

SECTION 1: Identification of the substance/mixture and of the company/undertaking

1.1. Product identifier

Product name : Crude Oil
Product form : Mixture

1.2. Relevant identified uses of the substance or mixture and uses advised against

Use of the substance/mixture : Refinery Feedstock

1.3. Details of the supplier of the safety data sheet

PDC Energy Inc.
1775 Sherman St. #3000
Denver, CO 80203
1-303-860-5800

1.4. Emergency telephone number

Emergency number : CHEMTREC: 1-800-424-9300

SECTION 2: Hazards identification

2.1. Classification of the substance or mixture

Classification (GHS-US)

Flam. Liq. 1 H224
Muta. 1B H340
Carc. 1A H350
Repr. 2 H361

2.2. Label elements

GHS-US labeling

Hazard pictograms (GHS-US) :



Signal word (GHS-US) :

Danger

Hazard statements (GHS-US) :

H224 - Extremely flammable liquid and vapor
H340 - May cause genetic defects
H350 - May cause cancer
H361 - Suspected of damaging fertility or the unborn child

Precautionary statements (GHS-US) :

P201 - Obtain special instructions before use
P202 - Do not handle until all safety precautions have been read and understood
P210 - Keep away from heat, sparks, open flames. - No smoking
P233 - Keep container tightly closed
P240 - Ground/bond container and receiving equipment
P241 - Use explosion-proof electrical, lighting, ventilating equipment
P242 - Use only non-sparking tools
P243 - Take precautionary measures against static discharge
P280 - Wear eye protection, protective clothing, protective gloves, face protection
P303 + P361 + P353 - If on skin (or hair): Take off immediately all contaminated clothing. Rinse skin with water/shower
P308 + P313 - If exposed or concerned: Get medical advice/attention
P370 + P378 - In case of fire: Use foam, water spray, or fog to extinguish
P403 + P235 - Store in a well-ventilated place. Keep cool
P405 - Store locked up
P501 - Dispose of contents/container to licensed waste handling facility

2.3. Other hazards

No additional information available

2.4. Unknown acute toxicity (GHS-US)

No data available

SECTION 3: Composition/information on ingredients

3.1. Substance

Not applicable

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3.2. Mixture

Name	Product identifier	%
Petroleum Crude Oil	(CAS No) 8002-05-9	1-99
Benzene	(CAS No) 71-43-2	0.1 - 1
Benzene, 1,2,4-trimethyl-	(CAS No) 95-63-6	0.1 - 1
Ethylbenzene	(CAS No) 100-41-4	0.1 - 1
Toluene	(CAS No) 108-88-3	0.1 - 1
Xylenes (o-, m-, p- isomers)	(CAS No) 1330-20-7	0.1 - 1
2-Methylnaphthalene	(CAS No) 91-57-6	0.1 - 1
Octane	(CAS No) 111-65-9	0.1 - 1
Nonane	(CAS No) 111-84-2	0.1 - 1
Decane	(CAS No) 124-18-5	0.1 - 1
Undecane	(CAS No) 1120-21-4	0.1 - 1

SECTION 4: First aid measures

4.1. Description of first aid measures

- First-aid measures general : Never give anything by mouth to an unconscious person. If you feel unwell, seek medical advice (show the label where possible).
- First-aid measures after inhalation : IF INHALED: Remove to fresh air and keep at rest in a position comfortable for breathing. Call a POISON CENTER or doctor/physician.
- First-aid measures after skin contact : IF ON SKIN: Immediately rinse with plenty of water (for at least 15 minutes). Get immediate medical advice/attention.
- First-aid measures after eye contact : IF IN EYES: Rinse immediately and thoroughly, pulling the eyelids well away from the eye (15 minutes minimum). Get medical advice/attention.
- First-aid measures after ingestion : IF SWALLOWED: Rinse mouth. Do NOT induce vomiting. Obtain emergency medical attention.

4.2. Most important symptoms and effects, both acute and delayed

- Symptoms/injuries : Harmful if inhaled. Causes skin irritation. Suspected of causing genetic defects. Suspected of causing cancer. Suspected of damaging fertility or the unborn child.
- Symptoms/injuries after inhalation : May cause respiratory irritation.
- Symptoms/injuries after skin contact : May cause moderate irritation.
- Symptoms/injuries after eye contact : Moderately irritating to eyes.
- Symptoms/injuries after ingestion : Acute ingestion causes CNS depression, oropharyngeal and gastric pain and vomiting. May cause a light irritation of the linings of the mouth, throat, and gastrointestinal tract.
- Chronic symptoms : May cause cancer. May have mutagenic effect. May damage fertility. May damage the unborn child.

4.3. Indication of any immediate medical attention and special treatment needed

No additional information available

SECTION 5: Firefighting measures

5.1. Extinguishing media

- Suitable extinguishing media : Carbon dioxide. Dry powder. Foam. Sand.
- Unsuitable extinguishing media : None known.

5.2. Special hazards arising from the substance or mixture

- Fire hazard : Flammable liquid and vapor.
- Explosion hazard : Explosive in the presence of open flames, sparks, and static discharge.
- Reactivity : No dangerous reactions known under normal conditions of use.

5.3. Advice for firefighters

- Firefighting instructions : Use water spray or fog for cooling exposed containers. Exercise caution when fighting any chemical fire. Do not dispose of fire-fighting water in the environment.
- Protection during firefighting : Do not enter fire area without proper protective equipment, including respiratory protection. Wear self-contained breathing apparatus and protective suit (see item 8).
- Other information : No additional information available.

SECTION 6: Accidental release measures

6.1. Personal precautions, protective equipment and emergency procedures

- General measures : Evacuate area. Remove ignition sources. Keep upwind. Ventilate area. Spill should be handled by trained clean-up crews properly equipped with respiratory equipment and full chemical protective gear (see Section 8).

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6.1.1. For non-emergency personnel

Protective equipment : Wear Protective equipment as described in Section 8.
 Emergency procedures : Evacuate unnecessary personnel.

6.1.2. For emergency responders

Protective equipment : Wear suitable protective clothing, gloves and eye or face protection. Approved supplied-air respirator, in case of emergency.

6.2. Environmental precautions

Prevent entry to sewers and public waters. Avoid release to the environment.

6.3. Methods and material for containment and cleaning up

For containment : Contain any spills with dikes or absorbents to prevent migration and entry into sewers or streams.
 Methods for cleaning up : Exclude sources of ignition and ventilate the area. Soak up spills with inert solids, such as clay or diatomaceous earth as soon as possible. Place in a suitable container for disposal in accordance with the waste regulations (see Section 13). Waste from this product may be hazardous as defined under RCRA (40 CFR 261).

6.4. Reference to other sections

No additional information available

SECTION 7: Handling and storage

7.1. Precautions for safe handling

Precautions for safe handling : Do not handle until all safety precautions have been read and understood. Wash hands and other exposed areas with mild soap and water before eating, drinking or smoking and when leaving work. Provide good ventilation in process area to prevent formation of vapor. Do not breathe vapors or mists. Keep away from sources of ignition - No smoking. Use appropriate personal protection equipment (PPE).

7.2. Conditions for safe storage, including any incompatibilities

Storage conditions : Keep only in the original container in a cool, well ventilated place away from : Heat sources. Keep container closed when not in use.

7.3. Specific end use(s)

No additional information available

SECTION 8: Exposure controls/personal protection

8.1. Control parameters

Benzene (71-43-2)	
ACGIH TWA (ppm)	0.5 ppm
ACGIH STEL (ppm)	2.5 ppm
OSHA PEL (TWA) (ppm)	1 ppm
OSHA PEL (STEL) (ppm)	5 ppm (see 29 CFR 1910.1028)
OSHA PEL (Ceiling) (ppm)	25 ppm

Benzene, 1,2,4-trimethyl- (95-63-6)	
Remark (ACGIH)	OELs not established
Remark (US OSHA)	OELs not established

Ethylbenzene (100-41-4)	
ACGIH TWA (ppm)	20 ppm
OSHA PEL (TWA) (mg/m ³)	435 mg/m ³
OSHA PEL (TWA) (ppm)	100 ppm
OSHA PEL (STEL) (mg/m ³)	545 mg/m ³
OSHA PEL (STEL) (ppm)	125 ppm

Toluene (108-88-3)	
ACGIH TWA (ppm)	20 ppm

Xylenes (o-, m-, p- isomers) (1330-20-7)	
OSHA PEL (TWA) (mg/m ³)	435 mg/m ³
OSHA PEL (TWA) (ppm)	100 ppm
OSHA PEL (STEL) (mg/m ³)	655 mg/m ³

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Xylenes (o-, m-, p- isomers) (1330-20-7)	
OSHA PEL (STEL) (ppm)	150 ppm
2-Methylnaphthalene (91-57-6)	
ACGIH TWA (ppm)	0.5 ppm
Remark (US OSHA)	OELs not established
Octane (111-65-9)	
ACGIH TWA (ppm)	300 ppm
OSHA PEL (TWA) (mg/m ³)	2350 mg/m ³
OSHA PEL (TWA) (ppm)	500 ppm
OSHA PEL (STEL) (mg/m ³)	1800 mg/m ³ Vacated
OSHA PEL (STEL) (ppm)	375 ppm Vacated
Nonane (111-84-2)	
ACGIH TWA (ppm)	200 ppm
OSHA PEL (TWA) (mg/m ³)	1050 mg/m ³
OSHA PEL (TWA) (ppm)	200 ppm
Decane (124-18-5)	
Remark (ACGIH)	OELs not established
Remark (US OSHA)	OELs not established
Undecane (1120-21-4)	
Remark (ACGIH)	OELs not established
Remark (US OSHA)	OELs not established

8.2. Exposure controls

Appropriate engineering controls

: Ensure adequate ventilation, especially in confined areas.

Personal protective equipment

: Face shield. Respiratory protection of the dependent type. Gloves. Protective goggles. Protective clothing.



Hand protection

: Use gloves chemically resistant to this material when prolonged or repeated contact could occur. Gloves should be classified under Standard EN 374 or ASTM F1296. Suggested glove materials are: . Gloves constructed of nitrile, neoprene, or PVC are recommended.

Eye protection

: Eye protection, including both chemical splash goggles and face shield, must be worn when possibility exists for eye contact due to spraying liquid or airborne particles.

Skin and body protection

: Chemical protective clothing such as DuPont TyChem®, Barricade or equivalent, recommended based on degree of exposure.

Respiratory protection

: An approved organic vapor respirator/supplied air or self-contained breathing apparatus must be used when vapor concentration exceeds applicable exposure limits. Where excessive vapor, mist, or dust may result, use approved respiratory protection equipment.

Thermal hazard protection

: No data available.

Environmental exposure controls

: Do not flush into surface water or sewer system.

SECTION 9: Physical and chemical properties

9.1. Information on basic physical and chemical properties

Physical state	: Liquid
Color	: Brown to Black.
Odor	: Petroleum-like odor.
Odor Threshold	: No data available
pH	: No data available
Relative evaporation rate (butyl acetate=1)	: No data available
Melting point	: No data available
Freezing point	: No data available
Boiling point	: 32.8 °C (91 °F)

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Flash point	: 10 °C (< 50 °F)
Self ignition temperature	: No data available
Decomposition temperature	: No data available
Flammability (solid, gas)	: No data available
Vapor pressure	: No data available
Relative vapor density at 20 °C	: No data available
Relative density	: No data available
Solubility	: No data available
Log Pow	: No data available
Log Kow	: No data available
Viscosity, kinematic	: No data available
Viscosity, dynamic	: No data available
Explosive properties	: No data available
Oxidizing properties	: No data available
Explosive limits	: No data available

9.2. Other information

No additional information available

SECTION 10: Stability and reactivity

10.1. Reactivity

No dangerous reactions known under normal conditions of use.

10.2. Chemical stability

Stable under recommended handling and storage conditions (see section 7).

10.3. Possibility of hazardous reactions

No data available.

10.4. Conditions to avoid

Sparks. Heat. Open flame.

10.5. Incompatible materials

Avoid contact with : Strong oxidizing agents.

10.6. Hazardous decomposition products

Thermal decomposition generates : Carbon oxides (CO, CO₂). Hydrocarbons.

SECTION 11: Toxicological information

11.1. Information on toxicological effects

Acute toxicity : Not classified

Benzene (71-43-2)	
LD50 oral rat	1800 mg/kg
LC50 inhalation rat (ppm)	13050 ppm/4h
ATE (oral)	1800.000 mg/kg

Benzene, 1,2,4-trimethyl- (95-63-6)	
LD50 oral rat	3400 mg/kg
LD50 dermal rabbit	> 3160 mg/kg
LC50 inhalation rat (mg/l)	18 g/m ³ 4h
ATE (oral)	3400.000 mg/kg body weight
ATE (dust, mist)	1.500 mg/l/4h

Ethylbenzene (100-41-4)	
LD50 oral rat	3500 mg/kg
LD50 dermal rabbit	15354 mg/kg
LC50 inhalation rat (mg/l)	17.2 mg/l/4h
ATE (oral)	3500.000 mg/kg body weight
ATE (dermal)	15354.000 mg/kg body weight
ATE (dust, mist)	1.500 mg/l/4h

Toluene (108-88-3)	
LD50 oral rat	636 mg/kg

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Toluene (108-88-3)	
LD50 dermal rat	12124 mg/kg
LD50 dermal rabbit	8390 mg/kg
LC50 inhalation rat (mg/l)	12.5 mg/l/4h
LC50 inhalation rat (ppm)	> 26700 ppm/1h
ATE (oral)	636.000 mg/kg body weight
ATE (dermal)	8390.000 mg/kg body weight
ATE (dust, mist)	12.500 mg/l/4h

Xylenes (o-, m-, p- isomers) (1330-20-7)	
LD50 oral rat	4300 mg/kg
LD50 dermal rabbit	> 1700 mg/kg
LC50 inhalation rat (mg/l)	47635 mg/l/4h
LC50 inhalation rat (ppm)	5000 ppm/4h
ATE (oral)	4300.000 mg/kg
ATE (dermal)	1100.000 mg/kg
ATE (dust, mist)	1.500 mg/l/4h

Octane (111-65-9)	
LD50 oral rat	118000 mg/m ³ 4 h; (Source: NLM_CIP)

Nonane (111-84-2)	
LC50 inhalation rat (ppm)	3200 ppm/4h (Source: IUCLID)

Decane (124-18-5)	
LD50 oral rat	> 5000 mg/kg (Source: IUCLID)
LD50 dermal rabbit	> 2000 mg/kg (Source: NLM_CIP)
LC50 inhalation rat (ppm)	> 1369 ppm 8 h;

Undecane (1120-21-4)	
LC50 inhalation rat (ppm)	> 442 ppm 8 h; (Source: IUCLID)

Skin corrosion/irritation	: Not classified
Serious eye damage/irritation	: Not classified
Respiratory or skin sensitization	: Not classified
Germ cell mutagenicity	: May cause genetic defects.
Carcinogenicity	: May cause cancer.

Benzene (71-43-2)	
IARC group	1 - Carcinogenic to humans
National Toxicity Program (NTP) Status	2 - Known Human Carcinogens

Ethylbenzene (100-41-4)	
IARC group	2B - Possibly carcinogenic to humans

Toluene (108-88-3)	
IARC group	3 - Not classifiable

Xylenes (o-, m-, p- isomers) (1330-20-7)	
IARC group	3 - Not classifiable

Reproductive toxicity	: Suspected of damaging fertility or the unborn child.
Specific target organ toxicity (single exposure)	: Not classified
Specific target organ toxicity (repeated exposure)	: Not classified
Aspiration hazard	: Not classified
Symptoms/injuries after inhalation	: May cause respiratory irritation.
Symptoms/injuries after skin contact	: May cause moderate irritation.
Symptoms/injuries after eye contact	: Moderately irritating to eyes.
Symptoms/injuries after ingestion	: Acute ingestion causes CNS depression, oropharyngeal and gastric pain and vomiting. May cause a light irritation of the linings of the mouth, throat, and gastrointestinal tract.
Chronic symptoms	: May cause cancer. May have mutagenic effect. May damage fertility. May damage the unborn child.

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SECTION 12: Ecological information

12.1. Toxicity

Ecology - general : Toxic to aquatic life with long lasting effects.

12.2. Persistence and degradability

No additional information available

12.3. Bioaccumulative potential

No additional information available

12.4. Mobility in soil

No additional information available

12.5. Other adverse effects

No additional information available

SECTION 13: Disposal considerations

13.1. Waste treatment methods

Waste treatment methods : Obtain the consent of pollution control authorities before discharging to wastewater treatment plants.

Sewage disposal recommendations : Avoid direct discharge into drains.

Waste disposal recommendations : Dispose in a safe manner in accordance with local/national regulations. Do not allow the product to be released into the environment.

SECTION 14: Transport information

In accordance with DOT

Transport document description : UN1267 Petroleum crude oil, 3, I

UN-No.(DOT) : 1267

DOT NA no. : UN1267

DOT Proper Shipping Name : Petroleum crude oil

Department of Transportation (DOT) Hazard Classes : 3 - Class 3 - Flammable and combustible liquid 49 CFR 173.120

Hazard labels (DOT) : 3 - Flammable liquid



Packing group (DOT) : I - Great Danger

DOT Quantity Limitations Passenger aircraft/rail (49 CFR 173.27) : 1 L

DOT Quantity Limitations Cargo aircraft only (49 CFR 175.75) : 30 L

DOT Vessel Stowage Location : E - The material may be stowed "on deck" or "under deck" on a cargo vessel and on a passenger vessel carrying a number of passengers limited to not more than the larger of 25 passengers, or one passenger per each 3 m of overall vessel length, but is prohibited from carriage on passenger vessels in which the limiting number of passengers is exceeded.

Additional information

Other information : No supplementary information available.

Transport by sea

No additional information available

Air transport

No additional information available

SECTION 15: Regulatory information

15.1. US Federal regulations

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All chemical substances in this product are listed in the EPA (Environmental Protection Agency) TSCA (Toxic Substances Control Act) Inventory

SARA Section 311/312 Hazard Classes

Fire hazard
Delayed (chronic) health hazard

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Benzene (71-43-2)	
Listed on the United States TSCA (Toxic Substances Control Act) inventory Listed on SARA Section 313 (Specific toxic chemical listings)	
RQ (Reportable quantity, section 304 of EPA's List of Lists) :	10 lb (received an adjusted RQ of 10 lbs based on potential carcinogenicity in an August 14, 1989 final rule)
SARA Section 313 - Emission Reporting	0.1 %

Benzene, 1,2,4-trimethyl- (95-63-6)	
Listed on the United States TSCA (Toxic Substances Control Act) inventory Listed on SARA Section 313 (Specific toxic chemical listings)	
SARA Section 313 - Emission Reporting	1 %

Ethylbenzene (100-41-4)	
Listed on the United States TSCA (Toxic Substances Control Act) inventory Listed on SARA Section 313 (Specific toxic chemical listings)	
RQ (Reportable quantity, section 304 of EPA's List of Lists) :	1000 lb
SARA Section 313 - Emission Reporting	0.1 %

Toluene (108-88-3)	
Listed on the United States TSCA (Toxic Substances Control Act) inventory Listed on SARA Section 313 (Specific toxic chemical listings)	

Xylenes (o-, m-, p- isomers) (1330-20-7)	
Listed on the United States TSCA (Toxic Substances Control Act) inventory Listed on SARA Section 313 (Specific toxic chemical listings)	
RQ (Reportable quantity, section 304 of EPA's List of Lists) :	100 lb
SARA Section 313 - Emission Reporting	1 %

2-Methylnaphthalene (91-57-6)	
Listed on the United States TSCA (Toxic Substances Control Act) inventory	

Octane (111-65-9)	
Listed on the United States TSCA (Toxic Substances Control Act) inventory	

Nonane (111-84-2)	
Listed on the United States TSCA (Toxic Substances Control Act) inventory	

Decane (124-18-5)	
Listed on the United States TSCA (Toxic Substances Control Act) inventory	

Undecane (1120-21-4)	
Listed on the United States TSCA (Toxic Substances Control Act) inventory	

15.2. International regulations

CANADA

Benzene (71-43-2)	
Listed on the Canadian DSL (Domestic Substances List) inventory.	

Benzene, 1,2,4-trimethyl- (95-63-6)	
Listed on the Canadian DSL (Domestic Substances List) inventory.	

Ethylbenzene (100-41-4)	
Listed on the Canadian DSL (Domestic Substances List) inventory.	

Toluene (108-88-3)	
Listed on the Canadian DSL (Domestic Substances List) inventory.	

Xylenes (o-, m-, p- isomers) (1330-20-7)	
Listed on the Canadian DSL (Domestic Substances List) inventory.	

2-Methylnaphthalene (91-57-6)	
Listed on the Canadian DSL (Domestic Substances List) inventory.	

Octane (111-65-9)	
Listed on the Canadian DSL (Domestic Substances List) inventory.	

Nonane (111-84-2)	
Listed on the Canadian DSL (Domestic Substances List) inventory.	

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Decane (124-18-5)

Listed on the Canadian DSL (Domestic Substances List) inventory.

Undecane (1120-21-4)

Listed on the Canadian DSL (Domestic Substances List) inventory.

No additional information available

15.2.2. National regulations

Benzene (71-43-2)

Listed on IARC (International Agency for Research on Cancer)
Listed as carcinogen on NTP (National Toxicology Program)
Listed on Inventory of Existing Chemical Substances (IECSC)
Listed on the AICS (the Australian Inventory of Chemical Substances)
Listed on the Japanese ENCS (Existing & New Chemicals Substances) inventory.
Listed on the Korean ECL (Existing Chemical List) inventory.

Benzene, 1,2,4-trimethyl- (95-63-6)

Listed on Inventory of Existing Chemical Substances (IECSC)
Listed on the AICS (the Australian Inventory of Chemical Substances)
Listed on the Korean ECL (Existing Chemical List) inventory.
Listed on the Japanese ENCS (Existing & New Chemicals Substances) inventory.

Ethylbenzene (100-41-4)

Listed on IARC (International Agency for Research on Cancer)
Listed on Inventory of Existing Chemical Substances (IECSC)
Listed on the AICS (the Australian Inventory of Chemical Substances)
Listed on the Japanese ENCS (Existing & New Chemicals Substances) inventory.
Listed on the Korean ECL (Existing Chemical List) inventory.

Toluene (108-88-3)

Listed on Inventory of Existing Chemical Substances (IECSC)
Listed on the AICS (the Australian Inventory of Chemical Substances)
Listed on the Japanese ENCS (Existing & New Chemicals Substances) inventory.
Listed on the Korean ECL (Existing Chemical List) inventory.

Xylenes (o-, m-, p- isomers) (1330-20-7)

Listed on Inventory of Existing Chemical Substances (IECSC)
Listed on the AICS (the Australian Inventory of Chemical Substances)
Listed on the Japanese ENCS (Existing & New Chemicals Substances) inventory.
Listed on the Korean ECL (Existing Chemical List) inventory.

2-Methylnaphthalene (91-57-6)

Listed on the AICS (the Australian Inventory of Chemical Substances)
Listed on Inventory of Existing Chemical Substances (IECSC)
Listed on the Japanese ENCS (Existing & New Chemicals Substances) inventory.

Octane (111-65-9)

Listed on the AICS (the Australian Inventory of Chemical Substances)
Listed on Inventory of Existing Chemical Substances (IECSC)
Listed on the Japanese ENCS (Existing & New Chemicals Substances) inventory.
Listed on KECI (Chemical Inventory of Korea)

Nonane (111-84-2)

Listed on the AICS (the Australian Inventory of Chemical Substances)
Listed on Inventory of Existing Chemical Substances (IECSC)
Listed on the Japanese ENCS (Existing & New Chemicals Substances) inventory.
Listed on KECI (Chemical Inventory of Korea)

Decane (124-18-5)

Listed on the AICS (the Australian Inventory of Chemical Substances)
Listed on Inventory of Existing Chemical Substances (IECSC)
Listed on the Japanese ENCS (Existing & New Chemicals Substances) inventory.
Listed on KECI (Chemical Inventory of Korea)

Undecane (1120-21-4)

Listed on the AICS (the Australian Inventory of Chemical Substances)
Listed on Inventory of Existing Chemical Substances (IECSC)
Listed on the Japanese ENCS (Existing & New Chemicals Substances) inventory.
Listed on KECI (Chemical Inventory of Korea)

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15.3. US State regulations

California Proposition 65

This product contains, or may contain, trace quantities of a substance(s) known to the state of California to cause cancer and/or reproductive toxicity

Benzene (71-43-2)				
U.S. - California - Proposition 65 - Carcinogens List	U.S. - California - Proposition 65 - Developmental Toxicity	U.S. - California - Proposition 65 - Reproductive Toxicity - Female	U.S. - California - Proposition 65 - Reproductive Toxicity - Male	No significance risk level (NSRL)
Yes	Yes		Yes	

Ethylbenzene (100-41-4)				
U.S. - California - Proposition 65 - Carcinogens List	U.S. - California - Proposition 65 - Developmental Toxicity	U.S. - California - Proposition 65 - Reproductive Toxicity - Female	U.S. - California - Proposition 65 - Reproductive Toxicity - Male	No significance risk level (NSRL)
Yes				

Toluene (108-88-3)				
U.S. - California - Proposition 65 - Carcinogens List	U.S. - California - Proposition 65 - Developmental Toxicity	U.S. - California - Proposition 65 - Reproductive Toxicity - Female	U.S. - California - Proposition 65 - Reproductive Toxicity - Male	No significance risk level (NSRL)
	Yes	Yes	Yes	

Benzene (71-43-2)				
RTK - U.S. - Massachusetts - Right To Know List RTK - U.S. - New Jersey - Right to Know Hazardous Substance List RTK - U.S. - Pennsylvania - RTK (Right to Know) - Special Hazardous Substances RTK - U.S. - Pennsylvania - RTK (Right to Know) - Environmental Hazard List				

Benzene, 1,2,4-trimethyl- (95-63-6)				
RTK - U.S. - New Jersey - Right to Know Hazardous Substance List RTK - U.S. - Massachusetts - Right To Know List RTK - U.S. - Pennsylvania - RTK (Right to Know) - Environmental Hazard List				

Ethylbenzene (100-41-4)				
RTK - U.S. - New Jersey - Right to Know Hazardous Substance List RTK - U.S. - Massachusetts - Right To Know List RTK - U.S. - Pennsylvania - RTK (Right to Know) - Environmental Hazard List				

Toluene (108-88-3)				
RTK - U.S. - Massachusetts - Right To Know List RTK - U.S. - New Jersey - Right to Know Hazardous Substance List RTK - U.S. - Pennsylvania - RTK (Right to Know) - Environmental Hazard List				

Xylenes (o-, m-, p- isomers) (1330-20-7)				
RTK - U.S. - Massachusetts - Right To Know List RTK - U.S. - New Jersey - Right to Know Hazardous Substance List RTK - U.S. - Pennsylvania - RTK (Right to Know) - Environmental Hazard List				

2-Methylnaphthalene (91-57-6)				
RTK - U.S. - New Jersey - Right to Know Hazardous Substance List				

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Prepared according to Federal Register / Vol. 77, No. 58 / Monday, March 26, 2012 / Rules and Regulations

Octane (111-65-9)
U.S. - Idaho - Non-Carcinogenic Toxic Air Pollutants - Acceptable Ambient Concentrations RTK - U.S. - New Jersey - Right to Know Hazardous Substance List U.S. - New York - Reporting of Releases Part 597 - List of Hazardous Substances RTK - U.S. - Massachusetts - Right To Know List RTK - U.S. - Pennsylvania - RTK (Right to Know) List

Nonane (111-84-2)
U.S. - Idaho - Non-Carcinogenic Toxic Air Pollutants - Acceptable Ambient Concentrations RTK - U.S. - New Jersey - Right to Know Hazardous Substance List U.S. - New York - Reporting of Releases Part 597 - List of Hazardous Substances RTK - U.S. - Massachusetts - Right To Know List RTK - U.S. - Pennsylvania - RTK (Right to Know) List

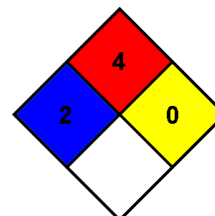
Decane (124-18-5)
RTK - U.S. - New Jersey - Right to Know Hazardous Substance List U.S. - New York - Reporting of Releases Part 597 - List of Hazardous Substances RTK - U.S. - Pennsylvania - RTK (Right to Know) List

Undecane (1120-21-4)
RTK - U.S. - New Jersey - Right to Know Hazardous Substance List U.S. - New York - Reporting of Releases Part 597 - List of Hazardous Substances

SECTION 16: Other information

Indication of changes : Revision 1.0: New SDS Created.
Revision date : 06/24/2014
Other information : Author: BAS.

NFPA health hazard : 2 - Intense or continued exposure could cause temporary incapacitation or possible residual injury unless prompt medical attention is given.
NFPA fire hazard : 4 - Will rapidly or completely vaporize at normal pressure and temperature, or is readily dispersed in air and will burn readily.
NFPA reactivity : 0 - Normally stable, even under fire exposure conditions, and are not reactive with water.



HMIS III Rating

Health : 2
Flammability : 4
Physical : 0
Personal Protection :

This information is based on our current knowledge and is intended to describe the product for the purposes of health, safety and environmental requirements only. It should not therefore be construed as guaranteeing any specific property of the product

SECTION 1: Identification of the substance/mixture and of the company/undertaking

1.1. Product identifier

Product name : Natural Gas
Product form : Mixture

1.2. Relevant identified uses of the substance or mixture and uses advised against

1.3. Details of the supplier of the safety data sheet

PDC Energy Inc.
1775 Sherman St. #3000
Denver, CO 80203
1-303-860-5800

1.4. Emergency telephone number

Emergency number : CHEMTREC: 1-800-424-9300

SECTION 2: Hazards identification

2.1. Classification of the substance or mixture

GHS-US classification

Simple Asphy SIAS
Flam. Gas 1 H220
Press. Gas (Liq.) H280
STOT SE 2 H371

2.2. Label elements

GHS-US labelling

Hazard pictograms (GHS-US) :



GHS02

GHS04

GHS08

Signal word (GHS-US) :

Danger

Hazard statements (GHS-US) :

H220 - Extremely flammable gas.
H280 - Contains gas under pressure; may explode if heated.
H371 - May cause damage to organs (heart).
SIAS - May displace oxygen and cause rapid suffocation

Precautionary statements (GHS-US) :

P210 - Keep away from heat, open flames, sparks. No smoking.
P260 - Do not breathe gas, spray, vapours, mist, fume.
P264 - Wash hands, forearms and face thoroughly after handling.
P270 - Do not eat, drink or smoke when using this product.
P377 - Leaking gas fire: Do not extinguish, unless leak can be stopped safely.
P381 - Eliminate all ignition sources if safe to do so.
P403 - Store in a well-ventilated place.
P405 - Store locked up.
P410+P403 - Protect from sunlight. Store in a well-ventilated place.
P501 - Dispose of contents/container to hazardous or special waste collection point, in accordance with local, regional, national and/or international regulation

2.3. Other hazards

No additional information available

2.4. Unknown acute toxicity (GHS US)

No data available

SECTION 3: Composition/information on ingredients

3.1. Substances

Not applicable

3.2. Mixtures

Name	Product identifier	%
Natural gas, dried	(CAS-No.) 68410-63-9	100*
Methane (as compressed gas)	(CAS-No.) 74-82-8	< 90*
Ethane	(CAS-No.) 74-84-0	< 1*
Hydrogen Sulfide	(CAS-No.) 7783-06-4	<1.0

*In accordance with paragraph (i) of the OSHA Hazard Communication Standard (29 CFR §1910.1200), the specific chemical identity or exact weight % has been withheld as a trade secret

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SECTION 4: First aid measures

4.1. Description of first aid measures

- First-aid measures general : If exposed or concerned, get medical attention/advice. Show this safety data sheet to the doctor in attendance. Wash contaminated clothing before re-use. Never give anything to an unconscious person.
- First-aid measures after inhalation : IF INHALED: Remove to fresh air and keep at rest in a position comfortable for breathing. Get medical attention if breathing is affected. If breathing is difficult, supply oxygen.
- First-aid measures after skin contact : IF ON SKIN (or clothing): Remove affected clothing and wash all exposed skin with water for at least 15 minutes. If irritation develops or persists, get medical attention.
- First-aid measures after eye contact : IF IN EYES: Immediately flush with plenty of water for at least 15 minutes. Remove contact lenses if present and easy to do so. Continue rinsing if pain, blinking, or irritation develops or persists, get medical attention. Continue rinsing.
- First-aid measures after ingestion : IF SWALLOWED: rinse mouth thoroughly. Do not induce vomiting without advice from poison control center. Get medical attention.

4.2. Most important symptoms and effects, both acute and delayed

- Symptoms/effects : May displace oxygen and cause rapid suffocation. May cause damage to organs (heart).
- Symptoms/effects after inhalation : May displace oxygen and cause rapid suffocation.
- Symptoms/effects after skin contact : May cause skin irritation.
- Symptoms/effects after eye contact : Direct contact with eyes is likely to be irritating.
- Symptoms/effects after ingestion : May cause gastrointestinal irritation.
- Chronic symptoms : May cause damage to organs through prolonged or repeated exposure.

SECTION 5: Firefighting measures

5.1. Extinguishing media

- Suitable extinguishing media : Foam. Dry powder. Carbon dioxide (CO₂). Water spray.

5.2. Special hazards arising from the substance or mixture

- Fire hazard : Extremely flammable gas.
- Explosion hazard : Contains gas under pressure; may explode if heated.
- Reactivity : No dangerous reactions known under normal conditions of use.

5.3. Advice for firefighters

- Firefighting instructions : Exercise caution when fighting any chemical fire. Do not dispose of fire-fighting water in the environment. Prevent human exposure to fire, fumes, smoke and products of combustion.
- Protection during firefighting : Do not enter fire area without proper protective equipment, including respiratory protection.

SECTION 6: Accidental release measures

6.1. Personal precautions, protective equipment and emergency procedures

- General measures : Evacuate area. Keep upwind. Ventilate area. Spill should be handled by trained clean-up crews properly equipped with respiratory equipment and full chemical protective gear (see Section 8).

6.1.1. For non-emergency personnel

- Protective equipment : Wear protective equipment as described in section 8.
- Emergency procedures : Evacuate unnecessary personnel.

6.1.2. For emergency responders

- Protective equipment : Wear suitable protective clothing, gloves and eye or face protection. For further information refer to section 8: "Exposure controls/personal protection".

6.2. Environmental precautions

Prevent entry to sewers and public waters. Notify authorities if liquid enters sewers or public waters. Avoid release to the environment.

6.3. Methods and material for containment and cleaning up

- For containment : Stop leak if safe to do so.
- Methods for cleaning up : Exclude sources of ignition and ventilate the area. Ground equipment electrically. Use explosion-proof equipment.

6.4. Reference to other sections

See Sections 8 and 13.

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SECTION 7: Handling and storage

7.1. Precautions for safe handling

Precautions for safe handling

: Do not handle until all safety precautions have been read and understood. Provide good ventilation in process area to prevent formation of vapour. Do not breathe gas. Natural gas can contain toxic and deadly concentrations of H₂S. Avoid contact with skin, eyes and clothing. If H₂S is encountered, review the Safety Data Sheet for proper handling instructions of Hydrogen Sulfide. Keep away from sources of ignition - No smoking. Wash hands and other exposed areas with mild soap and water before eating, drinking or smoking and when leaving work.

7.2. Conditions for safe storage, including any incompatibilities

Storage conditions

: Keep container tightly closed. Store in a well-ventilated place. Keep cool. Store in a dry place.

SECTION 8: Exposure controls/personal protection

8.1. Control parameters

Methane (as compressed gas) (74-82-8)	
Remark (ACGIH)	asphyxia (See Appendix F: Minimal Oxygen Content)
Remark (OSHA)	OELs not established
Ethane (74-84-0)	
ACGIH TWA (ppm)	1000 ppm Aliphatic hydrocarbon gases: Alkane C1-4
Remark (OSHA)	OELs not established
Natural gas, dried (68410-63-9)	
Remark (ACGIH)	OELs not established
Remark (OSHA)	OELs not established
Hydrogen sulfide (7783-06-4)	
ACGIH TWA (ppm)	1 ppm
ACGIH STEL (ppm)	5 ppm
OSHA PEL (Ceiling) (ppm)	20 ppm

8.2. Exposure controls

Appropriate engineering controls

: Provide adequate general and local exhaust ventilation. Use process enclosures, local exhaust ventilation, or other engineering controls to control airborne levels below recommended exposure limits. Use explosion-proof equipment with flammable materials. Ensure adequate ventilation, especially in confined areas.

Personal protective equipment

: Gloves. Protective goggles. Protective clothing. Insufficient ventilation: wear respiratory protection.



Hand protection

: Use gloves chemically resistant to this material when prolonged or repeated contact could occur. Gloves should be classified and selected according to regional or national standards. Suggested glove materials are: Neoprene, Nitrile/butadiene rubber, Polyethylene, Ethyl vinyl alcohol laminate PVC, or vinyl. Suitable gloves should be recommended by the glove supplier.

Eye protection

: Wear eye protection, including chemical splash goggles and a face shield when possibility exists for eye contact due to spraying liquid or airborne particles.

Skin and body protection

: Wear long sleeves, and chemically impervious PPE/coveralls to minimize bodily exposure.

Respiratory protection

: Wear a NIOSH-approved (or equivalent) full-facepiece airline respirator in the positive pressure mode with emergency escape provisions. In case of inadequate ventilation or risk of inhalation of vapors, use suitable respiratory equipment with gas filter (type A2). Use a positive-pressure air-supplied respirator if there is any potential for an uncontrolled release, exposure levels are not known, or any other circumstances where air-purifying respirators may not provide adequate protection.

SECTION 9: Physical and chemical properties

9.1. Information on basic physical and chemical properties

Physical state

: Gas

Color

: Colorless.

Odor

: Distinctive "natural gas".

Odor Threshold

: No data available

pH

: No data available

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Relative evaporation rate (butylacetate=1)	: No data available
Melting point	: No data available
Freezing point	: No data available
Boiling point	: -162 °C (-259 °F)
Flash point	: Flammable Gas
Auto-ignition temperature	: 482 - 632 °C (900 - 1170 °F)
Decomposition temperature	: No data available
Flammability (solid, gas)	: No data available
Lower Flammable Limit (LFL)	: 3.8 – 6.5
Upper Flammability Limit (UFL)	: 13 – 17
Vapor pressure	: 40 atm @ -86 °C (-187 °F)
Relative vapor density at 20 °C	: 0.6
Relative density	: 0.4 @ -164 °C (-263 °F)
Solubility	: Water: 3.5 %
Log Pow	: No data available
Log Kow	: No data available
Viscosity, kinematic	: No data available
Viscosity, dynamic	: No data available
Explosive properties	: No data available
Oxidizing properties	: No data available
Explosive limits	: No data available

9.2. Other information

No additional information available

SECTION 10: Stability and reactivity

10.1. Reactivity

No dangerous reactions known under normal conditions of use.

10.2. Chemical stability

Stable under recommended handling and storage conditions (see section 7).

10.3. Possibility of hazardous reactions

None under normal use.

10.4. Conditions to avoid

Ignition sources. Heat. Open flame. Sparks.

10.5. Incompatible materials

Oxidizing agent.

10.6. Hazardous decomposition products

Carbon oxides (CO, CO₂).

SECTION 11: Toxicological information

11.1. Information on toxicological effects

Acute toxicity : Not classified

Methane (as compressed gas) (74-82-8)	
LD50 oral rat	study technically not feasible
LD50 dermal rat	study technically not feasible
LC50 inhalation rat (mg/l)	not classified

Ethane (74-84-0)	
LC50 inhalation rat (mg/l)	658 mg/l/4h

Skin corrosion/irritation	: Not classified
Serious eye damage/irritation	: Not classified
Respiratory or skin sensitisation	: Not classified
Germ cell mutagenicity	: Not classified
Carcinogenicity	: Not classified
Reproductive toxicity	: Not classified
Specific target organ toxicity (single exposure)	: May cause damage to organs (heart).

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Specific target organ toxicity (repeated exposure)	: Not classified
Aspiration hazard	: Not classified
Symptoms/effects after inhalation	: May displace oxygen and cause rapid suffocation.
Symptoms/effects after skin contact	: May cause skin irritation.
Symptoms/effects after eye contact	: Direct contact with eyes is likely to be irritating.
Symptoms/effects after ingestion	: May cause gastrointestinal irritation.
Chronic symptoms	: May cause damage to organs through prolonged or repeated exposure.

SECTION 12: Ecological information

12.1. Toxicity

Ecology - general : Toxic to aquatic life. Toxic to aquatic life with long lasting effects.

12.2. Persistence and degradability

No additional information available

12.3. Bioaccumulative potential

No additional information available

12.4. Mobility in soil

No additional information available

12.5. Other adverse effects

No additional information available

SECTION 13: Disposal considerations

13.1. Waste treatment methods

Waste treatment methods : Do not discharge to public wastewater systems without permit of pollution control authorities. No discharge to surface waters is allowed without an NPDES permit.

Product/Packaging disposal recommendations : Do not allow the product to be released into the environment. Dispose in a safe manner in accordance with local/national regulations.

SECTION 14: Transport information

In accordance with DOT

Transport document description	: UN1971 Natural gas, compressed, 2.1
UN-No.(DOT)	: 1971
DOT NA no.	: UN1971
Proper Shipping Name (DOT)	: Natural gas, compressed
Class (DOT)	: 2.1 - Class 2.1 - Flammable gas 49 CFR 173.115
Hazard labels (DOT)	: 2.1 - Flammable gas



DOT Quantity Limitations Passenger aircraft/rail (49 CFR 173.27) : Forbidden

DOT Quantity Limitations Cargo aircraft only (49 CFR 175.75) : 150 kg

DOT Vessel Stowage Location : E - The material may be stowed "on deck" or "under deck" on a cargo vessel and on a passenger vessel carrying a number of passengers limited to not more than the larger of 25 passengers, or one passenger per each 3 m of overall vessel length, but is prohibited from carriage on passenger vessels in which the limiting number of passengers is exceeded.

DOT Vessel Stowage Other : 40 - Stow "clear of living quarters"

Additional information

Emergency Response Guide (ERG) Number : 115

Other information : No supplementary information available.

Transport by sea (IMDG)

No additional information available

Air transport (IATA)

No additional information available

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SECTION 15: Regulatory information

15.1. US Federal regulations

Natural Gas Odorized	
All chemical substances in this product are listed in the EPA (Environment Protection Agency) TSCA (Toxic Substances Control Act) Inventory or are exempt All chemical substances in this product are listed on the Canadian Domestic Substances List (DSL) or Non-Domestic Substances List (NDSL) or are exempt	
SARA Section 311/312 Hazard Classes	Health hazard - Specific target organ toxicity (single or repeated exposure) Physical hazard - Flammable (gases, aerosols, liquids, or solids) Physical hazard - Gas under pressure

15.2. International regulations

No additional information available.

15.3. US State regulations

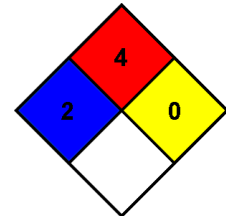
This product does not contain any substances known to the state of California to cause cancer and/or reproductive harm

Methane (as compressed gas) (74-82-8)
U.S. - New Jersey - Right to Know Hazardous Substance List U.S. - Pennsylvania - RTK (Right to Know) List U.S. - Massachusetts - Right To Know List
Ethane (74-84-0)
U.S. - New Jersey - Right to Know Hazardous Substance List U.S. - Massachusetts - Right To Know List U.S. - Pennsylvania - RTK (Right to Know) List

SECTION 16: Other information

Indication of changes : Revision 1.0: New SDS Created.
Revision date : 5/17/2018
Other information : Author: J.L.J.

NFPA health hazard : 2 - Materials that, under emergency conditions, can cause temporary incapacitation or residual injury.
NFPA fire hazard : 4 - Materials that rapidly or completely vaporize at atmospheric pressure and normal ambient temperature or that are readily dispersed in air and burn readily.
NFPA reactivity : 0 - Material that in themselves are normally stable, even under fire conditions.



Hazard Rating

Health : 2
Flammability : 4
Physical : 0
Personal protection :

This information is based on our current knowledge and is intended to describe the product for the purposes of health, safety and environmental requirements only. It should not therefore be construed as guaranteeing any specific property of the product

SECTION 1: Identification of the substance/mixture and of the company/undertaking

1.1. Product identifier

Product name : Produced Water
 Product form : Mixture

1.2. Relevant identified uses of the substance or mixture and uses advised against

Use of the substance/mixture : Water extracted from natural gas well production, process stream, waste

1.3. Details of the supplier of the safety data sheet

PDC Energy Inc.
 1775 Sherman St. #3000
 Denver, CO 80203
 1-303-860-5800

1.4. Emergency telephone number

Emergency number : CHEMTREC: 1-800-424-9300

SECTION 2: Hazards identification

2.1. Classification of the substance or mixture

GHS-US classification

Flam. Liq. 3 H226
 Skin Irrit. 2 H315
 Eye Irrit. 2A H319
 Carc. 1A H350

2.2. Label elements

GHS-US labelling

Hazard pictograms (GHS-US) :



Signal word (GHS-US) :

Danger

Hazard statements (GHS-US) :

H226 - Flammable liquid and vapour
 H315 - Causes skin irritation
 H319 - Causes serious eye irritation
 H350 - May cause cancer

Precautionary statements (GHS-US) :

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, open flames, sparks. - No smoking
 P233 - Keep container tightly closed
 P240 - Ground/Bond container and receiving equipment
 P241 - Use explosion-proof electrical, lighting, ventilating equipment
 P242 - Use only non-sparking tools
 P243 - Take precautionary measures against static discharge
 P264 - Wash hands, forearms and face, clothing thoroughly after handling
 P280 - Wear face protection, eye protection, protective clothing, protective gloves
 P302+P352 - If on skin: Wash with plenty of soap and water
 P303+P361+P353 - IF ON SKIN (or hair): Take off immediately all contaminated clothing. Rinse skin with water/shower
 P305+P351+P338 - IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing
 P308+P313 - If exposed or concerned: Get medical advice/attention
 P321 - Specific treatment (see first aid instructions on this label)
 P332+P313 - If skin irritation occurs: Get medical advice/attention
 P337+P313 - If eye irritation persists: Get medical advice/attention
 P362+P364 - Take off contaminated clothing and wash it before reuse
 P370+P378 - In case of fire: Use carbon dioxide (CO₂), dry extinguishing powder, foam, sand to extinguish
 P403+P235 - Store in a well-ventilated place. Keep cool
 P405 - Store locked up
 P501 - Dispose of contents/container to a licensed hazardous-waste disposal contractor or collection site except for empty clean containers which can be disposed of as non-hazardous waste

Produced Water

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2.3. Other hazards

No additional information available

2.4. Unknown acute toxicity (GHS US)

No data available

SECTION 3: Composition/information on ingredients

3.1. Substance

Not applicable

3.2. Mixture

Name	Product identifier	%
Calcium chloride	(CAS No) 10043-52-4	15 - 40*
Petroleum distillates (naphtha)**	(CAS No) 8002-05-9	< 1.0
Benzene**	(CAS No) 71-43-2	< 1.0
Hydrogen sulfide**	(CAS No) 7783-06-4	< 1.0
Trace levels of Benzene, toluene, ethylbenzene, naphthalene, xylenes**	(CAS No) 71-43-2, 108-88-3, 100-41-4, 91-20-3 1330-20-7 (varies)	<0.1

*In accordance with paragraph (j) of the OSHA Hazard Communication Standard (29 CFR §1910.1200), the specific chemical identity or exact weight % has been withheld as a trade secret

** EPA Method 8260B testing has shown these substance to be present in levels much less than 0.1% for classification. This information is provided for completeness.

SECTION 4: First aid measures

4.1. Description of first aid measures

- First-aid measures general : If exposed or concerned, get medical attention/advice. Show this safety data sheet to the doctor in attendance. Wash contaminated clothing before re-use. Never give anything to an unconscious person.
- First-aid measures after inhalation : IF INHALED: Remove to fresh air and keep at rest in a position comfortable for breathing. Get medical attention if breathing is affected. If breathing is difficult, supply oxygen.
- First-aid measures after skin contact : IF ON SKIN (or clothing): Remove affected clothing and wash all exposed skin with water for at least 15 minutes. If irritation develops or persists, get medical attention.
- First-aid measures after eye contact : IF IN EYES: Immediately flush with plenty of water for at least 15 minutes. Remove contact lenses if present and easy to do so. Continue rinsing if pain, blinking, or irritation develops or persists, get medical attention. Continue rinsing.
- First-aid measures after ingestion : IF SWALLOWED: rinse mouth thoroughly. Do not induce vomiting without advice from poison control center. Get medical attention if you feel unwell.

4.2. Most important symptoms and effects, both acute and delayed

- Symptoms/injuries : May cause cancer. Causes serious eye irritation. Causes skin irritation.
- Symptoms/injuries after inhalation : May cause respiratory irritation.
- Symptoms/injuries after skin contact : Causes skin irritation.
- Symptoms/injuries after eye contact : Causes serious eye irritation.
- Symptoms/injuries after ingestion : May cause gastrointestinal irritation.
- Chronic symptoms : May cause cancer.

4.3. Indication of any immediate medical attention and special treatment needed

No additional information available

SECTION 5: Firefighting measures

5.1. Extinguishing media

Suitable extinguishing media : Water spray. Carbon dioxide. Alcohol-resistant foam. Dry powder.

5.2. Special hazards arising from the substance or mixture

- Fire hazard : Flammable liquid and vapour.
- Explosion hazard : Product is not explosive.

5.3. Advice for firefighters

Firefighting instructions : Move containers from fire area if you can do it without risk. Use a smothering technique for extinguishing fire. Do not use a forced- water stream as this will scatter the fire. Use cold water spray to cool fire-exposed containers to minimize risk of rupture. Exercise caution when fighting any chemical fire. Do not dispose of fire-fighting water in the environment. Prevent human exposure to fire, fumes, smoke and products of combustion.

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- Protection during firefighting : Do not enter fire area without proper protective equipment, including respiratory protection.
- Precautions for Fire Involving Tanks or Car/Trailer Loads : Always stay away from tanks engulfed in flame. Fight fire from maximum distance or use unmanned hose holders or monitor nozzles. Cool containers with flooding quantities of water until well after fire is out. Withdraw immediately in case of rising sound from venting safety devices or discoloration of tank. If unmanned hose holders or monitor nozzles cannot be used, withdraw from area and let fire burn.

SECTION 6: Accidental release measures

6.1. Personal precautions, protective equipment and emergency procedures

- General measures : Extremely Flammable. Spillage of liquid product will create a fire hazard and may form an explosive atmosphere. Keep all sources of ignition and hot metal surfaces away from spill/release. The use of explosion-proof electrical equipment is recommended. Product may contain or release poisonous hydrogen sulfide gas. Provide sufficient ventilation in the affected area(s) and wear appropriate personal protective equipment as indicated in Section 8 when handling spill material. Evacuate area. Keep upwind. Ventilate area. Spill should be handled by trained clean-up crews properly equipped with respiratory equipment and full chemical protective gear (see Section 8).

6.1.1. For non-emergency personnel

- Protective equipment : Wear Protective equipment as described in Section 8.
- Emergency procedures : Evacuate unnecessary personnel.

6.1.2. For emergency responders

- Protective equipment : Wear suitable protective clothing, gloves and eye or face protection. Approved supplied-air respirator, in case of emergency.

6.2. Environmental precautions

Prevent entry to sewers and public waters. Notify authorities if liquid enters sewers or public waters. Avoid release to the environment.

6.3. Methods and material for containment and cleaning up

- For containment : Contain any spills with dikes or absorbents to prevent migration and entry into sewers or streams.
- Methods for cleaning up : Soak up spills with inert solids, such as clay or diatomaceous earth as soon as possible. Place in a suitable container for disposal in accordance with the waste regulations (see Section 13).

6.4. Reference to other sections

No additional information available

SECTION 7: Handling and storage

7.1. Precautions for safe handling

- Precautions for safe handling : Handle as a flammable liquid. Keep away from heat, sparks and open flame. No smoking. Use only with adequate ventilation. May release or contain dangerous levels of H₂S. Use only with adequate ventilation. Wear appropriate personal protective equipment and use exposure controls as indicated in Section 8. Vent slowly to the atmosphere when opening. Avoid all contact with skin and eyes. Avoid breathing product dust or vapors. Use explosion-proof electrical (ventilating, lighting and material handling) equipment. Non-sparking tools should be used. Ground and bond all transfer and storage equipment to prevent static sparks and equip with self-closing valves, pressure vacuum bungs and flame arrestors. Review all operations which have the potential of generating and accumulating electrostatic charge and/or flammable atmosphere. Use appropriate mitigating procedures. Do not enter confined spaces without following proper entry procedures. Remove contaminated clothing immediately. Wash with soap and water after working with this product. Scales, deposits and sludge from equipment associated with this product may have accumulation of Naturally Occurring Radioactive Materials (NORM). Equipment should be assessed for external gamma radiation.

7.2. Conditions for safe storage, including any incompatibilities

- Storage conditions : Keep away from flame, sparks, excessive temperatures and open flame. No smoking. Maintain vessels closed and clearly labeled. Empty vessels may contain explosive vapors. Do not pressurize, cut, heat, weld or expose these vessels to sources of ignition. This material may contain or release H₂S. In a tank or other closed container, the vapor space above this material may accumulate hazardous concentrations of H₂S. Do not enter confined spaces without following proper entry procedures. Use appropriate containment to avoid environmental contamination.

SECTION 8: Exposure controls/personal protection

8.1. Control parameters

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Petroleum distillates (naphtha) (8002-05-9)	
OSHA PEL (TWA) (mg/m ³)	1600 mg/m ³ (vacated)
OSHA PEL (TWA) (ppm)	400 ppm (vacated)
Benzene (71-43-2)	
ACGIH TWA (ppm)	0.5 ppm
ACGIH STEL (ppm)	2.5 ppm
OSHA PEL (TWA) (ppm)	1 ppm
OSHA PEL (STEL) (ppm)	5 ppm (see 29 CFR 1910.1028)
OSHA PEL (Ceiling) (ppm)	25 ppm
Hydrogen sulfide (7783-06-4)	
ACGIH TWA (ppm)	1 ppm
ACGIH STEL (ppm)	5 ppm
OSHA PEL (Ceiling) (ppm)	20 ppm
Calcium chloride (10043-52-4)	
Remark (ACGIH)	OELs not established
Remark (OSHA)	OELs not established
Benzene (71-43-2)	
ACGIH TWA (ppm)	0.5 ppm
ACGIH STEL (ppm)	2.5 ppm
OSHA PEL (TWA) (ppm)	1 ppm
OSHA PEL (STEL) (ppm)	5 ppm (see 29 CFR 1910.1028)
OSHA PEL (Ceiling) (ppm)	25 ppm
Toluene (108-88-3)	
ACGIH TWA (ppm)	20 ppm
Remark (ACGIH)	Visual impair; female repro;
Ethylbenzene (100-41-4)	
ACGIH TWA (ppm)	20 ppm
Remark (ACGIH)	upper respiratory tract irritation; kidney damage (nephropathy); cochlear impairment
OSHA PEL (TWA) (mg/m ³)	435 mg/m ³
OSHA PEL (TWA) (ppm)	100 ppm
OSHA PEL (STEL) (mg/m ³)	545 mg/m ³
OSHA PEL (STEL) (ppm)	125 ppm
Naphthalene (91-20-3)	
ACGIH TWA (ppm)	10 ppm
ACGIH STEL (ppm)	15 ppm
Remark (ACGIH)	5 ppm TWA notice of intended changes TLVs
OSHA PEL (TWA) (mg/m ³)	50 mg/m ³
OSHA PEL (TWA) (ppm)	10 ppm
Xylenes (o-, m-, p- isomers) (1330-20-7)	
ACGIH TWA (ppm)	100 ppm
ACGIH STEL (ppm)	150 ppm
OSHA PEL (TWA) (mg/m ³)	435 mg/m ³
OSHA PEL (TWA) (ppm)	100 ppm
OSHA PEL (STEL) (mg/m ³)	655 mg/m ³
OSHA PEL (STEL) (ppm)	150 ppm

8.2. Exposure controls

Personal protective equipment

: Gloves. Protective goggles. Wear chemically impervious apron over labcoat and full coverage clothing.



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Hand protection	: Use gloves chemically resistant to this material when prolonged or repeated contact could occur. Gloves should be classified under Standard EN 374 or ASTM F1296. Suggested glove materials are: Neoprene, Nitrile/butadiene rubber, Polyethylene, Ethyl vinyl alcohol laminate, PVC or vinyl. Suitable gloves should be recommended by the glove supplier.
Eye protection	: Wear eye protection, including chemical splash goggles and a face shield when possibility exists for eye contact due to spraying liquid or airborne particles.
Skin and body protection	: Wear long sleeves, and chemically impervious PPE/coveralls to minimize bodily exposure.
Respiratory protection	: Use NIOSH (or other equivalent national standard) -approved dust/particulate respirator. Where vapor, mist, or dust exceed PELs or other applicable OELs, use NIOSH-approved respiratory protective equipment.
Engineering Controls:	: Provide adequate general and local exhaust ventilation to: (1) Maintain airborne chemical concentrations below applicable exposure limits, (2) Prevent accumulation of flammable vapors and formation of explosive atmospheres, and (3) Prevent formation of oxygen deficient atmospheres, especially in confined spaces.

SECTION 9: Physical and chemical properties

9.1. Information on basic physical and chemical properties

Physical state	: Liquid
Appearance	: Clear or opaque liquid.
Color	: Colourless.
Odor	: Rotten eggs.
Odor Threshold	: No data available
pH	: No data available
Relative evaporation rate (butylacetate=1)	: No data available
Melting point	: No data available
Freezing point	: < 0 °C (32°F)
Boiling point	: Varies depending on hydrocarbon content
Flash point	: No data available
Auto-ignition temperature	: No data available
Decomposition temperature	: No data available
Flammability (solid, gas)	: No data available
Vapour pressure	: No data available
Relative vapour density at 20 °C	: > 1
Relative density	: > 1
Solubility	: No data available
Log Pow	: No data available
Log Kow	: No data available
Viscosity, kinematic	: No data available
Viscosity, dynamic	: No data available
Explosive properties	: No data available
Oxidising properties	: No data available
Explosive limits	: No data available

9.2. Other information

No additional information available

SECTION 10: Stability and reactivity

10.1. Reactivity

No additional information available

10.2. Chemical stability

Stable under recommended handling and storage conditions (see section 7).

10.3. Possibility of hazardous reactions

None known.

10.4. Conditions to avoid

Heat. Sparks. Open flame. Static electricity.

10.5. Incompatible materials

Strong oxidizing agents. Strong reducing agents. Chlorine. Fluorine. Bromine. Reactive metals.

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10.6. Hazardous decomposition products

Sulfur dioxide. Carbon oxides (CO, CO₂).

SECTION 11: Toxicological information

11.1. Information on toxicological effects

Acute toxicity : Inhalation:dust,mist: Not classified.

Petroleum distillates (naphtha) (8002-05-9)	
LD50 oral rat	> 4300 mg/kg
LD50 dermal rabbit	> 2000 mg/kg

Benzene (71-43-2)	
LD50 dermal rabbit	> 8200 mg/kg
LC50 inhalation rat (mg/l)	44.66 mg/l/4h (vapor)

Calcium chloride (10043-52-4)	
LD50 dermal rat	2630 mg/kg

Skin corrosion/irritation : Causes skin irritation.
Serious eye damage/irritation : Causes serious eye irritation.
Respiratory or skin sensitisation : Not classified
Germ cell mutagenicity : Not classified.
Carcinogenicity : May cause cancer.

Benzene (71-43-2)	
IARC group	1 - Carcinogenic to humans
National Toxicology Program (NTP) Status	2 - Known Human Carcinogens

Reproductive toxicity : Not classified
Specific target organ toxicity (single exposure) : Not classified
Specific target organ toxicity (repeated exposure) : Not classified.
Aspiration hazard : Not classified
Symptoms/injuries after inhalation : May cause drowsiness or dizziness.
Symptoms/injuries after skin contact : Causes skin irritation.
Symptoms/injuries after eye contact : Causes serious eye irritation.
Symptoms/injuries after ingestion : May cause gastrointestinal irritation.
Chronic symptoms : May cause cancer.

HYDROGEN SULFIDE: This product may contain or release hydrogen sulfide, which may be fatal if inhaled. Greater than 15-20 ppm continuous exposure can cause mucous membrane and respiratory tract irritation. 50-500 ppm can cause headache, nausea, dizziness, loss of reasoning and balance, difficulty breathing, fluid in the lungs and possible loss of consciousness. Greater than 500 ppm can cause rapid or immediate unconsciousness due to respiratory paralysis and death by suffocation unless removed from exposure and successfully resuscitated. Inhalation of a single breath at a concentration of 1000 ppm (0.1%) can cause immediate unconsciousness and death. Hydrogen sulfide is corrosive when moist. Skin contact may cause burns. There is a rapid loss of sense of smell on exposure to gas concentrations above 50 ppm. At high concentrations, individuals may not even recognize the odor before becoming unconscious.

SECTION 12: Ecological information

12.1. Toxicity

No additional information available

12.2. Persistence and degradability

No additional information available

12.3. Bioaccumulative potential

No additional information available

12.4. Mobility in soil

No additional information available

12.5. Other adverse effects

No additional information available

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SECTION 13: Disposal considerations

13.1. Waste treatment methods

- Waste treatment methods : Do not discharge to public wastewater systems without permit of pollution control authorities. No discharge to surface waters is allowed without an NPDES permit.
- Waste disposal recommendations : Dispose in a safe manner in accordance with local/national regulations. Do not allow the product to be released into the environment.

SECTION 14: Transport information

In accordance with DOT

- Transport document description : UN1993 Flammable liquids, n.o.s., 3, II
- UN-No.(DOT) : 1993
- DOT NA no. : UN1993
- Proper Shipping Name (DOT) : Flammable liquids, n.o.s.
- Class (DOT) : 3 - Class 3 - Flammable and combustible liquid 49 CFR 173.120
- Hazard labels (DOT) : 3 - Flammable liquid



- Packing group (DOT) : II - Medium Danger
- DOT Quantity Limitations Passenger aircraft/rail (49 CFR 173.27) : 5 L
- DOT Quantity Limitations Cargo aircraft only (49 CFR 175.75) : 60 L
- DOT Vessel Stowage Location : B - (i) The material may be stowed "on deck" or "under deck" on a cargo vessel and on a passenger vessel carrying a number of passengers limited to not more than the larger of 25 passengers, or one passenger per each 3 m of overall vessel length; and (ii) "On deck only" on passenger vessels in which the number of passengers specified in paragraph (k)(2)(i) of this section is exceeded

Additional information

- Emergency Response Guide (ERG) Number : 128
- Other information : No supplementary information available.

Transport by sea

No additional information available

Air transport

No additional information available

SECTION 15: Regulatory information

15.1. US Federal regulations

Produced Water	
All chemical substances in this product are listed in the EPA (Environment Protection Agency) TSCA (Toxic Substances Control Act) Inventory	
SARA Section 311/312 Hazard Classes	Delayed (chronic) health hazard Fire hazard Immediate (acute) health hazard
Benzene (71-43-2)	
Section 302 (EHS) TPQ	
Section 304 EHS RQ	
CERCLA RQ	10 lb
Section 313	Listed on US SARA Section 313
Hydrogen Sulfide (7783-06-4)	
Section 302 (EHS) TPQ	500 lb
Section 304 EHS RQ	100 lb
CERCLA RQ	100 lb
Section 313	Listed on US SARA Section 313

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15.2. International regulations

No additional information available.

15.3. US State regulations

WARNING! This product contains chemicals known to the state of California to cause cancer, birth defects, or other reproductive harm.

Benzene (71-43-2)				
U.S. - California - Proposition 65 - Carcinogens List	U.S. - California - Proposition 65 - Developmental Toxicity	U.S. - California - Proposition 65 - Reproductive Toxicity - Female	U.S. - California - Proposition 65 - Reproductive Toxicity - Male	Non-significant risk level (NSRL) & Maximum allowable dose level (MADL)
Yes	Yes	No	Yes	NSRL: 6.4 µg/day (oral), 13 µg/day (inhalation) MADL: 24µg/day (oral), 49 µg/day (inhalation)

Petroleum distillates (naphtha) (8002-05-9)
U.S. - Massachusetts - Right To Know List U.S. - New Jersey - Right to Know Hazardous Substance List U.S. - Pennsylvania - RTK (Right to Know) List

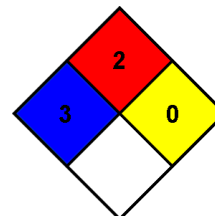
Benzene (71-43-2)
U.S. - Massachusetts - Right To Know List U.S. - New Jersey - Right to Know Hazardous Substance List U.S. - Pennsylvania - RTK (Right to Know) - Special Hazardous Substances U.S. - Pennsylvania - RTK (Right to Know) - Environmental Hazard List

Hydrogen sulfide (7783-06-4)
U.S. - Massachusetts - Right To Know List U.S. - New Jersey - Right to Know Hazardous Substance List U.S. - Pennsylvania - RTK (Right to Know) - Environmental Hazard List

SECTION 16: Other information

Indication of changes : Revision 1.0: New SDS Created.
Revision date : 11/29/2016
Other information : Author: SWE.

NFPA health hazard : 3 - Short exposure could cause serious temporary or residual injury even though prompt medical attention was given.
NFPA fire hazard : 2 - Must be moderately heated or exposed to relatively high temperature before ignition can occur.
NFPA reactivity : 0 - Normally stable, even under fire exposure conditions, and are not reactive with water.



HMIS III Rating

Health : 3*
Flammability : 2
Physical : 0
Personal protection :

This information is based on our current knowledge and is intended to describe the product for the purposes of health, safety and environmental requirements only. It should not therefore be construed as guaranteeing any specific property of the product.

SECTION 1: Identification of the substance/mixture and of the company/undertaking

1.1. Product identifier

Product name : Natural Gas Condensate
Product form : Mixture

1.2. Relevant identified uses of the substance or mixture and uses advised against

Use of the substance/mixture : Refinery Feedstock

1.3. Details of the supplier of the safety data sheet

PDC Energy Inc.
1775 Sherman St. #3000
Denver, CO 80203
1-303-860-5800

1.4. Emergency telephone number

Emergency number : CHEMTREC: 1-800-424-9300

SECTION 2: Hazards identification

2.1. Classification of the substance or mixture

Classification (GHS-US)

Flam. Liq. 1 H224
Skin Irrit. 2 H315
Eye Irrit. 2A H319
Muta. 1B H340
Carc. 1A H350
Repr. 2 H361
STOT RE 2 H373

2.2. Label elements

GHS-US labeling

Hazard pictograms (GHS-US) :



Signal word (GHS-US) :

Danger

Hazard statements (GHS-US) :

H224 - Extremely flammable liquid and vapor
H315 - Causes skin irritation
H319 - Causes serious eye irritation
H340 - May cause genetic defects
H350 - May cause cancer
H361 - Suspected of damaging fertility or the unborn child
H373 - May cause damage to organs through prolonged or repeated exposure

Precautionary statements (GHS-US) :

P201 - Obtain special instructions before use
P202 - Do not handle until all safety precautions have been read and understood
P210 - Keep away from heat, sparks, open flames. - No smoking
P233 - Keep container tightly closed
P240 - Ground/bond container and receiving equipment
P241 - Use explosion-proof electrical, lighting, ventilating equipment
P242 - Use only non-sparking tools
P243 - Take precautionary measures against static discharge
P260 - Do not breathe mist, spray, vapors
P264 - Wash hands, forearms and face thoroughly after handling
P280 - Wear eye protection, protective clothing, protective gloves, face protection
P302 + P352 - If on skin: Wash with plenty of water
P303 + P361 + P353 - If on skin (or hair): Take off immediately all contaminated clothing. Rinse skin with water/shower
P305+P351+P338 - IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing
P308 + P313 - If exposed or concerned: Get medical advice/attention
P314 - Get medical advice/attention if you feel unwell
P321 - Specific treatment (see first aid instructions on this label)
P332 + P313 - If skin irritation occurs: Get medical advice/attention
P337 + P313 - If eye irritation persists: Get medical advice/attention
P362 - Take off contaminated clothing and wash before reuse

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P370 + P378 - In case of fire: Use foam, water spray, or fog to extinguish
P403 + P235 - Store in a well-ventilated place. Keep cool
P405 - Store locked up
P501 - Dispose of contents/container to licensed waste handling facility

2.3. Other hazards

No additional information available

2.4. Unknown acute toxicity (GHS-US)

No data available

SECTION 3: Composition/information on ingredients

3.1. Substance

Not applicable

3.2. Mixture

Name	Product identifier	%
Petroleum Crude Oil	(CAS No) 8002-05-9	1-99
Octane	(CAS No) 111-65-9	3 - 7
Toluene	(CAS No) 108-88-3	1 - 5
Xylenes (o-, m-, p- isomers)	(CAS No) 1330-20-7	1 - 5
Nonane	(CAS No) 111-84-2	1 - 5
Decane	(CAS No) 124-18-5	1 - 5
Undecane	(CAS No) 1120-21-4	1 - 5
Benzene	(CAS No) 71-43-2	0.1 - 1
Benzene, 1,2,4-trimethyl-	(CAS No) 95-63-6	0.1 - 1
Ethylbenzene	(CAS No) 100-41-4	0.1 - 1

SECTION 4: First aid measures

4.1. Description of first aid measures

First-aid measures general : Never give anything by mouth to an unconscious person. If you feel unwell, seek medical advice (show the label where possible).

First-aid measures after inhalation : IF INHALED: Remove to fresh air and keep at rest in a position comfortable for breathing. Call a POISON CENTER or doctor/physician.

First-aid measures after skin contact : IF ON SKIN: Immediately rinse with plenty of water (for at least 15 minutes). Get immediate medical advice/attention.

First-aid measures after eye contact : IF IN EYES: Rinse immediately and thoroughly, pulling the eyelids well away from the eye (15 minutes minimum). Get medical advice/attention.

First-aid measures after ingestion : IF SWALLOWED: Rinse mouth. Do NOT induce vomiting. Obtain emergency medical attention.

4.2. Most important symptoms and effects, both acute and delayed

Symptoms/injuries : Harmful if inhaled. Causes skin irritation. Suspected of causing genetic defects. Suspected of causing cancer. Suspected of damaging fertility or the unborn child.

Symptoms/injuries after inhalation : May cause respiratory irritation.

Symptoms/injuries after skin contact : May cause moderate irritation.

Symptoms/injuries after eye contact : Moderately irritating to eyes.

Symptoms/injuries after ingestion : Acute ingestion causes CNS depression, oropharyngeal and gastric pain and vomiting. May cause a light irritation of the linings of the mouth, throat, and gastrointestinal tract.

Chronic symptoms : May cause cancer. May have mutagenic effect. May damage fertility. May damage the unborn child.

4.3. Indication of any immediate medical attention and special treatment needed

No additional information available

SECTION 5: Firefighting measures

5.1. Extinguishing media

Suitable extinguishing media : Carbon dioxide. Dry powder. Foam. Sand.

Unsuitable extinguishing media : None known.

5.2. Special hazards arising from the substance or mixture

Fire hazard : Flammable liquid and vapor.

Explosion hazard : Explosive in the presence of open flames, sparks, and static discharge.

Reactivity : No dangerous reactions known under normal conditions of use.

5.3. Advice for firefighters

Firefighting instructions : Use water spray or fog for cooling exposed containers. Exercise caution when fighting any chemical fire. Do not dispose of fire-fighting water in the environment.

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- Protection during firefighting : Do not enter fire area without proper protective equipment, including respiratory protection. Wear self-contained breathing apparatus and protective suit (see item 8).
- Other information : No additional information available.

SECTION 6: Accidental release measures

6.1. Personal precautions, protective equipment and emergency procedures

- General measures : Evacuate area. Remove ignition sources. Keep upwind. Ventilate area. Spill should be handled by trained clean-up crews properly equipped with respiratory equipment and full chemical protective gear (see Section 8).

6.1.1. For non-emergency personnel

- Protective equipment : Wear Protective equipment as described in Section 8.
- Emergency procedures : Evacuate unnecessary personnel.

6.1.2. For emergency responders

- Protective equipment : Wear suitable protective clothing, gloves and eye or face protection. Approved supplied-air respirator, in case of emergency.

6.2. Environmental precautions

Prevent entry to sewers and public waters. Avoid release to the environment.

6.3. Methods and material for containment and cleaning up

- For containment : Contain any spills with dikes or absorbents to prevent migration and entry into sewers or streams.
- Methods for cleaning up : Exclude sources of ignition and ventilate the area. Soak up spills with inert solids, such as clay or diatomaceous earth as soon as possible. Place in a suitable container for disposal in accordance with the waste regulations (see Section 13). Waste from this product may be hazardous as defined under RCRA (40 CFR 261).

6.4. Reference to other sections

No additional information available

SECTION 7: Handling and storage

7.1. Precautions for safe handling

- Precautions for safe handling : Do not handle until all safety precautions have been read and understood. Wash hands and other exposed areas with mild soap and water before eating, drinking or smoking and when leaving work. Provide good ventilation in process area to prevent formation of vapor. Do not breathe vapors or mists. Keep away from sources of ignition - No smoking. Use appropriate personal protection equipment (PPE).

7.2. Conditions for safe storage, including any incompatibilities

- Storage conditions : Keep only in the original container in a cool, well ventilated place away from : Heat sources. Keep container closed when not in use.

7.3. Specific end use(s)

No additional information available

SECTION 8: Exposure controls/personal protection

8.1. Control parameters

Octane (111-65-9)	
ACGIH TWA (ppm)	300 ppm
OSHA PEL (TWA) (mg/m ³)	2350 mg/m ³
OSHA PEL (TWA) (ppm)	500 ppm
OSHA PEL (STEL) (mg/m ³)	1800 mg/m ³ Vacated
OSHA PEL (STEL) (ppm)	375 ppm Vacated

Toluene (108-88-3)	
ACGIH TWA (ppm)	20 ppm

Xylenes (o-, m-, p- isomers) (1330-20-7)	
OSHA PEL (TWA) (mg/m ³)	435 mg/m ³
OSHA PEL (TWA) (ppm)	100 ppm
OSHA PEL (STEL) (mg/m ³)	655 mg/m ³
OSHA PEL (STEL) (ppm)	150 ppm

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Nonane (111-84-2)	
ACGIH TWA (ppm)	200 ppm
OSHA PEL (TWA) (mg/m ³)	1050 mg/m ³
OSHA PEL (TWA) (ppm)	200 ppm
Decane (124-18-5)	
Remark (ACGIH)	OELs not established
Remark (US OSHA)	OELs not established
Undecane (1120-21-4)	
Remark (ACGIH)	OELs not established
Remark (US OSHA)	OELs not established
Benzene (71-43-2)	
ACGIH TWA (ppm)	0.5 ppm
ACGIH STEL (ppm)	2.5 ppm
OSHA PEL (TWA) (ppm)	1 ppm
OSHA PEL (STEL) (ppm)	5 ppm (see 29 CFR 1910.1028)
OSHA PEL (Ceiling) (ppm)	25 ppm
Benzene, 1,2,4-trimethyl- (95-63-6)	
Remark (ACGIH)	OELs not established
Remark (US OSHA)	OELs not established
Ethylbenzene (100-41-4)	
ACGIH TWA (ppm)	20 ppm
OSHA PEL (TWA) (mg/m ³)	435 mg/m ³
OSHA PEL (TWA) (ppm)	100 ppm
OSHA PEL (STEL) (mg/m ³)	545 mg/m ³
OSHA PEL (STEL) (ppm)	125 ppm

8.2. Exposure controls

Appropriate engineering controls

: Ensure adequate ventilation, especially in confined areas.

Personal protective equipment

: Face shield. Respiratory protection of the dependent type. Gloves. Protective goggles. Protective clothing.



Hand protection

: Use gloves chemically resistant to this material when prolonged or repeated contact could occur. Gloves should be classified under Standard EN 374 or ASTM F1296. Suggested glove materials are: . Gloves constructed of nitrile, neoprene, or PVC are recommended.

Eye protection

: Eye protection, including both chemical splash goggles and face shield, must be worn when possibility exists for eye contact due to spraying liquid or airborne particles.

Skin and body protection

: Chemical protective clothing such as DuPont TyChem®, Barricade or equivalent, recommended based on degree of exposure.

Respiratory protection

: An approved organic vapor respirator/supplied air or self-contained breathing apparatus must be used when vapor concentration exceeds applicable exposure limits. Where excessive vapor, mist, or dust may result, use approved respiratory protection equipment.

Thermal hazard protection

: No data available.

Environmental exposure controls

: Do not flush into surface water or sewer system.

SECTION 9: Physical and chemical properties

9.1. Information on basic physical and chemical properties

Physical state	: Liquid
Color	: Clear to Yellow
Odor	: Petroleum-like odor
Odor Threshold	: No data available
pH	: No data available

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Relative evaporation rate (butyl acetate=1)	: No data available
Melting point	: No data available
Freezing point	: No data available
Boiling point	: 26.7 °C (80 °F)
Flash point	: 10 °C (< 50 °F)
Self ignition temperature	: No data available
Decomposition temperature	: No data available
Flammability (solid, gas)	: No data available
Vapor pressure	: No data available
Relative vapor density at 20 °C	: No data available
Relative density	: No data available
Solubility	: No data available
Log Pow	: No data available
Log Kow	: No data available
Viscosity, kinematic	: No data available
Viscosity, dynamic	: No data available
Explosive properties	: No data available
Oxidizing properties	: No data available
Explosive limits	: No data available

9.2. Other information

No additional information available

SECTION 10: Stability and reactivity

10.1. Reactivity

No dangerous reactions known under normal conditions of use.

10.2. Chemical stability

Stable under recommended handling and storage conditions (see section 7).

10.3. Possibility of hazardous reactions

No data available.

10.4. Conditions to avoid

Sparks. Heat. Open flame.

10.5. Incompatible materials

Avoid contact with : Strong oxidizing agents.

10.6. Hazardous decomposition products

Thermal decomposition generates : Carbon oxides (CO, CO₂). Hydrocarbons.

SECTION 11: Toxicological information

11.1. Information on toxicological effects

Acute toxicity : Not classified

Octane (111-65-9)	
LD50 oral rat	118000 mg/m ³ 4 h; (Source: NLM_CIP)
Toluene (108-88-3)	
LD50 oral rat	636 mg/kg
LD50 dermal rat	12124 mg/kg
LD50 dermal rabbit	8390 mg/kg
LC50 inhalation rat (mg/l)	12.5 mg/l/4h
LC50 inhalation rat (ppm)	> 26700 ppm/1h
ATE (oral)	636.000 mg/kg body weight
ATE (dermal)	8390.000 mg/kg body weight
ATE (dust, mist)	12.500 mg/l/4h
Xylenes (o-, m-, p- isomers) (1330-20-7)	
LD50 oral rat	4300 mg/kg
LD50 dermal rabbit	> 1700 mg/kg
LC50 inhalation rat (mg/l)	47635 mg/l/4h

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Xylenes (o-, m-, p- isomers) (1330-20-7)	
LC50 inhalation rat (ppm)	5000 ppm/4h
ATE (oral)	4300.000 mg/kg
ATE (dermal)	1100.000 mg/kg
ATE (dust, mist)	1.500 mg/l/4h

Nonane (111-84-2)	
LC50 inhalation rat (ppm)	3200 ppm/4h (Source: IUCLID)

Decane (124-18-5)	
LD50 oral rat	> 5000 mg/kg (Source: IUCLID)
LD50 dermal rabbit	> 2000 mg/kg (Source: NLM_CIP)
LC50 inhalation rat (ppm)	> 1369 ppm 8 h;

Undecane (1120-21-4)	
LC50 inhalation rat (ppm)	> 442 ppm 8 h; (Source: IUCLID)

Benzene (71-43-2)	
LD50 oral rat	1800 mg/kg
LC50 inhalation rat (ppm)	13050 ppm/4h
ATE (oral)	1800.000 mg/kg

Benzene, 1,2,4-trimethyl- (95-63-6)	
LD50 oral rat	3400 mg/kg
LD50 dermal rabbit	> 3160 mg/kg
LC50 inhalation rat (mg/l)	18 g/m ³ 4h
ATE (oral)	3400.000 mg/kg body weight
ATE (dust, mist)	1.500 mg/l/4h

Ethylbenzene (100-41-4)	
LD50 oral rat	3500 mg/kg
LD50 dermal rabbit	15354 mg/kg
LC50 inhalation rat (mg/l)	17.2 mg/l/4h
ATE (oral)	3500.000 mg/kg body weight
ATE (dermal)	15354.000 mg/kg body weight
ATE (dust, mist)	1.500 mg/l/4h

Skin corrosion/irritation : Causes skin irritation.
Serious eye damage/irritation : Causes serious eye irritation.
Respiratory or skin sensitization : Not classified
Germ cell mutagenicity : May cause genetic defects.
Carcinogenicity : May cause cancer.

Toluene (108-88-3)	
IARC group	3 - Not classifiable

Xylenes (o-, m-, p- isomers) (1330-20-7)	
IARC group	3 - Not classifiable

Benzene (71-43-2)	
IARC group	1 - Carcinogenic to humans
National Toxicity Program (NTP) Status	2 - Known Human Carcinogens

Ethylbenzene (100-41-4)	
IARC group	2B - Possibly carcinogenic to humans

Reproductive toxicity : Suspected of damaging fertility or the unborn child.
Specific target organ toxicity (single exposure) : Not classified

Specific target organ toxicity (repeated exposure) : May cause damage to organs through prolonged or repeated exposure.

Aspiration hazard : Not classified
Symptoms/injuries after inhalation : May cause respiratory irritation.
Symptoms/injuries after skin contact : May cause moderate irritation.
Symptoms/injuries after eye contact : Moderately irritating to eyes.
Symptoms/injuries after ingestion : Acute ingestion causes CNS depression, oropharyngeal and gastric pain and vomiting. May cause a light irritation of the linings of the mouth, throat, and gastrointestinal tract.

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Chronic symptoms : May cause cancer. May have mutagenic effect. May damage fertility. May damage the unborn child.

SECTION 12: Ecological information

12.1. Toxicity

Ecology - general : Toxic to aquatic life with long lasting effects.

12.2. Persistence and degradability

No additional information available

12.3. Bioaccumulative potential

No additional information available

12.4. Mobility in soil

No additional information available

12.5. Other adverse effects

No additional information available

SECTION 13: Disposal considerations

13.1. Waste treatment methods

Waste treatment methods : Obtain the consent of pollution control authorities before discharging to wastewater treatment plants.

Sewage disposal recommendations : Avoid direct discharge into drains.

Waste disposal recommendations : Dispose in a safe manner in accordance with local/national regulations. Do not allow the product to be released into the environment.

SECTION 14: Transport information

In accordance with DOT

Transport document description : UN1267 Petroleum crude oil, 3, I

UN-No.(DOT) : 1267

DOT NA no. : UN1267

DOT Proper Shipping Name : Petroleum crude oil

Department of Transportation (DOT) Hazard Classes : 3 - Class 3 - Flammable and combustible liquid 49 CFR 173.120

Hazard labels (DOT) : 3 - Flammable liquid



Packing group (DOT) : I - Great Danger

DOT Quantity Limitations Passenger aircraft/rail (49 CFR 173.27) : 1 L

DOT Quantity Limitations Cargo aircraft only (49 CFR 175.75) : 30 L

DOT Vessel Stowage Location : E - The material may be stowed "on deck" or "under deck" on a cargo vessel and on a passenger vessel carrying a number of passengers limited to not more than the larger of 25 passengers, or one passenger per each 3 m of overall vessel length, but is prohibited from carriage on passenger vessels in which the limiting number of passengers is exceeded.

Additional information

Other information : No supplementary information available.

Transport by sea

No additional information available

Air transport

No additional information available

SECTION 15: Regulatory information

15.1. US Federal regulations

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All chemical substances in this product are listed in the EPA (Environmental Protection Agency) TSCA (Toxic Substances Control Act) Inventory

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SARA Section 311/312 Hazard Classes	Fire hazard Delayed (chronic) health hazard Immediate (acute) health hazard

Octane (111-65-9)
Listed on the United States TSCA (Toxic Substances Control Act) inventory

Toluene (108-88-3)
Listed on the United States TSCA (Toxic Substances Control Act) inventory Listed on SARA Section 313 (Specific toxic chemical listings)

Xylenes (o-, m-, p- isomers) (1330-20-7)	
Listed on the United States TSCA (Toxic Substances Control Act) inventory Listed on SARA Section 313 (Specific toxic chemical listings)	
RQ (Reportable quantity, section 304 of EPA's List of Lists) :	100 lb
SARA Section 313 - Emission Reporting	1 %

Nonane (111-84-2)
Listed on the United States TSCA (Toxic Substances Control Act) inventory

Decane (124-18-5)
Listed on the United States TSCA (Toxic Substances Control Act) inventory

Undecane (1120-21-4)
Listed on the United States TSCA (Toxic Substances Control Act) inventory

Benzene (71-43-2)	
Listed on the United States TSCA (Toxic Substances Control Act) inventory Listed on SARA Section 313 (Specific toxic chemical listings)	
RQ (Reportable quantity, section 304 of EPA's List of Lists) :	10 lb (reieved an adjusted RQ of 10 lbs based on potential carcinogenicity in an August 14, 1989 final rule)
SARA Section 313 - Emission Reporting	0.1 %

Benzene, 1,2,4-trimethyl- (95-63-6)	
Listed on the United States TSCA (Toxic Substances Control Act) inventory Listed on SARA Section 313 (Specific toxic chemical listings)	
SARA Section 313 - Emission Reporting	1 %

Ethylbenzene (100-41-4)	
Listed on the United States TSCA (Toxic Substances Control Act) inventory Listed on SARA Section 313 (Specific toxic chemical listings)	
RQ (Reportable quantity, section 304 of EPA's List of Lists) :	1000 lb
SARA Section 313 - Emission Reporting	0.1 %

15.2. International regulations

CANADA

Octane (111-65-9)
Listed on the Canadian DSL (Domestic Substances List) inventory.

Toluene (108-88-3)
Listed on the Canadian DSL (Domestic Substances List) inventory.

Xylenes (o-, m-, p- isomers) (1330-20-7)
Listed on the Canadian DSL (Domestic Substances List) inventory.

Nonane (111-84-2)
Listed on the Canadian DSL (Domestic Substances List) inventory.

Decane (124-18-5)
Listed on the Canadian DSL (Domestic Substances List) inventory.

Undecane (1120-21-4)
Listed on the Canadian DSL (Domestic Substances List) inventory.

Benzene (71-43-2)
Listed on the Canadian DSL (Domestic Substances List) inventory.

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Benzene, 1,2,4-trimethyl- (95-63-6)

Listed on the Canadian DSL (Domestic Substances List) inventory.

Ethylbenzene (100-41-4)

Listed on the Canadian DSL (Domestic Substances List) inventory.

No additional information available

15.2.2. National regulations

Octane (111-65-9)

Listed on the AICS (the Australian Inventory of Chemical Substances)
Listed on Inventory of Existing Chemical Substances (IECSC)
Listed on the Japanese ENCS (Existing & New Chemicals Substances) inventory.
Listed on KECI (Chemical Inventory of Korea)

Toluene (108-88-3)

Listed on Inventory of Existing Chemical Substances (IECSC)
Listed on the AICS (the Australian Inventory of Chemical Substances)
Listed on the Japanese ENCS (Existing & New Chemicals Substances) inventory.
Listed on the Korean ECL (Existing Chemical List) inventory.

Xylenes (o-, m-, p- isomers) (1330-20-7)

Listed on Inventory of Existing Chemical Substances (IECSC)
Listed on the AICS (the Australian Inventory of Chemical Substances)
Listed on the Japanese ENCS (Existing & New Chemicals Substances) inventory.
Listed on the Korean ECL (Existing Chemical List) inventory.

Nonane (111-84-2)

Listed on the AICS (the Australian Inventory of Chemical Substances)
Listed on Inventory of Existing Chemical Substances (IECSC)
Listed on the Japanese ENCS (Existing & New Chemicals Substances) inventory.
Listed on KECI (Chemical Inventory of Korea)

Decane (124-18-5)

Listed on the AICS (the Australian Inventory of Chemical Substances)
Listed on Inventory of Existing Chemical Substances (IECSC)
Listed on the Japanese ENCS (Existing & New Chemicals Substances) inventory.
Listed on KECI (Chemical Inventory of Korea)

Undecane (1120-21-4)

Listed on the AICS (the Australian Inventory of Chemical Substances)
Listed on Inventory of Existing Chemical Substances (IECSC)
Listed on the Japanese ENCS (Existing & New Chemicals Substances) inventory.
Listed on KECI (Chemical Inventory of Korea)

Benzene (71-43-2)

Listed on IARC (International Agency for Research on Cancer)
Listed as carcinogen on NTP (National Toxicology Program)
Listed on Inventory of Existing Chemical Substances (IECSC)
Listed on the AICS (the Australian Inventory of Chemical Substances)
Listed on the Japanese ENCS (Existing & New Chemicals Substances) inventory.
Listed on the Korean ECL (Existing Chemical List) inventory.

Benzene, 1,2,4-trimethyl- (95-63-6)

Listed on Inventory of Existing Chemical Substances (IECSC)
Listed on the AICS (the Australian Inventory of Chemical Substances)
Listed on the Korean ECL (Existing Chemical List) inventory.
Listed on the Japanese ENCS (Existing & New Chemicals Substances) inventory.

Ethylbenzene (100-41-4)

Listed on IARC (International Agency for Research on Cancer)
Listed on Inventory of Existing Chemical Substances (IECSC)
Listed on the AICS (the Australian Inventory of Chemical Substances)
Listed on the Japanese ENCS (Existing & New Chemicals Substances) inventory.
Listed on the Korean ECL (Existing Chemical List) inventory.

15.3. US State regulations

California Proposition 65

This product contains, or may contain, trace quantities of a substance(s) known to the state of California to cause cancer and/or reproductive toxicity

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Toluene (108-88-3)				
U.S. - California - Proposition 65 - Carcinogens List	U.S. - California - Proposition 65 - Developmental Toxicity	U.S. - California - Proposition 65 - Reproductive Toxicity - Female	U.S. - California - Proposition 65 - Reproductive Toxicity - Male	No significance risk level (NSRL)
	Yes	Yes	Yes	

Benzene (71-43-2)				
U.S. - California - Proposition 65 - Carcinogens List	U.S. - California - Proposition 65 - Developmental Toxicity	U.S. - California - Proposition 65 - Reproductive Toxicity - Female	U.S. - California - Proposition 65 - Reproductive Toxicity - Male	No significance risk level (NSRL)
Yes	Yes		Yes	

Ethylbenzene (100-41-4)				
U.S. - California - Proposition 65 - Carcinogens List	U.S. - California - Proposition 65 - Developmental Toxicity	U.S. - California - Proposition 65 - Reproductive Toxicity - Female	U.S. - California - Proposition 65 - Reproductive Toxicity - Male	No significance risk level (NSRL)
Yes				

Octane (111-65-9)				
U.S. - Idaho - Non-Carcinogenic Toxic Air Pollutants - Acceptable Ambient Concentrations RTK - U.S. - New Jersey - Right to Know Hazardous Substance List U.S. - New York - Reporting of Releases Part 597 - List of Hazardous Substances RTK - U.S. - Massachusetts - Right To Know List RTK - U.S. - Pennsylvania - RTK (Right to Know) List				

Toluene (108-88-3)				
RTK - U.S. - Massachusetts - Right To Know List RTK - U.S. - New Jersey - Right to Know Hazardous Substance List RTK - U.S. - Pennsylvania - RTK (Right to Know) - Environmental Hazard List				

Xylenes (o-, m-, p- isomers) (1330-20-7)				
RTK - U.S. - Massachusetts - Right To Know List RTK - U.S. - New Jersey - Right to Know Hazardous Substance List RTK - U.S. - Pennsylvania - RTK (Right to Know) - Environmental Hazard List				

Nonane (111-84-2)				
U.S. - Idaho - Non-Carcinogenic Toxic Air Pollutants - Acceptable Ambient Concentrations RTK - U.S. - New Jersey - Right to Know Hazardous Substance List U.S. - New York - Reporting of Releases Part 597 - List of Hazardous Substances RTK - U.S. - Massachusetts - Right To Know List RTK - U.S. - Pennsylvania - RTK (Right to Know) List				

Decane (124-18-5)				
RTK - U.S. - New Jersey - Right to Know Hazardous Substance List U.S. - New York - Reporting of Releases Part 597 - List of Hazardous Substances RTK - U.S. - Pennsylvania - RTK (Right to Know) List				

Undecane (1120-21-4)				
RTK - U.S. - New Jersey - Right to Know Hazardous Substance List U.S. - New York - Reporting of Releases Part 597 - List of Hazardous Substances				

Benzene (71-43-2)				
RTK - U.S. - Massachusetts - Right To Know List RTK - U.S. - New Jersey - Right to Know Hazardous Substance List RTK - U.S. - Pennsylvania - RTK (Right to Know) - Special Hazardous Substances RTK - U.S. - Pennsylvania - RTK (Right to Know) - Environmental Hazard List				

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Benzene, 1,2,4-trimethyl- (95-63-6)

RTK - U.S. - New Jersey - Right to Know Hazardous Substance List
RTK - U.S. - Massachusetts - Right To Know List
RTK - U.S. - Pennsylvania - RTK (Right to Know) - Environmental Hazard List

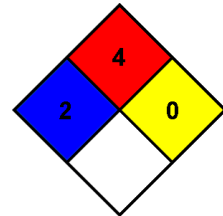
Ethylbenzene (100-41-4)

RTK - U.S. - New Jersey - Right to Know Hazardous Substance List
RTK - U.S. - Massachusetts - Right To Know List
RTK - U.S. - Pennsylvania - RTK (Right to Know) - Environmental Hazard List

SECTION 16: Other information

Indication of changes : Revision 1.0: New SDS Created.
Revision date : 06/24/2014
Other information : Author: BAS.

NFPA health hazard : 2 - Intense or continued exposure could cause temporary incapacitation or possible residual injury unless prompt medical attention is given.
NFPA fire hazard : 4 - Will rapidly or completely vaporize at normal pressure and temperature, or is readily dispersed in air and will burn readily.
NFPA reactivity : 0 - Normally stable, even under fire exposure conditions, and are not reactive with water.



HMIS III Rating

Health : 2
Flammability : 4
Physical : 0
Personal Protection :

This information is based on our current knowledge and is intended to describe the product for the purposes of health, safety and environmental requirements only. It should not therefore be construed as guaranteeing any specific property of the product