

**Perchloric acid 0,1 mol/l in dioxane potentiometrically adjusted (deviation  $\pm 1\%$ )**

Revision: 11.03.2025

Product code: 11370

Page 1 of 13

**SECTION 1: Identification of the substance/mixture and of the company/undertaking****1.1. Product identifier**Perchloric acid 0,1 mol/l in dioxane potentiometrically adjusted (deviation  $\pm 1\%$ )

UFI: H5G0-X1MN-T00U-XM3R

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

Reagents and laboratory chemicals

Only for laboratory and analysis purposes.

**Uses advised against**

Do not use for private purposes (household).

**1.3. Details of the supplier of the safety data sheet**

Company name: AnalytiChem GmbH

ACD

Street: Stempelstraße 6

Place: D-47167 Duisburg

Telephone: 0203/5194-0

Telefax: 0203/5194-290

E-mail: info@analytichem.de

Contact person: Abteilung Produktsicherheit

Telephone: 0203/5194-107/117

E-mail: produktsicherheit@analytichem.de

Internet: www.analytichem.de

Responsible Department: Abteilung Produktsicherheit

**1.4. Emergency telephone number:**

For Hazardous Materials [or Dangerous Goods] Incidents Spill, Leak, Fire, Exposure, or Accident Call CHEMTREC Day or Night Within USA and Canada: 1-800-424-9300 Outside USA and Canada: +1 703-741-5970 (collect calls accepted)

**Further Information**

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

**SECTION 2: Hazards identification****2.1. Classification of the substance or mixture****Regulation (EC) No 1272/2008**

Flam. Liq. 2; H225

Carc. 1B; H350

Eye Irrit. 2; H319

STOT SE 3; H335

Full text of hazard statements: see SECTION 16.

**2.2. Label elements****Regulation (EC) No 1272/2008****Hazard components for labelling**

1,4-dioxane

**Signal word:** Danger**Pictograms:**

according to Regulation (EC) No 1907/2006

**Perchloric acid 0,1 mol/l in dioxane potentiometrically adjusted (deviation  $\pm 1\%$ )**

Revision: 11.03.2025

Product code: 11370

Page 2 of 13

**Hazard statements**

H225	Highly flammable liquid and vapour.
H319	Causes serious eye irritation.
H335	May cause respiratory irritation.
H350	May cause cancer.

**Precautionary statements**

P201	Obtain special instructions before use.
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/hearing protection.
P308+P313	IF exposed or concerned: Get medical advice/attention.
P403+P235	Store in a well-ventilated place. Keep cool.

**Special labelling of certain mixtures**

EUH019	May form explosive peroxides.
EUH066	Repeated exposure may cause skin dryness or cracking. Restricted to professional users.

**2.3. Other hazards**

No information available.

**SECTION 3: Composition/information on ingredients****3.2. Mixtures****Relevant ingredients**

CAS No	Chemical name			Quantity
	EC No	Index No	REACH No	
	Classification (Regulation (EC) No 1272/2008)			
123-91-1	1,4-dioxane			95 - < 100 %
	204-661-8	603-024-00-5	01-2119462837-26	
	Flam. Liq. 2, Carc. 1B, Eye Irrit. 2, STOT SE 3; H225 H350 H319 H335 EUH019 EUH066			

Full text of H and EUH statements: see section 16.

**Specific Conc. Limits, M-factors and ATE**

CAS No	EC No	Chemical name	Quantity
	Specific Conc. Limits, M-factors and ATE		
123-91-1	204-661-8	1,4-dioxane	95 - < 100 %
	oral: LD50 = ca. 5150 mg/kg		

**Further Information**

This product does not contain substances of very high concern according to Regulation (EC) No 1907/2006 (REACH), Article 57 above the respective regulatory concentration limit of = 0.1 % (w/w).

**SECTION 4: First aid measures****4.1. Description of first aid measures****General information**

No data available

**After inhalation**

Provide fresh air.  
Call a physician immediately.

**After contact with skin**

Wash immediately with: Water

**Safety Data Sheet**

according to Regulation (EC) No 1907/2006

**Perchloric acid 0,1 mol/l in dioxane potentiometrically adjusted (deviation  $\pm 1\%$ )**

Revision: 11.03.2025

Product code: 11370

Page 3 of 13

Take off immediately all contaminated clothing and wash it before reuse.

Call a physician immediately.

**After contact with eyes**

After contact with the eyes, rinse with water with the eyelids open for a sufficient length of time, then consult an ophthalmologist immediately.

Remove contact lenses, if present and easy to do. Continue rinsing.

**After ingestion**

Rinse mouth immediately and drink plenty of water.

Call a physician immediately.

**4.2. Most important symptoms and effects, both acute and delayed**

Irritant

Cough

Dyspnoea

Dizziness

Gastrointestinal complaints

Headache

Vomiting

Repeated exposure may cause skin dryness or cracking.

Has degreasing effect on the skin.

**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 spray jet, Carbon dioxide (CO<sub>2</sub>), Foam, Extinguishing powder.

**Unsuitable extinguishing media**

no restriction

**5.2. Special hazards arising from the substance or mixture**

Combustible liquid.

Vapours are heavier than air, spread along floors and form explosive mixtures with air.

Hazardous combustion products

In case of fire may be liberated:

Carbon dioxide (CO<sub>2</sub>) Carbon monoxide

Hydrogen fluoride

Beware of reignition.

**5.3. Advice for firefighters**

Remove persons to safety. Do not inhale explosion and combustion gases.

Avoid contact with skin, eyes and clothes.

In case of fire: Wear self-contained breathing apparatus.

Use water spray jet to protect personnel and to cool endangered containers.

**Additional information**

Collect contaminated fire extinguishing water separately. Do not allow entering drains or surface water.

Suppress gases/vapours/mists with water spray jet.

Move undamaged containers from immediate hazard area if it can be done safely.

**SECTION 6: Accidental release measures****6.1. Personal precautions, protective equipment and emergency procedures**

**Perchloric acid 0,1 mol/l in dioxane potentiometrically adjusted (deviation  $\pm 1\%$ )**

Revision: 11.03.2025

Product code: 11370

Page 4 of 13

**General advice**

Keep away from sources of ignition - No smoking.

This material can be ignited by heat, sparks, flames, or other sources of ignition (e.g., static electricity, pilot lights, mechanical/electrical equipment, and electronic devices such as cell phones, computers, calculators, and pagers which have not been certified as intrinsically safe).

Take action to prevent static discharges.

**For non-emergency personnel**

Provide adequate ventilation.

Use personal protection equipment.

Avoid contact with skin, eyes and clothes.

Remove persons to safety.

Emergency procedures

Consult an expert

Do not breathe dust/fume/gas/mist/vapours/spray.

**For emergency responders**

Precautionary statements For emergency responders : Personal protection equipment: see section 8

**6.2. Environmental precautions**

Do not allow to enter into surface water or drains.

The vapour of the product is heavier than air and may accumulate below ground level, in pits, channels and basements in higher concentration.

Danger of explosion

**6.3. Methods and material for containment and cleaning up****For containment**

Cover drains.

Prevent spread over a wide area (e.g. by containment or oil barriers).

Collect in closed and suitable containers for disposal.

Absorb with liquid-binding material (sand, diatomaceous earth, acid- or universal binding agents).

**For cleaning up**

Clean contaminated articles and floor according to the environmental legislation.

**Other information**

Provide adequate ventilation.

Do not breathe dust/fume/gas/mist/vapours/spray.

Wear breathing apparatus if exposed to vapours/dusts/aerosols.

**6.4. Reference to other sections**

Safe handling: see section 7

Personal protection equipment: see section 8

Disposal: see section 13

**SECTION 7: Handling and storage****7.1. Precautions for safe handling****Advice on safe handling**

Avoid exposure - obtain special instructions before use.

Read label before use. Handle and open container with care.

When using do not eat, drink, smoke, sniff. Keep container tightly closed.

Use personal protection equipment. Use extractor hood (laboratory).

Do not breathe vapour/aerosol. Provide adequate ventilation.

**Advice on protection against fire and explosion**

Take action to prevent static discharges. Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking.

**Perchloric acid 0,1 mol/l in dioxane potentiometrically adjusted (deviation  $\pm 1\%$ )**

Revision: 11.03.2025

Product code: 11370

Page 5 of 13

**Advice on general occupational hygiene**

Remove contaminated, saturated clothing immediately. Draw up and observe skin protection programme. Wash hands and face before breaks and after work and take a shower if necessary. When using do not eat or drink. The choice of body protection depends on the concentration and quantity of hazardous substances. The chemical resistance of protective agents must be clarified with their suppliers.

**Further information on handling**

Take off immediately all contaminated clothing and wash it before reuse.  
If handled uncovered, arrangements with local exhaust ventilation have to be used.  
Draw up and observe skin protection programme.  
Wash hands and face before breaks and after work and take a shower if necessary.

**7.2. Conditions for safe storage, including any incompatibilities****Requirements for storage rooms and vessels**

Keep container tightly closed. Keep in a cool, well-ventilated place. Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking.

**Hints on joint storage**

Do not store together with: Oxidising agent. Pyrophoric or self-heating substances.  
national regulations

**Further information on storage conditions**

Vapours may form explosive mixtures with air.  
Keep container dry.

**7.3. Specific end use(s)**

Laboratory use  
Laboratory chemical

**SECTION 8: Exposure controls/personal protection****8.1. Control parameters****Occupational exposure limits**

CAS No	Substance	ppm	mg/m <sup>3</sup>	fib/cm <sup>3</sup>	Category	Origin
123-91-1	1,4-Dioxane, tech. grade	20	73		TWA (8 h)	

**DNEL/DMEL values**

CAS No	Substance	Exposure route	Effect	Value
123-91-1	1,4-dioxane			
Worker DNEL, long-term		inhalation	systemic	73 mg/m <sup>3</sup>
Worker DNEL, acute		inhalation	local	144 mg/m <sup>3</sup>
Worker DNEL, long-term		dermal	systemic	21 mg/kg bw/day
Consumer DNEL, long-term		inhalation	systemic	18,25 mg/m <sup>3</sup>
Consumer DNEL, acute		inhalation	local	72 mg/m <sup>3</sup>
Consumer DNEL, long-term		dermal	systemic	12 mg/kg bw/day
Consumer DNEL, long-term		oral	systemic	0,24 mg/kg bw/day

**Perchloric acid 0,1 mol/l in dioxane potentiometrically adjusted (deviation  $\pm 1\%$ )**

Revision: 11.03.2025

Product code: 11370

Page 6 of 13

**PNEC values**

CAS No	Substance	
Environmental compartment		Value
123-91-1	1,4-dioxane	
Freshwater		10 mg/l
Freshwater (intermittent releases)		10 mg/l
Marine water		0,67 mg/l
Freshwater sediment		37 mg/kg
Micro-organisms in sewage treatment plants (STP)		2700 mg/l
Soil		0,153 mg/kg

**8.2. Exposure controls****Appropriate engineering controls**

Technical measures and the application of suitable work processes have priority over personal protection equipment.

If handled uncovered, arrangements with local exhaust ventilation have to be used.

**Individual protection measures, such as personal protective equipment****Eye/face protection**

Suitable eye protection: goggles.

**Hand protection**

Protective gloves are recommended Company KCL GmbH, D-36124 Eichenzell, email: [vertrieb@kcl.de](mailto:vertrieb@kcl.de) With specification (test according to EN374):

By long-term hand contact

Trade name/designation: KCL 897 Butoject®

Suitable material: Butyl caoutchouc (butyl rubber) 0,3 mm

Wearing time with permanent contact: > 480 min

By short-term hand contact

Trade name/designation: KCL 897 Butoject®

Suitable material: Butyl caoutchouc (butyl rubber) 0,3 mm

Wearing time with occasional contact (splashes): > 480 min

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](http://www.kcl.de)).

**Skin protection**

Flame-retardant protective clothing. Wear anti-static footwear and clothing

**Respiratory protection**

Respiratory protection necessary at: aerosol or mist formation

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**

The vapour of the product is heavier than air and may accumulate below ground level, in pits, channels and basements in higher concentration.

Danger of explosion

**Perchloric acid 0,1 mol/l in dioxane potentiometrically adjusted (deviation  $\pm 1\%$ )**

Revision: 11.03.2025

Product code: 11370

Page 7 of 13

**SECTION 9: Physical and chemical properties**

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

Physical state:	Liquid
Colour:	colourless
Odour:	like: Ether
Odour threshold:	No data available
Melting point/freezing point:	No data available
Boiling point or initial boiling point and boiling range:	No data available
Flammability:	not applicable
Lower explosion limits:	No data available
Upper explosion limits:	No data available
Flash point:	~11 °C
Auto-ignition temperature:	No data available
Decomposition temperature:	not determined
pH-Value:	No data available
Viscosity / kinematic:	No data available
Water solubility:	No data available
Solubility in other solvents	not determined
Partition coefficient n-octanol/water:	No data available
Vapour pressure:	No data available
Vapour pressure:	No data available
Density (at 20 °C):	1,03918 g/cm <sup>3</sup>
Bulk density:	No data available
Relative vapour density:	not determined

**9.2. Other information**

**Information with regard to physical hazard classes**

**Explosive properties**

Vapours can form explosive mixtures with air.

**Sustained combustibility:**

Sustained combustibility

**Self-ignition temperature**

Solid:

not applicable

Gas:

not applicable

**Oxidizing properties**

Not oxidising.

**Other safety characteristics**

Evaporation rate:	not determined
Solvent separation test:	No data available
Solvent content:	No data available
Solid content:	0
Sublimation point:	No data available
Softening point:	No data available
Pour point:	No data available
No data available:	
Viscosity / dynamic: (at 20 °C)	No data available
Flow time:	No data available

**Further Information**

**Perchloric acid 0,1 mol/l in dioxane potentiometrically adjusted (deviation  $\pm 1\%$ )**

Revision: 11.03.2025

Product code: 11370

Page 8 of 13

No data available

**SECTION 10: Stability and reactivity****10.1. Reactivity**

Highly flammable.

Vapours can form explosive mixtures with air.

**10.2. Chemical stability**

Protect against: Air

**10.3. Possibility of hazardous reactions**

Oxidising agent

Hydrogen

Acids

Nitric acid

**10.4. Conditions to avoid**

Keep away from sources of heat (e.g. hot surfaces), sparks and open flames.

**10.5. Incompatible materials**

plastics

Copper

Copper alloys

**10.6. Hazardous decomposition products**

No data available

**Further information**

No data available

**SECTION 11: Toxicological information****11.1. Information on hazard classes as defined in Regulation (EC) No 1272/2008****Toxicokinetics, metabolism and distribution**

Avoid exposure - obtain special instructions before use.

**Acute toxicity**

Based on available data, the classification criteria are not met.

Inhalation effect: Damage to the respiratory tract.

Mucous membrane irritation in the mouth, throat, esophagus and gastrointestinal tract.

**ATEmix calculated**

ATE (oral) &gt; 2000 mg/kg; ATE (dermal) &gt; 2000 mg/kg; ATE (inhalation vapour) &gt; 20 mg/l; ATE (inhalation dust/mist) &gt; 5 mg/l

CAS No	Chemical name				
	Exposure route	Dose	Species	Source	Method
123-91-1	1,4-dioxane				
	oral	LD50 ca. 5150 mg/kg	Rat	Study report (1973)	OECD Guideline 401

**Irritation and corrosivity**

Serious eye damage/eye irritation: Causes serious eye irritation.

Skin corrosion/irritation: Based on available data, the classification criteria are not met.

Repeated exposure may cause skin dryness or cracking.

**Sensitising effects**

Based on available data, the classification criteria are not met.



**Safety Data Sheet**

according to Regulation (EC) No 1907/2006

**Perchloric acid 0,1 mol/l in dioxane potentiometrically adjusted (deviation  $\pm 1\%$ )**

Revision: 11.03.2025

Product code: 11370

Page 9 of 13

**Carcinogenic/mutagenic/toxic effects for reproduction**

May cause cancer. (1,4-dioxane)

Germ cell mutagenicity: Based on available data, the classification criteria are not met.

Reproductive toxicity: Based on available data, the classification criteria are not met.

**STOT-single exposure**

May cause respiratory irritation. (1,4-dioxane)

**STOT-repeated exposure**

Based on available data, the classification criteria are not met.

**Aspiration hazard**

Based on available data, the classification criteria are not met.

**Specific effects in experiment on an animal**

No data available

**Additional information on tests**

No data available

**Practical experience**

No data available

**11.2. Information on other hazards****Other information**

Pulmonary oedema

Liver and kidney damage

**Further information**

Irritant

Cough

Dyspnoea

Dizziness

Gastrointestinal complaints

Headache

Vomiting

Repeated exposure may cause skin dryness or cracking.

Has degreasing effect on the skin.

**SECTION 12: Ecological information****12.1. Toxicity**

Based on available data, the classification criteria are not met.

**Perchloric acid 0,1 mol/l in dioxane potentiometrically adjusted (deviation  $\pm 1\%$ )**

Revision: 11.03.2025

Product code: 11370

Page 10 of 13

CAS No	Chemical name					
	Aquatic toxicity	Dose	[h]   [d]	Species	Source	Method
123-91-1	1,4-dioxane					
	Acute fish toxicity	LC50 mg/l	6700	96 h	Menidia beryllina	J. Hazard Mat. 1, 303-318. (1975) Method by Dawson
	Acute algae toxicity	ErC50 mg/l	> 1000	72 h	Pseudokirchneriella subcapitata	Publication (1996) OECD Guideline 201
	Acute crustacea toxicity	EC50 mg/l	> 1000	48 h	Daphnia magna	Publication (2002) OECD Guideline 202
	Fish toxicity	NOEC mg/l	> 103	32 d	Pimephales promelas	European Chemicals Bureau, Institute for other: internal test method ET-15-1987-1
	Crustacea toxicity	NOEC mg/l	1000	21 d	Daphnia magna	Publication (2002) OECD Guideline 211

**12.2. Persistence and degradability**

There are no data available on the mixture itself.

**12.3. Bioaccumulative potential**

There are no data available on the mixture itself.

**Partition coefficient n-octanol/water**

CAS No	Chemical name	Log Pow
123-91-1	1,4-dioxane	-0,42

**BCF**

CAS No	Chemical name	BCF	Species	Source
123-91-1	1,4-dioxane	0,3 - 0,7	Cyprinus carpio	EU Risk assessment r

**12.4. Mobility in soil**

There are no data available on the mixture itself.

**12.5. Results of PBT and vPvB assessment**

The substances in the mixture do not meet the PBT/vPvB criteria according to REACH, annex XIII.

**12.6. Endocrine disrupting properties**

This product does not contain a substance that has endocrine disrupting properties with respect to non-target organisms as no components meets the criteria.

**12.7. Other adverse effects**

Do not empty into drains.

**Further information**

Avoid release to the environment.

**SECTION 13: Disposal considerations****13.1. Waste treatment methods****Disposal recommendations**

Do not allow to enter into surface water or drains.

Waste disposal according to directive 2008/98/EC, covering waste and dangerous waste.

Do not empty into drains.

**Contaminated packaging**

The allocation of waste identity numbers/waste descriptions must be carried out according to the EEC, specific to the industry and process.

**Perchloric acid 0,1 mol/l in dioxane potentiometrically adjusted (deviation  $\pm 1\%$ )**

Revision: 11.03.2025

Product code: 11370

Page 11 of 13

Handle contaminated packages in the same way as the substance itself.

**SECTION 14: Transport information**

**Land transport (ADR/RID)**

<b>14.1. UN number or ID number:</b>	UN 1993
<b>14.2. UN proper shipping name:</b>	FLAMMABLE LIQUID, N.O.S. (1,4-dioxane)
<b>14.3. Transport hazard class(es):</b>	3
<b>14.4. Packing group:</b>	II
Hazard label:	3
Classification code:	F1
Special Provisions:	274 601 640D
Limited quantity:	1 L
Excepted quantity:	E2
Transport category:	2
Hazard No:	33
Tunnel restriction code:	D/E

**Inland waterways transport (ADN)**

<b>14.1. UN number or ID number:</b>	UN 1993
<b>14.2. UN proper shipping name:</b>	FLAMMABLE LIQUID, N.O.S. (1,4-dioxane)
<b>14.3. Transport hazard class(es):</b>	3
<b>14.4. Packing group:</b>	II
Hazard label:	3
Classification code:	F1
Special Provisions:	274 601 640D
Limited quantity:	1 L
Excepted quantity:	E2

**Marine transport (IMDG)**

<b>14.1. UN number or ID number:</b>	UN 1993
<b>14.2. UN proper shipping name:</b>	FLAMMABLE LIQUID, N.O.S. (1,4-dioxane)
<b>14.3. Transport hazard class(es):</b>	3
<b>14.4. Packing group:</b>	II
Hazard label:	3
Special Provisions:	274
Limited quantity:	1 L
Excepted quantity:	E2
EmS:	F-E, S-E

**Air transport (ICAO-TI/IATA-DGR)**

<b>14.1. UN number or ID number:</b>	UN 1993
<b>14.2. UN proper shipping name:</b>	FLAMMABLE LIQUID, N.O.S. (1,4-dioxane)
<b>14.3. Transport hazard class(es):</b>	3
<b>14.4. Packing group:</b>	II
Hazard label:	3
Special Provisions:	A3
Limited quantity Passenger:	1 L
Passenger LQ:	Y341
Excepted quantity:	E2
IATA-packing instructions - Passenger:	353
IATA-max. quantity - Passenger:	5 L
IATA-packing instructions - Cargo:	364
IATA-max. quantity - Cargo:	60 L

**14.5. Environmental hazards**

according to Regulation (EC) No 1907/2006

**Perchloric acid 0,1 mol/l in dioxane potentiometrically adjusted (deviation  $\pm 1\%$ )**

Revision: 11.03.2025

Product code: 11370

Page 12 of 13

ENVIRONMENTALLY HAZARDOUS: No

**14.6. Special precautions for user**

Warning: Combustible liquid.

**14.7. Maritime transport in bulk according to IMO instruments**

not applicable

**SECTION 15: Regulatory information****15.1. Safety, health and environmental regulations/legislation specific for the substance or mixture****EU regulatory information**

Authorisations (REACH, annex XIV):

Substances of very high concern, SVHC (REACH, article 59):

1,4-dioxane

Restrictions on use (REACH, annex XVII):

Entry 3, Entry 40, Entry 75

Information according to Directive  
2012/18/EU (SEVESO III):

P5c FLAMMABLE LIQUIDS

**National regulatory information**

Employment restrictions:

Observe restrictions to employment for juveniles according to the 'juvenile work protection guideline' (94/33/EC). Observe employment restrictions under the Maternity Protection Directive (92/85/EEC) for expectant or nursing mothers.

Water hazard class (D):

2 - obviously hazardous to water

**SECTION 16: Other information****Changes**

This data sheet contains changes from the previous version in section(s): 1,9,12.

**Abbreviations and acronyms**

Flam. Liq. 2: Flammable liquids, hazard category 2

Eye Irrit. 2: Eye irritation, hazard category 2

Carc. 1B: Carcinogenicity, hazard category 1B

STOT SE 3: Specific target organ toxicity - single exposure, hazard category 3

ADR: Accord européen sur le transport des marchandises dangereuses par Route

(European Agreement concerning the International Carriage of Dangerous Goods by Road)

IMDG: International Maritime Code for Dangerous Goods

IATA: International Air Transport Association

GHS: Globally Harmonized System of Classification and Labelling of Chemicals

EINECS: European Inventory of Existing Commercial Chemical Substances

ELINCS: European List of Notified Chemical Substances

CAS: Chemical Abstracts Service

LC50: Lethal concentration, 50%

LD50: Lethal dose, 50%

**Classification for mixtures and used evaluation method according to Regulation (EC) No 1272/2008 [CLP]**

Classification	Classification procedure
Flam. Liq. 2; H225	On basis of test data
Carc. 1B; H350	Calculation method
Eye Irrit. 2; H319	Calculation method
STOT SE 3; H335	Calculation method

**Relevant H and EUH statements (number and full text)**

**Safety Data Sheet**

according to Regulation (EC) No 1907/2006

**Perchloric acid 0,1 mol/l in dioxane potentiometrically adjusted (deviation  $\pm 1\%$ )**

Revision: 11.03.2025

Product code: 11370

Page 13 of 13

H225	Highly flammable liquid and vapour.
H319	Causes serious eye irritation.
H335	May cause respiratory irritation.
H350	May cause cancer.
EUH019	May form explosive peroxides.
EUH066	Repeated exposure may cause skin dryness or cracking.

**Further Information**

Provide appropriate information, instructions and training to users

The above information describes exclusively the safety requirements of the product and is based on our present-day knowledge. The information is intended to give you advice about the safe handling of the product named in this safety data sheet, for storage, processing, transport and disposal. The information cannot be transferred to other products. In the case of mixing the product with other products or in the case of processing, the information on this safety data sheet is not necessarily valid for the new made-up material. The information is based on the present level of our knowledge. It does not, however, give assurance of product properties and establishes no contract legal rights.

The receiver of our product is singularly responsible for adhering to existing laws and regulations.

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*(The data for the relevant ingredients were taken respectively from the last version of the sub-contractor's safety data sheet.)*