms-rat-scu 2200 mg/kg
oms-rbt:bmr 1 mmol/L | oms-cat:bmr 1 mmol/L
oms-nml-ipr 75 gm/kg | mnt-mus-ihl 10 ppm/6H
oms-hmn:lym 5 umol/L | sln-asn 35000 ppm
dni-hmn:hla 2200 umol/L | slt-dmg-orl 11250 umol/L
mmo-smc 275 mg/L | mma-smc 549 mg/L
mrc-smc 275 mg/L | mnt-rat-ihl 1 ppm/6H
sce-rat-ihl 3 ppm/6H | mma-mus:lym 62500 ug/L
mma-mus:emb 2500 mg/L | otr-mus:emb 1 gm/L
msc-mus:lym 12500 ug/L | dnd-ham:ovr 17 mmol/L
cyt-ham:lng 550 mg/L | cyt-ham:ovr 600 mg/L
sln-ham:lvr 62500 ug/L | msc-hmn:lym 1 gm/L
oms-mus:lym 10 mmol/L | sce-ham:ovr 750 mg/L
dnd-mus:lym 3840 umol/L | oms-mus:oth 5 mmol/L
dni-mus-ipr 880 mg/kg | dni-mus-ihl 3000 ppm/4H-C
dni-mus:bmr 3 mmol/L |

*TERATOGENICITY:
Reproductive Effects Data:
TCLo: ihl-rat 670 mg/m3/24H (15D pre/1-22D preg)
TCLo: ihl-rat 56600 ug/m3/24H (1-22D preg)
TCLo: ihl-rat 50 ppm/24H (7-14D preg)
TCLo: ihl-rat 150 ppm/24H (7-14D preg)
TDLo: orl-mus 9 gm/kg (6-15D preg)
TDLo: orl-mus 12 gm/kg (6-15D preg)
TCLo: ihl-mus 500 ppm/7H (6-15D preg)
TDLo: ipr-mus 5 mg/kg (1D male)
TDLo: scu-mus 1100 mg/kg (12D preg)
TDLo: scu-mus 7030 mg/kg (12-13D preg)
TDLo: ivn-mus 13200 ug/kg (13-16D preg)
TDLo: par-mus 4 gm/kg (12D preg)
TCLo: ihl-mus 500 mg/m3/12H (6-15D preg)
TCLo: ihl-rbt 1 gm/m3/24H (7-20D preg)
TDLo: orl-mus 6500 mg/kg (8-12D preg)
TCLo: ihl-mus 5 ppm (6-15D preg)
TCLo: ihl-mus 20 ppm/6H (6-15D preg)

*STANDARDS, REGULATIONS & RECOMMENDATIONS:
OSHA: Federal Register (1/19/89) and 29 CFR 1910.1000 Subpart Z
Transitional Limit: PEL-TWA 10 ppm; Ceiling Limit 25 ppm;
Peak 50 ppm/10M [545,610]
Final Limit: PEL-TWA 1 ppm; STEL 5 ppm/15M [327,545,610]
Action level: PEL-TWA 0.5 ppm [610]
ACGIH: TLV-TWA 10 ppm [015,415,421,610]
NIOSH Criteria Document: Recommended exposure limit to this compound-air:
TWA 0.32 mg/m3; Ceiling Limit 3.2 mg/m3/15M [015]
NFPA Hazard Rating: Health (H): 2
Flammability (F): 3
Reactivity (R): 0
H2: Materials hazardous to health, but areas may be entered freely with
full-faced mask self-contained breathing apparatus which provides

eye protection (see NFPA for details).
F3: Materials which can be ignited under almost all normal temperature conditions (see NFPA for details).
R0: Materials which are normally stable even under fire exposure conditions and which are not reactive with water (see NFPA for details).

*OTHER TOXICITY DATA:
Skin and Eye Irritation Data:
skn-rbt 15 mg/24H open MLD
eye-rbt 88 mg MOD
eye-rbt 2 mg/24H SEV
skn-rbt 20 mg/24H MOD
Review: Toxicology Review-14
Standards and Regulations: DOT-Hazard: Flammable liquid; Label: Flammable liquid
Status: NIOSH Analytical Methods: See hydrocarbons, aromatic, 1501; hydrocarbons, BP 36-126 C, 1500
EPA TSCA Chemical Inventory, 1986
EPA TSCA Test Submission (TSCATS) Data Base, September 1989
EPA TSCA Section 8(e) Status Report 8EHQ-0680-0345
EPA TSCA Section 8(e) Status Report 8EHQ-1277-0027
EPA TSCA Section 8(e) Status Report 8EHQ-0378-0112
EPA TSCA Section 8(e) Status Report 8EHQ-0978-0244
EPA TSCA Section 8(e) Status Report 8EHQ-0379-0277
EPA TSCA Section 8(e) Status Report 8EHQ-0378-0112
EPA Genetox Program 1988, Positive: In vitro cytogenetics-human lymphocyte
EPA Genetox Program 1988, Positive: In vivo cytogenetics-human lymphocyte
EPA Genetox Program 1988, Positive: Mammalian micronucleus; Sperm morphology-mouse
EPA Genetox Program 1988, Negative: Cell transform.-SA7/SHE; In vitro SCE-human lymphocytes
EPA Genetox Program 1988, Negative: In vitro SCE-human
EPA Genetox Program 1988, Positive: Carcinogenicity-mouse/rat
NIOSH Analytical Methods: see Benzene by portable GC, 3700
OSHA Analytical Method #12

SECTION 12: Ecological information

Toxicity
Very toxic to aquatic organisms. May cause long term adverse effects in the aquatic environment.

The material and its container must be disposed of as hazardous waste.

SECTION 13: Disposal considerations

Disposal methods

Product disposal
Waste material must be disposed of in accordance with the national and local regulations. Leave chemicals in original containers.

Other disposal recommendations
Do not discharge this material into waterways, drains and sewers.

SECTION 14: Transport information

ADG (Road and Rail)
UN Number: 1267
Class: 3
Packing Group: II
Proper Shipping Name: PETROLEUM CRUDE OIL

Environmental Pollutant

Hazchem emergency action code (EAC)
3WE

IMDG
UN Number: 1267
Class: 3
Packing Group: II
EMS Number:
Proper Shipping Name: PETROLEUM CRUDE OIL

IATA
UN Number: 1267
Class: 3
Packing Group: II
Proper Shipping Name: PETROLEUM CRUDE OIL

SECTION 15: Regulatory information

Safety, health and environmental regulations specific for the product in question

Australia SUSMP
Poison Schedule: S5

SECTION 16: Other information

Further information/disclaimer
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Standard for the Uniform Scheduling of Medicines and Poisons, Commonwealth of Australia
National Road Transport Commission, 'Australian Code for the Transport of Dangerous Goods by Road and Rail 7th. Ed.'

Safe Work Australia, 'National Code of Practice fot the Preparation of Safety Data Sheets for Hazardous Chemicals', July 2020.
Safe Work Australia, 'National Guide for Classifying Hazardous Chemicals', July 2020.
Safe Work Australia, Workplace Exposure Standards for Airbourne Contaminants, December 2019
Safe Work Australia, Hazardous Chemical Information System (HCIS), hcis.safeworkaustralia.gov.au
IATA, Dangerous Goods Regulations (DGR)
IMO, International Maritime Dangerous Goods Code (IMDG)