SAFETY DATA SHEET

Dimethyl Disulfide
Version 3.5
Revision Date 2019-09-27

according to GB/T 16483 and GB/T 17519

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

Product information
Product Name: Dimethyl Disulfide
Material: 1123753, 1121187, 1119676, 1093527, 1086484, 1095605, 1095604, 1095602, 1095603, 1076483, 1034521, 1035203, 1031147, 1032633, 1034638, 1031751, 1036662, 1034642, 1031840, 1036791, 1036352, 1034364, 1036792, 1036131, 1024538

Use: Chemical intermediate

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

Local: Chevron Phillips Chemicals (Shanghai) Corporation
Room 1810-1812, Shanghai Mart,
2299 Yan An Road (W),
Shanghai, PRC 200336

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

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

SDS Number: 100000013403 1/13
Dimethyl Disulfide

GHS Classification and Labeling: Follow GB 13690, GB 15258 and GB 30000.2 to GB 30000.29 (GHS 2011)

Emergency Overview

<table>
<thead>
<tr>
<th>Danger</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Form:</strong> Liquid</td>
</tr>
<tr>
<td><strong>Physical state:</strong> Liquid</td>
</tr>
<tr>
<td><strong>Color:</strong> Yellow</td>
</tr>
<tr>
<td><strong>Odor:</strong> Mildly unpleasant</td>
</tr>
<tr>
<td><strong>Hazard:</strong> Highly flammable liquid and vapor. Toxic if swallowed. Toxic if inhaled. Causes skin irritation. Causes eye irritation. May cause an allergic skin reaction. Suspected of damaging fertility or the unborn child. May cause respiratory irritation. Causes damage to organs through prolonged or repeated exposure. May be harmful if swallowed and enters airways. Toxic to aquatic life. Toxic to aquatic life with long lasting effects.</td>
</tr>
</tbody>
</table>

Classification

- Flammable liquids, Category 2
- Acute toxicity, Category 3, Oral
- Acute toxicity, Category 3, Inhalation
- Skin corrosion/irritation, Category 2
- Serious eye damage/eye irritation, Category 2B
- Skin sensitization, Sub-category 1B
- Reproductive toxicity, Category 2
- Specific target organ toxicity - single exposure, Category 3, respiratory tract irritation
- Specific target organ toxicity - repeated exposure, Category 1
- Aspiration hazard, Category 2
- Short-term (acute) aquatic hazard, Category 2
- Long-term (chronic) aquatic hazard, Category 2

Labeling

<table>
<thead>
<tr>
<th>Symbol(s)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Signal Word</th>
</tr>
</thead>
<tbody>
<tr>
<td>Danger</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Hazard Statements</th>
</tr>
</thead>
<tbody>
<tr>
<td>H225: Highly flammable liquid and vapor.</td>
</tr>
<tr>
<td>H301 + H331: Toxic if swallowed or if inhaled.</td>
</tr>
<tr>
<td>H305: May be harmful if swallowed and enters airways.</td>
</tr>
<tr>
<td>H315 + H320: Causes skin and eye irritation.</td>
</tr>
<tr>
<td>H317: May cause an allergic skin reaction.</td>
</tr>
<tr>
<td>H335: May cause respiratory irritation.</td>
</tr>
<tr>
<td>H361: Suspected of damaging fertility or the unborn child.</td>
</tr>
<tr>
<td>H372: Causes damage to organs through prolonged or repeated exposure.</td>
</tr>
<tr>
<td>H411: Toxic to aquatic life with long lasting effects.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Precautionary Statements</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Prevention:</strong></td>
</tr>
<tr>
<td>P201: Obtain special instructions before use.</td>
</tr>
<tr>
<td>P202: Do not handle until all safety precautions have been read and understood.</td>
</tr>
<tr>
<td>P210: Keep away from heat/sparks/open flames/hot surfaces. No smoking.</td>
</tr>
<tr>
<td>P233: Keep container tightly closed.</td>
</tr>
</tbody>
</table>
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P240: Ground/bond container and receiving equipment.
P241: Use explosion-proof electrical/ ventilating/ lighting/ equipment.
P242: Use only non-sparking tools.
P243: Take precautionary measures against static discharge.
P264: Wash skin thoroughly after handling.
P270: Do not eat, drink or smoke when using this product.
P271: Use only outdoors or in a well-ventilated area.
P272: Contaminated work clothing should not be allowed out of the workplace.
P273: Avoid release to the environment.
P280: Wear protective gloves/ protective clothing/ eye protection/ face protection.

Response:
P303 + P361 + P353: IF ON SKIN (or hair): Take off immediately all contaminated clothing. Rinse skin with water/shower.
P304+P340+P311: IF INHALED: Remove person to fresh air and keep comfortable for breathing. Call a POISON CENTER/doctor.
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.
P331: Do NOT induce vomiting.
P333 + P313: If skin irritation or rash 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.
P371: Collect spillage.
P370+P378: In case of fire: Use dry sand, dry chemical or alcohol-resistant foam to extinguish.
P391: Store locked up.

Storage:
P403 + P233: Store in a well-ventilated place. Keep container tightly closed.
P403 + P235: Store in a well-ventilated place. Keep cool.
P405: Store locked up.

Disposal:
P501: Dispose of contents/ container to an approved waste disposal plant.

SECTION 3: Composition/information on ingredients

Synonyms: DMDS,
Disulfide, dimethyl
Dimethyl disulfide,
Dimethyl disulphide,
(Methylidithio) methane
Methyl disulfide
CPChem Dimethyl Disulfide

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Molecular formula : C2H6S2

<table>
<thead>
<tr>
<th>Chemical name</th>
<th>CAS-No. / EINECS-No.</th>
<th>Concentration</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dimethyl Disulfide</td>
<td>624-92-0</td>
<td>99 - 100</td>
</tr>
</tbody>
</table>

SECTION 4: First aid measures

General advice : Move out of dangerous area. Consult a physician. Show this material safety data sheet to the doctor in attendance. Material may produce a serious, potentially fatal pneumonia if swallowed or vomited.

If inhaled : Call a physician or poison control center immediately. If unconscious, place in recovery position and seek medical advice.

In case of skin contact : If on skin, rinse well with water. If on clothes, remove clothes.

In case of eye contact : Immediately flush eye(s) with plenty of water. 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. Take victim immediately to hospital.

SECTION 5: Firefighting measures

Flash point : 15 °C (59 °F)
Method: closed cup

Autoignition temperature : No data available

Suitable extinguishing media : Alcohol-resistant foam. Carbon dioxide (CO2). Dry chemical.

Unsuitable extinguishing media : High volume water jet.

Specific hazards during firefighting : Do not allow run-off from fire fighting to enter drains or water courses.

Special protective equipment for fire-fighters : Wear self-contained breathing apparatus for firefighting if necessary.

Further information : Collect contaminated fire extinguishing water separately. This must not be discharged into drains. Fire residues and contaminated fire extinguishing water must be disposed of in accordance with local regulations. For safety reasons in case of fire, cans should be stored separately in closed containments. Use a water spray to cool fully closed containers.
### Dimethyl Disulfide

**Version 3.5**

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<table>
<thead>
<tr>
<th>Section</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Fire and explosion protection</strong></td>
<td>Do not spray on an open flame or any other 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.</td>
</tr>
<tr>
<td><strong>Hazardous decomposition products</strong></td>
<td>Hydrogen Sulfide. Sulfur oxides.</td>
</tr>
</tbody>
</table>

### SECTION 6: Accidental release measures

| Personal precautions | Use personal protective equipment. 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. |
| Methods for cleaning up | Contain spillage, and then collect with non-combustible absorbent material, (e.g. sand, earth, diatomaceous earth, vermiculite) and place in container for disposal according to local / national regulations (see section 13). |

### SECTION 7: Handling and storage

**Handling**

**Advice on safe handling**

In case of an accident, this substance must be handled under Strictly Controlled Conditions (SCC) in accordance with REACH regulation Article 18(4) for transported isolated intermediates. Avoid formation of aerosol. Do not breathe vapors/dust. Avoid contact with skin and eyes. 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 an open flame or any other 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.

**Storage**

**Requirements for storage areas and containers**

Prevent unauthorized access. No smoking. Keep container tightly closed in a dry and well-ventilated place. Containers which are opened must be carefully resealed and kept upright to prevent leakage. Observe label precautions. Electrical installations / working materials must comply with the technological safety standards.

SDS Number:100000013403

5/13
Use: Chemical intermediate

SECTION 8: Exposure controls/personal protection

Engineering measures

The substance is registered as a Transported Isolated Intermediate with Strictly Controlled Conditions (SCC) defined in Article 18(4) of Regulation EC No. 1907/2006 and must therefore be handled as such.

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: Wear a supplied-air NIOSH approved respirator unless ventilation or other engineering controls are adequate to maintain minimal oxygen content of 19.5% by volume under normal atmospheric pressure. Wear a NIOSH approved respirator that provides protection when working with this material if exposure to harmful levels of airborne material may occur, such as: Air-Purifying Respirator for Organic Vapors. Use a positive pressure, air-supplying respirator if there is potential for uncontrolled release, 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. Wear face-shield and protective suit for abnormal processing problems.

Skin and body protection: Choose body protection according to the amount and concentration of the dangerous substance at the work place. Wear as appropriate: Flame-resistant clothing. Workers should wear antistatic footwear.

Hygiene measures: Avoid contact with skin, eyes and clothing. When using do not eat or drink. When using do not smoke. Wash hands before breaks and immediately after handling the product.

SECTION 9: Physical and chemical properties

Information on basic physical and chemical properties

Appearance
Dimethyl Disulfide

Form: Liquid
Physical state: Liquid
Color: Yellow
Odor: Mildly unpleasant

Safety data
Flash point: 15 °C (59 °F)
   Method: closed cup
Lower explosion limit: 1.1 %(V)
Upper explosion limit: 16 %(V)
Oxidizing properties: no
Autoignition temperature: No data available
Molecular formula: C2H6S2
Molecular weight: 94.2 g/mol
pH: No data available
Pour point: No data available
Boiling point/boiling range: 109 °C (228 °F)
Vapor pressure: 28.60 MMHG
   at 25 °C (77 °F)
Relative density: 1.06
   at 4 °C (39 °F)
Water solubility: Negligible
Partition coefficient: n-octanol/water
   Pow: 1.77
Viscosity, dynamic: 0.62 mPa.s
Relative vapor density: 3.25
   (Air = 1.0)
Evaporation rate: No data available
Percent volatile: > 99 %

SECTION 10: Stability and reactivity

Chemical stability: This material is considered stable under normal ambient and anticipated storage and handling conditions of temperature and pressure.

Possibility of hazardous reactions
Dimethyl Disulfide

Hazardous reactions: Hazardous polymerization does not occur.

Further information: No decomposition if stored and applied as directed.

Hazardous reactions: Vapors may form explosive mixture with air.

Conditions to avoid: Heat, flames and sparks.

Hazardous decomposition products: Hydrogen Sulfide, Sulfur oxides

Other data: No decomposition if stored and applied as directed.

SECTION 11: Toxicological information

Acute oral toxicity

Dimethyl Disulfide: LD50: > 300 - < 500 mg/kg
Species: Rat
Sex: female
Method: OECD Test Guideline 423

Acute inhalation toxicity

Dimethyl Disulfide: LC50: 5.05 mg/l
Exposure time: 4 h
Species: Rat
Test atmosphere: vapor
Method: OECD Test Guideline 403

Dimethyl Disulfide

Skin irritation: May cause skin irritation and/or dermatitis.

Eye irritation: May cause irreversible eye damage.

Sensitization: Causes sensitization.

Genotoxicity in vitro

Dimethyl Disulfide: Test Type: Ames test
Method: Mutagenicity (Escherichia coli - reverse mutation assay)
Result: negative
### Genotoxicity in vivo

| Dimethyl Disulfide | Test Type: Mouse micronucleus assay | Result: negative |

### Aspiration toxicity

| Dimethyl Disulfide | May be harmful if swallowed and enters airways. |

### CMR effects

| Dimethyl Disulfide | Mutagenicity: Tests on bacterial or mammalian cell cultures did not show mutagenic effects. |

Further information:
- Solvents may degrease the skin.

## SECTION 12: Ecological information

### Toxicity to fish

<table>
<thead>
<tr>
<th>Dimethyl Disulfide</th>
<th>LC50: 0.97 mg/l</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Exposure time: 96 h</td>
</tr>
<tr>
<td></td>
<td>Species: Oncorhynchus mykiss (rainbow trout)</td>
</tr>
<tr>
<td></td>
<td>static test</td>
</tr>
</tbody>
</table>

### Toxicity to daphnia and other aquatic invertebrates

<table>
<thead>
<tr>
<th>Dimethyl Disulfide</th>
<th>LC50: 1.82 mg/l</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Exposure time: 48 h</td>
</tr>
<tr>
<td></td>
<td>Species: Daphnia magna (Water flea)</td>
</tr>
<tr>
<td></td>
<td>semi-static test Method: OECD Test Guideline 202</td>
</tr>
</tbody>
</table>

### Toxicity to algae

<table>
<thead>
<tr>
<th>Dimethyl Disulfide</th>
<th>ErC50: 3.9 mg/l</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Exposure time: 96 h</td>
</tr>
<tr>
<td></td>
<td>Species: Skeletonema costatum (Marine Algae)</td>
</tr>
<tr>
<td></td>
<td>static test Method: OECD Test Guideline 201</td>
</tr>
</tbody>
</table>

### Toxicity to fish (Chronic toxicity)
Dimethyl Disulfide

**Toxicity to daphnia and other aquatic invertebrates (Chronic toxicity)**

- **Dimethyl Disulfide**
  - NOEC: 0.47 mg/l
  - Exposure time: 38 d
  - Species: Cyprinodon variegatus (sheepshead minnow)
  - Method: OECD Test Guideline 210

- **Dimethyl Disulfide**
  - NOEC: 0.0025 mg/l
  - Exposure time: 21 d
  - Species: Daphnia magna (Water flea)
  - Method: OECD Test Guideline 211

**Biodegradability**

- **Dimethyl Disulfide**
  - Aerobic
  - Result: Partially biodegradable.
  - 50 - 60%
  - Testing period: 28 d
  - Method: OECD Test Guideline 310
  - The 10 day time window criterion is not fulfilled.
  - Expected to be inherently biodegradable.

**Results of PBT assessment**

- **Dimethyl Disulfide**
  - Non-classified PBT substance, Non-classified vPvB substance

**Additional ecological information**

- Toxic to aquatic life with long lasting effects.
- An environmental hazard cannot be excluded in the event of unprofessional handling or disposal. Very toxic to aquatic life with long lasting effects.

**Ecotoxicology Assessment**

**Short-term (acute) aquatic hazard**

- **Dimethyl Disulfide**
  - Very toxic to aquatic life.

**Long-term (chronic) aquatic hazard**

- **Dimethyl Disulfide**
  - Very toxic to aquatic life with long lasting effects.

**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**

- The product should not be allowed to enter drains, water courses or the soil. Do not contaminate ponds, waterways or ditches with chemical or used container. Send to a licensed disposal facility.
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)**

UN2381, DIMETHYL DISULFIDE, 3 (6.1), II, MARINE POLLUTANT, (DIMETHYL DISULFIDE)

**IMO / IMDG (INTERNATIONAL MARITIME DANGEROUS GOODS)**

UN2381, DIMETHYL DISULPHIDE, 3 (6.1), II, (15 °C), MARINE POLLUTANT, (DIMETHYL DISULFIDE)

**IATA (INTERNATIONAL AIR TRANSPORT ASSOCIATION)**

UN2381, NON: NOT PERMITTED FOR TRANSPORT

**ADR (AGREEMENT ON DANGEROUS GOODS BY ROAD (EUROPE))**

UN2381, DIMETHYL DISULPHIDE, 3 (6.1), II, (D/E), ENVIRONMENTALLY HAZARDOUS, (DIMETHYL DISULFIDE)

**RID (REGULATIONS CONCERNING THE INTERNATIONAL TRANSPORT OF DANGEROUS GOODS (EUROPE))**

UN2381, DIMETHYL DISULPHIDE, 3 (6.1), II, ENVIRONMENTALLY HAZARDOUS, (DIMETHYL DISULFIDE)

**ADN (EUROPEAN AGREEMENT CONCERNING THE INTERNATIONAL CARRIAGE OF DANGEROUS GOODS BY INLAND WATERWAYS)**

UN2381, DIMETHYL DISULPHIDE, 3 (6.1), II, ENVIRONMENTALLY HAZARDOUS, (DIMETHYL DISULFIDE)

Transport in bulk according to Annex II of MARPOL 73/78 and the IBC Code

**SECTION 15: Regulatory information**

Classification and Labeling of Commonly Used Dangerous: Primary label: Combustible Liquid.

SDS Number: 100000013403 11/13
SECTION 16: Other information

Further information
Legacy SDS Number : 96150

Local emergency contact number: 0532-83889090

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.
<table>
<thead>
<tr>
<th>EOSCA</th>
<th>European Oilfield Specialty Chemicals Association</th>
<th>PEL</th>
<th>Permissible Exposure Limit</th>
</tr>
</thead>
<tbody>
<tr>
<td>EINECS</td>
<td>European Inventory of Existing Chemical Substances</td>
<td>PICCS</td>
<td>Philippines Inventory of Commercial Chemical Substances</td>
</tr>
<tr>
<td>MAK</td>
<td>Germany Maximum Concentration Values</td>
<td>PRNT</td>
<td>Presumed Not Toxic</td>
</tr>
<tr>
<td>GHS</td>
<td>Globally Harmonized System</td>
<td>RCRA</td>
<td>Resource Conservation Recovery Act</td>
</tr>
<tr>
<td>&gt;=</td>
<td>Greater Than or Equal To</td>
<td>STEL</td>
<td>Short-term Exposure Limit</td>
</tr>
<tr>
<td>IC50</td>
<td>Inhibition Concentration 50%</td>
<td>SARA</td>
<td>Superfund Amendments and Reauthorization Act.</td>
</tr>
<tr>
<td>IARC</td>
<td>International Agency for Research on Cancer</td>
<td>TLV</td>
<td>Threshold Limit Value</td>
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<tr>
<td>IECSC</td>
<td>Inventory of Existing Chemical Substances in China</td>
<td>TWA</td>
<td>Time Weighted Average</td>
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<td>ENCS</td>
<td>Japan, Inventory of Existing and New Chemical Substances</td>
<td>TSCA</td>
<td>Toxic Substance Control Act</td>
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<td>Korea, Existing Chemical Inventory</td>
<td>UVCB</td>
<td>Unknown or Variable Composition, Complex Reaction Products, and Biological Materials</td>
</tr>
<tr>
<td>&lt;=</td>
<td>Less Than or Equal To</td>
<td>WHMIS</td>
<td>Workplace Hazardous Materials Information System</td>
</tr>
<tr>
<td>LC50</td>
<td>Lethal Concentration 50%</td>
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