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

**1.1 Product identifiers**
- **Product name**: Perchloric acid
- **Product Number**: 244252
- **Brand**: SIGALD
- **REACH No.**: 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**: Laboratory chemicals, Manufacture of substances
- **Uses advised against**: This product is not intended for consumer use.

**1.3 Details of the supplier of the safety data sheet**
- **Company**: Sigma-Aldrich Inc.
  3050 SPRUCE ST
  ST. LOUIS MO 63103
  UNITED STATES
- **Telephone**: +1 314 771-5765
- **Fax**: +1 800 325-5052

**1.4 Emergency telephone**
- **Emergency Phone #**: 800-424-9300 CHEMTREC (USA) +1-703-527-3887 CHEMTREC (International) 24 Hours/day; 7 Days/week

**SECTION 2: Hazards identification**

**2.1 Classification of the substance or mixture**

**Classification according to Regulation (EC) No 1272/2008**
- Oxidizing liquids (Category 1), H271
- Corrosive to Metals (Category 1), H290
- Acute toxicity, Oral (Category 4), H302
- Skin corrosion (Sub-category 1A), H314
- Serious eye damage (Category 1), H318
- 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 according Regulation (EC) No 1272/2008

Pictogram

Signal word Danger

Hazard statement(s)
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 statement(s)
P210 Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking.
P280 Wear protective gloves/ protective clothing/ eye protection/ face protection.
P301 + P312 IF SWALLOWED: Call a POISON CENTER/ doctor if you feel unwell.
P303 + P361 + P353 IF ON SKIN (or hair): Take off immediately all contaminated clothing. Rinse skin with 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.
P314 Get medical advice/ attention if you feel unwell.

Supplemental Hazard Statements none

Reduced Labeling (<= 125 ml)

Pictogram

Signal word Danger

Hazard statement(s)
H271 May cause fire or explosion; strong oxidizer.
H314 Causes severe skin burns and eye damage.

Precautionary statement(s)
P210 Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking.
P280 Wear protective gloves/ protective clothing/ eye protection/ face protection.
P303 + P361 + P353 IF ON SKIN (or hair): Take off immediately all contaminated clothing. Rinse skin with 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.

Supplemental Hazard Statements none
2.3 Other hazards
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.

SECTION 3: Composition/information on ingredients

3.2 Mixtures
Synonyms: PCA
Molecular weight: 100.46 g/mol

<table>
<thead>
<tr>
<th>Component</th>
<th>Classification</th>
<th>Concentration</th>
</tr>
</thead>
<tbody>
<tr>
<td>Perchloric acid</td>
<td>Ox. Liq. 1; Met. Corr. 1; Acute Tox. 4; Skin Corr. 1A; Eye Dam. 1; STOT RE 2; H271, H290, H302, H314, H318, H373</td>
<td>&gt;= 70 - &lt; 90 %</td>
</tr>
<tr>
<td>CAS-No.</td>
<td>7601-90-3</td>
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<tr>
<td>EC-No.</td>
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<tr>
<td>Registration number</td>
<td>01-2120066865-44-XXXX</td>
<td></td>
</tr>
</tbody>
</table>

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 aiders need to protect themselves. Show this material safety data sheet to the doctor in attendance.

If inhaled
After inhalation: fresh air. Call in physician.

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

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

If swallowed
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**
The most important known symptoms and effects are described in the labelling (see section 2.2) and/or in section 11

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

### SECTION 5: Firefighting measures

#### 5.1 Extinguishing media

**Suitable extinguishing media**
- Water
- Foam
- Carbon dioxide (CO2)
- 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

- **Chlorine**
- Hydrogen chloride gas
- Combustible.
  Development of hazardous combustion gases or vapours possible in the event of fire.
  Has a fire-promoting effect due to release of oxygen.

#### 5.3 Advice 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.

#### 5.4 Further information

Suppress (knock down) gases/vapors/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: Do not breathe vapors, aerosols. Avoid substance contact. Ensure adequate ventilation. Evacuate the danger area, observe emergency procedures, consult an expert.

For personal protection see section 8.

#### 6.2 Environmental precautions

Do not let product enter drains.

#### 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

For disposal see section 13.

### SECTION 7: Handling and storage

#### 7.1 Precautions for safe handling

**Advice on safe handling**
Work under hood. Do not inhale substance/mixture. Avoid generation of vapours/aerosols.
**Advice on protection against fire and explosion**
Keep away from open flames, hot surfaces and sources of ignition.

**Hygiene measures**
Immediately change contaminated clothing. Apply preventive skin protection. Wash hands and face after working with substance.
For precautions see section 2.2.

**7.2 Conditions for safe storage, including any incompatibilities**

**Storage conditions**
No metal containers.
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.

**Storage class**
Storage class (TRGS 510): 5.1A: Strongly oxidizing hazardous materials

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

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**SECTION 8: Exposure controls/personal protection**

**8.1 Control parameters**

**Ingredients with workplace control parameters**

**8.2 Exposure controls**

**Personal protective equipment**

**Eye/face protection**
Use equipment for eye protection tested and approved under appropriate government standards such as NIOSH (US) or EN 166(EU). Tightly fitting safety goggles

**Skin protection**
Handle with gloves. Gloves must be inspected prior to use. Use proper glove removal technique (without touching glove's outer surface) to avoid skin contact with this product. Dispose of contaminated gloves after use in accordance with applicable laws and good laboratory practices. Wash and dry hands.

The selected protective gloves have to 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: 420 min
Material tested: Lapren® (KCL 706 / Aldrich Z677558, Size M)
The life science business of Merck operates as MilliporeSigma in the US and Canada

**Body Protection**
protective clothing

**Respiratory protection**
required when vapours/aerosols are generated.
Our recommendations on filtering respiratory protection are based on the following standards: DIN EN 143, DIN 14387 and other accompanying standards relating to the used respiratory protection system.
Recommended Filter type: Filter type ABEK

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.

**Control of environmental exposure**
Do not let product enter drains.

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**SECTION 9: Physical and chemical properties**

9.1 **Information on basic physical and chemical properties**

- a) Physical state: liquid, clear
- b) Color: colorless
- c) Odor: No data available
- d) Melting point/freezing point: -18 °C
- e) Initial boiling point and boiling range: ca.203 °C at 1.013 hPa
- f) Flammability (solid, gas): No data available
- g) Upper/lower flammability or explosive limits: No data available
- h) Flash point: No data available
- i) Autoignition temperature: No data available
- j) Decomposition temperature: No data available
- k) pH: No data available
- l) Viscosity: Viscosity, kinematic: No data available
  Viscosity, dynamic: No data available
m) Water solubility  completely miscible
n) Partition coefficient:  No data available
   n-octanol/water
o) Vapor pressure  9.1 hPa at 25 °C
p) Density  1,664 g/mL at 25 °C
   Relative density  No data available
q) Relative vapor  No data available
density
r) Particle  No data available
characteristics
s) Explosive properties  Not explosive
t) Oxidizing properties  No data available

9.2 Other safety information
   No data available

SECTION 10: Stability and reactivity

10.1 Reactivity
   No data available

10.2 Chemical stability
   The product is chemically stable under standard ambient conditions (room temperature).
   Stable under recommended storage conditions.

10.3 Possibility of hazardous reactions
   Amines and alcohols cause exothermic reactions.

10.4 Conditions to avoid
   No information available

10.5 Incompatible materials
   Strong bases, Strong acids, Amines, Phosphorus halides, Alcohols, Organic materials,
   Powdered metals, Strong reducing agents, Strong oxidizing agents, 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 toxicity
   LD50 Oral - Rat - < 2.000 mg/kg
   (OECD Test Guideline 423)
   Symptoms: mucosal irritations, Cough, Shortness of breath, Possible damages:, damage of
   respiratory tract
   Dermal: No data available

The life science business of Merck operates as MilliporeSigma in
the US and Canada
Skin corrosion/irritation
Mixture causes severe burns.

Serious eye damage/eye irritation
Mixture causes serious eye damage. Risk of blindness!

Respiratory or skin sensitization
No data available

Germ cell mutagenicity
Test Type: Ames test
Test system: Salmonella typhimurium
Metabolic activation: with and without metabolic activation
Method: OECD Test Guideline 471
Result: negative

Carcinogenicity
No data available

Reproductive toxicity
No data available

Specific target organ toxicity - single exposure
No data available

Specific target organ toxicity - repeated exposure
Mixture may cause damage to organs through prolonged or repeated exposure. - Thyroid

Aspiration hazard
No data available

11.2 Additional Information

Endocrine disrupting properties

Product:
Assessment The substance/mixture does not contain components considered to have endocrine disrupting properties according to REACH Article 57(f) or Commission Delegated regulation (EU) 2017/2100 or Commission Regulation (EU) 2018/605 at levels of 0.1% or higher.
burning sensation, Cough, wheezing, laryngitis, Shortness of breath, spasm, inflammation and edema of the larynx, spasm, inflammation and edema of the bronchi, pneumonitis, pulmonary edema, Material is extremely destructive to tissue of the mucous membranes and upper respiratory tract, eyes, and skin., To the best of our knowledge, the chemical, physical, and toxicological properties have not been thoroughly investigated. Other dangerous properties can not be excluded.

Handle in accordance with good industrial hygiene and safety practice.

Components

Perchloric acid

Acute toxicity
LD50 Oral - Rat - 1.100 mg/kg
Lungs, Thorax, or Respiration: Dyspnea.
Inhalation: No data available
Dermal: No data available

**Skin corrosion/irritation**
Extremely corrosive and destructive to tissue.

**Serious eye damage/eye irritation**
Corrosive

**Respiratory or skin sensitization**
No data available

**Germ cell mutagenicity**
Test Type: Ames test
Test system: Salmonella typhimurium
Result: negative

**Carcinogenicity**
No data available

**Reproductive toxicity**
No data available

**Specific target organ toxicity - single exposure**
No data available

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

**Aspiration hazard**
No data available

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**SECTION 12: Ecological information**

### 12.1 Toxicity

**Mixture**

Toxicity to daphnia and other aquatic invertebrates: Immobilization EC50 - Daphnia magna (Water flea) - > 100 mg/l - 48 h (OECD Test Guideline 202)

### 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
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.

### 12.6 Endocrine disrupting properties

**Product:**
Assessment: The substance/mixture does not contain components considered to have endocrine disrupting properties according to REACH Article 57(f) or Commission
12.7 Other adverse effects
Do not empty into drains. Neutralization will not reduce ecotoxic effects.

Components

**Perchloric acid**

- Toxicity to fish
  - flow-through test EC50 - Lepomis macrochirus (Bluegill sunfish) - 1.470 mg/l - 96 h
  - (US-EPA)
  - Remarks: (in analogy to similar products)
  - The value is given in analogy to the following substances: Sodium perchlorate monohydrate

- Toxicity to daphnia and other aquatic invertebrates
  - static test EC50 - Daphnia magna (Water flea) - > 100 mg/l - 48 h
  - (OECD Test Guideline 202)

- Toxicity to algae
  - static test ErC50 - Pseudokirchneriella subcapitata (green algae) - > 435,7 mg/l - 72 h
  - (OECD Test Guideline 201)
  - Remarks: (in analogy to similar products)
  - The value is given in analogy to the following substances: Sodium perchlorate

- Toxicity to bacteria
  - static test EC50 - activated sludge - > 1.000 mg/l - 3 h
  - (ISO 8192)
  - Remarks: (in analogy to similar products)
  - The value is given in analogy to the following substances: Sodium perchlorate

**SECTION 13: Disposal considerations**

13.1 Waste treatment methods

**Product**
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**

14.1 UN number

- ADR/RID: 1873
- IMDG: 1873
- IATA: 1873

14.2 UN proper shipping name

- ADR/RID: PERCHLORIC ACID
- IMDG: PERCHLORIC ACID
- IATA: Perchloric acid
14.3 Transport hazard class(es)
ADR/RID: 5.1 (8)  
IMDG: 5.1 (8)  
IATA: 5.1 (8)

14.4 Packaging group
ADR/RID: I  
IMDG: I  
IATA: I

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

15.1 Safety, health and environmental regulations/legislation specific for the substance or mixture
This material safety data sheet complies with the requirements of Regulation (EC) No. 1907/2006.

National legislation

Other regulations
Observe work restrictions regarding maternity protection in accordance to Dir 92/85/EEC or stricter national regulations where applicable.
Take note of Dir 94/33/EC on the protection of young people at work.

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.
H271 May cause fire or explosion; strong oxidizer.
H272 May intensify fire; oxidizer.
H290 May be corrosive to metals.
H302 Harmful if swallowed.
H314 Causes severe skin burns and eye damage.
H315 Causes skin irritation.
H318 Causes serious eye damage.
H319 Causes serious eye irritation.
H373 May cause damage to organs (/$/*_2ORGAN_REPEAT$//) through prolonged or repeated exposure.

Further information
The above information is believed to be correct but does not purport to be all inclusive and shall be used only as a guide. The information in this document is based on the present state of our knowledge and is applicable to the product with regard to appropriate safety precautions. It does not represent any guarantee of the properties of the product. Sigma-Aldrich Corporation and its Affiliates shall not be held liable for any...
damage resulting from handling or from contact with the above product. See www.sigma-aldrich.com and/or the reverse side of invoice or packing slip for additional terms and conditions of sale.

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