

**Crude Hydrogen**

Version 2.5

Revision Date 2024-06-05

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

Product Name : Crude Hydrogen
Material : 1015516

Company : Chevron Phillips Chemical Company LP
10001 Six Pines Drive
The Woodlands, TX 77380

Emergency telephone:**Health:**

866.442.9628 (North America)
1.832.813.4984 (International)

Transport:

CHEMTREC 800.424.9300 or 703.527.3887(int'l)
Asia: CHEMWATCH (+612 9186 1132) China: 0532 8388 9090
Mexico CHEMTREC 01-800-681-9531 (24 hours)
South America SOS-Cotec Inside Brazil: 0800.111.767 Outside Brazil: +55.19.3467.1600
Argentina: +(54)-1159839431
EUROPE: BIG +32.14.584545 (phone) or +32.14583516 (telefax)
Austria: VIZ +43 1 406 43 43 (24 hours/day, 7 days/week)
Belgium: 070 245 245 (24 hours/day, 7 days/week)
Bulgaria: +359 2 9154 233
Croatia: +3851 2348 342 (24 hours/day, 7 days/week)
Cyprus: 1401
Czech Republic: Toxicological Information Center +420 224 919 293, +420 224 915 402
Denmark: Danish Poison Center (Giftlinjen): +45 8212 1212
Estonia: BIG +32.14.584545 (phone) or +32.14583516 (telefax)
Finland: 0800 147 111 09 471 977 (24 hours/day)
France: ORFILA number (INRS): + 33 (0) 1 45 42 59 59 (24 hours/day, 7 days/week)
Germany: BIG +32.14.584545 (phone) or +32.14583516 (telefax)
Greece: (0030) 2107793777 (24 hours/day, 7 days/week)
Hungary: +36-80-201-199 (24 hours/day, 7 days/week)
Iceland: 543 2222 (24 hours/day, 7 days/week)
Ireland: BIG +32.14.584545 (phone) or +32.14583516 (telefax)

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Italy: POISON CENTER MILAN – Azienda Ospedaliera Niguarda Ca` Grande Tel. +39 02 66101029; POISON CENTER ROME – Policlinico “Agostino Gemelli”, Servizio di tossicologia clinica Tel. +39 06 3054343; POISON CENTER ROME – Ospedale Pediatrico Bambino Gesù Tel. +39 06 68593726; POISON CENTER ROME – Policlinico “Umberto I” Tel. +39 06 4997 8000; POISON CENTER FOGGIA – Azienda Ospedaliera Universitaria Riuniti Tel. +39 0881 732326; POISON CENTER NAPLES – Azienda Ospedaliera “Antonio Cardarelli” Tel. +39 081 7472870; POISON CENTER FLORENCE – Azienda Ospedaliera universitaria Careggi Tel. +39 055 7947819; POISON CENTER PAVIA – IRCCS Fondazione Salvatore Maugeri Tel. +39 0382 24444; POISON CENTER BERGAMO – Azienda Ospedaliera “Papa Giovanni XXIII” Tel. 800 883 300; POISON CENTER VERONA – Azienda Ospedaliera Universitaria integrata Tel. 800 011 858;

Latvia: State Fire and Rescue Service, phone number: 112; Toxicology and Sepsis Clinic Poisoning and Drug Information Center, Hipokrāta 2, Riga, Latvia, LV-1038, phone number +371 67042473. (24 hours.)

Liechtenstein: BIG +32.14.584545 (phone) or +32.14583516 (telefax)

Lithuania: +370 (85) 2362052

Luxembourg: (+352) 8002 5500 (24 hours/day, 7 days/week)

Malta: +356 2395 2000

The Netherlands: NVIC: +31 (0)88 755 8000

Norway: 22 59 13 00 (24 hours/day, 7 days/week)

Poland: BIG +32.14.584545 (phone) or +32.14583516 (telefax)

Portugal: CIAV phone number: +351 800 250 250

Romania: +40213183606

Slovakia: +421 2 5477 4166

Slovenia: Phone number: 112

Spain: National Emergency Telephone Number of Spanish Poison Centre: +34 91 562 04 20 (24 hours/day, 7 days/week)

Sweden: 112 – ask for Poisons Information

Responsible Department : Product Safety and Toxicology Group
 E-mail address : SDS@CPChem.com
 Website : www.CPChem.com

SECTION 2: Hazards identification**Classification of the substance or mixture**

This product has been classified in accordance with the hazard communication standard 29 CFR 1910.1200; the SDS and labels contain all the information as required by the standard.

Classification

: Flammable gases, Category 1
 Gases under pressure, Compressed gas
 Simple Asphyxiant

Labeling

Symbol(s)



Signal Word

: Danger

Hazard Statements

: H220: Extremely flammable gas.
 H280: Contains gas under pressure; may explode if heated.
 May displace oxygen and cause rapid suffocation.

Precautionary Statements

: **Prevention:**

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P210 Keep away from heat/ sparks/ open flames/ hot surfaces. No smoking.
Response:
P377 Leaking gas fire: Do not extinguish, unless leak can be stopped safely.
P381 Eliminate all ignition sources if safe to do so.
Storage:
P410 + P403 Protect from sunlight. Store in a well-ventilated place.

Carcinogenicity:

IARC No ingredient of this product present at levels greater than or equal to 0.1% is identified as probable, possible or confirmed human carcinogen by IARC.
NTP No ingredient of this product present at levels greater than or equal to 0.1% is identified as a known or anticipated carcinogen by NTP.

SECTION 3: Composition/information on ingredients

Synonyms : PTA Unit 1544 Ethylene tail gas
CB Unit 1592 Ethylene tail gas
CB Unit 1594 Ethylene tail gas

Molecular formula : UVCB

Component	CAS-No.	Weight %
Fuel Gas	68476-26-6	100
Hydrogen	1333-74-0	0 - 70
Ethylene	74-85-1	0 - 12
Methane	74-82-8	0 - 68
Ethane	74-84-0	0 - 3

SECTION 4: First aid measures

General advice : Move out of dangerous area. Show this material safety data sheet to the doctor in attendance.

If inhaled : If unconscious, place in recovery position and seek medical advice. If symptoms persist, call a physician.

In case of skin contact : Wash off with soap and water.

In case of eye contact : Flush eyes with water as a precaution. Remove contact lenses. Protect unharmed eye. Keep eye wide open while rinsing. If eye irritation persists, consult a specialist.

If swallowed : Keep respiratory tract clear. Never give anything by mouth to an unconscious person. If symptoms persist, call a physician.

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SECTION 5: Firefighting measures

Flash point	: No data available
Autoignition temperature	: 585°C (1,085°F)
Suitable extinguishing media	: Alcohol-resistant foam. Carbon dioxide (CO2). Dry chemical.
Unsuitable extinguishing media	: High volume water jet.
Special protective equipment for fire-fighters	: Wear self-contained breathing apparatus for firefighting if necessary.
Further information	: For safety reasons in case of fire, cans should be stored separately in closed containments. Use a water spray to cool fully closed containers.
Fire and explosion protection	: Do not spray on a naked flame or any incandescent material. Take necessary action to avoid static electricity discharge (which might cause ignition of organic vapors). Use only explosion-proof equipment. Keep away from open flames, hot surfaces and sources of ignition.
Hazardous decomposition products	: No data available.

SECTION 6: Accidental release measures

Personal precautions	: Ensure adequate ventilation. Remove all sources of ignition. Evacuate personnel to safe areas. Beware of vapors accumulating to form explosive concentrations. Vapors can accumulate in low areas.
Environmental precautions	: Prevent product from entering drains. Prevent further leakage or spillage if safe to do so. If the product contaminates rivers and lakes or drains inform respective authorities.

SECTION 7: Handling and storage**Handling**

Advice on safe handling	: For personal protection see section 8. Smoking, eating and drinking should be prohibited in the application area. Take precautionary measures against static discharges. Provide sufficient air exchange and/or exhaust in work rooms. Open drum carefully as content may be under pressure. Dispose of rinse water in accordance with local and national regulations.
Advice on protection against fire and explosion	: Do not spray on a naked flame or any incandescent material. Take necessary action to avoid static electricity discharge (which might cause ignition of organic vapors). Use only explosion-proof equipment. Keep away from open flames, hot surfaces and sources of ignition.

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Storage

Requirements for storage areas and containers : Prevent unauthorized access. No smoking. Keep container tightly closed in a dry and well-ventilated place. Observe label precautions. Electrical installations / working materials must comply with the technological safety standards.

SECTION 8: Exposure controls/personal protection**Ingredients with workplace control parameters****US**

Components	Basis	Value	Control parameters	Note
Ethylene	ACGIH	TWA	200 ppm,	A4,

A4 Not classifiable as a human carcinogen

Engineering measures

Adequate ventilation to control airborne concentrations below the exposure guidelines/limits. Consider the potential hazards of this material (see Section 2), applicable exposure limits, job activities, and other substances in the work place when designing engineering controls and selecting personal protective equipment. If engineering controls or work practices are not adequate to prevent exposure to harmful levels of this material, the personal protective equipment listed below is recommended. The user should read and understand all instructions and limitations supplied with the equipment since protection is usually provided for a limited time or under certain circumstances.

Personal protective equipment

Respiratory protection : If ventilation or other engineering controls are not adequate to maintain minimal oxygen content of 19.5% by volume under normal atmospheric pressure, a supplied-air NIOSH approved respirator may be appropriate. If exposure to harmful levels of airborne material may occur, a NIOSH approved respirator that provides protection may be appropriate, such as:. A positive pressure, air-supplying respirator may be appropriate if there is potential for uncontrolled release, aerosolization, exposure levels are not known, or other circumstances where air-purifying respirators may not provide adequate protection.

Hand protection : The suitability for a specific workplace should be discussed with the producers of the protective gloves. Please observe the instructions regarding permeability and breakthrough time which are provided by the supplier of the gloves. Also take into consideration the specific local conditions under which the product is used, such as the danger of cuts, abrasion, and the contact time. Gloves should be discarded and replaced if there is any indication of degradation or chemical breakthrough.

Eye protection : Eye wash bottle with pure water. Safety glasses.

Skin and body protection : Choose body protection in relation to its type, to the concentration and amount of dangerous substances, and to the specific work-place. Wear as appropriate:. Flame retardant antistatic protective clothing. Workers should wear antistatic footwear.

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Hygiene measures : Wash hands before breaks and at the end of workday.

SECTION 9: Physical and chemical properties

Information on basic physical and chemical properties

Appearance

Form : Compressed gas
Physical state : Gaseous
Color : Colorless
Odor : Odorless

Safety data

Flash point : No data available

Lower explosion limit : 4 %(V)
Upper explosion limit : 75 %(V)
Oxidizing properties : No

Autoignition temperature : 585°C (1,085°F)

Molecular formula : UVCB
Molecular weight : Not applicable
pH : Not applicable
Freezing point : No data available

Pour point : Not applicable

Boiling point/boiling range : -253°C (-423°F)
Vapor pressure : No data available

Density : 0.0052 LB/FT3
at (760.00 MMHG)

Water solubility : partly soluble
Partition coefficient: n-octanol/water : No data available
Viscosity, dynamic : 0.013 cP

Relative vapor density : 0.5
(Air = 1.0)

Evaporation rate : Not applicable

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SECTION 10: Stability and reactivity

Reactivity	: Stable under recommended storage conditions.
Chemical stability	: This material is considered stable under normal ambient and anticipated storage and handling conditions of temperature and pressure.
Possibility of hazardous reactions	
Hazardous reactions	: Hazardous reactions: Hazardous polymerization does not occur. Hazardous reactions: Vapors may form explosive mixture with air.
Conditions to avoid	: Heat, flames and sparks.
Materials to avoid	: May react with oxygen and strong oxidizing agents, such as chlorates, nitrates, peroxides, etc.
Hazardous decomposition products	: No data available
Other data	: No decomposition if stored and applied as directed.

SECTION 11: Toxicological information

Crude Hydrogen Acute oral toxicity	: No data available Negligible or unlikely exposure pathways
Crude Hydrogen Acute inhalation toxicity	: No data available
Crude Hydrogen Acute dermal toxicity	: Negligible or unlikely exposure pathways
Crude Hydrogen Skin irritation	: No skin irritation
Crude Hydrogen Eye irritation	: No eye irritation
Crude Hydrogen Sensitization	: No adverse effects expected.
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Repeated dose toxicity : This information is not available.

Genotoxicity in vitro

Ethylene : Test Type: Ames test
Test system: TA100
Metabolic activation: with and without metabolic activation
Method: OECD Test Guideline 471
Result: negative

Test Type: Chromosome aberration test in vitro
Test system: Chinese hamster ovary cells
Metabolic activation: with and without metabolic activation
Method: OECD Test Guideline 473
Result: negative

Genotoxicity in vivo

Ethylene : Test Type: Micronucleus test
Species: Rat
Route of Application: inhalation (gas)
Exposure time: 5 days and 13 weeks
Dose: 10000 ppm
Result: negative

Test Type: Micronucleus test
Species: Rat
Route of Application: inhalation (gas)
Exposure time: 4 weeks
Dose: 40, 1000, 3000 ppm
Method: OECD Test Guideline 474
Result: negative

Carcinogenicity

Ethylene : Species: Rat
Dose: 0. 300, 1000, 3000 ppm
Exposure time: 2 yrs
Number of exposures: 6 h/d, 5 d/wk
Remarks: no increase incidence of tumors

Reproductive toxicity

Ethylene : Species: Rat
Application Route: Inhalation
Dose: 0. 200, 1000, 5000 ppm
Number of exposures: 6 h/d
NOAEL Parent: 5000 ppm
NOAEL F1: 5000 ppm
no abnormalities observed

Ethane : Species: Rat
Sex: male and female
Application Route: Inhalation
Dose: 0, 1600, 5000, 16000 ppm
Exposure time: 6 weeks
Number of exposures: 6 hours/day, 7 days/week
Test period: 6 weeks

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Test substance: yes
Method: OECD Guideline 422
NOAEL Parent: 16000 ppm
NOAEL F1: 16000 ppm
no abnormalities observed

Developmental Toxicity

Ethylene : Species: Rat
Application Route: Inhalation
Dose: 0. 200, 1000, 5000 ppm
Number of exposures: 6 h/d
NOAEL Teratogenicity: 5000 ppm
NOAEL Maternal: 5000 ppm
No toxicity to reproduction
Animal testing did not show any effects on fertility.

CMR effects

Methane : Carcinogenicity: Weight of evidence does not support classification as a carcinogen
Mutagenicity: Weight of evidence does not support classification as a germ cell mutagen.
Teratogenicity: Damage to fetus not classifiable
Reproductive toxicity: Weight of evidence does not support classification for reproductive toxicity

Ethane Carcinogenicity: Weight of evidence does not support classification as a carcinogen
Mutagenicity: In vitro tests did not show mutagenic effects
Teratogenicity: No evidence of adverse effects on sexual function and fertility, or on development, based on animal experiments.
Reproductive toxicity: Weight of evidence does not support classification for reproductive toxicity

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Further information : No data available.

SECTION 12: Ecological information

Ecotoxicity effects

Biodegradability : Not applicable

Elimination information (persistence and degradability)

Bioaccumulation

Ethylene : Bioaccumulation is unlikely.

Methane : This material is not expected to bioaccumulate.

Ethane : This material is not expected to bioaccumulate.

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Mobility	: No data available
Results of PBT assessment	: This substance/mixture contains no components considered to be either persistent, bioaccumulative and toxic (PBT), or very persistent and very bioaccumulative (vPvB) at levels of 0.1% or higher.
Additional ecological information	: No data available
Ecotoxicology Assessment	
Short-term (acute) aquatic hazard	: This material is not expected to be harmful to aquatic organisms.
Long-term (chronic) aquatic hazard	: This material is not expected to be harmful to aquatic organisms.

SECTION 13: Disposal considerations

The information in this SDS pertains only to the product as shipped.

Use material for its intended purpose or recycle if possible. This material, if it must be discarded, may meet the criteria of a hazardous waste as defined by US EPA under RCRA (40 CFR 261) or other State and local regulations. Measurement of certain physical properties and analysis for regulated components may be necessary to make a correct determination. If this material is classified as a hazardous waste, federal law requires disposal at a licensed hazardous waste disposal facility.

Product	: Do not dispose of waste into sewer. Do not contaminate ponds, waterways or ditches with chemical or used container. Send to a licensed waste management company.
Contaminated packaging	: Empty remaining contents. Dispose of as unused product. Do not re-use empty containers. Do not burn, or use a cutting torch on, the empty drum.

SECTION 14: Transport information

The shipping descriptions shown here are for bulk shipments only, and may not apply to shipments in non-bulk packages (see regulatory definition).

Consult the appropriate domestic or international mode-specific and quantity-specific Dangerous Goods Regulations for additional shipping description requirements (e.g., technical name or names, etc.) Therefore, the information shown here, may not always agree with the bill of lading shipping description for the material. Flashpoints for the material may vary slightly between the SDS and the bill of lading.

US DOT (UNITED STATES DEPARTMENT OF TRANSPORTATION)

UN2034, HYDROGEN AND METHANE MIXTURES, COMPRESSED, 2.1

IMO / IMDG (INTERNATIONAL MARITIME DANGEROUS GOODS)

UN2034, HYDROGEN AND METHANE MIXTURE, COMPRESSED, 2.1

IATA (INTERNATIONAL AIR TRANSPORT ASSOCIATION)

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UN2034, HYDROGEN AND METHANE MIXTURE, COMPRESSED, 2.1

ADR (AGREEMENT ON DANGEROUS GOODS BY ROAD (EUROPE))
UN2034, HYDROGEN AND METHANE MIXTURE, COMPRESSED, 2.1, (B/D)

RID (REGULATIONS CONCERNING THE INTERNATIONAL TRANSPORT OF DANGEROUS GOODS (EUROPE))
23,UN2034,HYDROGEN AND METHANE MIXTURE, COMPRESSED, 2.1

ADN (EUROPEAN AGREEMENT CONCERNING THE INTERNATIONAL CARRIAGE OF DANGEROUS GOODS BY INLAND WATERWAYS)
UN2034, HYDROGEN AND METHANE MIXTURE, COMPRESSED, 2.1

Maritime transport in bulk according to IMO instruments

SECTION 15: Regulatory information

National legislation

- SARA 311/312 Hazards

: Flammable (gases, aerosols, liquids, or solids)
Gases under pressure
Simple Asphyxiant
- CERCLA Reportable Quantity

: This material does not contain any components with a CERCLA RQ.
- SARA 302 Reportable Quantity

: This material does not contain any components with a SARA 302 RQ.
- SARA 302 Threshold Planning Quantity

: This material does not contain any components with a section 302 EHS TPQ.
- SARA 304 Reportable Quantity

: This material does not contain any components with a section 304 EHS RQ.
- SARA 313 Components

: The following components are subject to reporting levels established by SARA Title III, Section 313:
: Ethylene - 74-85-1

Clean Air Act

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Ozone-Depletion Potential : This product neither contains, nor was manufactured with a Class I or Class II ODS as defined by the U.S. Clean Air Act Section 602 (40 CFR 82, Subpt. A, App.A + B).

This product does not contain any hazardous air pollutants (HAP), as defined by the U.S. Clean Air Act Section 112 (40 CFR 61).

The following chemical(s) are listed under the U.S. Clean Air Act Section 112(r) for Accidental Release Prevention (40 CFR 68.130, Subpart F):

- : Hydrogen - 1333-74-0
- Methane - 74-82-8
- Ethylene - 74-85-1
- Ethane - 74-84-0

The following chemical(s) are listed under the U.S. Clean Air Act Section 111 SOCMII Intermediate or Final VOC's (40 CFR 60.489):

- : Ethylene - 74-85-1

US State Regulations

Pennsylvania Right To Know

- : Fuel Gas - 68476-26-6
- Hydrogen - 1333-74-0
- Methane - 74-82-8
- Ethylene - 74-85-1
- Ethane - 74-84-0
- Nitrogen - 7727-37-9
- Carbon Monoxide - 630-08-0

California Prop. 65 Components

- : WARNING: This product can expose you to chemicals including [listed below], which is [are] known to the State of California to cause birth defects or other reproductive harm. For more information go to www.P65Warnings.ca.gov.

Carbon Monoxide 630-08-0

Notification status

- Europe REACH : Not applicable
- Switzerland CH INV : Not applicable
- United States of America (USA) : Exemptions from the obligation to register On or in compliance with the active portion of the TSCA inventory
- TSCA

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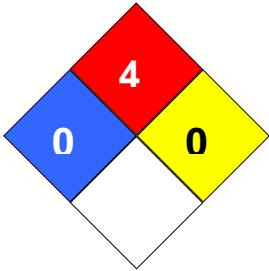
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Canada DSL	:	Not applicable
Australia AIIC	:	Not applicable
New Zealand NZIoC	:	Not applicable
Japan ENCS	:	Not applicable
Korea KECI	:	Not applicable
Philippines PICCS	:	Not applicable
Taiwan TCSI	:	Not applicable
China IECSC	:	Not applicable

SECTION 16: Other information

NFPA Classification : Health Hazard: 0
Fire Hazard: 4
Reactivity Hazard: 0



Further information

Legacy SDS Number : 5860

Significant changes since the last version are highlighted in the margin. This version replaces all previous versions.

The information in this SDS pertains only to the product as shipped.

The information provided in this Safety Data Sheet is correct to the best of our knowledge, information and belief at the date of its publication. The information given is designed only as a guidance for safe handling, use, processing, storage, transportation, disposal and release and is not to be considered a warranty or quality specification. The information relates only to the specific material designated and may not be valid for such material used in combination with any other materials or in any process, unless specified in the text.

Key or legend to abbreviations and acronyms used in the safety data sheet			
ACGIH	American Conference of Government Industrial Hygienists	LD50	Lethal Dose 50%
AIIC	Australian Inventory of Industrial Chemicals	LOAEL	Lowest Observed Adverse Effect Level
DSL	Canada, Domestic Substances List	NFPA	National Fire Protection Agency
NDSL	Canada, Non-Domestic Substances List	NIOSH	National Institute for Occupational Safety & Health
CNS	Central Nervous System	NTP	National Toxicology Program
CAS	Chemical Abstract Service	NZIoC	New Zealand Inventory of Chemicals
EC50	Effective Concentration	NOAEL	No Observable Adverse Effect Level
EC50	Effective Concentration 50%	NOEC	No Observed Effect Concentration
EGEST	EOSCA Generic Exposure Scenario Tool	OSHA	Occupational Safety & Health Administration
EOSCA	European Oilfield Specialty Chemicals Association	PEL	Permissible Exposure Limit
EINECS	European Inventory of Existing Chemical Substances	PICCS	Philippines Inventory of Commercial Chemical Substances
MAK	Germany Maximum Concentration Values	PRNT	Presumed Not Toxic

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GHS	Globally Harmonized System	RCRA	Resource Conservation Recovery Act
>=	Greater Than or Equal To	STEL	Short-term Exposure Limit
IC50	Inhibition Concentration 50%	SARA	Superfund Amendments and Reauthorization Act.
IARC	International Agency for Research on Cancer	TLV	Threshold Limit Value
IECSC	Inventory of Existing Chemical Substances in China	TWA	Time Weighted Average
ENCS	Japan, Inventory of Existing and New Chemical Substances	TSCA	Toxic Substance Control Act
KECI	Korea, Existing Chemical Inventory	UVCB	Unknown or Variable Composition, Complex Reaction Products, and Biological Materials
<=	Less Than or Equal To	WHMIS	Workplace Hazardous Materials Information System
LC50	Lethal Concentration 50%	ATE	Acute toxicity estimate