SAFETY DATA SHEET

Classified in accordance with Health Canada Hazardous Products Regulations (SOR/2015-17)

1. Identification

Product identifier: AROMATIC CONCENTRATE GRADE 3

Other means of identification

Common name(s), synonym(s): 90% AC1 and 10% Octylenes Mixture; AC3

SDS number: NOVA-0149

Recommended use and restriction on use

Recommended use: Feedstock for petrochemical manufacturing.

Restrictions on use: All uses other than the identified.

Manufacturer/Importer/Supplier/Distributor Information

Manufacturer

Company Name:	NOVA Chemicals
Address:	P.O. Box 2518, Station M Calgary, Alberta, Canada T2P 5C6
Telephone:	Product Information: 1-412-490-4063
SDS Information Email:	msdsemail@novachem.com

Emergency telephone number:

1-800-561-6682, 1-403-314-8767 (NOVA Chemicals) (24 hours)

2. Hazard(s) identification

Hazard Classification According to Hazardous Products Regulations

Physical Hazards

Flammable liquids	Category 1
Static-accumulating flammable liquid	Category 1

Health Hazards

Acute toxicity (Oral)	Category 4
Acute toxicity (Inhalation - vapour)	Category 4
Skin Corrosion/Irritation	Category 2
Serious Eye Damage/Eye Irritation	Category 2A
Germ Cell Mutagenicity	Category 1B
Carcinogenicity	Category 1A
Toxic to reproduction	Category 2
Specific Target Organ Toxicity - Single Exposure	Category 3
Specific Target Organ Toxicity - Repeated Exposure	Category 1
Specific Target Organ Toxicity - Repeated Exposure	Category 2
Aspiration Hazard	Category 1

Environmental Hazards

Acute hazards to the aquatic environment	Category 1

Chronic hazards to the aquatic environment	Category 1

Label Elements

Hazard Symbol:

Signal Word: Danger

Hazard Statement:

Extremely flammable liquid and vapour.
Static accumulating flammable liquid can become electrostatically charged even in bonded and grounded equipment.
Sparks may ignite liquid and vapour.
May cause flash fire or explosion.
Harmful if swallowed or if inhaled.
Causes skin irritation.
Causes serious eye irritation.
May cause genetic defects.
May cause cancer.
Suspected of damaging fertility or the unborn child.
May cause respiratory irritation.
Causes damage to organs through prolonged or repeated exposure.
(Blood)
(Auditory system)
May cause damage to organs through prolonged or repeated exposure.
(Central nervous system)
May be fatal if swallowed and enters airways.
Very toxic to aquatic life with long lasting effects.

Precautionary Statements:

Prevention:

Obtain special instructions before use. Do not handle until all safety precautions have been read and understood. Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking. Keep container tightly closed. Ground and bond container and receiving equipment. Use explosion-proof [electrical/ventilating/lighting] equipment. Use non-sparking tools. Take action to prevent static discharges. These alone may be insufficient to remove static electricity. Do not breathe dust/fume/gas/mist/vapours/spray. Wash hands thoroughly after handling. Do not eat, drink or smoke when using this product. Use only outdoors or in a well-ventilated area. Avoid release to the environment. Wear protective gloves/protective clothing/eye protection/face protection.

Response:

IF SWALLOWED: rinse mouth. Do NOT induce vomiting. Immediately call a POISON CENTRE/doctor. IF ON SKIN (or hair): Take off immediately all contaminated clothing and wash it before reuse. Rinse skin with water [or shower]. If skin irritation occurs: Get medical advice/attention. IF INHALED: Remove person to fresh air and keep comfortable for breathing. Call a POISON CENTRE/doctor if you feel unwell. IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. If eye irritation persists: Get medical advice/attention. IF exposed or concerned: Get medical advice/attention. In case of fire: Use dry

chemical, foam, carbon dioxide (CO2), water spray or fog to extinguish. Collect spillage.

Storage: Store in a well-ventilated place. Keep container tightly closed. Keep cool. Store locked up.

Disposal: Dispose of contents/container to an appropriate treatment and disposal facility in accordance with applicable laws and regulations, and product characteristics at time of disposal.

Other hazards which do not result in GHS classification: None.

3. Composition/information on ingredients

Mixtures

Chemical Identity	Common name and synonyms	CAS number	Content in percent (%)*
Benzene	Benzol	71-43-2	27 - 47%
4,7-Methano-1H-indene, 3a,4,7,7a-tetrahydro-	Dicyclopentadiene, DCPD	77-73-6	9 - 18%
Toluene	Methylbenzene	108-88-3	2.7 - 7.2%
1,3-Cyclopentadiene	Cyclopentadiene	542-92-7	0.9 - 7.2%
1-Octene	Octylene	111-66-0	0.65 - 5.73%
Benzene, ethenyl-	Styrene	100-42-5	0.9 - 5.4%
1,3-Pentadiene	Piperylene	504-60-9	1.8 - 4.5%
1,3-Butadiene, 2-methyl-	Isoprene	78-79-5	0.09 - 3.6%
1-Pentene	Pent-1-ene	109-67-1	1.30 - 2.48%
Cyclopentene	1-Cyclopentene	142-29-0	1.50 - 2.07%
2-Octene	Octene-2	111-67-1	0.30 - 1.71%
Benzene, dimethyl-	Xylene (mixed isomers)	1330-20-7	0.41 - 1.62%
3-Methyl-2-heptene	2-heptene, 3-methyl	3404-75-9	0 - 1.5%
Benzene, ethyl-	Ethylbenzene, Phenylethane	100-41-4	0.27 - 0.90%
Naphthalene	Naphthalene	91-20-3	0.02 - 0.90%
n-Undecane	Undecane	1120-21-4	0.009 - 0.90%
1,3-Butadiene	Vinylethylene	106-99-0	0 - 0.8%
Octane	n-Octane	111-65-9	0 - 0.13%

* All concentrations are percent by weight.

Additional Information: This product is a mixture of CAS # 68921-67-5 - Hydrocarbons, ethylene-manuf.-by-product distn. residues and CAS # 25377-83-7 - Octene (Mixed Isomers). Hydrogen sulphide (CAS # 7783-06-4) may also be present up to 30 ppm. This product is considered hazardous by the Hazardous Products Regulations, 2015.

4. First-aid measures

Inhalation: IF INHALED: Remove person to fresh air and keep comfortable for breathing. Call a POISON CENTRE/doctor if you feel unwell.

Ingestion: IF SWALLOWED: rinse mouth. Do NOT induce vomiting. Immediately call a POISON CENTRE/doctor.

Skin Contact: IF ON SKIN (or hair): Take off immediately all contaminated clothing and wash before reuse. Rinse skin with water/shower. If skin irritation occurs: Get medical advice/attention.

Eye contact: IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. If eye irritation persists: Get medical advice/attention.

Most important symptoms/effects, acute and delayed

Symptoms: Eye irritation. Skin irritation. Respiratory irritation. Vomiting, nausea, abdominal pain and central nervous system effects including headache.

Indication of immediate medical attention and special treatment needed

Treatment: For more detailed medical emergency support information, call 1-800-561-6682 or 1-403-314-8767 (24 hours, NOVA Chemicals Emergency Response). Ensure thorough eye and skin decontamination. Treat unconsciousness, nausea, hypotension, seizures and cardiac arrhythmias in the conventional manner. Aspiration of this product during induced emesis can result in lung injury. If evacuation of stomach contents is considered necessary, use the method least likely to cause aspiration, such as gastric lavage after protecting the airway. Observe hospitalized patients for delayed chemical pneumonia, acute tubular necrosis, encephalopathy and dysrhythmias. Monitor for urinary phenol within 72 hours of acute exposure.

5. Fire-fighting measures

General Fire Hazards: Extremely flammable liquid and vapour. Vapours are heavier than air and may travel to a source of ignition and flash back. Closed containers may rupture violently when heated. Material will float and can be re-ignited on surface of water. If tank, rail car or tank truck is involved in fire, ISOLATE for 800 metres (1/2 mile) in all directions; also, consider initial evacuation for 800 metres (1/2 mile) in all directions. Vapours may form explosive mixture with air. Keep containers away from source of heat or fire. This product may be a static accumulator which can form an ignitable vapour-air mixture in a storage tank.

Suitable (and unsuitable) extinguishing media

Suitable extinguishing media: Use dry chemical, foam, carbon dioxide (CO2), water spray or fog to extinguish. Use water to cool fire-exposed containers and to protect personnel.

Unsuitable extinguishing media: Do not use straight/direct streams as this may actually spread flames.

Specific hazards arising from the chemical: Upon combustion, this product emits carbon monoxide, carbon dioxide, low molecular weight hydrocarbons.

Special protective equipment and precautions for firefighters

Special fire fighting procedures: Keep upwind. Keep unauthorized personnel away. Move containers from fire area if you can do so without risk. Fight fire from maximum distance or use unmanned holders or monitor nozzles. Immediately withdraw in case of fire and container venting or heat discolouration of a container. Avoid inhaling any smoke and combustion materials. Remove and isolate contaminated clothing and shoes. Cool containers with flooding quantities of water until well after the fire is out. Prevent run-off from fire control or dilution from entering streams, sewers or drinking water supply. Reference Emergency Response Guidebook No. 128 for additional details and instructions.

Special protective equipment for firefighters:	Firefighters must use standard protective equipment including flame retardant coat, helmet with face shield, gloves, rubber boots, and in enclosed spaces, SCBA.

6. Accidental release measures

Personal precautions, protective equipment and emergency procedures:	Isolate area. Keep unauthorized personnel away. Alert stand-by emergency and fire fighting personnel. Monitor surrounding area for buildup of flammable concentrations in air.
Methods and material for containment and cleaning up:	Wear appropriate personal protective equipment. Do not touch or walk through spilled material. In case of leakage, eliminate all ignition sources. As an immediate precautionary measure, isolate spill or leak area for at least 50 metres (164 feet) in all directions. Keep upwind. Keep out of low areas. Stop leak if safe to do so. Contain discharge by booming on water or diking on ground. Prevent run-off from fire control or dilution from entering streams, sewers or drinking water supply. Small Spills: Remove liquid material with non-sparking approved pumps, skimmers or vacuum equipment. Absorb with earth, sand or other non-combustible material and transfer to containers for later disposal. Use non-sparking tools. Large Spills: Consider downwind evacuation for 300 metres (1000 feet). Spills on water will volatilize rapidly, making containment or recovery difficult. A vapour-suppressing foam may be used to reduce vapours. Remove pooled liquid material with approved, non-sparking pumps, skimmers or vacuum equipment. Absorb or cover with dry earth, sand or other non-combustible material and transfer to containers. Soil remediation may be required.

7. Handling and storage

Precautions for safe handling:	Obtain special instructions before use. Do not handle until all safety precautions have been read and understood. Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking. Keep container tightly closed. Ground and bond container and receiving equipment. Use explosion-proof [electrical/ventilating/lighting] equipment. Use non-sparking tools. Take action to prevent static discharges. These alone may be insufficient to remove static electricity. For additional information on equipment bonding and grounding, refer to the American Petroleum Institute (API) Recommended Practice 2003, "Protection Against Ignitions Arising out of Static, Lightning, and Stray Currents" or National Fire Protection Association (NFPA) 77, "Recommended Practice on Static Electricity". For additional information on storing and handling flammable liquids, refer to the National Fire Protection Association (NFPA) 30, "Flammable and Combustible Liquids Code". Take special precautions when cold cutting or breaking into lines, or when cleaning and disposing of empty containers. Parts and equipment should be steam cleaned prior to maintenance procedures. Do not breathe dust/fume/gas/mist/vapours/spray. Avoid contact with skin and eyes. Keep away from incompatible materials such as oxidizing agents and acids. Wash thoroughly after handling. Do not eat, drink or smoke when using the product. Use only outdoors or in a well-ventilated area. Avoid release to the environment. Wear protective gloves/protective clothing/eye protection/face protection. In case of inadequate ventilation, use respiratory protection.
Conditions for safe storage, including any incompatibilities:	Storage area should be clearly identified, well-illuminated and clear of obstruction. Store in a well-ventilated place. Keep container tightly closed. Store locked up. Only allow access to authorized persons. Store and handle in properly designed pressure vessels and equipment. Store and

use away from heat, sparks, open flame, or any other ignition source. Use non-sparking ventilation systems, approved explosion-proof equipment, and intrinsically safe electrical systems. Have appropriate extinguishing capability in storage area (e.g. sprinkler system, portable fire extinguishers) and flammable gas detectors. Keep absorbents for leaks and spills readily available. Inspect vents during winter conditions for vapour ice buildup. Storage tanks should be above ground and diked to hold entire contents. Store away from incompatible materials. Store according to applicable regulations and standards for flammable materials.

8. Exposure controls/personal protection

Control Parameters

Occupational Exposure Limits

1,3-Butadiene, 2-methyl-: While no peer-reviewed workplace exposure limit has been established for isoprene, based on the current literature, adoption of an internal Isoprene 8 hr. TWA exposure limit of 10 ppm or 28 mg/m3 is recommended.

Chemical Identity	type	Exposure Limit Values		Source
Benzene	TWA	0.5 ppm	1.6 mg/m3	Canada. Alberta OELs (Occupational Health & Safety Code, Schedule 1, Table 2), as amended
	STEL	2.5 ppm	8 mg/m3	Canada. Alberta OELs (Occupational Health & Safety Code, Schedule 1, Table 2), as amended
Benzene	STEL	2.5 ppm		Canada. British Columbia OELs. (Occupational Exposure Limits for Chemical Substances, Occupational Health and Safety Regulation 296/97, as amended)
	TWA	0.5 ppm		Canada. British Columbia OELs. (Occupational Exposure Limits for Chemical Substances, Occupational Health and Safety Regulation 296/97, as amended)
Benzene	STEL	2.5 ppm		Canada. Ontario OELs. (Control of Exposure to Biological or Chemical Agents), as amended
	TWA	0.5 ppm		Canada. Ontario OELs. (Control of Exposure to Biological or Chemical Agents), as amended
Benzene	STEL	5 ppm	15.5 mg/m3	Canada. Quebec OELs. (Ministry of Labor - Regulation Respecting the Quality of the Work Environment), as amended
	TWA	1 ppm	3 mg/m3	Canada. Quebec OELs. (Ministry of Labor - Regulation Respecting the Quality of the Work Environment), as amended
Benzene	TWA	0.5 ppm		US. ACGIH Threshold Limit Values, as amended
	STEL	2.5 ppm		US. ACGIH Threshold Limit Values, as amended
Benzene	REL	0.1 ppm		US. NIOSH: Pocket Guide to Chemical Hazards, as amended
Benzene	STEL	1 ppm		US. NIOSH: Pocket Guide to Chemical Hazards, as amended
Benzene	IDLH	500 ppm		US. NIOSH. Immediately Dangerous to Life or Health (IDLH) Values, as amended
4,7-Methano-1H-indene, 3a,4,7,7a-tetrahydro-	TWA	5 ppm	27 mg/m3	Canada. Alberta OELs (Occupational Health & Safety Code, Schedule 1, Table 2), as amended
4,7-Methano-1H-indene, 3a,4,7,7a-tetrahydro-	TWA	5 ppm		Canada. British Columbia OELs. (Occupational Exposure Limits for Chemical Substances, Occupational Health and Safety Regulation 296/97, as amended)
4,7-Methano-1H-indene, 3a,4,7,7a-tetrahydro-	TWA	5 ppm		Canada. Ontario OELs. (Control of Exposure to Biological or Chemical Agents), as amended
4,7-Methano-1H-indene, 3a,4,7,7a-tetrahydro-	TWA	5 ppm	27 mg/m3	Canada. Quebec OELs. (Ministry of Labor - Regulation Respecting the Quality of the Work Environment), as amended
4,7-Methano-1H-indene, 3a,4,7,7a-tetrahydro-	REL	5 ppm	30 mg/m3	US. NIOSH: Pocket Guide to Chemical Hazards, as amended

4,7-Methano-1H-indene, 3a,4,7,7a-tetrahydro-	STEL	1 ppm		US. ACGIH Threshold Limit Values, as amended
	TWA	0.5 ppm		US. ACGIH Threshold Limit Values, as amended
Toluene	TWA	50 ppm	188 mg/m3	Canada. Alberta OELs (Occupational Health & Safety Code, Schedule 1, Table 2), as amended
Toluene	TWA	20 ppm		Canada. British Columbia OELs. (Occupational Exposure Limits for Chemical Substances, Occupational Health and Safety Regulation 296/97, as amended)
Toluene	TWA	20 ppm		Canada. Ontario OELs. (Control of Exposure to Biological or Chemical Agents), as amended
Toluene	TWA	50 ppm	188 mg/m3	Canada. Quebec OELs. (Ministry of Labor - Regulation Respecting the Quality of the Work Environment), as amended
Toluene	TWA	20 ppm		US. ACGIH Threshold Limit Values, as amended
Toluene	STEL	150 ppm	560 mg/m3	US. NIOSH: Pocket Guide to Chemical Hazards, as amended
Toluene	REL	100 ppm	375 mg/m3	US. NIOSH: Pocket Guide to Chemical Hazards, as amended
Toluene	IDLH	500 ppm		US. NIOSH. Immediately Dangerous to Life or Health (IDLH) Values, as amended
1,3-Cyclopentadiene	TWA	75 ppm	203 mg/m3	Canada. Alberta OELs (Occupational Health & Safety Code, Schedule 1, Table 2), as amended
1,3-Cyclopentadiene	TWA	75 ppm		Canada. British Columbia OELs. (Occupational Exposure Limits for Chemical Substances, Occupational Health and Safety Regulation 296/97, as amended)
1,3-Cyclopentadiene	TWA	75 ppm		Canada. Ontario OELs. (Control of Exposure to Biological or Chemical Agents), as amended
1,3-Cyclopentadiene	TWA	75 ppm	203 mg/m3	Canada. Quebec OELs. (Ministry of Labor - Regulation Respecting the Quality of the Work Environment), as amended
1,3-Cyclopentadiene	TWA	0.5 ppm		US. ACGIH Threshold Limit Values, as amended
	STEL	1 ppm		US. ACGIH Threshold Limit Values, as amended
1,3-Cyclopentadiene	REL	75 ppm	200 mg/m3	US. NIOSH: Pocket Guide to Chemical Hazards, as amended
1,3-Cyclopentadiene	IDLH	750 ppm		US. NIOSH. Immediately Dangerous to Life or Health (IDLH) Values, as amended
Benzene, ethenyl-	STEL	40 ppm	170 mg/m3	Canada. Alberta OELs (Occupational Health & Safety Code, Schedule 1, Table 2), as amended
	TWA	20 ppm	85 mg/m3	Canada. Alberta OELs (Occupational Health & Safety Code, Schedule 1, Table 2), as amended
Benzene, ethenyl-	TWA	50 ppm		Canada. British Columbia OELs. (Occupational Exposure Limits for Chemical Substances, Occupational Health and Safety Regulation 296/97, as amended)
	STEL	75 ppm		Canada. British Columbia OELs. (Occupational Exposure Limits for Chemical Substances, Occupational Health and Safety Regulation 296/97, as amended)
Benzene, ethenyl-	STEL	100 ppm		Canada. Ontario OELs. (Control of Exposure to Biological or Chemical Agents), as amended
	TWA	35 ppm		Canada. Ontario OELs. (Control of Exposure to Biological or Chemical Agents), as amended
Benzene, ethenyl-	TWA	50 ppm	213 mg/m3	Canada. Quebec OELs. (Ministry of Labor - Regulation Respecting the Quality of the Work Environment), as amended
	STEL	100 ppm	426 mg/m3	Canada. Quebec OELs. (Ministry of Labor - Regulation Respecting the Quality of the Work Environment), as amended
Benzene, ethenyl-	STEL	40 ppm		US. ACGIH Threshold Limit Values, as amended
	TWA	20 ppm		US. ACGIH Threshold Limit Values, as amended

Benzene, ethenyl-	REL	50 ppm	215 mg/m3	US. NIOSH: Pocket Guide to Chemical Hazards, as amended
Benzene, ethenyl-	STEL	100 ppm	425 mg/m3	US. NIOSH: Pocket Guide to Chemical Hazards, as amended
Benzene, ethenyl-	IDLH	700 ppm		US. NIOSH. Immediately Dangerous to Life or Health (IDLH) Values, as amended
Benzene, dimethyl-	STEL	150 ppm	651 mg/m3	Canada. Alberta OELs (Occupational Health & Safety Code, Schedule 1, Table 2), as amended
	TWA	100 ppm	434 mg/m3	Canada. Alberta OELs (Occupational Health & Safety Code, Schedule 1, Table 2), as amended
Benzene, dimethyl-	TWA	100 ppm		Canada. British Columbia OELs. (Occupational Exposure Limits for Chemical Substances, Occupational Health and Safety Regulation 296/97, as amended)
	STEL	150 ppm		Canada. British Columbia OELs. (Occupational Exposure Limits for Chemical Substances, Occupational Health and Safety Regulation 296/97, as amended)
Benzene, dimethyl-	STEL	150 ppm		Canada. Ontario OELs. (Control of Exposure to Biological or Chemical Agents), as amended
	TWA	100 ppm		Canada. Ontario OELs. (Control of Exposure to Biological or Chemical Agents), as amended
Benzene, dimethyl-	TWA	100 ppm	434 mg/m3	Canada. Quebec OELs. (Ministry of Labor - Regulation Respecting the Quality of the Work Environment), as amended
	STEL	150 ppm	651 mg/m3	Canada. Quebec OELs. (Ministry of Labor - Regulation Respecting the Quality of the Work Environment), as amended
Benzene, dimethyl-	TWA	100 ppm		US. ACGIH Threshold Limit Values, as amended
	STEL	150 ppm		US. ACGIH Threshold Limit Values, as amended
Benzene, dimethyl-	REL	100 ppm	435 mg/m3	US. NIOSH: Pocket Guide to Chemical Hazards, as amended
Benzene, dimethyl-	STEL	150 ppm	655 mg/m3	US. NIOSH: Pocket Guide to Chemical Hazards, as amended
Benzene, ethyl-	STEL	125 ppm	543 mg/m3	Canada. Alberta OELs (Occupational Health & Safety Code, Schedule 1, Table 2), as amended
	TWA	100 ppm	434 mg/m3	Canada. Alberta OELs (Occupational Health & Safety Code, Schedule 1, Table 2), as amended
Benzene, ethyl-	TWA	20 ppm		Canada. British Columbia OELs. (Occupational Exposure Limits for Chemical Substances, Occupational Health and Safety Regulation 296/97, as amended)
Benzene, ethyl-	TWA	20 ppm		Canada. Ontario OELs. (Control of Exposure to Biological or Chemical Agents), as amended
Benzene, ethyl-	TWA	100 ppm	434 mg/m3	Canada. Quebec OELs. (Ministry of Labor - Regulation Respecting the Quality of the Work Environment), as amended
	STEL	125 ppm	543 mg/m3	Canada. Quebec OELs. (Ministry of Labor - Regulation Respecting the Quality of the Work Environment), as amended
Benzene, ethyl-	TWA	20 ppm		US. ACGIH Threshold Limit Values, as amended
Benzene, ethyl-	REL	100 ppm	435 mg/m3	US. NIOSH: Pocket Guide to Chemical Hazards, as amended
Benzene, ethyl-	STEL	125 ppm	545 mg/m3	US. NIOSH: Pocket Guide to Chemical Hazards, as amended
Benzene, ethyl-	IDLH	800 ppm		US. NIOSH. Immediately Dangerous to Life or Health (IDLH) Values, as amended
Naphthalene	STEL	15 ppm	79 mg/m3	Canada. Alberta OELs (Occupational Health & Safety Code, Schedule 1, Table 2), as amended
	TWA	10 ppm	52 mg/m3	Canada. Alberta OELs (Occupational Health & Safety Code, Schedule 1, Table 2), as amended

Naphthalene	TWA	10 ppm		Canada. British Columbia OELs. (Occupational Exposure Limits for Chemical Substances, Occupational Health and Safety Regulation 296/97, as amended)
	STEL	15 ppm		Canada. British Columbia OELs. (Occupational Exposure Limits for Chemical Substances, Occupational Health and Safety Regulation 296/97, as amended)
Naphthalene	TWA	10 ppm		Canada. Ontario OELs. (Control of Exposure to Biological or Chemical Agents), as amended
Naphthalene	TWA	10 ppm	52 mg/m3	Canada. Quebec OELs. (Ministry of Labor - Regulation Respecting the Quality of the Work Environment), as amended
	STEL	15 ppm	79 mg/m3	Canada. Quebec OELs. (Ministry of Labor - Regulation Respecting the Quality of the Work Environment), as amended
Naphthalene	TWA	10 ppm		US. ACGIH Threshold Limit Values, as amended
Naphthalene	REL	10 ppm	50 mg/m3	US. NIOSH: Pocket Guide to Chemical Hazards, as amended
Naphthalene	STEL	15 ppm	75 mg/m3	US. NIOSH: Pocket Guide to Chemical Hazards, as amended
Naphthalene	IDLH	250 ppm		US. NIOSH. Immediately Dangerous to Life or Health (IDLH) Values, as amended
1,3-Butadiene	TWA	2 ppm	4.4 mg/m3	Canada. Alberta OELs (Occupational Health & Safety Code, Schedule 1, Table 2), as amended
1,3-Butadiene	TWA	2 ppm		Canada. British Columbia OELs. (Occupational Exposure Limits for Chemical Substances, Occupational Health and Safety Regulation 296/97, as amended)
1,3-Butadiene	TWA	2 ppm		Canada. Ontario OELs. (Control of Exposure to Biological or Chemical Agents), as amended
1,3-Butadiene	TWA	2 ppm	4.4 mg/m3	Canada. Quebec OELs. (Ministry of Labor - Regulation Respecting the Quality of the Work Environment), as amended
1,3-Butadiene	TWA	2 ppm		US. ACGIH Threshold Limit Values, as amended
1,3-Butadiene	IDLH	2,000 ppm		US. NIOSH. Immediately Dangerous to Life or Health (IDLH) Values, as amended
Octane	TWA	300 ppm	1,400 mg/m3	Canada. Alberta OELs (Occupational Health & Safety Code, Schedule 1, Table 2), as amended
Octane	TWA	300 ppm		Canada. British Columbia OELs. (Occupational Exposure Limits for Chemical Substances, Occupational Health and Safety Regulation 296/97, as amended)
Octane	STEL	375 ppm	1,750 mg/m3	Canada. Quebec OELs. (Ministry of Labor - Regulation Respecting the Quality of the Work Environment), as amended
	TWA	300 ppm	1,400 mg/m3	Canada. Quebec OELs. (Ministry of Labor - Regulation Respecting the Quality of the Work Environment), as amended
Octane	TWA	300 ppm		Canada. Ontario OELs. (Control of Exposure to Biological or Chemical Agents), as amended
Octane	TWA	300 ppm		US. ACGIH Threshold Limit Values, as amended
Octane	Ceil_Time	385 ppm	1,800 mg/m3	US. NIOSH: Pocket Guide to Chemical Hazards, as amended
Octane	REL	75 ppm	350 mg/m3	US. NIOSH: Pocket Guide to Chemical Hazards, as amended
Octane	IDLH	1,000 ppm		US. NIOSH. Immediately Dangerous to Life or Health (IDLH) Values, as amended

Biological Limit Values

Chemical Identity	Exposure Limit Values	Source
Benzene (t,t-Muconic acid: Sampling time: End of shift.)	500 µg/g (Creatinine in urine)	ACGIH BEI

Benzene (S-Phenylmercapturic acid: Sampling time: End of shift.)	25 µg/g (Creatinine in urine)	ACGIH BEI
Toluene (toluene: Sampling time: End of shift.)	0.03 mg/l (Urine)	ACGIH BEI
Toluene (toluene: Sampling time: Prior to last shift of work week.)	0.02 mg/l (Blood)	ACGIH BEI
Toluene (o-Cresol, with hydrolysis: Sampling time: End of shift.)	0.3 mg/g (Creatinine in urine)	ACGIH BEI
Benzene, ethenyl- (Mandelic acid plus phenylglyoxylic acid: Sampling time: End of shift.)	400 mg/g (Creatinine in urine)	ACGIH BEI
Benzene, ethenyl- (styrene: Sampling time: End of shift.)	40 µg/l (Urine)	ACGIH BEI
Benzene, dimethyl- (Methylhippuric acids: Sampling time: End of shift.)	1.5 g/g (Creatinine in urine)	ACGIH BEI
Benzene, ethyl- (Sum of mandelic acid and phenylglyoxylic acid: Sampling time: End of shift.)	0.15 g/g (Creatinine in urine)	ACGIH BEI
1,3-Butadiene (1,2-Dihydroxy-4-(N-acetylcysteinyl)-butane: Sampling time: End of shift.)	2.5 mg/l (Urine)	ACGIH BEI
1,3-Butadiene (Mixture of N-1- and N-2-(hydroxybutenyl)valine hemoglobin (Hb) adducts: Sampling time: Not critical.)	2.5 pmol/g (Blood)	ACGIH BEI

Exposure guidelines

Chemical Identity	Notations	Source
Benzene	Can be absorbed through the skin.	Canada. Alberta OELs (Occupational Health & Safety Code, Schedule 1, Table 2), as amended
	Can be absorbed through the skin.	Canada. British Columbia OELs. (Occupational Exposure Limits for Chemical Substances, Occupational Health and Safety Regulation 296/97, as amended)
	Can be absorbed through the skin.	Canada. Ontario OELs. (Control of Exposure to Biological or Chemical Agents), as amended
Toluene	Can be absorbed through the skin.	Canada. Alberta OELs (Occupational Health & Safety Code, Schedule 1, Table 2), as amended
	Can be absorbed through the skin.	Canada. Quebec OELs. (Ministry of Labor - Regulation Respecting the Quality of the Work Environment), as amended
Benzene, ethenyl-	Can be absorbed through the skin.	Canada. Quebec OELs. (Ministry of Labor - Regulation Respecting the Quality of the Work Environment), as amended
Naphthalene	Can be absorbed through the skin.	Canada. Alberta OELs (Occupational Health & Safety Code, Schedule 1, Table 2), as amended
	Can be absorbed through the skin.	Canada. British Columbia OELs. (Occupational Exposure Limits for Chemical Substances, Occupational Health and Safety Regulation 296/97, as amended)
	Can be absorbed through the skin.	Canada. Ontario OELs. (Control of Exposure to Biological or Chemical Agents), as amended

Appropriate Engineering Controls

Engineering methods to reduce hazardous exposure are preferred controls. Methods include mechanical ventilation (dilution and local exhaust) process or personal enclosure, remote and automated operation, control of process conditions, leak detection and repair systems, and other process modifications. Ensure all exhaust ventilation systems are discharged to outdoors, away from air intakes and ignition sources. Supply sufficient replacement air to make up for air removed by exhaust systems.

Administrative (procedure) controls and use of personal protective equipment may also be required.

Individual protection measures, such as personal protective equipment

General information: Personal protective equipment (PPE) should not be considered a long-term solution to exposure control. Employer programs to properly select, fit, maintain and train employees to use equipment must accompany PPE. Consult a competent industrial hygiene resource, the PPE manufacturer's recommendation, and/or applicable regulations to determine hazard potential and ensure adequate protection.

Eye/face protection: Safety glasses. Chemical goggles are recommended if splashing is possible or to prevent eye irritation from vapours.

Skin Protection

Hand Protection: Chemical resistant gloves.

Skin and Body Protection: Wear appropriate clothing to prevent any possibility of skin contact. Wear work clothes with long sleeves and pants. If splashing or contact with liquid material is possible, consider the need for an impervious overcoat. Fire resistant (i.e., Nomex) or natural fibre clothing (i.e., cotton or wool) is recommended. Synthetic clothing can generate static electricity and is not recommended where a flammable vapour release may occur. Wear chemical-resistant safety footwear with good traction to prevent slipping. Static Dissipative (SD) rated footwear is also recommended.

Respiratory Protection: Appropriate NIOSH approved air-purifying respirator that meets the requirements of CSA Standard CAN/CSA-Z94.4, or self-contained breathing apparatus should be used. Air supplied breathing apparatus must be used when oxygen concentrations are low or if airborne concentrations exceed the limits of the air-purifying respirators.

Hygiene measures: Use effective control measures and PPE to maintain worker exposure to concentrations that are below these limits. Ensure that eyewash stations and safety showers are in close proximity to work locations.

9. Physical and chemical properties

Appearance

Physical state:	liquid
Form:	liquid
Colour:	Pale yellow
Odour:	Pungent
Odour Threshold:	0.011 ppm (DCPD) 0.0045 ppm (H2S)
pH:	not applicable
Melting point/freezing point:	-38 - -25 °C (-36 - -13 °F) (Aromatic Concentrate Grade 1)
Initial boiling point and boiling range:	20 - 336 °C (68 - 637 °F) (by simulated distillation)
Flash Point:	< -30 °C (-22 °F) (estimated) (Aromatic Concentrate Grade 1)
Evaporation rate:	No data available.
Flammability (solid, gas):	not applicable

Upper/lower limit on flammability or explosive limits

Flammability limit - upper (%):	7.8 %(V) (Benzene) 6.8 %(V) (1-Octene)
Flammability limit - lower(%):	1.2 %(V) (Benzene) 0.7 %(V) (1-Octene)
Vapour pressure:	14 kPa (20 °C (68 °F)) 0.95 atm (77 °C (171 °F)) 27 kPa

	(37.8 °C (100.0 °F)) (estimated) (Aromatic Concentrate Grade 3)
Vapour density:	2.8 (Air=1) (Benzene)
Density:	840 - 860 kg/m3
Relative density:	0.84 - 0.86 (15 °C (59 °F)) (Water=1)
Solubility(ies)	
Solubility in water:	0.0018 g/ml Slightly soluble (Benzene)
Solubility (other):	No data available.
Partition coefficient (n-octanol/water):	2.13 (Benzene) (Log Pow)
Auto-ignition temperature:	400 - 500 °C (752 - 932 °F) (AC1) 221 °C (430 °F) (1-Octene)
Decomposition temperature:	No data available.
Viscosity:	0.47 - 0.58 mm2/s (40 °C (104 °F)), (Aromatic Concentrate Grade 3) estimated

10. Stability and reactivity

Reactivity:	Reactive with oxidizing agents, acids and halogens. May attack and degrade some types of plastics, rubbers and coatings. Some minor components of product may react at elevated temperatures and pressures, causing hydrocarbon deposits. Hydrogen sulphide and other sulphur compounds may be corrosive.
Chemical Stability:	Material is stable under normal conditions.
Possibility of Hazardous Reactions:	No data available.
Conditions to Avoid:	Exposure to open flame or excessive heat can cause fire or explosion. Keep away from heat, sparks and open flame.
Incompatible Materials:	Oxidizing agents, acids and halogens.
Hazardous Decomposition Products:	Upon decomposition, this product emits carbon monoxide, carbon dioxide, low molecular weight hydrocarbons.

11. Toxicological information

Information on likely routes of exposure

Inhalation:	Harmful if inhaled. Excessive inhalation of this product may result in heartbeat irregularities and central nervous system effects including headache. Excessive inhalation of this material may also cause damage to blood systems and possibly cancer (leukemia).
Ingestion:	Harmful if swallowed. May be fatal if swallowed and enters airways. Ingestion of this product may result in vomiting, nausea, abdominal pain and central nervous system effects. Ingestion may also cause blood disorders.
Skin Contact:	Causes skin irritation.
Eye contact:	Causes serious eye irritation.

Symptoms related to the physical, chemical and toxicological characteristics

Inhalation:	Respiratory irritation. Heartbeat irregularities and central nervous system effects including headache.

Ingestion: Vomiting, nausea, abdominal pain and central nervous system effects including headache.

Skin Contact: Skin irritation.

Eye contact: Eye irritation.

Information on toxicological effects

Acute toxicity (list all possible routes of exposure)

Oral
Product: ATEmix: 779.81 mg/kg

Dermal
Product: Not classified for acute toxicity based on available data.

Inhalation
Product: ATEmix: 13.85 mg/l Vapour

Repeated dose toxicity
Product: No data available.

Components:

Benzene	LOAEL (Rat, Oral): 25 mg/kg (Target Organ(s): Blood) LOAEL (Rat, Inhalation - vapour): 0.958 mg/l (Target Organ(s): Blood) LOAEL (Human, Inhalation - vapour): 0.0018 mg/l (Target Organ(s): Blood)

Skin Corrosion/Irritation
Product: Causes skin irritation.

Serious Eye Damage/Eye Irritation
Product: Causes serious eye irritation.

Respiratory or Skin Sensitization
Product: No data available.

Components:

4,7-Methano-1H-indene, 3a,4,7,7a-tetrahydro-	Skin sensitization, Draize (Guinea Pig): Not a skin sensitizer.

Carcinogenicity
Product: May cause cancer.

IARC Monographs on the Evaluation of Carcinogenic Risks to Humans:

Benzene	Overall evaluation: 1. Carcinogenic to humans.
Benzene, ethenyl-	Overall evaluation: 2A. Probably carcinogenic to humans.
1,3-Butadiene, 2-methyl-	Overall evaluation: 2B. Possibly carcinogenic to humans.
Benzene, ethyl-	Overall evaluation: 2B. Possibly carcinogenic to humans.
Naphthalene	Overall evaluation: 2B. Possibly carcinogenic to humans.
1,3-Butadiene	Overall evaluation: 1. Carcinogenic to humans.

US. National Toxicology Program (NTP) Report on Carcinogens:

Benzene	Known To Be Human Carcinogen.
Benzene, ethenyl-	Reasonably Anticipated to be a Human Carcinogen.
1,3-Butadiene, 2-methyl-	Reasonably Anticipated to be a Human Carcinogen.
Naphthalene	Reasonably Anticipated to be a Human Carcinogen.
1,3-Butadiene	Known To Be Human Carcinogen.

ACGIH Carcinogen List:

Benzene	Group A1: Confirmed human carcinogen.

1,3-Butadiene	Group A2: Suspected human carcinogen.

Germ Cell Mutagenicity

In vitro
Product: May cause genetic defects.

In vivo
Product: May cause genetic defects.

Reproductive toxicity
Product: Suspected of damaging fertility or the unborn child.

Specific Target Organ Toxicity - Single Exposure
Product: May cause respiratory irritation.

Specific Target Organ Toxicity - Repeated Exposure
Product: Blood, Auditory system - Causes damage to organs through prolonged or repeated exposure.

Central nervous system - May cause damage to organs through prolonged or repeated exposure.

Aspiration Hazard
Product: May be fatal if swallowed and enters airways.

Other effects: Xylene is a developmental toxicant in Canada.

12. Ecological information

Ecotoxicity:

Acute hazards to the aquatic environment:

Fish
Product: LC 50 (Oncorhynchus mykiss, 96 h): 1.0 mg/l semi-static
Very toxic to aquatic life.

Aquatic Invertebrates
Product: LC 50 (Daphnia magna, 48 h): 1.2 mg/l Static

Toxicity to aquatic plants
Product: EC 50 (Algae (Pseudokirchneriella subcapitata), 96 h): 1.8 mg/l

Chronic hazards to the aquatic environment:

Fish
Product: Very toxic to aquatic life with long lasting effects.

Aquatic Invertebrates
Product: Very toxic to aquatic life with long lasting effects.

Toxicity to aquatic plants
Product: Very toxic to aquatic life with long lasting effects.

Persistence and Degradability

Biodegradation
Product: Atmospheric oxidation constitutes a significant route of degradation. Product is likely to biodegrade significantly.

BOD/COD Ratio
Product: No data available.

Bioaccumulative Potential
Bioconcentration Factor (BCF)
Product: No data available.

Components:
4,7-Methano-1H-indene, 3a,4,7,7a-tetrahydro- — Carp, Bioconcentration Factor (BCF): 58.9 - 384

Partition Coefficient n-octanol / water (log Kow)
Product: 2.13 (Benzene) (Log Pow)

Mobility in Soil: Components have slight water solubility. Calculation of atmospheric half-lives of constituent chemicals has identified a half-life of 0.9 to 65.8 hours as result of indirect hydrolysis by hydroxyl radical attack.

Other Adverse Effects: No data available.

13. Disposal considerations

Disposal instructions: Dispose of contents/container to an appropriate treatment and disposal facility in accordance with applicable laws and regulations, and product characteristics at time of disposal. Waste generator is advised to carefully consider hazardous properties and control measures needed for other materials that may be found in the waste.

Contaminated Packaging: Check local, federal and provincial environmental regulations prior to disposal.

14. Transport information

TDG

UN Number:	UN 3295
UN Proper Shipping Name:	HYDROCARBONS, LIQUID, N.O.S.
Class	3
Packing Group	I
Label(s)	3
Subsidiary risk label	–
Special precautions for user:	Reference Emergency Response Guidebook No. 128, latest revision.

15. Regulatory information

Canada Federal Regulations

List of Toxic Substances (CEPA, Schedule 1)

Chemical Identity
Benzene
1,3-Butadiene, 2-methyl-
Naphthalene
1,3-Butadiene

Export Control List (CEPA 1999, Schedule 3)
Not regulated

National Pollutant Release Inventory (NPRI)

Canada. Canadian Environmental Protection Act (CEPA). National Pollutant Release Inventory (NPRI) (Parts 1-4)

NPRI	Benzene 4,7-Methano-1H-indene, 3a,4,7,7a-tetrahydro- Toluene Benzene, ethenyl- 1,3-Butadiene, 2-methyl- Benzene, dimethyl-

Canada. National Pollutant Release Inventory (NPRI) Substances, Part 5, VOCs with Additional Reporting Requirements

NPRI PT5	Benzene Toluene Benzene, ethenyl- 1-Pentene Benzene, dimethyl- 2-Hexene Pentane, 2-methyl- 1,3-Butadiene 2-Pentene Pentane, 3-methyl- Octane

Greenhouse Gases

Not regulated

Precursor Control Regulations

Chemical Identity

Toluene

Canada. Substances Subject to Significant New Activity (SNAc) Reporting Requirements

Not regulated

Inventory status

Canada DSL Inventory List:	On or in compliance with the inventory
US TSCA Inventory:	On or in compliance with the inventory

16. Other information, including date of preparation or last revision

Issue Date:	12/10/2019
Revision Information:	12/10/2019: SDS Update
Version #:	1.0
Abbreviations and acronyms:	ACGIH = American Conference of Governmental Industrial Hygienists; BOD = Biochemical Oxygen Demand; CAS = Chemical Abstracts Service; CEPA = Canadian Environmental Protection Act; COD = Chemical Oxygen Demand; DSL = Domestic Substances List; EC50 = Effective Concentration 50%; EPA = Environmental Protection Agency; GHS = Globally Harmonized System for the Classification and Labelling of Chemicals; IARC = International Agency for Research on Cancer; IDLH = Immediately Dangerous to Life or Health; Kow = Octanol/water partition coefficient; LC50 = Lethal Concentration 50%; LD50 = Lethal Dose 50%; LEL = Lower Explosive Limit; NDSL = Non-Domestic Substances List; NFPA = National Fire Protection Association; NIOSH = National Institute for Occupational Safety and Health; NTP = National Toxicology Program; OEL = Occupational Exposure Limit; OSHA = Occupational Safety and Health Administration; PNOC = Particulates Not Otherwise Classified; PPE = Personal Protective Equipment; REL = Recommended Exposure Limit; SCBA = Self Contained Breathing Apparatus; SDS = Safety Data Sheet; STEL = Short Term Exposure Limit; TDG = Transportation of Dangerous Goods; TLV = Threshold Limit Value; TSCA = Toxic Substances Control Act; TWA = Time Weighted Average
Further Information:	For additional information on equipment bonding and grounding, refer to the

American Petroleum Institute (API) Recommended Practice 2003, "Protection Against Ignitions Arising out of Static, Lightning, and Stray Currents" or National Fire Protection Association (NFPA) 77, "Recommended Practice on Static Electricity".

For additional information on storing and handling flammable liquids, refer to the National Fire Protection Association (NFPA) 30, "Flammable and Combustible Liquids Code".

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