SAFETY DATA SHEET
according to Regulation (EC) No. 1907/2006

Revision Date 18.02.2013 Version 15.0

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

1.1 Product identifier

Catalogue No.	822334
Product name	Hydroxylammonium chloride for synthesis
REACH Registration Number	A registration number is not available for this substance as the substance or its use are exempted from registration according to Article 2 REACH Regulation (EC) No 1907/2006, the annual tonnage does not require a registration or the registration is envisaged for a later registration deadline.

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

Identified uses	Chemical for synthesis For additional information on uses please refer to the Merck Chemicals portal (www.merck-chemicals.com).

1.3 Details of the supplier of the safety data sheet

Company	Merck KGaA * 64271 Darmstadt * Germany * Phone:+49 6151 72-0
Responsible Department	EQ-RS * e-mail: prodsafe@merckgroup.com

1.4 Emergency telephone number

Please contact the regional company representation in your country.

SECTION 2. Hazards identification

2.1 Classification of the substance or mixture

Classification (REGULATION (EC) No 1272/2008)

Acute toxicity, Category 4, Oral, H302
Acute toxicity, Category 4, Dermal, H312
Carcinogenicity, Category 2, H351
Skin irritation, Category 2, H315
Eye irritation, Category 2, H319
Skin sensitization, Category 1, H317
Specific target organ toxicity - repeated exposure, Category 2, Oral, H373
Acute aquatic toxicity, Category 1, H400
Corrosive to metals, Category 1, H290

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

Classification (67/548/EEC or 1999/45/EC)

E	Explosive	R2
Xn	Harmful	R21/22 - 48/22
Xi	Irritant	R36/38 R43
Carc.Cat.3	Carcinogenic Category 3	R40
N	Dangerous for the environment	R50

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

2.2 Label elements

Labelling (REGULATION (EC) No 1272/2008)

Hazard pictograms

Signal word
Warning

Hazard statements
H302 + H312 Harmful if swallowed or in contact with skin
H351 Suspected of causing cancer.
H315 Causes skin irritation.
H319 Causes serious eye irritation.
H317 May cause an allergic skin reaction.
H373 May cause damage to organs through prolonged or repeated exposure.
H400 Very toxic to aquatic life.
H290 May be corrosive to metals.

Precautionary statements
Prevention
P273 Avoid release to the environment.
P281 Use personal protective equipment as required.
Response
P302 + P352 IF ON SKIN: Wash with plenty of soap and water.
P305 + P351 + P338 IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
P308 + P313 IF exposed or concerned: Get medical advice/ attention.

Reduced labelling (≤125 ml)

Hazard pictograms

Signal word
Warning

Hazard statements
H351 Suspected of causing cancer.
H317 May cause an allergic skin reaction.

Precautionary statements
P281 Use personal protective equipment as required.
P302 + P352 IF ON SKIN: Wash with plenty of soap and water.
P308 + P313 IF exposed or concerned: Get medical advice/ attention.

Index-No. 612-123-00-2

Labelling (67/548/EEC or 1999/45/EC)

Symbol(s)	E	Explosive
	Xn	Harmful
	N	Dangerous for the environment

R-phrase(s)	2-21/22-36/38-40-43-48/22-50	Risk of explosion by shock, friction, fire or other sources of ignition. Harmful in contact with skin and if swallowed. Irritating to eyes and skin. Limited evidence of a carcinogenic effect. May cause sensitization by skin contact. Harmful: danger of serious damage to health by prolonged exposure if swallowed. Very toxic to aquatic organisms.
S-phrase(s)	36/37-61	Wear suitable protective clothing and gloves. Avoid release to the environment. Refer to special instructions/ Safety data sheets.
EC-No.	226-798-2	EC Label

Reduced labelling (≤125 ml)

Symbol(s)	E	Explosive
	Xn	Harmful
	N	Dangerous for the environment
R-phrase(s)	2-21/22-40-43-48/22	Risk of explosion by shock, friction, fire or other sources of ignition. Harmful in contact with skin and if swallowed. Limited evidence of a carcinogenic effect. May cause sensitization by skin contact. Harmful: danger of serious damage to health by prolonged exposure if swallowed.
S-phrase(s)	36/37	Wear suitable protective clothing and gloves.

2.3 Other hazards

None known.

SECTION 3. Composition/information on ingredients

3.1 Substance

Formula	$NH_2OH * HCl$	H_4ClNO (Hill)
CAS-No.	5470-11-1	
Index-No.	612-123-00-2	
EC-No.	226-798-2	
Molar mass	69,49 g/mol	

Hazardous components (REGULATION (EC) No 1272/2008)

Chemical Name (Concentration)

CAS-No.	Registration number	Classification
Hydroxylammonium chloride (<= 100 %)		
5470-11-1	*)	Corrosive to metals, Category 1, H290 Carcinogenicity, Category 2, H351 Acute toxicity, Category 4, H312 Acute toxicity, Category 4, H302 Specific target organ toxicity - repeated exposure, Category 2, H373 Eye irritation, Category 2, H319 Skin irritation, Category 2, H315 Skin sensitization, Category 1, H317 Acute aquatic toxicity, Category 1, H400

*) A registration number is not available for this substance as the substance or its use are exempted from registration according to Article 2 REACH Regulation (EC) No 1907/2006, the annual tonnage does not require a registration or the registration is envisaged for a later registration deadline.

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

Hazardous components (1999/45/EC)

Chemical Name (Concentration)

CAS-No.	Classification
Hydroxylammonium chloride (<= 100 %)	
5470-11-1	E, Explosive; R2 Carc.Cat.3; R40 Xn, Harmful; R21/22-48/22 Xi, Irritant; R36/38 R43 N, Dangerous for the environment; R50

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

3.2 Mixture

not applicable

SECTION 4. First aid measures

4.1 Description of first aid measures

After inhalation: fresh air. Consult a physician.

After skin contact: wash off with plenty of water. Remove contaminated clothing. Consult a physician.

After eye contact: rinse out with plenty of water. Call in ophthalmologist.

After swallowing: immediately make victim drink water (two glasses at most). Consult a physician.

4.2 Most important symptoms and effects, both acute and delayed

Allergic reactions, irritant effects, Dermatitis, Cyanosis
The following applies to ammonium salts in general: after swallowing: local irritation symptoms, nausea, vomiting, diarrhoea. Systemic effect: after the uptake of very large qantities: drop in blood pressure, collapse, CNS disorders, spasms, narcotic conditions, respiratory paralysis, haemolysis.

4.3 Indication of any immediate medical attention and special treatment needed

No information available.

SECTION 5. Firefighting measures

5.1 Extinguishing media

Suitable extinguishing media
Water, Carbon dioxide (CO2), Foam, Dry powder

Unsuitable extinguishing media
For this substance/mixture no limitations of extinguishing agents are given.

5.2 Special hazards arising from the substance or mixture

Combustible.
In the event of decomposition: danger of explosion!
Risk of dust explosion.
Development of hazardous combustion gases or vapours possible in the event of fire.
Fire may cause evolution of:
Hydrogen chloride gas, nitrogen oxides, nitrous gases

5.3 Advice for firefighters

Special protective equipment for firefighters
Stay in danger area only with self-contained breathing apparatus. Prevent skin contact by keeping a safe distance or by wearing suitable protective clothing.

Further information
Suppress (knock down) gases/vapours/mists with a water spray jet. Prevent fire extinguishing water from contaminating surface water or the ground water system.

SECTION 6. Accidental release measures

6.1 Personal precautions, protective equipment and emergency procedures
Advice for non-emergency personnel: Avoid substance contact. Avoid inhalation of dusts. Ensure adequate ventilation. Evacuate the danger area, observe emergency procedures, consult an expert.

Advice for emergency responders: Protective equipment see section 8.

6.2 Environmental precautions
Do not empty into drains. Risk of explosion.

6.3 Methods and materials for containment and cleaning up
Cover drains. Collect, bind, and pump off spills.
Observe possible material restrictions (see sections 7 and 10).
Take up dry. Dispose of properly. Clean up affected area. Avoid generation of dusts.

6.4 Reference to other sections
Indications about waste treatment see section 13.

SECTION 7. Handling and storage

7.1 Precautions for safe handling
Advice on safe handling
Observe label precautions.

Work under hood. Do not inhale substance/mixture.

Hygiene measures
Immediately change contaminated clothing. Apply preventive skin protection. Wash hands and face after working with substance.

7.2 Conditions for safe storage, including any incompatibilities
Storage conditions
Tightly closed and away from sources of ignition and heat. Observe national regulations. Dry.

Store at +15°C to +25°C.

7.3 Specific end use(s)
Apart from the uses mentioned in section 1.2 no other specific uses are stipulated.

SECTION 8. Exposure controls/personal protection

8.1 Control parameters

8.2 Exposure controls

Engineering measures

Technical measures and appropriate working operations should be given priority over the use of personal protective equipment.

See section 7.1.

Individual protection measures
Protective clothing needs to be selected specifically for the workplace, depending on concentrations and quantities of the hazardous substances handled. The chemical resistance of the protective equipment should be enquired at the respective supplier.

Eye/face protection
Safety glasses

Hand protection

full contact:

Glove material:	Nitrile rubber
Glove thickness:	0,11 mm
Break through time:	> 480 min

splash contact:

Glove material:	Nitrile rubber
Glove thickness:	0,11 mm
Break through time:	> 480 min

The protective gloves to be used must comply with the specifications of EC Directive 89/686/EEC and the related standard EN374, for example KCL 741 Dermatril® L (full contact), KCL 741 Dermatril® L (splash contact).
The breakthrough times stated above were determined by KCL in laboratory tests acc. to EN374 with samples of the recommended glove types.
This recommendation applies only to the product stated in the safety data sheet<(>,<)> supplied by us and for the designated use. When dissolving in or mixing with other substances and under conditions deviating from those stated in EN374 please contact the supplier of CE-approved gloves (e.g. KCL GmbH, D-36124 Eichenzell, Internet: www.kcl.de).

Other protective equipment
protective clothing

Respiratory protection
required when dusts are generated.
Recommended Filter type: Filter P 2 (acc. to DIN 3181) for solid and liquid particles of harmful substances
The entrepeneur has to ensure that maintenance, cleaning and testing of respiratory protective devices are carried out according to the instructions of the producer. These measures have to be properly documented.

Environmental exposure controls
Do not empty into drains.
Risk of explosion.

SECTION 9. Physical and chemical properties

9.1 Information on basic physical and chemical properties

Form	solid
Colour	colourless

Odour	slight chlorine
Odour Threshold	No information available.
pH	2,5 - 3,5 at 50 g/l 20 °C
Melting point	159 °C
Boiling point	No information available.
Flash point	No information available.
Evaporation rate	No information available.
Flammability (solid, gas)	No information available.
Lower explosion limit	No information available.
Upper explosion limit	No information available.
Vapour pressure	No information available.
Relative vapor density	No information available.
Relative density	1,67 g/cm³ at 20 °C
Water solubility	830 g/l at 20 °C
Partition coefficient: n-octanol/water	log Pow: -2,66 (calculated) Bioaccumulation is not expected. (Lit.)
Auto-ignition temperature	No information available.
Decomposition temperature	> 150 °C explosion decomposition
Viscosity, dynamic	No information available.
Explosive properties	No information available.
Oxidizing properties	No information available.

9.2 Other data

Bulk density	ca.900 kg/m³
Corrosion	May be corrosive to metals.

SECTION 10. Stability and reactivity

10.1 Reactivity

Explosive
Mechanical sensitivity (friction)

10.2 Chemical stability

The product is chemically stable under standard ambient conditions (room temperature) .

10.3 Possibility of hazardous reactions

Violent reactions possible with:

alkaline substances

Possible formation of:

hydroxylamine

Risk of explosion with:

fire-promoting substances, Oxidizing agents

10.4 Conditions to avoid

Heating (decomposition).

10.5 Incompatible materials

Aluminium, Copper, Zinc, Tin

10.6 Hazardous decomposition products

in the event of fire: See section 5.

SECTION 11. Toxicological information

11.1 Information on toxicological effects

Acute oral toxicity
LD50 rat: 141 mg/kg (RTECS)

absorption
Symptoms: Irritations of mucous membranes in the mouth, pharynx, oesophagus and gastrointestinal tract.

Acute inhalation toxicity

Symptoms: mucosal irritations

Acute dermal toxicity
absorption

Skin irritation
Dermatitis
Causes skin irritation.

Eye irritation
Causes serious eye irritation.

Sensitisation
Human experience
Result: positive
(Lit.)
May cause an allergic skin reaction.

Germ cell mutagenicity

This information is not available.

Carcinogenicity
This information is not available.

Reproductive toxicity
This information is not available.

Teratogenicity
This information is not available.

CMR effects
Carcinogenicity:
Suspected of causing cancer.

Specific target organ toxicity - single exposure
This information is not available.

Specific target organ toxicity - repeated exposure
May cause damage to organs through prolonged or repeated exposure.

Aspiration hazard
This information is not available.

11.2 Further information
After absorption:
drop in blood pressure, Cyanosis, Risk of methaemoglobin formation.
The following applies to ammonium salts in general: after swallowing: local irritation symptoms, nausea, vomiting, diarrhoea. Systemic effect: after the uptake of very large qantities: drop in blood pressure, collapse, CNS disorders, spasms, narcotic conditions, respiratory paralysis, haemolysis.
Handle in accordance with good industrial hygiene and safety practice.

SECTION 12. Ecological information

12.1 Toxicity
No information available.

12.2 Persistence and degradability
No information available.

12.3 Bioaccumulative potential
Partition coefficient: n-octanol/water
log Pow: -2,66
(calculated)
Bioaccumulation is not expected. (Lit.)

12.4 Mobility in soil
No information available.

12.5 Results of PBT and vPvB assessment
PBT/vPvB assessment not available as chemical safety assessment not required/not conducted.

12.6 Other adverse effects
Additional ecological information
Discharge into the environment must be avoided.

SECTION 13. Disposal considerations

Waste treatment methods

See www.retrologistik.com for processes regarding the return of chemicals and containers, or contact us there if you have further questions.

SECTION 14. Transport information

Land transport (ADR/RID)

14.1 UN number	UN 2923
14.2 Proper shipping name	CORROSIVE SOLID, TOXIC, N.O.S. (HYDROXYLAMMONIUM CHLORIDE)
14.3 Class	8 (6.1)
14.4 Packing group	III
14.5 Environmentally hazardous	yes
14.6 Special precautions for user	yes
Tunnel restriction code	E

Inland waterway transport (ADN)

Not relevant

Air transport (IATA)

14.1 UN number	UN 2923
14.2 Proper shipping name	CORROSIVE SOLID, TOXIC, N.O.S. (HYDROXYLAMMONIUM CHLORIDE)
14.3 Class	8 (6.1)
14.4 Packing group	III
14.5 Environmentally hazardous	yes
14.6 Special precautions for user	no

Sea transport (IMDG)

14.1 UN number	UN 2923
14.2 Proper shipping name	CORROSIVE SOLID, TOXIC, N.O.S. (HYDROXYLAMMONIUM CHLORIDE)
14.3 Class	8 (6.1)
14.4 Packing group	III
14.5 Environmentally hazardous	yes
14.6 Special precautions for user	yes
EmS	F-A S-B
Segregation Group	0001 Acids

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

Not relevant

SECTION 15. Regulatory information

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

EU regulations

Major Accident Hazard Legislation	96/82/EC Explosive 5 Quantity 1: 10 t Quantity 2: 50 t
	96/82/EC Dangerous for the environment 9a Quantity 1: 100 t Quantity 2: 200 t
Occupational restrictions	Take note of Dir 94/33/EC on the protection of young people at work. Observe work restrictions regarding maternity protection in accordance to Dir 92/85/EEC or stricter national regulations where applicable.

National legislation

Storage class	4.1A
German explosives Act	applies, C, III.

15.2 Chemical Safety Assessment

For this product a chemical safety assessment was not carried out.

SECTION 16. Other information

Full text of H-Statements referred to under sections 2 and 3.

H290	May be corrosive to metals.
H302	Harmful if swallowed.
H312	Harmful in contact with skin.
H315	Causes skin irritation.
H317	May cause an allergic skin reaction.
H319	Causes serious eye irritation.
H351	Suspected of causing cancer.
H373	May cause damage to organs through prolonged or repeated exposure.
H400	Very toxic to aquatic life.

Full text of R-phrases referred to under sections 2 and 3

R 2	Risk of explosion by shock, friction, fire or other sources of ignition.
R21/22	Harmful in contact with skin and if swallowed.
R36/38	Irritating to eyes and skin.
R40	Limited evidence of a carcinogenic effect.
R43	May cause sensitization by skin contact.
R48/22	Harmful: danger of serious damage to health by prolonged exposure if swallowed.
R50	Very toxic to aquatic organisms.

Training advice

Provide adequate information, instruction and training for operators.

Key or legend to abbreviations and acronyms used in the safety data sheet

Used abbreviations and acronyms can be looked up at www.wikipedia.org.

Regional representation
This information is given on the authorised Safety Data Sheet for your country.

The information contained herein is based on the present state of our knowledge. It characterises the product with regard to the appropriate safety precautions. It does not represent a guarantee of any properties of the product.