HALLIBURTON

SAFETY DATA SHEET

according to Regulation (EC) No. 453/2010

FE acid with SCA-130

Revision Date: 30-Oct-2015 **Revision Number:** 1

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

1.1. Product Identifier

Product Name FE acid with SCA-130
Internal ID Code HM008193

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

Recommended Use Solvent
Sector of use Refer to the Annex for a listing of uses.

1.3. Details of the supplier of the safety data sheet

Halliburton Energy Services
Halliburton House, Howemoss Place
Kirkhill Industrial Estate
Dyce
Aberdeen, AB21 0GN
United Kingdom

www.halliburton.com

For further information, please contact
E-Mail address: fdunexchem@halliburton.com

1.4. Emergency telephone number

+44 8 08 189 0979 / 1-760-476-3961

Emergency telephone - §45 - (EC)1272/2008	
Europe	**112**
Croatia	Centar za kontrolu otrovanja (CKO): (+385 1) 23-48-342 (Poison Control Center (PCC) - Institute for Medical Research and Occupational Health)
Cyprus	+210 7793777
Denmark	Poison Control Hotline (DK): +45 82 12 12 12
France	ORFILA (FR): + 01 45 42 59 59
Germany	Poison Center Berlin (DE): +49 030 30686 790
Italy	Poison Center, Milan (IT): +39 02 6610 1029
Netherlands	National Poisons Information Center (NL): +31 30 274 88 88 (NB: this service is only available to health professionals)
Norway	Poisons Information (NO):+ 47 22 591300
Poland	Poison Control and Information Centre, Warsaw (PL): +48 22 619 66 54; +48 22 619 08 97
Romania	+40 21 318 36 06
Spain	Poison Information Service (ES): +34 91 562 04 20
United Kingdom	NHS Direct (UK): +44 0845 46 47

SECTION 2: Hazards Identification

2.1. Classification of the substance or mixture

REGULATION (EC) No 1272/2008

Skin Corrosion / irritation	Category 2 - H315
Serious Eye Damage / Eye Irritation	Category 2 - H319

2.2. Label Elements

Hazard Pictograms

Signal Word **Warning**

Hazard Statements
H315 - Causes skin irritation
H319 - Causes serious eye irritation

Precautionary Statements - EU (§28, 1272/2008)
P264 - Wash face, hands and any exposed skin thoroughly after handling
P280 - Wear protective gloves/protective clothing/eye protection/face protection
P302 + P352 - IF ON SKIN: Wash with plenty of soap and water
P332 + P313 - If skin irritation occurs: Get medical advice/attention
P305 + P351 + P338 - IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing
P337 + P313 - If eye irritation persists: Get medical advice/attention

Contains

Substances	**CAS Number**
Hydrochloric acid	7647-01-0
Formic acid	64-18-6
Citric acid	77-92-9
Aldol	107-89-1
Acetic acid	64-19-7

2.3. Other Hazards
Chronic exposure to corrosive fumes/gases may cause erosion of the teeth followed by jaw necrosis. Bronchial irritation with chronic cough and frequent attacks of pneumonia are common. Gastrointestinal disturbances may also be seen
This mixture contains no substance considered to be persistent, bioaccumulating nor toxic (PBT).
This mixture contains no substance considered to be very persistent nor very bioaccumulating (vPvB).

SECTION 3: Composition/information on Ingredients

3.2. Mixtures Mixture

Substances	**EINECS**	**CAS Number**	**PERCENT (w/w)**	**EU - CLP Substance Classification**	**REACH No.**
Hydrochloric acid	231-595-7	7647-01-0	10 - 25%	Skin Corr. 1A (H314) Eye Corr. 1 (H318) STOT SE 3 (H335) Met. Corr. 1 (H290)	01-2119484862-27
Formic acid	200-579-1	64-18-6	0.1 - 1%	Acute Tox. 4 (H302) Acute Tox. 3 (H331) Skin Corr. 1A (H314) Eye Corr. 1 (H318) STOT SE 3 (H335) Flam. Liq. 3 (H226) Met. Corr. 1 (H290)	01-2119491174-37
Citric acid	201-069-1	77-92-9	1 - 5%	Eye Irrit. 2A (H319)	No data available
Aldol	203-530-2	107-89-1	1 - 5%	Acute Tox. 2 (H310) Eye Irrit. 2A (H319)	No data available
Acetic acid	200-580-7	64-19-7	1 - 5%	Skin Corr. 1A (H314) Eye Corr. 1 (H318) STOT SE 3 (H335) Flam. Liq. 3 (H226)	No data available

For the full text of the H-phrases mentioned in this Section, see Section 16

SECTION 4: First aid measures

4.1. Description of first aid measures

Inhalation If inhaled, move victim to fresh air and seek medical attention.

Eyes In case of contact, or suspected contact, immediately flush eyes with plenty of water for at least 15 minutes and get medical attention immediately after flushing.

Skin In case of contact, immediately flush skin with plenty of soap and water for at least 15 minutes. Get medical attention. Remove contaminated clothing and launder before reuse.

Ingestion Do NOT induce vomiting. Give nothing by mouth. Obtain immediate medical attention.

4.2. Most Important symptoms and effects, both acute and delayed

Causes eye irritation. Causes skin irritation.

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

Water fog, carbon dioxide, foam, dry chemical.

Extinguishing media which must not be used for safety reasons

None known.

5.2. Special hazards arising from the substance or mixture

Special Exposure Hazards

May form explosive mixtures with strong alkalis. Decomposition in fire may produce harmful gases. Reaction with steel and certain other metals generates flammable hydrogen gas. Do not allow runoff to enter waterways.

Special exposure hazards arising from the substance or preparation itself, combustion products, resulting gases

The product causes burns of eyes, skin and mucous membranes

5.3. Advice for firefighters

Special Protective Equipment for Fire-Fighters

Full protective clothing and approved self-contained breathing apparatus required for fire fighting personnel.

SECTION 6: Accidental release measures

6.1. Personal precautions, protective equipment and emergency procedures

Use appropriate protective equipment. Ensure adequate ventilation. Avoid contact with skin, eyes and clothing. Avoid breathing vapors. Evacuate all persons from the area.

See Section 8 for additional information

6.2. Environmental precautions

Prevent from entering sewers, waterways, or low areas. Consult local authorities.

6.3. Methods and material for containment and cleaning up

Isolate spill and stop leak where safe. Contain spill with sand or other inert materials. Neutralize to pH of 6-8. Scoop up and remove.

6.4. Reference to other sections

See Section 8 and 13 for additional information.

SECTION 7: Handling and Storage

7.1. Precautions for Safe Handling

Avoid contact with eyes, skin, or clothing. Avoid breathing vapors. Ensure adequate ventilation. Wash hands after use. Launder contaminated clothing before reuse. Use appropriate protective equipment.

Hygiene Measures

Handle in accordance with good industrial hygiene and safety practice.

7.2. Conditions for safe storage, including any incompatibilities

Store away from alkalis. Store in a cool well ventilated area. Keep container closed when not in use. Store locked up. Product has a shelf life of 24 months.

7.3. Specific End Use(s)

Exposure Scenario Please refer to the attached Annex for a listing of exposure scenarios.
Other Guidelines No information available

SECTION 8: Exposure Controls/Personal Protection

8.1. Control parameters

Exposure Limits

Substances	CAS Number	EU	UK	Netherlands	France
Hydrochloric acid	7647-01-0	Not applicable	TWA: 1 ppm TWA: 2 mg/m³ STEL: 5 ppm STEL: 8 mg/m³	TWA: 8 mg/m³ STEL: 15 mg/m³	STEL: 5 ppm STEL: 7.6 mg/m³
Formic acid	64-18-6	TWA: 5 ppm TWA: 9 mg/m³	TWA: 5 ppm TWA: 9.6 mg/m³ STEL: 15 ppm STEL: 28.8 mg/m³	STEL: 5 mg/m³	5 ppm
Citric acid	77-92-9	Not applicable	Not applicable	Not applicable	Not applicable
Aldol	107-89-1	Not applicable	Not applicable	Not applicable	Not applicable
Acetic acid	64-19-7	Not applicable	Not applicable	Not applicable	STEL: 10 ppm STEL: 25 mg/m³

Substances	CAS Number	Germany	Spain	Portugal	Finland
Hydrochloric acid	7647-01-0	TWA: 2 ppm TWA: 3 mg/m³ TWA: 3.0 mg/m³	TWA: 5 ppm TWA: 7.6 mg/m³ 10 ppm STEL [VLA-EC]; 15 mg/m³ STEL [VLA-EC]	TWA: 5 ppm TWA: 8 mg/m³ STEL: 10 ppm STEL: 15 mg/m³	STEL: 5 ppm STEL: 7.6 mg/m³
Formic acid	64-18-6	TWA: 5 ppm TWA: 9.5 mg/m³	TWA: 5 ppm TWA: 9 mg/m³	TWA: 5 ppm TWA: 9 mg/m³ STEL: 10 ppm	TWA: 3 ppm TWA: 5 mg/m³ STEL: 10 ppm STEL: 19 mg/m³
Citric acid	77-92-9	Not applicable	Not applicable	Not applicable	Not applicable
Aldol	107-89-1	Not applicable	Not applicable	Not applicable	Not applicable
Acetic acid	64-19-7	TWA: 10 ppm TWA: 25 mg/m³	TWA: 10 ppm TWA: 25 mg/m³ 15 ppm STEL [VLA-EC]; 37 mg/m³ STEL [VLA-EC]	TWA: 10 ppm TWA: 25 mg/m³ STEL: 15 ppm	TWA: 5 ppm TWA: 13 mg/m³ STEL: 10 ppm STEL: 25 mg/m³

Substances	CAS Number	Austria	Ireland	Switzerland	Norway
Hydrochloric acid	7647-01-0	TWA: 5 ppm TWA: 8 mg/m³ STEL" 10 ppm STEL" 15 mg/m³	5 ppm TWA; 8 mg/m³ TWA 10 ppm STEL (as F); 15 mg/m³ STEL	TWA: 2 ppm TWA: 3.0 mg/m³ STEL: 4 ppm STEL: 6 mg/m³	Not applicable
Formic acid	64-18-6	TWA: 5 ppm TWA: 9 mg/m³ STEL" 5 ppm STEL" 9 mg/m³	5 ppm TWA; 9 mg/m³ TWA 15 ppm STEL (calculated); 27 mg/m³ STEL (calculated)	TWA: 5 ppm TWA: 9.5 mg/m³ STEL: 10 ppm STEL: 19 mg/m³	TWA: 5 ppm TWA: 9 mg/m³ STEL: 10 ppm STEL: 18 mg/m³
Citric acid	77-92-9	Not applicable	Not applicable	Not applicable	Not applicable
Aldol	107-89-1	Not applicable	Not applicable	Not applicable	Not applicable
Acetic acid	64-19-7	TWA: 10 ppm TWA: 25 mg/m³ STEL" 20 ppm STEL" 50 mg/m³	10 ppm TWA; 25 mg/m³ TWA 15 ppm STEL; 37 mg/m³ STEL	TWA: 10 ppm TWA: 25 mg/m³ STEL: 20 ppm STEL: 50 mg/m³	TWA: 10 ppm TWA: 25 mg/m³ STEL: 20 ppm STEL: 37.5 mg/m³

Substances	CAS Number	Italy	Poland	Hungary	Czech Republic
Hydrochloric acid	7647-01-0	TWA: 5 ppm TWA: 8 mg/m³ STEL: 10 ppm STEL: 15 mg/m³	TWA: 5 mg/m³ STEL: 10 mg/m³	TWA: 8 mg/m³ STEL: 16 mg/m³	TWA: 8 mg/m³
Formic acid	64-18-6	TWA: 5 ppm TWA: 9 mg/m³	TWA: 5 mg/m³ STEL: 15 mg/m³	TWA: 9 mg/m³	TWA: 9 mg/m³
Citric acid	77-92-9	Not applicable	Not applicable	Not applicable	Not applicable
Aldol	107-89-1	Not applicable	Not applicable	Not applicable	Not applicable
Acetic acid	64-19-7	Not applicable	TWA: 15 mg/m³ STEL: 30 mg/m³	Not applicable	TWA: 25 mg/m³

Substances	CAS Number	Denmark	Romania	Croatia	Cyprus
Hydrochloric acid	7647-01-0	Not applicable	TWA: 5 ppm TWA: 8 mg/m³ STEL: 10 ppm STEL: 15 mg/m³	TWA: 5 ppm TWA: 8 mg/m³ STEL: 10 ppm STEL: 15 mg/m³	TWA: 5 ppm TWA: 8 mg/m³ STEL: 10 ppm STEL: 15 mg/m³
Formic acid	64-18-6	TWA: 5 ppm TWA: 9 mg/m³	TWA: 5 ppm TWA: 9 mg/m³	TWA: 5 ppm TWA: 9 mg/m³	TWA: 5 ppm TWA: 9 mg/m³
Citric acid	77-92-9	Not applicable	Not applicable	Not applicable	Not applicable
Aldol	107-89-1	Not applicable	Not applicable	Not applicable	Not applicable
Acetic acid	64-19-7	TWA: 10 ppm TWA: 25 mg/m³	TWA: 10 ppm TWA: 25 mg/m³	TWA: 10 ppm TWA: 25 mg/m³	TWA: 10 ppm TWA: 25 mg/m³

Derived No Effect Level (DNEL)

Worker

Substances	Long-term exposure - systemic effects, Inhalation	Acute / short term exposure - systemic effects, Inhalation	Long-term exposure - local effects, Inhalation	Acute / short term exposure - local effects, Inhalation	Long-term exposure - systemic effects, Dermal	Acute / short term exposure - systemic effects, Dermal	Long-term exposure - local effects, Dermal	Acute / short term exposure - local effects, Dermal	Hazards for the eyes - local effects
Hydrochloric acid	Not available	Not available	8 mg/m³	15 mg/m³	Not available	Not available	Not available	Not available	Not available
Formic acid	Not available	Not available	9.5 mg/m³	19 mg/m³	Not available	Not available	Not available	Not available	Not available

General Population

Substances	Long-term exposure - systemic effects, Inhalation	Acute / short term exposure - systemic effects, Inhalation	Long-term exposure - local effects, Inhalation	Acute / short term exposure - local effects, Inhalation	Long-term exposure - systemic effects, Dermal	Acute / short term exposure - systemic effects, Dermal	Long-term exposure - local effects, Dermal	Acute / short term exposure - local effects, Dermal	Long-term exposure - systemic effects, Oral	Acute / short term exposure - local effects, Oral	Hazards for the eyes - local effects
Formic acid	Not available	Not available	3 mg/m³	9.5 mg/m³	Not available	Not available	Not available	Not available	Not available	Not available	Not available

Predicted No Effect Concentration (PNEC)

Substances	Freshwater	Marine water	Intermittent release	Sewage treatment plant	Sediment (freshwater)	Sediment (marine water)	Air	Soil	Secondary poisoning
Hydrochloric acid	36 ug/L	36 ug/L	45 ug/L	36 ug/L	Not available	Not available	Not available	Not available	Not available
Formic acid	2 mg/L	0.2 mg/L	1 mg/L	7.2 mg/L	13.4 mg/kg sediment dw	1.34 mg/kg sediment dw	Not available	1.5 mg/kg soil dw	Not available

8.2. Exposure controls

Engineering Controls Use in a well ventilated area. Local exhaust ventilation should be used in areas without good cross ventilation.

Personal protective equipment

If engineering controls and work practices cannot prevent excessive exposures, the selection and proper use of personal protective equipment should be determined by an industrial hygienist or other qualified professional based on the specific application of this product.

Respiratory Protection If engineering controls and work practices cannot keep exposure below occupational exposure limits or if exposure is unknown, wear a NIOSH certified, European Standard EN 149, AS/NZS 1715:2009, or equivalent respirator when using this product. Selection of and instruction on using all personal protective equipment, including respirators, should be performed by an Industrial Hygienist or other qualified professional.
Acid gas respirator.

Hand Protection Chemical-resistant protective gloves (EN 374) Suitable materials for longer, direct contact (recommended: protection index 6, corresponding to > 480 minutes permeation time as per EN 374): Butyl rubber gloves. (>= 0.7 mm thickness)
This information is based on literature references and on information provided by glove manufacturers, or is derived by analogy with similar substances. Please note that in practice the working life of chemical-resistant protective gloves may be considerably shorter than the permeation time determined in accordance with EN 374 as a result of the many influencing factors (e.g. temperature). If signs of wear and tear are noticed then the gloves should be replaced. Manufacturer's directions for use should be observed because of great diversity of types.

Skin Protection Full protective chemical resistant clothing. Rubber boots

Eye Protection Chemical goggles; also wear a face shield if splashing hazard exists.

Other Precautions Eyewash fountains and safety showers must be easily accessible.

Environmental Exposure Controls Do not allow material to contaminate ground water system

SECTION 9: Physical and Chemical Properties

9.1. Information on basic physical and chemical properties

Physical State: Liquid
Color: Not determined
Odor: Pungent acrid
Odor Threshold: No information available

Property	Values	Remarks/ - Method
pH:	No data available	
Freezing Point/Range		
Melting Point/Range	No data available	
Boiling Point/Range		
No data available		
Flash Point	No data available	
Flammability (solid, gas)	No data available	
upper flammability limit	No data available	
lower flammability limit	No data available	
Evaporation rate	No data available	
Vapor Pressure	No data available	
Vapor Density	No data available	
Specific Gravity	1.077	
Water Solubility	Soluble in water	
Solubility in other solvents	No data available	
Partition coefficient: n-octanol/water	No data available	
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

VOC Content (%) No data available

SECTION 10: Stability and Reactivity

10.1. Reactivity

Not expected to be reactive.

10.2. Chemical Stability

Stable

10.3. Possibility of Hazardous Reactions

Will Not Occur

10.4. Conditions to Avoid

None anticipated

10.5. Incompatible Materials

Strong alkalis.

10.6. Hazardous Decomposition Products

Flammable hydrogen gas. Chlorine. Hydrogen sulfide.

SECTION 11: Toxicological Information

11.1. Information on Toxicological Effects

Acute Toxicity

Inhalation May cause mild respiratory irritation.
Eye Contact Causes eye irritation.
Skin Contact Causes skin irritation.
Ingestion Irritation of the mouth, throat, and stomach.

Chronic Effects/Carcinogenicity Prolonged, excessive exposure may cause erosion of the teeth.

Toxicology data for the components

Substances	CAS	LD50 Oral	LD50 Dermal	LC50 Inhalation

	Number			
Hydrochloric acid	7647-01-0	No data available	5010 mg/kg (Rabbit) > 5010 mg/kg (Rabbit) 1449 mg/kg (Mouse)	3124 mg/L (Rat) 1h 3.2 mg/L (Mouse) 8.3 mg/L (Rat) 1405 mg/L (Rat) 554 mg/L (Mouse)
Formic acid	64-18-6	730 mg/kg (Rat)	> 2000 mg/kg (Rat) (Similar substance)	7.4 mg/L (Rat) 4h 15 mg/L (Rat) 15m
Citric acid	77-92-9	3000 mg/kg (Rat) 5790 mg/kg (Mice) 11,700 mg/kg (Rat) 5400 mg/kg (Rat)	> 2000 mg/kg (Rat)	No data available
Aldol	107-89-1	2180 mg/kg (Rat)	140 mg/kg (Rabbit)	No data available
Acetic acid	64-19-7	3310 mg/kg (Rat)	1060 mg/kg (Rabbit)	11.4 mg/L (Rat) 4h

Substances	CAS Number	Skin corrosion/irritation
Hydrochloric acid	7647-01-0	Causes severe burns
Formic acid	64-18-6	Corrosive to skin (Rabbit)
Citric acid	77-92-9	Not irritating to skin in rabbits.
Aldol	107-89-1	May cause mild skin irritation. (Rabbit)
Acetic acid	64-19-7	Corrosive to skin

Substances	CAS Number	Eye damage/irritation
Hydrochloric acid	7647-01-0	Causes severe burns
Formic acid	64-18-6	Corrosive to eyes (Rabbit)
Citric acid	77-92-9	Causes severe eye irritation.
Aldol	107-89-1	Causes moderate eye irritation. (Rabbit)
Acetic acid	64-19-7	Corrosive to eyes

Substances	CAS Number	Skin Sensitization
Hydrochloric acid	7647-01-0	Did not cause sensitization on laboratory animals (guinea pig)
Formic acid	64-18-6	Did not cause sensitization on laboratory animals (guinea pig)
Citric acid	77-92-9	Patch test on human volunteers did not demonstrate irritating properties
Aldol	107-89-1	No information available
Acetic acid	64-19-7	Not regarded as a sensitizer.

Substances	CAS Number	Respiratory Sensitization
Hydrochloric acid	7647-01-0	No information available
Formic acid	64-18-6	No information available
Citric acid	77-92-9	No information available
Aldol	107-89-1	No information available
Acetic acid	64-19-7	No data of sufficient quality are available.

Substances	CAS Number	Mutagenic Effects
Hydrochloric acid	7647-01-0	Not regarded as mutagenic.
Formic acid	64-18-6	In vitro tests did not show mutagenic effects In vivo tests did not show mutagenic effects.
Citric acid	77-92-9	Did not show mutagenic effects in animal experiments
Aldol	107-89-1	No information available
Acetic acid	64-19-7	Did not show mutagenic effects in animal experiments. In vitro tests did not show mutagenic effects. (similar substances)

Substances	CAS Number	Carcinogenic Effects
Hydrochloric acid	7647-01-0	No data of sufficient quality are available.
Formic acid	64-18-6	Did not show carcinogenic effects in animal experiments (similar substances)
Citric acid	77-92-9	Did not show carcinogenic effects in animal experiments
Aldol	107-89-1	No information available.
Acetic acid	64-19-7	Did not show carcinogenic effects in animal experiments

Substances	CAS Number	Reproductive toxicity
Hydrochloric acid	7647-01-0	Embryo and fetotoxicity has been observed in female rats exposed to maternally toxic levels of hydrogen chloride (450 mg/m^3, 1hr.).
Formic acid	64-18-6	Did not show teratogenic effects in animal experiments. (similar substances) Animal testing did not show any effects on fertility.
Citric acid	77-92-9	Animal testing did not show any effects on fertility. Did not show teratogenic effects in animal experiments.
Aldol	107-89-1	No information available.

Acetic acid	64-19-7	Not a confirmed teratogen or embryotoxin. Animal testing did not show any effects on fertility.

Substances	CAS Number	STOT - single exposure
Hydrochloric acid	7647-01-0	May cause respiratory irritation.
Formic acid	64-18-6	May cause respiratory irritation.
Citric acid	77-92-9	No data of sufficient quality are available.
Aldol	107-89-1	No information available
Acetic acid	64-19-7	Causes severe respiratory irritation.

Substances	CAS Number	STOT - repeated exposure
Hydrochloric acid	7647-01-0	No significant toxicity observed in animal studies at concentration requiring classification.
Formic acid	64-18-6	No significant toxicity observed in animal studies at concentration requiring classification.
Citric acid	77-92-9	No significant toxicity observed in animal studies at concentration requiring classification.
Aldol	107-89-1	No information available
Acetic acid	64-19-7	Not applicable due to corrosivity of the substance.

Substances	CAS Number	Aspiration hazard
Hydrochloric acid	7647-01-0	Not applicable
Formic acid	64-18-6	Not applicable
Citric acid	77-92-9	No adverse health effects are expected from swallowing.
Aldol	107-89-1	No information available
Acetic acid	64-19-7	Not applicable

SECTION 12: Ecological Information

12.1. Toxicity

Ecotoxicity Effects

Substances	CAS Number	Toxicity to Algae	Toxicity to Fish	Toxicity to Microorganisms	Toxicity to Invertebrates
Hydrochloric acid	7647-01-0	No information available	LC50 282 mg/L (Gambusia affinis) LC50 20.5 mg/L (Lepomis macrochirus) LC50 (96h) 3.25 – 3.5 (pH) (Lepomis macrochirus)	EC50 (3h) >= 5 and <= 5.5 (pH) (Activated sludge, domestic)	EC50 (48h) 4.9 (pH) (Daphnia magna)
Formic acid	64-18-6	EC50 25 mg/L (Desmodesmus subspicatus) EC50 (72h) 1240 mg/L (growth rate) (Pseudokirchnerella subcapitata) (Similar substance)	LC50 (96h) 175 mg/L (Lepomis Macrochirus) LC50 (96h) 130 mg/L (Danio rerio) (Similar substance) LC50 (96h) 1720 mg/L (Scophthalmus maximus) (Similar substance) LC50 (96h) 3500 mg/L (Oncorhynchus mykiss) (similar substance)	NOEC (13d) 72 mg/L (activated sludge, domestic)	EC50 (48h) 120 mg/L (Daphnia magna) EC50 (48h) 450 mg/L (Daphnia magna) (similar substance) EC50 (48h) 365 mg/L (Daphnia magna) (Similar substance) LC50 (96h) 1308 mg/L (Crangon crangon) (Similar substance) NOEC (21d) >= 100 mg/L (Daphnia magna)
Citric acid	77-92-9	NOEC (8d) 425 mg/L (Scenedesmus quadricauda)	LC50 (96h) >100 mg/L (Pimephales promelas) LC50 (96h) 1516 mg/L (Lepomis macrochirus)	No information available	No information available
Aldol	107-89-1	EC50 (5d) >237 mg/L (Nitzscheria linearis)	No information available	No information available	No information available
Acetic acid	64-19-7	EC50 (72h) 55.22 mg/L (Anabaena flos-aquae)	LC50 (96h) 75 mg/L (Lepomis macrochirus) LC50 (96h) > 300.82 mg/L (Oncorhynchus mykiss) LC50 (96h) 251 mg/L (Gambusia affinis)	NOEC (16h) 1150 mg/L (Pseudomonas putida)	EC50 (48h) 65 mg/L (Daphnia magna)

Effect concentrations in the aquatic environment are attributable to a change in pH value

12.2. Persistence and degradability

The methods for determining biodegradability are not applicable to inorganic substances.

Substances	CAS Number	Persistence and Degradability
Hydrochloric acid	7647-01-0	The methods for determining biodegradability are not applicable to inorganic substances.
Formic acid	64-18-6	Readily biodegradable (100 @ 14d)
Citric acid	77-92-9	No information available
Aldol	107-89-1	No information available
Acetic acid	64-19-7	(99% @ 7d)

12.3. Bioaccumulative potential

Does not bioaccumulate.

Substances	CAS Number	Log Pow
Hydrochloric acid	7647-01-0	0.25
Formic acid	64-18-6	-2.1
Citric acid	77-92-9	No information available
Aldol	107-89-1	-0.72
Acetic acid	64-19-7	-0.17

12.4. Mobility in soil

Substances	CAS Number	Mobility
Hydrochloric acid	7647-01-0	No information available
Formic acid	64-18-6	KOC = 31
Citric acid	77-92-9	No information available
Aldol	107-89-1	No information available
Acetic acid	64-19-7	No information available

12.5. Results of PBT and vPvB assessment

This mixture contains no substance considered to be persistent, bioaccumulating nor toxic (PBT). This mixture contains no substance considered to be very persistent nor very bioaccumulating (vPvB).

Substances	PBT and vPvB assessment
Hydrochloric acid	Not applicable
Formic acid	Not PBT/vPvB
Acetic acid	Not PBT/vPvB

12.6. Other adverse effects

Endocrine Disruptor Information

This product does not contain any known or suspected endocrine disruptors

SECTION 13: Disposal Considerations

13.1. Waste treatment methods

Disposal Method Disposal should be made in accordance with federal, state, and local regulations. Substance should NOT be deposited into a sewage facility.

Contaminated Packaging Follow all applicable national or local regulations.

SECTION 14: Transport Information

IMDG/IMO

UN Number: Not restricted
UN Proper Shipping Name: Not restricted
Transport Hazard Class(es): Not applicable
Packing Group: Not applicable
Environmental Hazards: Not applicable

RID

UN Number: Not restricted
UN Proper Shipping Name: Not restricted
Transport Hazard Class(es): Not applicable
Packing Group: Not applicable
Environmental Hazards: Not applicable

ADR

UN Number: Not restricted
UN Proper Shipping Name: Not restricted

Transport Hazard Class(es): Not applicable
Packing Group: Not applicable
Environmental Hazards: Not applicable

IATA/ICAO
UN Number: Not restricted
UN Proper Shipping Name: Not restricted
Transport Hazard Class(es): Not applicable
Packing Group: Not applicable
Environmental Hazards: Not applicable

14.1. UN Number: Not restricted

14.2. UN Proper Shipping Name: Not restricted

14.3. Transport Hazard Class(es): Not applicable

14.4. Packing Group: Not applicable

14.5. Environmental Hazards: Not applicable

14.6. Special Precautions for User: None

14.7. Transport in bulk according to Annex II of MARPOL 73/78 and the IBC Code: Not applicable

SECTION 15: Regulatory Information

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

International Inventories

EINECS Inventory	This product, and all its components, complies with EINECS
US TSCA Inventory	All components listed on inventory or are exempt.
Canadian DSL Inventory	All components listed on inventory or are exempt.

Legend
TSCA - United States Toxic Substances Control Act Section 8(b) Inventory
EINECS/ELINCS - European Inventory of Existing Commercial Chemical Substances/EU List of Notified Chemical Substances
DSL/NDSL - Canadian Domestic Substances List/Non-Domestic Substances List

Germany, Water Endangering Classes (WGK) WGK 1: Low hazard to waters.

15.2. Chemical Safety Assessment
Yes

SECTION 16: Other Information

Full text of H-Statements referred to under sections 2 and 3
H290 - May be corrosive to metals
H314 - Causes severe skin burns and eye damage
H318 - Causes serious eye damage
H335 - May cause respiratory irritation

Key or legend to abbreviations and acronyms
bw – body weight
CAS – Chemical Abstracts Service
CLP – REGULATION (EC) No 1272/2008 OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL on Classification, Labelling and Packaging of substances and mixtures
EC – European Commission
EC10 – Effective Concentration 10%
EC50 – Effective Concentration 50%
EEC – European Economic Community
ErC50 – Effective Concentration growth rate 50%
IBC Code – International Code for the Construction and Equipment of Ships carrying Dangerous Chemicals in Bulk
LC50 – Lethal Concentration 50%
LD50 – Lethal Dose 50%
LL0 – Lethal Loading 0%

LL50 – Lethal Loading 50%
MARPOL – International Convention for the Prevention of Pollution from Ships
mg/kg – milligram/kilogram
mg/L – milligram/liter
NIOSH – National Institute for Occupational Safety and Health
NOEC – No Observed Effect Concentration
NTP – National Toxicology Program
OEL – Occupational Exposure Limit
PBT – Persistent Bioaccumulative and Toxic
PC – Chemical Product category
PEL – Permissible Exposure Limit
ppm – parts per million
PROC – Process category
REACH – REGULATION (EC) No 1907/2006 OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL concerning the Registration, Evaluation, Authorisation and Restriction of Chemicals
STEL – Short Term Exposure Limit
SU – Sector of Use category

Key literature references and sources for data
www.ChemADVISOR.com/
NZ CCID

Revision Date: 23-Oct-2015
Revision Note
Not applicable

This safety data sheet complies with the requirements of Regulation (EC) No. 453/2010

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End of Safety Data Sheet