# SAFETY DATA SHEET

**Creation Date** 11-Nov-2010 **Revision Date** 10-Jul-2015 **Revision Number** 7

## SECTION 1: IDENTIFICATION OF THE SUBSTANCE/MIXTURE AND OF THE COMPANY/UNDERTAKING

### 1.1. Product identification

| | |
|---|---|
| **Product Description:** | **Chloroacetyl chloride** |
| **Cat No. :** | **147290000; 147290010; 147290025; 147291000; 147292500** |
| **Synonyms** | Chloroacetic acid chloride.; Chloracetyl chloride |
| **CAS-No** | 79-04-9 |
| **EC-No.** | 201-171-6 |
| **Molecular Formula** | C2 H2 Cl2 O |
| **Reach Registration Number** | 01-2119437241-50 |

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

| | |
|---|---|
| **Recommended Use** | Laboratory chemicals. |
| **Sector of use** | SU3 - Industrial uses: Uses of substances as such or in preparations at industrial sites |
| **Product category** | PC21 - Laboratory chemicals |
| **Process categories** | PROC15 - Use as a laboratory reagent |
| **Environmental release category** | ERC6a - Industrial use resulting in manufacture of another substance (use of intermediates) |
| **Uses advised against** | No Information available |

### 1.3. Details of the supplier of the safety data sheet

| | |
|---|---|
| **Company** | Acros Organics BVBA<br>Janssen Pharmaceuticalaan 3a<br>2440 Geel, Belgium |
| **E-mail address** | begel.sdsdesk@thermofisher.com |

### 1.4. Emergency telephone number

For information **US** call: 001-800-ACROS-01 / **Europe** call: +32 14 57 52 11
Emergency Number **US:**001-201-796-7100 / **Europe:** +32 14 57 52 99
**CHEMTREC** Tel. No.**US:**001-800-424-9300 / **Europe:**001-703-527-3887

## SECTION 2: HAZARDS IDENTIFICATION

### 2.1. Classification of the substance or mixture

**CLP Classification - Regulation (EC) No 1272/2008**

**Physical hazards**

| | |
|---|---|
| Substances/mixtures corrosive to metal | Category 1 |

**Health hazards**

| | |
|---|---|
| Acute oral toxicity | Category 3 |
| Acute dermal toxicity | Category 3 |
| Acute Inhalation Toxicity - Vapors | Category 3 |
| Skin Corrosion/irritation | Category 1 A |
| Serious Eye Damage/Eye Irritation | Category 1 |
| Specific target organ toxicity - (repeated exposure) | Category 1 |

**Environmental hazards**

| | |
|---|---|
| Acute aquatic toxicity | Category 1 |

### 2.2. Label elements

**Signal Word** **Danger**

**Hazard Statements**

H290 - May be corrosive to metals
H331 - Toxic if inhaled
H311 - Toxic in contact with skin
H301 - Toxic if swallowed
H314 - Causes severe skin burns and eye damage
H372 - Causes damage to organs through prolonged or repeated exposure
H400 - Very toxic to aquatic life
EUH029 - Contact with water liberates toxic gas
EUH014 - Reacts violently with water

**Precautionary Statements**

P280 - Wear protective gloves/ protective clothing/ eye protection/ face protection
P305 + P351 + P338 - IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing
P310 - Immediately call a POISON CENTER or doctor/ physician
P304 + P340 - IF INHALED: Remove to fresh air and keep at rest in a position comfortable for breathing
P301 + P330 + P331 - IF SWALLOWED: Rinse mouth. Do NOT induce vomiting
P303 + P361 + P353 - IF ON SKIN (or hair): Remove/ Take off immediately all contaminated clothing. Rinse skin with water/ shower

### 2.3. Other hazards

Reacts violently with water
Lachrymator (substance which increases the flow of tears)

## SECTION 3: COMPOSITION/INFORMATION ON INGREDIENTS

### 3.1. Substances

| Component | CAS-No | EC-No. | Weight % | CLP Classification - Regulation (EC) No 1272/2008 |
|---|---|---|---|---|
| Chloroacetyl chloride | 79-04-9 | EEC No. 201-171-6 | >95 | Acute Tox. 3 (H301)<br>Acute Tox. 3 (H311)<br>Acute Tox. 3 (H331)<br>Skin Corr. 1A (H314)<br>STOT RE 1 (H372)<br>Aquatic Acute 1 (H400)<br>EUH014<br>EUH029<br>Met. Corr. 1 (H290) |

| Reach Registration Number | 01-2119437241-50 |
|---|---|

*Full text of Hazard Statements: see section 16*

## SECTION 4: FIRST AID MEASURES

### 4.1. Description of first aid measures

**General Advice** Immediate medical attention is required. Show this safety data sheet to the doctor in attendance.

**Eye Contact** Rinse immediately with plenty of water, also under the eyelids, for at least 15 minutes. Immediate medical attention is required.

**Skin Contact** Wash off immediately with plenty of water for at least 15 minutes. Immediate medical attention is required.

**Ingestion** Do not induce vomiting. Call a physician or Poison Control Center immediately.

**Inhalation** If breathing is difficult, give oxygen. Do not use mouth-to-mouth resuscitation if victim ingested or inhaled the substance; induce artificial respiration with a respiratory medical device. Move to fresh air. Immediate medical attention is required.

**Protection of First-aiders** Ensure that medical personnel are aware of the material(s) involved, take precautions to protect themselves and prevent spread of contamination.

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

Causes burns by all exposure routes. . Product is a corrosive material. Use of gastric lavage or emesis is contraindicated. Possible perforation of stomach or esophagus should be investigated: Ingestion causes severe swelling, severe damage to the delicate tissue and danger of perforation

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

**Notes to Physician** Treat symptomatically.

## SECTION 5: FIREFIGHTING MEASURES

### 5.1. Extinguishing media

**Suitable Extinguishing Media**
$CO_2$, dry chemical, dry sand, alcohol-resistant foam.

**Extinguishing media which must not be used for safety reasons**
Contact with water liberates toxic gas. Water.

### 5.2. Special hazards arising from the substance or mixture

Thermal decomposition can lead to release of irritating gases and vapors. The product causes burns of eyes, skin and mucous membranes. Contact with water liberates toxic gas. Reacts violently with water. Do not allow run-off from fire fighting to enter drains or water courses.

**Hazardous Combustion Products**
Hydrogen chloride gas, Carbon monoxide (CO), Carbon dioxide ($CO_2$), Phosgene, Thermal decomposition can lead to release of irritating gases and vapors.

### 5.3. Advice for firefighters

As in any fire, wear self-contained breathing apparatus pressure-demand, MSHA/NIOSH (approved or equivalent) and full protective gear. Thermal decomposition can lead to release of irritating gases and vapors.

## SECTION 6: ACCIDENTAL RELEASE MEASURES

### 6.1. Personal precautions, protective equipment and emergency procedures

Evacuate personnel to safe areas. Keep people away from and upwind of spill/leak. Use personal protective equipment. Ensure

adequate ventilation.

### 6.2. Environmental precautions

Do not flush into surface water or sanitary sewer system. Do not allow material to contaminate ground water system. Prevent product from entering drains. Local authorities should be advised if significant spillages cannot be contained. See Section 12 for additional ecological information. Avoid release to the environment. Collect spillage.

### 6.3. Methods and material for containment and cleaning up

Soak up with inert absorbent material. Keep in suitable, closed containers for disposal. Do not expose spill to water.

### 6.4. Reference to other sections

Refer to protective measures listed in Sections 8 and 13.

## SECTION 7: HANDLING AND STORAGE

### 7.1. Precautions for safe handling

Use only under a chemical fume hood. Do not breathe vapors or spray mist. Wear personal protective equipment. Do not get in eyes, on skin, or on clothing. Do not ingest. Do not allow contact with water.

### 7.2. Conditions for safe storage, including any incompatibilities

Keep containers tightly closed in a dry, cool and well-ventilated place. Corrosives area. Keep away from water. Do not store in metal containers.

### 7.3. Specific end use(s)

Use in laboratories

## SECTION 8: EXPOSURE CONTROLS/PERSONAL PROTECTION

### 8.1. Control parameters

**Exposure limits**
List source(s): **IRE -** 2010 Code of Practice for the Safety, Health and Welfare at Work (Chemical Agents) Regulations 2001. Published by the Health and Safety Authority.

| Component | European Union | The United Kingdom | France | Belgium | Spain |
|---|---|---|---|---|---|
| Chloroacetyl chloride | | | TWA / VME: 0.05 ppm (8 heures).<br>TWA / VME: 0.2 mg/m³ (8 heures). | TWA: 0.05 ppm 8 uren<br>TWA: 0.23 mg/m³ 8 uren<br>STEL: 0.15 ppm 15 minuten<br>STEL: 0.7 mg/m³ 15 minuten<br>Huid | STEL / VLA-EC: 0.15 ppm (15 minutos).<br>STEL / VLA-EC: 0.7 mg/m³ (15 minutos).<br>TWA / VLA-ED: 0.05 ppm (8 horas)<br>TWA / VLA-ED: 0.23 mg/m³ (8 horas)<br>Piel |

| Component | Italy | Germany | Portugal | The Netherlands | Finland |
|---|---|---|---|---|---|
| Chloroacetyl chloride | | Haut | STEL: 0.15 ppm 15 minutos<br>TWA: 0.05 ppm 8 horas<br>Pele | | |

| Component | Austria | Denmark | Switzerland | Poland | Norway |
|---|---|---|---|---|---|
| Chloroacetyl chloride | Haut<br>MAK-KZW: 0.1 ppm 15 Minuten<br>MAK-KZW: 0.4 mg/m³ 15 Minuten<br>MAK-TMW: 0.05 ppm 8 | TWA: 0.05 ppm 8 timer<br>TWA: 0.2 mg/m³ 8 timer | TWA: 0.05 ppm 8 Stunden<br>TWA: 0.24 mg/m³ 8 Stunden | STEL: 0.6 mg/m³ 15 minutach<br>TWA: 0.2 mg/m³ 8 godzinach | TWA: 0.05 ppm 8 timer<br>TWA: 0.2 mg/m³ 8 timer<br>STEL: 0.15 ppm 15 minutter.<br>STEL: 0.6 mg/m³ 15 minutter. |

| | | | | | |
|---|---|---|---|---|---|
| | Stunden<br>MAK-TMW: 0.2 mg/m³ 8 Stunden | | | | Hud |

| Component | Bulgaria | Croatia | Ireland | Cyprus | Czech Republic |
|---|---|---|---|---|---|
| Chloroacetyl chloride | | | TWA: 0.05 ppm 8 hr.<br>TWA: 0.2 mg/m³ 8 hr.<br>STEL: 0.15 ppm 15 min<br>STEL: 0.6 mg/m³ 15 min | | |

| Component | Estonia | Gibraltar | Greece | Hungary | Iceland |
|---|---|---|---|---|---|
| Chloroacetyl chloride | | | TWA: 0.05 ppm<br>TWA: 0.2 mg/m³ | | TWA: 0.05 ppm 8 klukkustundum.<br>TWA: 0.2 mg/m³ 8 klukkustundum.<br>Ceiling: 0.1 ppm<br>Ceiling: 0.4 mg/m³ |

| Component | Latvia | Lithuania | Luxembourg | Malta | Romania |
|---|---|---|---|---|---|
| Chloroacetyl chloride | TWA: 0.3 mg/m³ | | | | TWA: 2 ppm 8 ore<br>TWA: 10 mg/m³ 8 ore<br>STEL: 4 ppm 15 minute<br>STEL: 20 mg/m³ 15 minute |

| Component | Russia | Slovak Republic | Slovenia | Sweden | Turkey |
|---|---|---|---|---|---|
| Chloroacetyl chloride | Skin notation<br>MAC: 0.3 mg/m³ | | TWA: 0.2 mg/m³ 8 urah<br>Koža | | |

**Biological limit values**
This product, as supplied, does not contain any hazardous materials with biological limits established by the region specific regulatory bodies.

**Monitoring methods**
BS EN 14042:2003 Title Identifier: Workplace atmospheres. Guide for the application and use of procedures for the assessment of exposure to chemical and biological agents.

**Derived No Effect Level (DNEL)** No information available

| Route of exposure | Acute effects (local) | Acute effects (systemic) | Chronic effects (local) | Chronic effects (systemic) |
|---|---|---|---|---|
| **Oral** | | | | |
| **Dermal** | | | | |
| **Inhalation** | | | | |

**Predicted No Effect Concentration (PNEC)** No information available.

**8.2. Exposure controls**

**Engineering Measures**
Ensure that eyewash stations and safety showers are close to the workstation location. Ensure adequate ventilation, especially in confined areas.
Wherever possible, engineering control measures such as the isolation or enclosure of the process, the introduction of process or equipment changes to minimise release or contact, and the use of properly designed ventilation systems, should be adopted to control hazardous materials at source

**Personal protective equipment**

**Eye Protection** If splashes are likely to occur, wear: Goggles Face-shield (European standard - EN 166)

**Hand Protection** Protective gloves

| Glove material | Breakthrough time | Glove thickness | EU standard | Glove comments |
|---|---|---|---|---|
| Natural rubber | See manufacturers | - | | (minimum requirement) |

| | | |
|---|---|---|
| Butyl rubber<br>Nitrile rubber<br>Neoprene<br>PVC | recommendations | EN 374 |

**Skin and body protection** Long sleeved clothing

Inspect gloves before use.
Please observe the instructions regarding permeability and breakthrough time which are provided by the supplier of the gloves. (Refer to manufacturer/supplier for information)
Ensure gloves are suitable for the task: Chemical compatability, Dexterity, Operational conditions, User susceptibility, e.g. sensitisation effects, also take into consideration the specific local conditions under which the product is used, such as the danger of cuts, abrasion.
Remove gloves with care avoiding skin contamination.

**Respiratory Protection** When workers are facing concentrations above the exposure limit they must use appropriate certified respirators.
To protect the wearer, respiratory protective equipment must be the correct fit and be used and maintained properly

**Large scale/emergency use** Use a NIOSH/MSHA or European Standard EN 136 approved respirator if exposure limits are exceeded or if irritation or other symptoms are experienced
**Recommended Filter type:** Particulates filter conforming to EN 143 Acid gases filter Type E Yellow conforming to EN14387

**Small scale/Laboratory use** Use a NIOSH/MSHA or European Standard EN 149:2001 approved respirator if exposure limits are exceeded or if irritation or other symptoms are experienced.
**Recommended half mask:-** Valve filtering: EN405; or; Half mask: EN140; plus filter, EN 141
When RPE is used a face piece Fit Test should be conducted

**Hygiene Measures** Handle in accordance with good industrial hygiene and safety practice.

**Environmental exposure controls** Prevent product from entering drains. Do not allow material to contaminate ground water system. Local authorities should be advised if significant spillages cannot be contained.

## SECTION 9: PHYSICAL AND CHEMICAL PROPERTIES

### 9.1. Information on basic physical and chemical properties

| | | |
|---|---|---|
| **Appearance** | Clear | |
| **Physical State** | Liquid | |
| **Odor** | pungent | |
| **Odor Threshold** | No data available | |
| **pH** | No information available | |
| **Melting Point/Range** | -22 °C / -7.6 °F | |
| **Softening Point** | No data available | |
| **Boiling Point/Range** | 105 °C / 221 °F | @ 760 mmHg |
| **Flash Point** | No information available | **Method -** No information available |
| **Evaporation Rate** | No data available | |
| **Flammability (solid,gas)** | Not applicable | Liquid |
| **Explosion Limits** | No data available | |
| **Vapor Pressure** | No data available | |
| **Vapor Density** | No data available | (Air = 1.0) |
| **Specific Gravity / Density** | 1.420 | |
| **Bulk Density** | Not applicable | Liquid |
| **Water Solubility** | Reacts violently with water | |
| **Solubility in other solvents** | No information available | |

**Partition Coefficient (n-octanol/water)**

| **Component** | **log Pow** |
|---|---|
| Chloroacetyl chloride | -0.22 |

| | |
|---|---|
| **Autoignition Temperature** | No data available |
| **Decomposition Temperature** | No data available |
| **Viscosity** | No data available |
| **Explosive Properties** | No information available |
| **Oxidizing Properties** | No information available |

**9.2. Other information**

| | |
|---|---|
| **Molecular Formula** | C2 H2 Cl2 O |
| **Molecular Weight** | 112.94 |

## SECTION 10: STABILITY AND REACTIVITY

**10.1. Reactivity**

Yes

**10.2. Chemical stability**

Stable under normal conditions

**10.3. Possibility of hazardous reactions**

| | |
|---|---|
| **Hazardous Polymerization** | Hazardous polymerization does not occur. |
| **Hazardous Reactions** | Reacts violently with water. Contact with acids liberates toxic gas. Corrosive to metals. |

**10.4. Conditions to avoid**

Incompatible products. Excess heat. Exposure to moist air or water. Exposure to moisture.

**10.5. Incompatible materials**

Alcohols. Bases. Amines. Metals. Water.

**10.6. Hazardous decomposition products**

Hydrogen chloride gas. Carbon monoxide (CO). Carbon dioxide ($CO_2$). Phosgene. Thermal decomposition can lead to release of irritating gases and vapors.

## SECTION 11: TOXICOLOGICAL INFORMATION

**11.1. Information on toxicological effects**

**Product Information**

**(a) acute toxicity;**

| | |
|---|---|
| **Oral** | Category 3 |
| **Dermal** | Category 3 |
| **Inhalation** | Category 3 |

| Component | LD50 Oral | LD50 Dermal | LC50 Inhalation |
|---|---|---|---|
| Chloroacetyl chloride | 200 mg/kg ( Rat ) 208 mg/kg ( Rat ) | 662 mg/kg ( Rat ) | 660 ppm ( Rat ) 1 h |

**(b) skin corrosion/irritation;** Category 1 A

**(c) serious eye damage/irritation;** Category 1

**(d) respiratory or skin sensitization;**

| | |
|---|---|
| **Respiratory** | Based on available data, the classification criteria are not met |
| **Skin** | Based on available data, the classification criteria are not met |

**(e) germ cell mutagenicity;** Based on available data, the classification criteria are not met

**(f) carcinogenicity;** Based on available data, the classification criteria are not met

There are no known carcinogenic chemicals in this product

**(g) reproductive toxicity;** Based on available data, the classification criteria are not met

**(h) STOT-single exposure;** Based on available data, the classification criteria are not met

**(i) STOT-repeated exposure;** Category 1

**Target Organs** Eyes, Respiratory system, Skin.

**(j) aspiration hazard;** Based on available data, the classification criteria are not met

**Other Adverse Effects** See actual entry in RTECS for complete information

**Symptoms / effects,both acute and delayed** Product is a corrosive material. Use of gastric lavage or emesis is contraindicated. Possible perforation of stomach or esophagus should be investigated: Ingestion causes severe swelling, severe damage to the delicate tissue and danger of perforation

## SECTION 12: ECOLOGICAL INFORMATION

**12.1. Toxicity**

**Ecotoxicity effects** Very toxic to aquatic organisms. The product contains following substances which are hazardous for the environment. Reacts with water so no ecotoxicity data for the substance is available.

| Component | Freshwater Fish | Water Flea | Freshwater Algae | Microtox |
|---|---|---|---|---|
| Chloroacetyl chloride | 42 mg/ 96h | 35 mg/L 48h | | |

**12.2. Persistence and degradability** No information available

**Persistence** Persistence is unlikely, based on information available.

**Degradability** No information available, Reacts with water.

**Degradation in sewage treatment plant** Contains substances known to be hazardous to the environment or not degradable in waste water treatment plants. Reacts violently with water.

**12.3. Bioaccumulative potential** Product does not bioaccumulate due to reaction with water; Bioaccumulation is unlikely

| Component | log Pow | Bioconcentration factor (BCF) |
|---|---|---|
| Chloroacetyl chloride | -0.22 | No data available |

**12.4. Mobility in soil** Reacts violently with water Is not likely mobile in the environment.

**12.5. Results of PBT and vPvB assessment** Reacts violently with water.

**12.6. Other adverse effects**

**Endocrine Disruptor Information** This product does not contain any known or suspected endocrine disruptors

**Persistent Organic Pollutant** This product does not contain any known or suspected substance

**Ozone Depletion Potential** This product does not contain any known or suspected substance

## SECTION 13: DISPOSAL CONSIDERATIONS

**13.1. Waste treatment methods**

**Waste from Residues / Unused Products** Should not be released into the environment. Waste is classified as hazardous. Dispose of in accordance with the European Directives on waste and hazardous waste. Dispose of in accordance with local regulations.

**Contaminated Packaging** Dispose of this container to hazardous or special waste collection point.

**European Waste Catalogue (EWC)** According to the European Waste Catalogue, Waste Codes are not product specific, but application specific.

**Other Information** Do not dispose of waste into sewer. Waste codes should be assigned by the user based on the application for which the product was used. Do not empty into drains. Large amounts

will affect pH and harm aquatic organisms. Do not let this chemical enter the environment.

## SECTION 14: TRANSPORT INFORMATION

**IMDG/IMO**

**14.1. UN number** UN1752
**14.2. UN proper shipping name** CHLOROACETYL CHLORIDE
**14.3. Transport hazard class(es)** 6.1
**Subsidiary Hazard Class** 8
**14.4. Packing group** I

**ADR**

**14.1. UN number** UN1752
**14.2. UN proper shipping name** CHLOROACETYL CHLORIDE
**14.3. Transport hazard class(es)** 6.1
**Subsidiary Hazard Class** 8
**14.4. Packing group** I

**IATA** Forbidden

**14.1. UN number**
**14.2. UN proper shipping name**
**14.3. Transport hazard class(es)**
**14.4. Packing group**

**14.5. Environmental hazards** Dangerous for the environment
Product is a marine pollutant according to the criteria set by IMDG/IMO

**14.6. Special precautions for user** No special precautions required

**14.7. Transport in bulk according to Annex II of MARPOL73/78 and the IBC Code** Not applicable, packaged goods

## SECTION 15: REGULATORY INFORMATION

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

**International Inventories** X = listed

| Component | EINECS | ELINCS | NLP | TSCA | DSL | NDSL | PICCS | ENCS | IECSC | AICS | KECL |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Chloroacetyl chloride | 201-171-6 | - | | X | X | - | X | X | X | X | X |

**National Regulations**

| Component | Germany - Water Classification (VwVwS) | Germany - TA-Luft Class |
|---|---|---|
| Chloroacetyl chloride | WGK 3 | |

Take note of Control of Substances Hazardous to Health Regulations (COSHH) 2002 and 2005 Amendment.
Take note of Dir 94/33/EC on the protection of young people at work
Take note of Directive 98/24/EC on the protection of the health and safety of workers from the risks related to chemical agents at work

**15.2. Chemical safety assessment**

A Chemical Safety Assessment/Report (CSA/CSR) has not been conducted

## SECTION 16: OTHER INFORMATION

**Full Text of H-/EUH-Statements Referred to Under Section 3**

H301 - Toxic if swallowed
H311 - Toxic in contact with skin
H331 - Toxic if inhaled
H314 - Causes severe skin burns and eye damage
H372 - Causes damage to organs through prolonged or repeated exposure
H400 - Very toxic to aquatic life
EUH014 - Reacts violently with water
EUH029 - Contact with water liberates toxic gas
H290 - May be corrosive to metals

**Legend**

**CAS** - Chemical Abstracts Service

**EINECS/ELINCS** - European Inventory of Existing Commercial Chemical Substances/EU List of Notified Chemical Substances

**PICCS** - Philippines Inventory of Chemicals and Chemical Substances

**IECSC** - Chinese Inventory of Existing Chemical Substances

**KECL** - Korean Existing and Evaluated Chemical Substances

**TSCA** - United States Toxic Substances Control Act Section 8(b) Inventory

**DSL/NDSL** - Canadian Domestic Substances List/Non-Domestic Substances List

**ENCS** - Japanese Existing and New Chemical Substances

**AICS** - Australian Inventory of Chemical Substances

**NZIoC** - New Zealand Inventory of Chemicals

**WEL** - Workplace Exposure Limit

**ACGIH** - American Conference of Governmental Industrial Hygienists

**DNEL** - Derived No Effect Level

**RPE** - Respiratory Protective Equipment

**LC50** - Lethal Concentration 50%

**NOEC** - No Observed Effect Concentration

**PBT** - Persistent, Bioaccumulative, Toxic

**TWA** - Time Weighted Average

**IARC** - International Agency for Research on Cancer

**PNEC** - Predicted No Effect Concentration

**LD50** - Lethal Dose 50%

**EC50** - Effective Concentration 50%

**POW** - Partition coefficient Octanol:Water

**vPvB** - very Persistent, very Bioaccumulative

**ADR** - European Agreement Concerning the International Carriage of Dangerous Goods by Road

**IMO/IMDG** - International Maritime Organization/International Maritime Dangerous Goods Code

**OECD** - Organisation for Economic Co-operation and Development

**BCF** - Bioconcentration factor

**ICAO/IATA** - International Civil Aviation Organization/International Air Transport Association

**MARPOL** - International Convention for the Prevention of Pollution from Ships

**ATE** - Acute Toxicity Estimate

**VOC** - Volatile Organic Compounds

**Key literature references and sources for data**

Suppliers safety data sheet, Chemadvisor - LOLI, Merck index, RTECS

**Training Advice**

Chemical incident response training.

| | |
|---|---|
| **Creation Date** | 11-Nov-2010 |
| **Revision Date** | 10-Jul-2015 |
| **Revision Summary** | SDS sections updated, 2, 3, 10. |

## This safety data sheet complies with the requirements of Regulation (EC) No. 1907/2006

**Disclaimer**

**The information provided on 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 guide for safe handling, use, processing, storage, transportation, disposal and release and is not to be considered as 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 material or in any process, unless specified in the text.**

# End of Safety Data Sheet