# Safety Data Sheet

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## 1. IDENTIFICATION OF THE SUBSTANCE/MIXTURE AND OF THE COMPANY/UNDERTAKING

### 1.1 Product Identifier

**Material Name** : **Crude Oil, Sour (=>0.5% Sulphur)**

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

**Product Use** : Refinery Feedstock.

### 1.3 Details of the supplier of the substance or mixture

**Manufacturer/Supplier** :
**Shell Trading International Limited**
80 Strand
London,
WC2R 0ZA
United Kingdom

**Telephone** : +44 (0) 20 7546 5000
**Email Contact for MSDS** : TRsds@shell.com

### 1.4 Emergency Telephone Number

: +44 (0)151 350 4595

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## 2. HAZARDS IDENTIFICATION

### 2.1 Classification of substance or mixture

| **Regulation (EC) No 1272/2008 (CLP)** | |
|---|---|
| **Hazard classes / Hazard categories** | **Hazard Statement** |
| Flammable liquids, Category 2 | H225 |
| Carcinogenicity, Category 1B | H350 |
| Serious eye damage/eye irritation, Category 2A | H319 |
| Aspiration hazard, Category 1 | H304 |
| Specific target organ toxicity - repeated exposure, Category 2; bone marrow; Liver; Thymus. | H373 |
| Specific target organ toxicity - single exposure, Category 3; Narcotic effects. | H336 |
| Chronic hazards to the aquatic environment, Category 2 | H411 |

| **67/548/EEC or 1999/45/EC** | |
|---|---|
| **Hazard Characteristics** | **R-phrase(s)** |
| Highly flammable., Toxic. | R11; R45; R48/21/22; R51/53; R65; R66; R67 |

### 2.2 Label Elements

**Labeling according to Regulation (EC) No 1272/2008**

**Symbol(s)** :

**Signal Words** : Danger

**CLP Hazard Statements** : PHYSICAL HAZARDS:
H225: Highly flammable liquid and vapor.

HEALTH HAZARDS:
H350: May cause cancer.
H304: May be fatal if swallowed and enters airways.
H319: Causes serious eye irritation.
H336: May cause drowsiness or dizziness.
H373: May cause damage to organs or organ systems through prolonged or repeated exposure.

H313: May be harmful in contact with skin.

ENVIRONMENTAL HAZARDS:
H411: Toxic to aquatic life with long lasting effects.

**CLP Precautionary statements**
**Prevention** : P210: Keep away from heat/sparks/open flames/hot surfaces. - No smoking.
P201: Obtain special instructions before use.
P280: Wear protective gloves/protective clothing/eye protection/face protection.

**Response** : P301+P310: IF SWALLOWED: Immediately call a POISON CENTER or doctor/physician.
P331: Do NOT induce vomiting.

**Storage** : No precautionary phrases.

**Disposal** : P501: Dispose of contents and container to appropriate waste site or reclaimer in accordance with local and national regulations.

### Labeling according to Directive 1999/45/EC/67/548/EEC

EC Symbols : F Highly flammable.
T Toxic.

EC Classification : Highly flammable. Carcinogenic, category 2. Harmful. Dangerous for the environment.

EC Risk Phrases : R11 Highly flammable.
R45 May cause cancer.
R48/21/22 Harmful: danger of serious damage to health by prolonged exposure in contact with skin and if swallowed.
R51/53 Toxic to aquatic organisms, may cause long-term adverse effects in the aquatic environment.
R65 Harmful: may cause lung damage if swallowed.
R66 Repeated exposure may cause skin dryness or cracking.
R67 Vapours may cause drowsiness and dizziness.

EC Safety Phrases : S45 In case of accident or if you feel unwell, seek medical advice immediately (show the label where possible).
S53 Avoid exposure. Obtain special instructions before use.
S61 Avoid release to the environment. Refer to special instructions/Safety data sheets.
S62 If swallowed, do not induce vomiting: seek medical advice immediately and show this container or label.

### 2.3 Other Hazards

**Health Hazards** : Hydrogen sulphide is highly toxic and may be fatal if inhaled. Hydrogen sulphide (H2S), an extremely flammable and toxic gas, and other hazardous vapours may evolve and collect in the headspace of storage tanks, transport vessels and other enclosed containers.
May dull the sense of smell, so do not rely on odour as an

indication of hazard.
H2S has a broad range of effects dependent on the airborne concentration and length of exposure: 0.02 ppm odour threshold, smell of rotten eggs; 10 ppm eye and respiratory tract irritation; 100 ppm coughing, headache, dizziness, nausea, eye irritation, loss of sense of smell in minutes; 200 ppm potential for pulmonary oedema after >20-30 minutes; 500 ppm loss of consciousness after short exposures, potential for respiratory arrest; >1000ppm immediate loss of consciousness, may lead rapidly to death, prompt cardiopulmonary resuscitation may be required. Do not depend on sense of smell for warning. H2S causes rapid olfactory fatigue (deadens sense of smell). There is no evidence that H2S will accumulate in the body tissue after repeated exposure. Repeated exposure may cause skin dryness or cracking. This product contains benzene which may cause leukaemia (AML - acute myelogenous leukaemia). May cause MDS (Myelodysplastic Syndrome).

**Safety Hazards** : May ignite on surfaces at temperatures above auto-ignition temperature. Electrostatic charges may be generated during pumping. Electrostatic discharge may cause fire. Flammable vapours may be present even at temperatures below the flash point.

**Other Information** : This product is intended for use in closed systems only.

## 3. COMPOSITION/INFORMATION ON INGREDIENTS

### 3.2 Mixtures

**Preparation Description** : Raw petroleum extracted in its natural state from the ground (excluding hydrocarbons from shale) and containing predominantly aliphatic, alicyclic and aromatic hydrocarbons. It may also contain small amounts of nitrogen, oxygen and sulphur compounds. Product is not a mixture according to regulation 1907/2006/EC.

**Hazardous Components**

**Classification of components according to Regulation (EC) No 1272/2008**

| Chemical Name | CAS No. | EINECS | REACH Registration No. | Conc. |
|---|---|---|---|---|
| Petroleum, Crude Oil | 8002-05-9 | 232-298-5 | Exempt | 100.00% |

| Chemical Name | Hazard Class & Category | Hazard Statement |
|---|---|---|
| Petroleum, Crude Oil | Flam. Liq., 2; Carc., 1B; Eye Dam., 2A; STOT RE, 2; STOT SE, 3; Aquatic Chronic, 2; Asp. Tox., 1; | H225; H350; H319; H373; H336; H411; H304; |

**Classification of components according to 67/548/EEC**

| Chemical Name | CAS No. | EINECS | REACH Registration No. | Symbol(s) | R-phrase(s) | Conc. |
|---|---|---|---|---|---|---|
| Petroleum, Crude Oil | 8002-05-9 | 232-298-5 | Exempt | F, T, N | R11; R45; R48/21/22; R51/53; R65; R66; R67 | 100.00% |

**Additional Information** : Contains Benzene, CAS # 71-43-2. Contains Ethylbenzene, CAS # 100-41-4. Contains n-Hexane, CAS # 110-54-3. Contains Naphthalene, CAS # 91-20-3. Contains hydrogen sulphide, CAS # 7783-06-4. Contains Natural Gasoline, CAS # 8006-61-9. Hydrogen sulphide may be present both in the liquid and the vapour. Composition is complex and varies with the source of the crude oil.

Refer to chapter 16 for full text of EC R-phrases.

## 4. FIRST AID MEASURES

### 4.1 Description of First Aid Measures

**General Information** : Vaporisation of H2S that has been trapped in clothing can be dangerous to rescuers. Maintain respiratory protection to avoid contamination from the victim to rescuer. Mechanical ventilation should be used to resuscitate if at all possible.

**Inhalation** : Remove to fresh air. If rapid recovery does not occur, transport to nearest medical facility for additional treatment.

**Skin Contact** : Remove contaminated clothing. Immediately flush skin with large amounts of water for at least 15 minutes, and follow by washing with soap and water if available. If redness, swelling, pain and/or blisters occur, transport to the nearest medical facility for additional treatment.

**Eye Contact** : Flush eyes with water while holding eyelids open. Rest eyes for 30 minutes. If redness, burning, blurred vision, or swelling persist transport to the nearest medical facility for additional treatment.

**Ingestion** : If swallowed, do not induce vomiting: transport to nearest medical facility for additional treatment. If vomiting occurs spontaneously, keep head below hips to prevent aspiration. Give nothing by mouth. Do not induce vomiting. If any of the following delayed signs and symptoms appear within the next 6 hours, transport to the nearest medical facility: fever greater than 101° F (38.3°C), shortness of breath, chest congestion or continued coughing or wheezing.

**4.2 Most important symptoms/effects, acute & delayed** : Defatting dermatitis signs and symptoms may include a burning sensation and/or a dried/cracked appearance. Eye irritation signs and symptoms may include a burning sensation, redness, swelling, and/or blurred vision. If material enters lungs, signs and symptoms may include coughing, choking, wheezing, difficulty in breathing, chest congestion, shortness of breath, and/or fever. The onset of respiratory symptoms may be delayed for several hours after exposure. Breathing of high vapour concentrations may cause central nervous system (CNS) depression resulting in dizziness, light-headedness, headache, nausea and loss of coordination. Continued inhalation may result in unconsciousness and death. H2S has a broad range of effects dependent on the airborne concentration and length of exposure: 0.02 ppm odour threshold, smell of rotten eggs; 10 ppm eye and respiratory tract irritation; 100 ppm coughing, headache, dizziness, nausea, eye irritation, loss of sense of smell in minutes; 200 ppm potential for pulmonary oedema after >20-30 minutes; 500 ppm loss of consciousness after short exposures, potential for respiratory arrest; >1000ppm immediate loss of consciousness, may lead rapidly to death, prompt cardiopulmonary resuscitation may be required. Do not depend on sense of smell for warning. H2S causes rapid olfactory fatigue (deadens sense of smell). There is no evidence that H2S will accumulate in the body tissue after repeated exposure.

**4.3 Indication of immediate medical attention and special treatment needed** : Hydrogen sulphide (H2S) - CNS asphyxiant. May cause rhinitis, bronchitis and occasionally pulmonary oedema after severe exposure. CONSIDER: Oxygen therapy. Consult a Poison Control Center for guidance.

Exposure to hydrogen sulphide at concentrations above the recommended occupational exposure standard may cause headache, dizziness, irritation of the eyes, upper respiratory tract, mouth and digestive tract, convulsions, respiratory

paralysis, unconsciousness and even death.
Call a doctor or poison control center for guidance.
Potential for chemical pneumonitis.

## 5. FIRE FIGHTING MEASURES

Clear fire area of all non-emergency personnel.

| | | |
|---|---|---|
| **5.1 Extinguishing Media** | : | Foam, water spray or fog. Dry chemical powder, carbon dioxide, sand or earth may be used for small fires only. |
| **Unsuitable Extinguishing Media** | : | Do not use direct water jets on the burning product as they could cause a steam explosion and spread of the fire. Simultaneous use of foam and water on the same surface is to be avoided as water destroys the foam. |
| **5.2 Special hazards arising from substance or mixture** | : | Hazardous combustion products may include: A complex mixture of airborne solid and liquid particulates and gases (smoke). Carbon monoxide. Oxides of nitrogen. Oxides of sulphur. Unidentified organic and inorganic compounds. Flammable vapours may be present even at temperatures below the flash point. The vapour is heavier than air, spreads along the ground and distant ignition is possible. Hydrogen sulphide ($H_2S$) and toxic sulphur oxides may be given off when this material is heated. Do not depend on sense of smell for warning. |
| **5.3 Advice for fire-fighters** | : | Wear full protective clothing and self-contained breathing apparatus. |
| **Additional Advice** | : | Keep adjacent containers cool by spraying with water. If possible remove containers from the danger zone. If the fire cannot be extinguished the only course of action is to evacuate immediately. |

## 6. ACCIDENTAL RELEASE MEASURES

Avoid contact with spilled or released material. For guidance on selection of personal protective equipment see Chapter 8 of this Material Safety Data Sheet. See Chapter 13 for information on disposal. Observe the relevant local and international regulations. Remove contaminated clothing. Evacuate the area of all non-essential personnel. Avoid contact with skin, eyes and clothing. Ventilate contaminated area thoroughly.

| | | |
|---|---|---|
| **6.1 Personal Precautions, Protective Equipment and Emergency Procedures** | : | May ignite on surfaces at temperatures above auto-ignition temperature. Do not breathe fumes, vapour. Do not operate electrical equipment. |
| **6.2 Environmental** | : | Shut off leaks, if possible without personal risks. Remove all |

**Precautions** possible sources of ignition in the surrounding area. Use appropriate containment (of product and fire fighting water) to avoid environmental contamination. Prevent from spreading or entering drains, ditches or rivers by using sand, earth, or other appropriate barriers. Attempt to disperse the vapour or to direct its flow to a safe location for example by using fog sprays. Take precautionary measures against static discharge. Ensure electrical continuity by bonding and grounding (earthing) all equipment.

**6.3 Methods and Material for Containment and Clean Up** : For large liquid spills (> 1 drum), transfer by mechanical means such as vacuum truck to a salvage tank for recovery or safe disposal. Do not flush away residues with water. Retain as contaminated waste. Allow residues to evaporate or soak up with an appropriate absorbent material and dispose of safely. Remove contaminated soil and dispose of safely.
For small liquid spills (< 1 drum), transfer by mechanical means to a labelled, sealable container for product recovery or safe disposal. Allow residues to evaporate or soak up with an appropriate absorbent material and dispose of safely. Remove contaminated soil and dispose of safely.

**Additional Advice** : Notify authorities if any exposure to the general public or the environment occurs or is likely to occur. Local authorities should be advised if significant spillages cannot be contained. Maritime spillages should be dealt with using a Shipboard Oil Pollution Emergency Plan (SOPEP), as required by MARPOL Annex 1 Regulation 26.

## 7. HANDLING AND STORAGE

**General Precautions** : Use the information in this data sheet as input to a risk assessment of local circumstances to help determine appropriate controls for safe handling, storage and disposal of this material. Properly dispose of any contaminated rags or cleaning materials in order to prevent fires. Prevent spillages. For comprehensive advice on handling, product transfer, storage and tank cleaning refer to the product supplier.

**7.1 Precautions for Safe Handling** : The inherent toxic and olfactory (sense of smell) fatiguing properties of hydrogen sulphide require that air monitoring alarms be used if concentrations are expected to reach harmful levels such as in enclosed spaces, heated transport vessels and spill or leak situations. If the air concentration exceeds 50 ppm, the area should be evacuated unless respiratory protection is in use. Avoid prolonged or repeated contact with skin. When using do not eat or drink. Extinguish any naked flames. Do not smoke. Remove ignition sources. Avoid sparks.

Electrostatic charges may be generated during pumping. Electrostatic discharge may cause fire. Earth all equipment.

**7.2 Conditions for safe storage, including any incompatibilities** : Drum and small container storage: Drums should be stacked to a maximum of 3 high. Use properly labelled and closeable containers. Prevent ingress of water. Keep container in a well-ventilated place equipped with hydrogen sulphide detectors. Tank storage: Tanks must be specifically designed for use with this product. Bulk storage tanks should be diked (bunded). Locate tanks away from heat and other sources of ignition.

**7.3 Specific End Uses** : Not applicable

**Additional Information** : Ensure that all local regulations regarding handling and storage facilities are followed. Hydrogen sulphide (H2S) and toxic sulphur oxides may be given off when this material is heated. Do not depend on sense of smell for warning. Hydrogen sulphide (H2S or Sour Gas) may be present when loading and unloading transport vessels. Stay upwind and away from newly opened hatches and allow to vent thoroughly before handling material. Steam may be used to vent hatches. Keep all sources of ignition away from loading area.
Use hydrogen sulphide monitors for detection.
Exposure to this product should be reduced as low as reasonably practicable. Reference should be made to the Health and Safety Executive's publication "COSHH Essentials".

**Product Transfer** : Avoid splash filling. Wait 2 minutes after tank filling (for tanks such as those on road tanker vehicles) before opening hatches or manholes. Wait 30 minutes after tank filling (for large storage tanks) before opening hatches or manholes. Keep containers closed when not in use. Do not use compressed air for filling, discharging or handling.

**Recommended Materials** : For containers, or container linings use mild steel, stainless steel. Aluminium may also be used for applications where it does not present an unnecessary fire hazard. Examples of suitable materials are: high density polyethylene (HDPE), polypropylene (PP), polyvinyl chloride (PVC), polyvinyl fluoride (PVDF), and fluoroelastomers (FKM), e.g. Viton, which have been specifically tested for compatibility with this product. For container linings, or coatings, use Epoxy (amine-cured), or Epoxy Novolac, or Phenolic Epoxy. For seals and gaskets use: fluoroelastomers (FKM), e.g. Viton A, B, or F, or Neoprene (CR), or nitrile (NBR, HNBR), or graphite, or expanded PTFE (e.g. Gore-Tex).

**Unsuitable Materials** : Some synthetic materials may be unsuitable for containers or container linings depending on the material specification and intended use. Examples of materials to avoid are: natural rubber (NR), ethylene propylene rubber (EPDM), polymethyl methacrylate (PMMA), polystyrene, polyisobutylene. However, some may be suitable for glove materials.

**Container Advice** : Do not cut, drill, grind, weld or perform similar operations on or near containers. Containers, even those that have been emptied, can contain explosive vapours.

## 8. EXPOSURE CONTROLS/PERSONAL PROTECTION

If the American Conference of Governmental Industrial Hygienists (ACGIH) value is provided on this document, it is provided for information only.

### 8.1 Control Parameters

**Occupational Exposure Limits**

| Material | Source | Type | ppm | mg/m3 | Notation |
|---|---|---|---|---|---|
| Benzene | EH40 WEL | TWA | 1 ppm | | |
| | EH40 WEL | SKIN_DES | | | Can be absorbed through the skin. |
| | ACGIH | TWA | 0.5 ppm | | |
| | ACGIH | STEL | 2.5 ppm | | |
| | ACGIH | SKIN_DES | | | Can be absorbed through the skin. |
| | SHELL IS | TWA | 0.5 ppm | 1.6 mg/m3 | |
| | SHELL IS | STEL | 2.5 ppm | 8 mg/m3 | |
| Hydrogen Sulphide | EH40 WEL | TWA | 5 ppm | 7 mg/m3 | |
| | EH40 WEL | STEL | 10 ppm | 14 mg/m3 | |
| | ACGIH | TWA | 1 ppm | | |
| | ACGIH | STEL | 5 ppm | | |
| Ethylbenzene | EH40 WEL | TWA | 100 ppm | 441 mg/m3 | |

| | | | | | |
|---|---|---|---|---|---|
| | EH40 WEL | STEL | 125 ppm | 552 mg/m3 | |
| | EH40 WEL | SKIN_DES | | | Can be absorbed through the skin. |
| | ACGIH | TWA | 20 ppm | | |
| n-hexane | EH40 WEL | TWA | 20 ppm | 72 mg/m3 | |
| | ACGIH | TWA | 50 ppm | | |
| | ACGIH | SKIN_DES | | | Can be absorbed through the skin. |
| Naphthalene | ACGIH | TWA | 10 ppm | | |
| | ACGIH | STEL | 15 ppm | | |
| | ACGIH | SKIN_DES | | | Can be absorbed through the skin. |

**Additional Information** : SHELL IS is the Shell Internal Standard.

| Material | Source | Hazard Designation |
|---|---|---|
| Petroleum, Crude Oil | EH40 (UK) | Carcinogenic. |
| Benzene | EH40 (UK) | Carcinogenic. |

**Biological Exposure Index (BEI)**

| Material | Determinant | Sampling Time | BEI | Reference |
|---|---|---|---|---|
| Benzene | S-Phenylmercapturic acid in Creatinine in urine | Sampling time: End of shift. | 25 µg/g | ACGIH BEL (2011) |

| | | | | |
|---|---|---|---|---|
| | t,t-Muconic acid in Creatinine in urine | Sampling time: End of shift. | 500 µg/g | ACGIH BEL (2011) |
| Ethylbenzene | Sum of mandelic acid and phenylglyoxylic acid in Creatinine in urine | Sampling time: End of shift at end of work week. | 0.7 g/g | ACGIH BEL (12 2010) |
| | Ethyl benzene in End-exhaled air | Sampling time: Not critical. | | ACGIH BEL (12 2010) |
| n-hexane | 2,5-Hexanedion, without hydrolysis in Urine | Sampling time: End of shift at end of work week. | 0.4 mg/l | ACGIH BEL (2011) |

**Derived No Effect Levels (DNEL)** : Not applicable.

**PNEC related information** : Not applicable.

### 8.2 Exposure Controls

**General Information** : The level of protection and types of controls necessary will vary depending upon potential exposure conditions. Select controls based on a risk assessment of local circumstances. Appropriate measures include: Use sealed systems as far as possible. Adequate explosion-proof ventilation to control airborne concentrations below the exposure guidelines/limits. Local exhaust ventilation is recommended. Eye washes and showers for emergency use.

**Occupational Exposure Controls**

**Personal Protective Equipment** : Personal protective equipment (PPE) should meet recommended national standards. Check with PPE suppliers.

**Eye Protection** : Chemical splash goggles (chemical monogoggles). Approved to EU Standard EN166.

**Hand Protection** : Incidental contact/Splash protection: Neoprene rubber. Where hand contact with the product may occur the use of gloves approved to relevant standards (e.g. Europe: EN374, US: F739) made from the following materials may provide suitable chemical protection: PVC. Longer term protection: Nitrile rubber. Suitability and durability of a glove is dependent on usage, e.g. frequency and duration of contact, chemical resistance of glove material, glove thickness, dexterity. Always seek advice from glove suppliers. Contaminated gloves should be replaced. Personal hygiene is a key element of effective hand care. Gloves must only be worn on clean hands. After using gloves, hands should be washed and dried thoroughly. Application of a non-perfumed moisturizer is recommended. Breakthrough times for gloves varies depending on, e.g. chemical resistance, material thickness, frequency and duration of contact. Selection should also take into account other usage requirements, e.g. dexterity, heat resistance, other chemical substances handled.

**Body protection** : Chemical resistant gloves/gauntlets, boots, and apron (where risk of splashing).

**Respiratory Protection** : If engineering controls do not maintain airborne concentrations to a level which is adequate to protect worker health, select respiratory protection equipment suitable for the specific conditions of use and meeting relevant legislation. Check with respiratory protective equipment suppliers. Where air-filtering respirators are unsuitable (e.g. airborne concentrations are high, risk of oxygen deficiency, confined space) use appropriate positive pressure breathing apparatus. All respiratory protection equipment and use must be in accordance with local regulations. If air-filtering respirators are suitable for conditions of use: Select a filter suitable for combined particulate/organic gases and vapours [boiling point >65 °C (149 °F)] meeting EN14387. Select a filter suitable for acid gases and vapours meeting EN14387.

**Thermal Hazards** : Not applicable.

**Monitoring Methods** : Monitoring of the concentration of substances in the breathing zone of workers or in the general workplace may be required to confirm compliance with an OEL and adequacy of exposure controls. For some substances biological monitoring may also be appropriate.

**Environmental Exposure Controls**

**Environmental exposure control measures** : Local guidelines on emission limits for volatile substances must be observed for the discharge of exhaust air containing vapour.

## 9. PHYSICAL AND CHEMICAL PROPERTIES

### 9.1 Information on basic physical and chemical properties

| | |
|---|---|
| Appearance | : Brown to black. Viscous liquid. |
| Odour | : Potential smell of rotten eggs and sulphur.. |
| pH | : Not applicable |
| Initial Boiling Point and Boiling Range | : Data not available |
| Freezing Point | : Data not available |
| Flash point | : < 23 °C / 73 °F |
| Upper / lower Flammability or Explosion limits | : 0.6 - 8 %(V) |
| Auto-ignition temperature | : > 220 °C / 428 °F |
| Vapour pressure | : Typical 10 - 70 kPa |
| Specific gravity | : Data not available |
| Density | : < 1,010 g/cm3 at 15 °C / 59 °F |
| Water solubility | : Insoluble. |
| n-octanol/water partition coefficient (log Pow) | : 2 - 6 |
| Kinematic viscosity | : 3 - 1,000 mm2/s at 40 °C / 104 °F |
| Vapour density (air=1) | : Data not available |
| Decomposition Temperature | : Data not available |

### 9.2 Other Information

| | |
|---|---|
| Other Information | : Not applicable. |

## 10. STABILITY AND REACTIVITY

| | |
|---|---|
| **10.1 Reactivity** | : Stable under normal conditions of use. |
| **10.2 Chemical Stability** | : Stable under normal conditions of use. |
| **10.3 Possibility of Hazardous Reactions** | : Data not available |
| **10.4 Conditions to Avoid** | : Avoid heat, sparks, open flames and other ignition sources. |
| **10.5 Incompatible Materials** | : Strong oxidising agents. |
| **10.6 Hazardous Decomposition Products** | : Hazardous decomposition products are not expected to form during normal storage. Thermal decomposition is highly dependent on conditions. A complex mixture of airborne solids, liquids and gases including carbon monoxide, carbon dioxide, |

sulphur oxides and unidentified organic compounds will be evolved when this material undergoes combustion or thermal or oxidative degradation.

**Other Information**

| | |
|---|---|
| **Hazardous Polymerisation** | No, hazardous, exothermic polymerization cannot occur. |

## 11. TOXICOLOGICAL INFORMATION

### 11.1 Information on Toxicological effects

| | |
|---|---|
| **Basis for Assessment** | Information given is based on product data, a knowledge of the components and the toxicology of similar products. |
| **Likely Routes of Exposure** | Exposure may occur via inhalation, ingestion, skin absorption, skin or eye contact, and accidental ingestion. |
| **Acute Oral Toxicity** | Low toxicity: LD50 > 5000 mg/kg , Rat |
| **Acute Dermal Toxicity** | Low toxicity: LD50 >2000 mg/kg , Rabbit |
| **Acute Inhalation Toxicity** | Extremely toxic: LC100 = 600ppm(v) / 30 min, Man (Hydrogen Sulphide)<br>Low toxicity by inhalation. (Petroleum, Crude Oil) |
| **Skin Corrosion/Irritation** | Not irritating to skin. Prolonged/repeated contact may cause defatting of the skin which can lead to dermatitis. |
| **Serious Eye Damage/Irritation** | Causes serious eye irritation. |
| **Respiratory Irritation** | Not expected to be a respiratory irritant. |
| **Respiratory or Skin Sensitisation** | Not expected to be a sensitiser. |
| **Aspiration Hazard** | Aspiration into the lungs when swallowed or vomited may cause chemical pneumonitis which can be fatal. |
| **Germ Cell Mutagenicity** | Not expected to be mutagenic. |
| **Carcinogenicity** | Causes cancer in laboratory animals. May cause leukaemia (AML - acute myelogenous leukemia). (Benzene) |
| **Reproductive and Developmental Toxicity** | Not expected to impair fertility. Not expected to be a developmental toxicant. |
| **Specific target organ toxicity - single exposure** | High concentrations may cause central nervous system depression resulting in headaches, dizziness and nausea; continued inhalation may result in unconsciousness and/or death. |
| **Specific target organ toxicity - repeated exposure** | May cause damage to organs or organ systems through prolonged or repeated exposure. Bone Marrow Thymus. Liver. |
| **Additional Information** | H2S has a broad range of effects dependent on the airborne |

concentration and length of exposure: 0.02 ppm odour threshold, smell of rotten eggs; 10 ppm eye and respiratory tract irritation; 100 ppm coughing, headache, dizziness, nausea, eye irritation, loss of sense of smell in minutes; 200 ppm potential for pulmonary oedema after >20-30 minutes; 500 ppm loss of consciousness after short exposures, potential for respiratory arrest; >1000ppm immediate loss of consciousness, may lead rapidly to death, prompt cardiopulmonary resuscitation may be required. Do not depend on sense of smell for warning. H2S causes rapid olfactory fatigue (deadens sense of smell). There is no evidence that H2S will accumulate in the body tissue after repeated exposure.
May cause MDS (Myelodysplastic Syndrome). (Benzene)

## 12. ECOLOGICAL INFORMATION

| | | |
|---|---|---|
| **Basis for Assessment** | : | Incomplete ecotoxicological data are available for this product. The information given below is based partly on a knowledge of the components and the ecotoxicology of similar products. |
| **12.1 Toxicity** | | |
| **Acute Toxicity** | : | Expected to be harmful: LL/EL/IL50 1-10 mg/l (to aquatic organisms) (LL/EL50 expressed as the nominal amount of product required to prepare aqueous test extract). |
| **Fish** | : | Expected to be harmful: LL/EL/IL50 1-10 mg/l |
| **Aquatic Invertebrates** | : | Expected to be harmful: LL/EL/IL50 1-10 mg/l |
| **Algae** | : | Expected to be harmful: LL/EL/IL50 1-10 mg/l |
| **Microorganisms** | : | Data not available |
| **12.2 Persistence and degradability** | : | Major constituents are inherently biodegradable, but contains components that may persist in the environment. |
| **12.3 Bioaccumulative Potential** | : | Contains constituents with the potential to bioaccumulate. |
| **12.4 Mobility** | : | Contains volatile constituents. Partly evaporates from water or soil surfaces, but a significant proportion will remain after one day. If the product enters soil, one or more constituents will or may be mobile and may contaminate groundwater. |
| **12.5 Result of the PBT and vPvB assessment** | : | The substance does not fulfill all screening criteria for persistence, bioaccumulation and toxicity and hence is not considered to be PBT or vPvB. |

| | | |
|---|---|---|
| **12.6 Other Adverse Effects** | : | Films formed on water may affect oxygen transfer and damage organisms. |

## 13. DISPOSAL CONSIDERATIONS

### 13.1 Waste Treatment Methods

| | | |
|---|---|---|
| **Material Disposal** | : | Recover or recycle if possible. It is the responsibility of the waste generator to determine the toxicity and physical properties of the material generated to determine the proper waste classification and disposal methods in compliance with applicable regulations. Do not dispose into the environment, in drains or in water courses. Do not dispose of tank water bottoms by allowing them to drain into the ground. This will result in soil and groundwater contamination. Waste arising from a spillage or tank cleaning should be disposed of in accordance with prevailing regulations, preferably to a recognised collector or contractor. The competence of the collector or contractor should be established beforehand. |
| **Container Disposal** | : | Send to drum recoverer or metal reclaimer. Drain container thoroughly. After draining, vent in a safe place away from sparks and fire. Residues may cause an explosion hazard if heated above the flash point. Do not puncture, cut or weld uncleaned drums. Do not pollute the soil, water or environment with the waste container. Comply with any local recovery or waste disposal regulations. |
| **Local Legislation** | : | Disposal should be in accordance with applicable regional, national, and local laws and regulations. Local regulations may be more stringent than regional or national requirements and must be complied with.<br>13 07 03 wastes of liquid fuels, other fuels (including mixtures). The number given to waste is associated with the appropriate usage. The user must decide if their particular use results in another waste code being assigned. |

## 14. TRANSPORT INFORMATION

**Land transport (ADR/RID):**
**ADR**

| | | |
|---|---|---|
| 14.1 UN No. | : | 3494 |
| 14.2 UN Proper Shipping Name | : | PETROLEUM SOUR CRUDE OIL, FLAMMABLE, TOXIC |
| 14.3 Transport Hazard Class | : | 3 |

14.4 Packing group : II
Danger label (primary risk) : 3
Danger label (subsidiary risk) : 6.1
14.5 Environmental Hazard : Environmentally Hazardous

**RID**
14.1 UN No. : 3494
14.2 UN Proper Shipping Name : PETROLEUM SOUR CRUDE OIL, FLAMMABLE, TOXIC
14.3 Transport Hazard Class : 3
14.4 Packing group : II
Danger label (primary risk) : 3
Danger label (subsidiary risk) : 6.1
14.5 Environmental Hazard : Environmentally Hazardous

**Inland waterways transport (ADN):**
14.1 UN No. : 3494
14.2 UN Proper Shipping Name : PETROLEUM SOUR CRUDE OIL, FLAMMABLE, TOXIC
14.3 Transport Hazard Class : 3
14.4 Packing group : II
Danger label (primary risk) : 3
Danger label (subsidiary risk) : 6.1
N2
CMR
F

14.5 Environmental Hazard : Environmentally Hazardous

**Sea transport (IMDG Code):**
14.1 UN No. : UN 3494
14.2 UN Proper Shipping Name : PETROLEUM SOUR CRUDE OIL, FLAMMABLE, TOXIC
14.3 Transport Hazard Class : 3
Subsidiary class/Division : 6.1
14.4 Packing group : II
14.5 Marine pollutant : Yes

**Air transport (IATA):**

| | | |
|---|---|---|
| 14.1 UN No. | : | 3494 |
| 14.2 UN Proper Shipping Name | : | Petroleum sour crude oil, flammable, toxic |
| 14.3 Transport Hazard Class | : | 3 |
| Subsidiary class/Division | : | 6.1 |
| 14.4 Packing group | : | II |

## 15. REGULATORY INFORMATION

The regulatory information is not intended to be comprehensive. Other regulations may apply to this material.

### 15.1 Safety, health and environmental regulations/legislation specific for the substance or mixture

**Other regulatory Information**

| | | |
|---|---|---|
| **Authorisation and/or Restrictions in Use** | : | Product is not subject to Authorisation under REACh. |

**Chemical Inventory Status**

| | | |
|---|---|---|
| EINECS | : | All components listed or polymer exempt. |
| TSCA | : | All components listed. |

| | | |
|---|---|---|
| **15.2 Chemical Safety Assessment** | : | Not applicable. |

## 16. OTHER INFORMATION

**R-phrase(s)**

| | |
|---|---|
| R11 | Highly flammable. |
| R45 | May cause cancer. |
| R48/21/22 | Harmful: danger of serious damage to health by prolonged exposure in contact with skin and if swallowed. |
| R51/53 | Toxic to aquatic organisms, may cause long-term adverse effects in the aquatic environment. |
| R65 | Harmful: may cause lung damage if swallowed. |
| R66 | Repeated exposure may cause skin dryness or cracking. |
| R67 | Vapours may cause drowsiness and dizziness. |

**CLP Hazard Statements**

| | |
|---|---|
| H225 | Highly flammable liquid and vapor. |
| H304 | May be fatal if swallowed and enters airways. |
| H319 | Causes serious eye irritation. |
| H336 | May cause drowsiness or dizziness. |
| H350 | May cause cancer. |
| H373 | May cause damage to organs or organ systems through prolonged or repeated exposure. |
| H411 | Toxic to aquatic life with long lasting effects. |

**Identified Uses according to the Use Descriptor System**

**Additional Information** : This product is exempt from the obligation to register under REACH in accordance with Article 2(7)(b).

**Other Information**

**Further Information** : This product is intended for use in closed systems only.

**MSDS Distribution** : The information in this document should be made available to all who may handle the product.

**MSDS Version Number** : 1.5

**MSDS Effective Date** : 15.11.2011

**MSDS Revisions** : A vertical bar (|) in the left margin indicates an amendment from the previous version.

**MSDS Regulation** : Regulation 1907/2006/EC

**Disclaimer** : 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.