SAFETY DATA SHEET

LudgerLiberate Orela Kit - LL-ORELA-A2

Version: 1.1
Date Written: 22nd March 2012
Date reviewed: 3rd March 2017

SECTION 1. IDENTIFICATION OF THE SUBSTANCE/PREPARATION AND OF THE COMPANY / UNDERTAKING

Product Name **LudgerClean cartridges with 1M HCl**

Product Catalogue Name **LC-CEX-A6, LC-CEX-H-01**

Company: Ludger Ltd
Culham Science Centre
Abingdon
Oxfordshire
OX14 3EB
Telephone: 01865 408554
Emergency Telephone: 01865 408554
Email: info@ludger.com

SECTION 2. HAZARDS IDENTIFICATION

2.1 Classification of the substance or mixture
Classification according to Regulation (EC) No 1272/2008 [EU-GHS/CLP]
Skin corrosion (category 1B)
Specific target organ toxicity – single exposure (Category 3)

2.2 Label elements

Signal Word: Danger

Hazard Statement(s)

H314	Causes severe skin burns and eye damage.
H335	May cause respiratory irritation.

Precautionary Statement(s)

P261	Avoid breathing dust/ fume/ gas/ mist/ vapours/ spray.
P280	Wear protective gloves/ protective clothing/ eye protection/ face protection.
P305+P315+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 CENTRE or doctor/ physician.

2.3 Other hazard information:
None.

SECTION 3. COMPOSITION / INFORMATION ON INGREDIENTS

3.1 Substances

Synonyms:	Hydrochloric acid:	HCl
	Resin:	AG Cation exchange resin, hydrogen form

Formula: Hydrochloric acid: HCl
Molecular Weight: HCl: 36.46g/mol

Component		Classification	Concentration
Name	CEX Resin	-	> 97 %
CAS-No.	none		
EC-No.	none		
2nd Name	Hydrochloric Acid	Skin Corr. 1B; STOT SE3; H314,	1 – 3 %
CAS-No.	7647-01-0	H335	
EC-No.	231-595-7		
Index-No.	017-002-01-X		

For the full text of the H-statements mentioned in this section, Sections 2 and 16.

SECTION 4. FIRST-AID MEASURES

4.1 Description of First Aid Measures

General Advice
Consult a physician if exposure causes ill effects and if in any doubt. Show this safety data sheet to the physician/ first responder in attendance.

If Ingested
Do NOT induce vomiting. Do not give anything by mouth if the person is unconscious. Rinse mouth well with water.

If the skin is exposed
Remove contaminated clothing and shoes immediately. Wash the area well with plenty of soap and water.

If eyes are exposed
Rinse thoroughly with water or eye wash, for at least 15 minutes. Remove contact lenses if present and continue rinsing.

If inhaled
Remove the person to a source of fresh air/ ventilation. If not breathing, give artificial respiration.

4.2 Most important symptoms and effects, both acute and delayed
Burning sensation, coughing and difficulty breathing. This product can be destructive to tissue of the mucous membranes and upper respiratory tract, eyes and skin.

4.3 Indication of immediate medical attention and special treatment needed
No data available.

SECTION 5. FIRE-FIGHTING MEASURES

5.1 Extinguishing media
Select an extinguisher whose media is compatible with the surroundings of the fire. Compatible fire extinguisher media are Carbon dioxide, alcohol-resistant foam, and water spray.

5.2 Special hazards arising from the substance or mixture
Hydrogen Chloride gas

5.3 Advice for Firefighters
If necessary, firefighters are to wear self-contained breathing apparatus.

SECTION 6. ACCIDENTAL RELEASE MEASURES

6.1 Personal precautions, protective equipment and emergency procedures
Wear personal protective equipment. Avoid breathing in vapours, mist or gas by ensuring adequate ventilation. Move any unrequired staff away from the spill area.

6.2 Environmental Precautions
Prevent any further leakage if practical and safe to do so. Do not let the product enter the drainage system.

6.3 Methods and material for containment and cleaning up
Soak up the spillage by using an inert absorbent material, such as vermiculite. Collect the waste material and store it in a suitable container with a lid, and arrange for collection and disposal.

6.4 Reference to other sections
For information on disposal see Section 13.

SECTION 7. HANDLING AND STORAGE

7.1 Precautions for safe handling
Avoid contact with skin, eyes and inhalation of vapour or mist. Wear PPE.

7.2 Conditions for safe storage, including any incompatibilities
Store in a cool, dry, well-ventilated place at 2 – 8 °C. Cartridges must be stored horizontally.

7.3 Specific end uses
No data available.

SECTION 8. EXPOSURE CONTROLS/PERSONAL PROTECTION

8.1 Control parameters

Components with workplace control parameters

Component	CAS-No.	Value	Control parameters	Basis
Hydrochloric Acid	7647-01-0	TWA	5 ppm 8 mg/m3	Europe. Commission Directive 2009/39/EC establishing a first list of inductive occupational limit values.
	Remarks	Indicative		
		STEL	10 ppm 15 mg/m3	Europe. Commission Directive 2009/39/EC establishing a first list of inductive occupational limit values.
		Indicative		

		TWA	1 ppm 2 mg/m3	UK. EH40 WEL- Work-place Exposure Limits
		Indicative		
		STEL	5 ppm 8 mg/m3	UK. EH40 WEL- Work-place Exposure Limits

8.2 Exposure controls

Appropriate engineering controls
Handle the product following good laboratory and safety practices. Wash hands before and after handling the product, even with wearing gloves.

Personal Protective Equipment
Eye/face protection
Wear fitted safety goggles/ glasses when handling the product. Use equipment for eye protection tested and approved under appropriate government standards such as NIOSH (US) or EN 166 (EU).

Skin protection
Wear gloves when handling the product. Gloves must be inspected before use for tears/ holes and proper glove removal technique to be employed, to avoid skin contact with the product. Dispose of used gloves as contaminated waste (See section 13), wash and dry hands. Gloves must satisfy the specifications of EU Directive 89/686/EEC and the standard EN 374 derived from it.

Body Protection
Wear a laboratory coat or similar covering over clothing when handling the product.

Respiratory protection
Handle the product whilst using a fume cupboard/extraction hood.

Thermal hazards
No data available.

SECTION 9. PHYSICAL AND CHEMICAL PROPERTIES

9.1 Information on basic physical and chemical properties

Appearance	Form: Solid and Liquid Colour: Pale orange
Odour	Pungent
Odour threshold	No data available
pH	No data available
Freezing/Melting Point	-30°C
Initial boiling point and boiling range	No data available
Flash Point	No data available
Evaporation rate	No data available
Flammability	No data available
Upper/lower flammability or explosive limits	No data available
Vapour Pressure	No data available
Vapour Density	No data available
Relative Density	No data available
Solubility in water	Fully miscible.

Partition coefficient	No data available
Autoignition temperature	No data available
Decomposition temperature	No data available
Viscosity	No data available
Explosive properties	None
Oxidising properties	No data available

9.2 Other information
No data available

SECTION 10. STABILITY AND REACTIVITY

10.1 Reactivity
No data available

10.2 Chemical stability
Stable when stored in recommended conditions.

10.3 Possibility of Hazardous Reactions
No data available

10.4 Conditions to Avoid
Excessive humidity and heat. Store at the correct temperature, 2 – 8 °C.

10.5 Incompatible materials
Bases, Amines, Alkali metals, Metals, permanganates, e.g. potassium permanganate, Fluorine, metal acetylides, hexalithium disilicide.

10.6 Hazardous decomposition products
Other decomposition products - No data available

SECTION 11. TOXICOLOGICAL INFORMATION

11.1 Information on toxicological effects

Acute toxicity
Hydrochloric acid: LD50 Oral – Rabbit – 900mg/kg

Skin corrosion/irritation
No data available

Serious eye damage/irritation
No data available

Respiratory or skin sensitisation
No data available

Germ cell mutagenicity
No data available

Carcinogenicity
This product is or contains a component that is not classifiable as to its carcinogenicity based on its IARC, ACGIH, NTP or EPA classification.
IARC: 3 – Group 3: Not classifiable as to its carcinogenicity to humans.

Reproductive toxicity
No data available

STOT-single exposure
Inhalation – May cause respiratory irritation.

STOT-repeated exposure
No data available

Aspiration hazard
No data available

Potential Health Hazards

Inhalation	Harmful if inhaled. Material is destructive to the tissue of the mucous membranes and upper respiratory tract.
Ingestion	Harmful if swallowed. Causes burns.
Skin	Harmful if absorbed through the skin. Causes skin burns.
Eyes	Causes burns to the eyes**.**

Signs and symptoms of exposure
Burning sensation, coughing, breathing problems, inflammation of the larynx and bronchi. The product is destructive to the tissue of the mucous membranes and upper respiratory tract, eyes and skin.

Additional Information
RTECS: MW4025000

SECTION 12. ECOLOGICAL INFORMATION

12.1 Toxicity
Hydrochloric acid: Toxicity to Fish
LC50 – Gambusia affinis (mosquito Fish) – 282 mg/l – 96h

12.2 Persistence and Degradability
No data available

12.3 Bioaccumulative potential
No data available

12.4 Mobility in soil
No data available

12.5 Results of PBT and vPvB assessment
No data available

12.6 Other adverse effects
No data available

SECTION 13. DISPOSAL CONSIDERATIONS

13.1 Waste Treatment Methods
Contact a licensed professional disposal company of waste chemical (solid and liquid) materials, to arrange collection and disposal of waste products.

Contaminated packaging
Dispose of it as an unused product.

SECTION 14. TRANSPORT INFORMATION

This information is for HCl as the CEX resin has no classification.

14.1 UN Number
ADR/RID: 1789 IMDG: 1789 IATA: 1789

14.2 UN Proper Shipping Name
ADR/RID: HYDROCHLORIC ACID
IMDG: HYDROCHLORIC ACID
IATA: Hydrochloric Acid

14.3 Transport hazard class(es)
ADR/RID: 8 IMDG: 8 IATA: 8

14.4 Packing group
ADR/RID: II IMDG: II IATA: II

14.5 Environmental hazards
ADR/RID: No IMDG Marine pollutant: No IATA: No

14.6 Special precautions for user
No data available

SECTION 15. REGULATORY INFORMATION

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

15.1. Safety, health and environmental regulations/legislation specific to the substance or mixture
No data available

15.2 Chemical Safety Assessment
No data available

Please note that the label elements that used to go in Section 15 are now in Section 2.

SECTION 16. OTHER INFORMATION

The advice offered is derived from the currently available information on the hazardous materials in this product and its component(s). Consideration has been made regarding the quantities offered in the pre-dispensed container. The advice offered is, therefore not all-inclusive nor should it be taken as the descriptive of the compound generally.

Hazard Statement(s)

H314	Causes severe skin burns and eye damage.
H335	May cause respiratory irritation.

Precautionary Statement(s)

P261	Avoid breathing dust/ fume/ gas/ mist/ vapours/ spray.
P280	Wear protective gloves/ protective clothing/ eye protection/ face protection.
P305+P315+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 CENTRE or doctor/ physician.

SECTION 1. IDENTIFICATION OF THE SUBSTANCE/PREPARATION AND OF THE COMPANY / UNDERTAKING

Product Name	**Acetic Acid Solution, aqueous 50%**
Product Catalogue Name	**LL-ACETIC-50PC-01**
CAS-No.	**64-19-7**
Company:	Ludger Ltd Culham Science Centre Abingdon Oxfordshire OX14 3EB
Telephone:	01865 408554
Emergency Telephone:	01865 408554
Email:	info@ludger.com

SECTION 2. HAZARDS IDENTIFICATION

2.1 Classification of the substance or mixture

Classification according to Regulation (EC) No 1272/2008 [EU-GHS/CLP]
Skin corrosion/irritation (Category 1B), H314
Serious eye damage/eye irritation (Category 1), H318
Hazardous to the aquatic environment (Category 3), H402

2.2 Label elements

Signal Word: Danger

Hazard Statement(s)

H314	Causes severe skin burns and eye damage
H402	Harmful to aquatic life

Precautionary Statement(s)

P260	Do not breathe mist, vapours, or spray.
P264	Wash exposed skin thoroughly after handling.
P273	Avoid release to the environment.
P280	Wear protective gloves and eye protection.
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.
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 centre or doctor/physician.
P363	Wash contaminated clothing before reuse.

P405 Store locked up.
P501 Dispose of contents/container to comply with local, state and federal regulations.
If inhaled: Remove the person to fresh air and keep comfortable for breathing.

2.3 Other hazard information:
None.

SECTION 3. COMPOSITION/INFORMATION ON INGREDIENTS

3.1 Substances
Synonyms: acetic acid
Formula: $C_2H_4O_2$
Molecular weight: 60.05 g/mol

Component	Classification	Concentration
Name Acetic Acid	Flam. Liq. 3; Skin Corr. 1B;	50%
CAS-No. 64-19-7	Acute Tox. 4 (Inhalation: vapour)	
EC-No. 200-580-7	Eye De. 1; Aquatic Acute 3	
Index-No. 6007-002-00-6	H226, H314, H318, H332, H402	

SECTION 4. FIRST-AID MEASURES

4.1 Description of First Aid Measures

General Advice
Consult a physician if exposure causes ill effects and if in any doubt. Show this safety data sheet to the physician/ first responder in attendance.

If Ingested
Do NOT induce vomiting. Rinse mouth well with water; never give anything by mouth if the person is unconscious.

If the skin is exposed
Remove any contaminated clothing/shoes. Wash the affected area well with soap and water.

If eyes are exposed
Rinse thoroughly with water/eye wash solution for at least 15 minutes. Remove contact lenses, if present and is easy/safe to do so, continue with rinsing.

If inhaled
Move the person into a source of fresh/ ventilation. If not breathing, give artificial respiration.

4.2 Most important symptoms and effects, both acute and delayed
Problems with breathing, including coughing, wheezing, and shortness of breath. Headache, nausea, a burning sensation and the product is damaging to the respiratory system. Causes severe skin burns and eye damage.

4.3 Indication of immediate medical attention and special treatment needed
No data available.

SECTION 5. FIRE-FIGHTING MEASURES

5.1 Extinguishing media

Suitable extinguishing media	Dry powder Dry sand
Unsuitable extinguishing media	Do NOT use a water jet.

5.2 Special hazards arising from the substance or mixture
Carbon oxides.

5.3 Advice for Firefighters
If necessary wear self-contained breathing equipment.

SECTION 6. ACCIDENTAL RELEASE MEASURES

6.1 Personal precautions, protective equipment and emergency procedures
Wear PPE (Personal Protective Equipment). Avoid breathing in vapours, gas or mist. Ensure adequate ventilation. Remove all sources of ignition. Evacuate personnel to safe areas. Beware of vapours accumulating to form explosive concentrations. Vapours can accumulate in low areas.

6.2 Environmental Precautions
Do not let the product enter the drainage system.

6.3 Methods and material for containment and cleaning up
Contain the spillage by using spillage mats or inert material such as vermiculite or sand. Collect the contaminated material and put it into a suitable container, with a lid and arrange for collection and disposal.

6.4 Reference to other sections
For more information on disposal, see section 13.

SECTION 7. HANDLING AND STORAGE

7.1 Precautions for safe handling
Avoid contact with skin, eyes and breathing in vapour, mist or gas. Keep away from sources of ignition - No smoking. Take measures to prevent the build-up of electrostatic charge.

7.2 Conditions for safe storage, including any incompatibilities
Store in a cool place. Keep the container tightly closed in a dry and well-ventilated place. Containers which are opened must be carefully resealed and kept upright to prevent leakage. Moisture sensitive.

7.3 Specific end uses
No data available.

SECTION 8. EXPOSURE CONTROLS/PERSONAL PROTECTION

8.1 Control parameters

Components with workplace control parameters.

Component	CAS-No.	Value	Control Parameters	Basis
Acetic Acid	64-19-7	TWA	10ppm 25mg/m3	Commission Directive (EU) 2017/164 establishing a fourth list of indicative occupational exposure limit values pursuant to Council Directive 98/24/EC, and amending Commission Directives 91/322/EEC, 2000/39/EC and 2009/161/EU
	Remarks	Indicative		
		STEL	20 ppm 50 mg/m3	Commission Directive (EU) 2017/164 establishing a fourth list of indicative occupational exposure limit values pursuant to Council Directive 98/24/EC, and amending Commission Directives 91/322/EEC, 2000/39/EC and 2009/161/EU
		Indicative		

8.2 Exposure controls

Appropriate engineering controls
Wash and dry hands before and after handling the product, in accordance to good laboratory and safety practices.

Personal Protective Equipment
Eye/face protection
Wear safety glasses/ goggles, when handling the product. These should be tested and approved under appropriate government standards such as NIOSH (US) or EN 166 (EU).

Skin protection
Handle the product wearing gloves. Gloves must be checked before use, for rips and tares, when removed the proper technique in removing them should be used, so no skin comes into contact with the outside of the glove. Gloves should be disposed of as solid contaminated waste. Gloves must satisfy the specifications of Regulation (EU) 2016/425 and the standard EN 374 derived from it.

Full contact
Material: butyl-rubber
Minimum layer thickness: 0.3 mm
Break through time: 480 min
Material tested: Butoject® (KCL 897 / Aldrich Z677647, Size M)

Splash contact
Material: Nature latex/chloroprene
Minimum layer thickness: 0.6 mm
Break through time: 32 min
Material tested: Lapren® (KCL 706 / Aldrich Z677558, Size M)

data source: KCL GmbH, D-36124 Eichenzell, phone +49 (0)6659 87300, e-mail sales@kcl.de, test method: EN374

If used in solution, or mixed with other substances, and under conditions which differ from EN 374, contact the supplier of the CE-approved gloves. This recommendation is advisory only and must be evaluated by an industrial hygienist and safety officer familiar with the specific situation of anticipated use by our customers. It should not be construed as offering approval for any specific use scenario.

Body Protection
Wear a laboratory coat or similar covering over clothes, when handling the product.

Respiratory protection
Handle the product under extraction from a fume cabinet or extraction hood.

Thermal hazards
No data available

SECTION 9. PHYSICAL AND CHEMICAL PROPERTIES

9.1 Information on basic physical and chemical properties

Appearance	Form: Liquid
Odour	Vinegar odour
Odour threshold	No data available
pH	No data available
Freezing/Melting Point	No data available
Initial boiling point and boiling range	No data available
Flash Point	No data available
Evaporation rate	No data available
Flammability	Non-flammable
Upper/lower flammability or explosive limits	No data available
Vapour Pressure	No data available
Relative Density	No data available
Specific gravity/density	1.06 g/ml
Solubility in water and solvents (mg/l)	No data available
Partition coefficient	No data available
Autoignition temperature	No data available
Decomposition temperature	No data available
Viscosity, kinematic	2 mm^2/s
Explosive properties	No data available
Oxidising properties	No data available

9.2 Other information
No data available

SECTION 10. STABILITY AND REACTIVITY

10.1 Reactivity
Thermal decomposition generates corrosive vapours.

10.2 Chemical stability
Stable under normal conditions.

10.3 Possibility of Hazardous Reactions
Reacts violently with (some) bases: release of heat.

10.4 Conditions to Avoid
Direct sunlight. Extremely high or low temperatures.

10.5 Incompatible materials
Oxidizing materials, Metals, Amines, Alcohols, Peroxides, permanganates, e.g. potassium permanganate, soluble carbonates and phosphates, and Hydroxides.

10.6 Hazardous decomposition products
Carbon monoxide. Carbon dioxide. Thermal decomposition generates corrosive vapours.

SECTION 11. TOXICOLOGICAL INFORMATION

11.1 Information on toxicological effects

LD50 oral rat	2138 mg/kg
ATE US (oral)	2138 mg/kg body weight

Acute toxicity
No data available

Skin corrosion/irritation
Causes severe skin burns.

Serious eye damage/irritation
Causes serious eye damage.

Respiratory or skin sensitisation
No data available

Germ cell mutagenicity
No data available

Carcinogenicity
IARC: No components of this product present at levels greater than or equal to 0.1% are identified as probable, possible or confirmed human carcinogen by IARC.

Reproductive toxicity
No data available

STOT-single exposure
No data available

STOT-repeated exposure
No data available

Aspiration hazard.
No data available

Potential Health Hazards

Inhalation	May be harmful if inhaled. Material is extremely destructive to the tissue of the mucous membranes and upper respiratory tract.
Ingestion	May be harmful if swallowed. Causes burns.
Skin	May be harmful if absorbed through the skin. Causes skin burns.
Eyes	Causes eye burns.

Signs and symptoms of exposure
Material can cause problems with the respiratory tract, such as burning sensations, coughing, wheezing and laryngitis, breathing problems, Headache and nausea. Eyes and skin burns.

SECTION 12. ECOLOGICAL INFORMATION

12.1 Toxicity

LC50 fish 1	> 1000 mg/l (Equivalent or similar to OECD 203, 96 h, Oncorhynchus mykiss, Semi-static system, Fresh water, Experimental value, GLP)
EC50 Daphnia 1	> 1000 mg/l (OECD 202: Daphnia sp. Acute Immobilisation Test, 48 h, Daphnia magna, Static system, Fresh water, Experimental value, GLP)

12.2 Persistence and Degradability
No data available

12.3 Bioaccumulative potential
No data available

12.4 Mobility in soil
No data available

12.5 Results of PBT and vPvB assessment
No data available

12.6 Other adverse effects
No data available

SECTION 13. DISPOSAL CONSIDERATIONS

13.1 Waste Treatment Methods
Contact a licensed professional waste disposal company, for solid and liquid chemical waste. To collect and dispose of any waste product.

Contaminated packaging
Dispose of as contaminated solid waste or as unused product.

SECTION 14. TRANSPORT INFORMATION

14.1 UN Number
ADR/RID: 2790 IMDG: 2790 IATA: 2790

14.2 UN Proper Shipping Name
ADR/RID: ACETIC ACID SOLUTION
IMDG: ACETIC ACID, SOLUTION
IATA: Acetic Acid Solution

14.3 Transport hazard class(es)
ADR/RID: 8 IMDG: 8 IATA: 8

14.4 Packing group
ADR/RID: II IMDG: II IATA: II

14.5 Environmental hazards
ADR/RID: No IMDG Marine pollutant: No IATA: No

14.6 Special precautions for user
No data available

SECTION 15. REGULATORY INFORMATION

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

15.1 Safety, health and environmental regulations/legislation specific to the substance or mixture
No data available.

15.2 Chemical Safety Assessment
No data available.

Please note that the label elements that used to go in Section 15 are now in Section 2.

SECTION 16. OTHER INFORMATION

The advice offered is derived from the currently available information on the hazardous materials in this product and its component(s). Consideration has been made regarding the quantities offered in the pre-dispensed container. The advice offered is, therefore not all-inclusive nor should it be taken as the descriptive of the compound generally.

SECTION 1. IDENTIFICATION OF THE SUBSTANCE/PREPARATION AND OF THE COMPANY / UNDERTAKING

Product Name	**Orela Reagent**
Product Catalogue Name	**LL-ORELAREAGENT-01**
Company:	Ludger Ltd Culham Science Centre Abingdon Oxfordshire OX14 3EB
Telephone:	01865 408554
Emergency Telephone:	01865 408554
Email:	info@ludger.com
Application of product:	Research & Development

SECTION 2. HAZARDS IDENTIFICATION

2.1 Classification of the substance or mixture
Classification according to Regulation (EC) No 1272/2008 [EU-GHS/CLP]
Flammable liquids (Category 2)
Acute toxicity, Oral (Category 4)
Acute toxicity, Dermal (Category 3)
Skin corrosion (Category 1A)
Serious eye damage (Category 1)
Specific target organ toxicity – single exposure (Category 3), Respiratory system

Classification according to EU Directives 67/548/EEC or 1999/45/EC
Highly flammable. Causes burns. Irritating to the respiratory system.

2.2 Label elements

Signal Word: Danger

Hazard Statement(s)

H225	Highly flammable liquid and vapour
H302	Harmful if swallowed
H311	Toxic in contact with skin
H314	Causes severe skin burns and eye damage
H335	May cause respiratory irritation.

Precautionary Statement(s)

P210	Keep away from heat/spark/open flames/hot surfaces – No smoking
P280	Wear protective gloves/ protective clothing/ eye protection/ face protection
P301 + P312 + P330	IF SWALLOWED: Call a POISON CENTER/doctor if you feel unwell. Rinse

	mouth
P301 + P330 + P331	IF SWALLOWED: Rinse mouth. Do NOT induce vomiting.
P303 + P361 + P353	IF ON SKIN (or hair): Take off immediately all contaminated clothing. Rinse skin with water
P305 + P351 + P338 + P310	IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. Immediately call a POISON CENTER/doctor.

2.3 Other hazard information:

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.
Lachrymator.

3. COMPOSITION/INFORMATION ON INGREDIENTS

3.1 Substances
Synonyms: Orela Reagent

SECTION 4. FIRST-AID MEASURES

4.1 Description of First Aid Measures

General Advice
Consult a physician if exposure causes ill effects and if in any doubt. Show this safety data sheet to the physician/ first responder in attendance.

If Ingested
Do NOT induce vomiting. Rinse mouth well with water, if the person is unconscious do not give them anything by mouth.

If the skin is exposed
Remove any contaminated clothing. Wash the area well with plenty of soap and water. If the chemical reaction is bad, consult a doctor.

If eyes are exposed
Rinse thoroughly with water/ eye wash solution, for at least 15 minutes. If present and possible, remove contact lenses and continue rinsing.

If inhaled
Move the person into a source of fresh air/ventilation. If not breathing, give artificial respiration, and consult a doctor.

4.2 Most important symptoms and effects, both acute and delayed
Shortness of breath, coughing, wheezing, laryngitis, headache, nausea and vomiting. Spasm, inflammation and edema of the larynx and bronchi.

4.3 Indication of immediate medical attention and special treatment needed
No Data available.

SECTION 5. FIRE-FIGHTING MEASURES

5.1 Extinguishing media
Select an extinguishing media appropriate to the surrounding area. Compatible media for the product are water spray, alcohol-resistant foam, dry chemical or carbon dioxide.

5.2 Special hazards arising from the substance or mixture
Carbon oxides, nitrogen oxides (NOx).

5.3 Advice for Firefighters
Use water spray to cool unopened containers, and wear a self-contained breathing apparatus if necessary.

SECTION 6. ACCIDENTAL RELEASE MEASURES

6.1 Personal precautions, protective equipment and emergency procedures
Ensure adequate ventilation; avoid breathing vapours, mist or gas. Remove any sources of ignition. Be aware that vapours can accumulate in low areas, potential for explosion. Move any unnecessary staff away from the spill.

6.2 Environmental Precautions
If safe and practical to do so, prevent any further spillage/leakage. Do not let the product enter the drainage system.

6.3 Methods and material for containment and cleaning up
Contain the spillage, a spill kit, mats or an inert material such as vermiculite would be advisable to use. Sweep up the contaminated material and store it in a suitable container with a lid. Arrange disposal.

6.4 Reference to other sections
For more information on disposal of waste material, see Section 13.

SECTION 7. HANDLING AND STORAGE

7.1 Precautions for safe handling
Wash hands before and after handling the product. Avoid contact with skin and eyes and inhalation of mist/ vapour. Keep away from sources of ignition.

7.2 Conditions for safe storage, including any incompatibilities
Store at 2 - 8°C, in a spark-free refrigerator. Re-seal any opened containers and keep them upright.

7.3 Specific end uses
No data available.

SECTION 8. EXPOSURE CONTROLS/PERSONAL PROTECTION

8.1 Control parameters

Value	Control Parameter	Basis
STEL	6 ppm 11 mg/m3	UK. EH40 WEL - Workplace Exposure Limits
TWA	2 ppm 3.8 mg/m3	UK. EH40 WEL - Workplace Exposure Limits
TWA	5 ppm 9.4 mg/m3	Europe. Commission Directive 2000/39/EC establishes a first list of indicative occupational exposure limit values
Remarks	Indicative	

8.2 Exposure controls

Appropriate engineering controls
When handling the product wear PPE, and wash hands, avoid contact with skin, eyes and clothing. Wash hands before and after handling the product.

Personal Protective Equipment

Eye/face protection
Wear safety glasses/goggles with side shields. Equipment used should be tested and approved under appropriate government standards such as NIOSH (US) or EN 166 (EU).

Skin protection
Handle the product wearing gloves. Check gloves before use for holes etc. and to be removed after use, using the proper glove removal technique, to avoid any contact with the product and skin. Worn gloves must be treated as contaminated waste and disposed of according to good laboratory practices. Gloves must satisfy the specifications of EU Directive 89/686/EEC and the standard EN 374 derived from it.

Body Protection
Wear a laboratory coat or similar covering over clothing.

Respiratory protection
Handle the product under extraction, such as a fume hood or cabinet.

Thermal hazards
No data available

SECTION 9. PHYSICAL AND CHEMICAL PROPERTIES

9.1 Information on basic physical and chemical properties

Appearance	Form: Liquid Colour: Pale yellow
Odour	No data available
Odour threshold	No data available
pH	>12.0 at 20°C
Freezing/Melting Point	Melting point/range:-81.2°C
Initial boiling point and boiling range	39.5°C
Flash Point	-24°C – closed cup
Evaporation rate	No data available
Flammability	No data available
Upper/lower flammability or explosive limits	Upper explosion limit: 14 % (V) Lower explosion limit: 3.5% (V)
Vapour Pressure	1,531 hPa at 50°C
Vapour Density	No data available
Relative Density	0.806 g/cm3
Solubility in water	No data available
Partition coefficient: n-Octanol/water	log Pow: -0.13
Autoignition temperature	384°C
Decomposition temperature	No data available
Viscosity	No data available
Explosive properties	No data available
Oxidising properties	No data available

9.2 Other information
No data available

SECTION 10. STABILITY AND REACTIVITY

10.1 Reactivity
No data available.

10.2 Chemical stability
No data available.

10.3 Possibility of Hazardous Reactions
No data available.

10.4 Conditions to Avoid
Heat, flames and sparks. Extremes of temperature and direct sunlight.
Cleaning solutions containing strong acids, as acid reacts with the product, causing a reaction that produces a large amount of heat. The product causes corrosion in copper, aluminium, zinc and galvanised surfaces.

10.5 Incompatible materials
Cleaning solutions containing strong acids. Strong acids, Zinc, Tin/tin oxides.

10.6 Hazardous decomposition products
Other decomposition products – No data available.

SECTION 11. TOXICOLOGICAL INFORMATION

11.1 Information on toxicological effects

Acute toxicity
No data available.

Skin corrosion/irritation
No data available.

Serious eye damage/irritation
No data available.

Respiratory or skin sensitisation
No data available.

Germ cell mutagenicity
No data available.

Carcinogenicity
IARC: No component of this product presents at levels greater than or equal to 0.1% is identified as probable, possible or confirmed human carcinogen by IARC.

Reproductive toxicity
No data available.

STOT-single exposure
No data available.

STOT-repeated exposure
No data available.

Aspiration hazard.
No data available.

Potential Health Hazards

Inhalation	Harmful if inhaled. Material is destructive to the tissue of the mucous membranes and upper respiratory tract. Causes respiratory tract irritation.
Ingestion	Harmful if swallowed. Causes burns.
Skin	Toxic if absorbed through the skin. Causes skin burns.
Eyes	Causes eye burns.

Signs and symptoms of exposure
Problems with respiratory system, burning sensation, shortness of breath, coughing, wheezing, headache, nausea and vomiting.

SECTION 12. ECOLOGICAL INFORMATION

12.1 Toxicity
No data available.

12.2 Persistence and Degradability
No data available.

12.3 Bioaccumulative potential
No data available.

12.4 Mobility in soil
No data available.

12.5 Results of PBT and vPvB assessment
No data available.

12.6 Other adverse effects
No data available.

SECTION 13. DISPOSAL CONSIDERATIONS

13.1 Waste Treatment Methods
Contact and arrange disposal of any waste product with a professional licensed disposal company. The waste product can be burnt in a chemical incinerator, fitted with an afterburner and scrubber, but it must be made clear that the material is highly flammable.

Contaminated packaging
Dispose of as contaminated solid waste.

SECTION 14. TRANSPORT INFORMATION

14.1 UN Number
ADR/RID: 2270 IMDG: 2270 IATA: 2270

14.2 Transport hazard class (es)
ADR/RID: 3 (8) IMDG: 3 (8) IATA: 3 (8)

14.3 Packing group
ADR/RID: II IMDG: II IATA: II

14.4 Environmental hazards
ADR/RID: No IMDG Marine pollutant: No IATA: No

14.5 Special precautions for user
No data available

SECTION 15. REGULATORY INFORMATION

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

15.1 Safety, health and environmental regulations/legislation specific to the substance or mixture
No data available.

15.2 Chemical Safety Assessment
No data available.

Please note that the label elements, hazard statements and precautionary statements that used to go in Section 15 are now in Section 2.

SECTION 16. OTHER INFORMATION

The advice offered is derived from the currently available information on the hazardous materials in this product and its component(s). Consideration has been made regarding the quantities offered in the pre-dispensed container. The advice offered is, therefore not all-inclusive nor should it be taken as the descriptive of the compound generally.