

SAFETY DATA SHEET

according to Regulation (EC) No. 1907/2006

Revision Date 18.05.2018

Version 2.1

SECTION 1. Identification of the substance/mixture and of the company/undertaking**1.1 Product identifier**

Catalogue No. 100518

Product name Perchloric acid 60% for analysis EMSURE® ACS

REACH Registration Number This product is a mixture. REACH Registration Number see section 3.

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

Identified uses Reagent for analysis, Chemical production

For additional information on uses please refer to the Merck Chemicals portal (www.merckgroup.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 EHS Manager *+61 (3) 8727 6300 * Monday through Friday, 8:00am to 5:00pm (EST)

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Poisons Information Centre: 13 1126

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SECTION 2. Hazards identification

2.1 Classification of the substance or mixture

Classification (REGULATION (EC) No 1272/2008)

Oxidizing liquid, Category 1, H271

Corrosive to metals, Category 1, H290

Acute toxicity, Category 4, Oral, H302

Skin corrosion, Category 1A, H314

Specific target organ toxicity - repeated exposure, Category 2, Thyroid, H373

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

2.2 Label elements

Labelling (REGULATION (EC) No 1272/2008)

Hazard pictograms



Signal word

Danger

Hazard statements

H271 May cause fire or explosion; strong oxidizer.

H290 May be corrosive to metals.

H302 Harmful if swallowed.

H314 Causes severe skin burns and eye damage.

H373 May cause damage to organs (Thyroid) through prolonged or repeated exposure.

Precautionary statements

Prevention

P210 Keep away from heat.

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P221 Take any precaution to avoid mixing with combustibles, heavy-metal compounds, acids and alkalis.

P280 Wear protective gloves/ protective clothing/ eye protection/ face protection.

Response

P301 + P330 + P331 IF SWALLOWED: Rinse mouth. Do NOT induce vomiting.

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 + P310 IF exposed or concerned: immediately call a POISON CENTER or doctor/ physician.

Reduced labelling (≤125 ml)

Hazard pictograms



Signal word

Danger

Hazard statements

H271 May cause fire or explosion; strong oxidizer.

H314 Causes severe skin burns and eye damage.

Precautionary statements

P210 Keep away from heat.

P280 Wear protective gloves/ protective clothing/ eye protection/ face protection.

P301 + P330 + P331 IF SWALLOWED: Rinse mouth. Do NOT induce vomiting.

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 + P310 IF exposed or concerned: immediately call a POISON CENTER or doctor/ physician.

2.3 Other hazards

None known.

SECTION 3. Composition/information on ingredients

Chemical nature Aqueous solution

3.1 Substance

Not applicable

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3.2 Mixture

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

Chemical name (Concentration)

CAS-No. Registration number Classification

Perchloric acid (>= 50 % - < 80 %)

7601-90-3 *)

Oxidizing liquid, Category 1, H271

Corrosive to metals, Category 1, H290

Acute toxicity, Category 4, H302

Skin corrosion, Category 1A, H314

Specific target organ toxicity - repeated exposure, Category 2,
H373

*) 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.

SECTION 4. First aid measures

4.1 Description of first aid measures

General advice

First aider needs to protect himself.

After inhalation: fresh air. Call in physician.

In case of skin contact: Take off immediately all contaminated clothing. Rinse skin with water/shower. Call a physician immediately.

After eye contact: rinse out with plenty of water. Immediately call in ophthalmologist. Remove contact lenses.

After swallowing: make victim drink water (two glasses at most), avoid vomiting (risk of perforation). Call a physician immediately. Do not attempt to neutralise.

4.2 Most important symptoms and effects, both acute and delayed

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Lung oedema

Headache, Nausea, Vomiting, Unconsciousness, Spasm, cardiac arrest, death

May cause irreversible eye damage.

Irritation and corrosion, Cough, Shortness of breath

Risk of blindness!

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

Use extinguishing measures that are appropriate to local circumstances and the surrounding environment.

Unsuitable extinguishing media

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

5.2 Special hazards arising from the substance or mixture

Not combustible.

Explosive decomposition possible on heating.

Has a fire-promoting effect due to release of oxygen.

Ambient fire may liberate hazardous vapours.

Fire may cause evolution of:

Hydrogen chloride gas

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

The Safety Data Sheets for catalogue items are available at www.merckgroup.com

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Advice for non-emergency personnel: Do not breathe vapours, aerosols. Avoid substance contact. 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 let product enter drains. Explosive properties

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 carefully with liquid-absorbent material (e.g. Chemizorb®). Dispose of properly. Clean up affected area.

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

Keep all containers, equipment and working place clean. Explosive perchlorates may develop. Carefully avoid drying of perchloric acid solution at inaccessible places (e.g. cracks in tiles and jointings).

Observe label precautions.

Work under hood. Do not inhale substance/mixture. Avoid generation of vapours/aerosols.

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

Requirements for storage areas and containers

No metal containers.

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Storage conditions

Tightly closed. Separately or together with other oxidising substances only and away from sources of ignition and heat. Because of their oxidation potential these products can raise the burning rate of combustible substances substantially or ignite combustible substances on contact with them.

Recommended storage temperature see product label.

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

Contains no substances with occupational exposure limit values.

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

Tightly fitting safety goggles

Hand protection

full contact:

Glove material:	natural latex
Glove thickness:	0.6 mm
Break through time:	> 480 min

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splash contact:

Glove material: natural latex
Glove thickness: 0.6 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 706 Lapren® (full contact), KCL 706 Lapren® (splash contact).

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 vapours/aerosols are generated.

Recommended Filter type: Filter B (acc. to DIN 3181) for inorganic gases and vapours

The entrepreneur 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 let product enter drains.

Explosive properties

SECTION 9. Physical and chemical properties

9.1 Information on basic physical and chemical properties

Form	liquid
Colour	colourless
Odour	odourless

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Odour Threshold	Not applicable
pH	at 20 °C strongly acid
Melting point	No information available.
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 vapour density	No information available.
Density	1.53 g/cm ³ at 15 °C
Relative density	No information available.
Water solubility	at 20 °C soluble
Partition coefficient: n- octanol/water	No information available.
Auto-ignition temperature	No information available.

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Decomposition temperature No information available.

Viscosity, dynamic No information available.

Explosive properties Not classified as explosive.

Oxidizing properties The substance or mixture is classified as oxidizing with the category 1.

9.2 Other data

Corrosion May be corrosive to metals.

SECTION 10. Stability and reactivity

10.1 Reactivity

Explosive

10.2 Chemical stability

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

10.3 Possibility of hazardous reactions

Risk of explosion with:

semimetals, Antimony oxide, Metals, Hydrogen, Impurities, organic combustible substances, acetic acid, Halogenated hydrocarbon, Hydrogen halides, Fluorine, Ether, sulfoxides, metallic oxides, Alcohols, acetonitrile, Activated charcoal, Hydrogen chloride gas, ethanol, glycerol, charcoal, carbon/soot, Methanol, dichloromethane, phosphine, Oxides of phosphorus, Rust, Mild steel, Sulphur trioxide, heat, dibenzoyl sulfoxide, dibutyl sulfoxide, dimethyl ether, Iron (II) sulfate, Hydrogen fluoride, glycol, glycol ether, phenylacetylene, Wood/Sawdust, dehydrating substances, hypophosphites, oleic acid, Diethylether, dimethyl sulfoxide, Iron, ferric oxide, Light metals, Cellulose, antimony, Bismuth, hydrofluoric acid

Acetylene, with, nitrogen oxides

Sulphuric acid, with, Organic Substances

Nitric acid, with, Organic Substances

Lead oxides, with, heat

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chromium(VI) oxide, with, heat

thallium acetate, with, ethylbenzene

Risk of explosion/exothermic reaction with:

metallic salts, Acetic anhydride, phenol, pyridine, Reducing agents, conc. sulfuric acid, nonmetallic oxides, acetic acid, Organic Substances, ethylbenzene, glycol, hypophosphites, phenols, Sulphur trioxide

Exothermic reaction with:

Ketones, phosphides, bases, trichloroethene

Risk of ignition or formation of inflammable gases or vapours with:

fats, hydrogen iodide, methylpropene, Acid chlorides, combustible substances

ANILINE, with, formaldehyde

10.4 Conditions to avoid

Heating (explosive decomposition).

10.5 Incompatible materials

rubber, Light metals

Hydrogen may form upon contact with light metals (danger of explosion!).

Metals

10.6 Hazardous decomposition products

in the event of fire: See section 5.

SECTION 11. Toxicological information

11.1 Information on toxicological effects

Mixture

Acute oral toxicity

Acute toxicity estimate: 833.33 mg/kg

Calculation method

Symptoms: If ingested, severe burns of the mouth and throat, as well as a danger of perforation of the oesophagus and the stomach.

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Acute inhalation toxicity

Symptoms: mucosal irritations, Cough, Shortness of breath, Possible damages: damage of respiratory tract, Lung oedema, Symptoms may be delayed.

Acute dermal toxicity

This information is not available.

Skin irritation

Mixture causes severe burns.

Eye irritation

Mixture causes serious eye damage. Risk of blindness!

Sensitisation

This information is not available.

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.

Specific target organ toxicity - single exposure

This information is not available.

Specific target organ toxicity - repeated exposure

Mixture may cause damage to organs through prolonged or repeated exposure.

Target Organs: Thyroid

Aspiration hazard

This information is not available.

11.2 Further information

The Safety Data Sheets for catalogue items are available at www.merckgroup.com

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After uptake:

Headache, Nausea, Vomiting, agitation, spasms, Shortness of breath, Unconsciousness, cardiac arrest, death

Other dangerous properties can not be excluded.

Handle in accordance with good industrial hygiene and safety practice.

Components

Perchloric acid

Acute oral toxicity

LD50 Rat: 200 - 2,000 mg/kg

OECD Test Guideline 423

Repeated dose toxicity

Rat

male and female

Oral

90 d

daily

NOAEL: 1 mg/kg

OECD Test Guideline 408

The value is given in analogy to the following substances: Perchloric acid, ammonium salt (1:1)

Germ cell mutagenicity

Genotoxicity in vitro

Ames test

Salmonella typhimurium

Result: negative

Method: OECD Test Guideline 471

SECTION 12. Ecological information

Mixture

12.1 Toxicity

Toxicity to fish

LC100 Cyprinus carpio (Carp): 180 mg/l; 24 h

12.2 Persistence and degradability

No information available.

12.3 Bioaccumulative potential

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No information available.

12.4 Mobility in soil

No information available.

12.5 Results of PBT and vPvB assessment

Substance(s) in the mixture do(es) not meet the criteria for PBT or vPvB according to Regulation (EC) No 1907/2006, Annex XIII, or a PBT/vPvB assessment was not conducted.

12.6 Other adverse effects

Additional ecological information

Biological effects:

Harmful effect due to pH shift.

Forms corrosive mixtures with water even if diluted.

Discharge into the environment must be avoided.

Components

Perchloric acid

Toxicity to daphnia and other aquatic invertebrates

static test EC50 Daphnia magna (Water flea): > 100 mg/l; 48 h

OECD Test Guideline 202

Partition coefficient: n-octanol/water

log Pow: -4.63 (25 °C)

EPI Suite™

Bioaccumulation is not expected.

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SECTION 13. Disposal considerations

Waste treatment methods

Waste material must be disposed of in accordance with the national and local regulations. Leave chemicals in original containers. No mixing with other waste. Handle uncleaned containers like the product itself.

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 1873
14.2 Proper shipping name	PERCHLORIC ACID
14.3 Class	5.1 (8)
14.4 Packing group	I
14.5 Environmentally hazardous	--
14.6 Special precautions for user	yes
Tunnel restriction code	B/E

Inland waterway transport (ADN)

Not relevant

Air transport (IATA)

14.1 UN number	UN 1873
14.2 Proper shipping name	PERCHLORIC ACID
14.3 Class	5.1 (8)
14.4 Packing group	I
14.5 Environmentally hazardous	--

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14.6 Special precautions for user yes

IATA (Passenger) Not permitted for transport

Sea transport (IMDG)

14.1 UN number UN 1873

14.2 Proper shipping name PERCHLORIC ACID MORE THAN 50% BUT NOT MORE THAN 72%

14.3 Class 5.1 (8)

14.4 Packing group I

14.5 Environmentally hazardous --

14.6 Special precautions for user yes

EmS F-A S-Q

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

Other regulations

Hazchem Code 2P

SECTION 15. Regulatory information

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

National legislation

Storage class 5.1A

15.2 Chemical safety assessment

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

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SECTION 16. Other information

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

H271	May cause fire or explosion; strong oxidizer.
H290	May be corrosive to metals.
H302	Harmful if swallowed.
H314	Causes severe skin burns and eye damage.
H373	May cause damage to organs through prolonged or repeated exposure.

Training advice

Provide adequate information, instruction and training for operators.

Labelling

Hazard pictograms



Signal word

Danger

Hazard statements

H271 May cause fire or explosion; strong oxidizer.
H290 May be corrosive to metals.
H302 Harmful if swallowed.
H314 Causes severe skin burns and eye damage.
H373 May cause damage to organs (Thyroid) through prolonged or repeated exposure.

Precautionary statements

Prevention

P210 Keep away from heat.
P221 Take any precaution to avoid mixing with combustibles, heavy-metal compounds, acids and

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alkalis.

P280 Wear protective gloves/ protective clothing/ eye protection/ face protection.

Response

P301 + P330 + P331 IF SWALLOWED: Rinse mouth. Do NOT induce vomiting.

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 + P310 IF exposed or concerned: immediately call a POISON CENTER or doctor/ physician.

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.

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.