SAFETY DATA SHEET (SDS)

in accordance with Regulation (EC) No 1907/2006 (REACH), Annex II — Regulation (EU) 2020/878

Date: 21.10.2026 | Version: 7 | EN

hydrogen chloride

chlorane

CAS 7647-01-0

ClH | EC 933-977-5

MOLAR MASS	LOGP
36.46	0.25 (pomiar: CRC Handbook 105th ed. (Haynes 2024))

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HAZARD CLASSIFICATION (GHS / CLP)



Danger

H314 | H335

Hazard class scope limited to the harmonised classification (CLP Annex VI); classes outside the harmonised entry may require supplier self-classification (CLP Art. 4(3)) — verify with the supplier safety data sheet.

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

1.1 Substance name	hydrogen chloride
1.1 IUPAC name	chlorane
1.1 CAS number	7647-01-0
1.1 EC number	933-977-5
1.1 PubChem CID	313
1.1 InChIKey	VEXZGXHMUGYJMC-UHFFFAOYSA-N
1.1 SMILES	Cl
1.1 Molecular formula	ClH [7]
1.1 Molar mass	36.46 g/mol [7]
1.1 Exact mass	35.9767 Da [7]

1.2 Uses

For laboratory and research purposes. Not for use in the production of food, medicines or cosmetics without appropriate authorisation.

1.3 Details of the supplier

REFERENCE COPY — NO SUPPLIER DETAILS — NOT FOR DISTRIBUTION	Supplier details are not included in this reference copy. The supplier placing the substance on the market must complete this section and remains responsible for the sheet under REACH. MolGod.org prepares documentation and is not the supplier of this substance.

1.4 Emergency telephone number

Emergency telephone	112 (EU-wide emergency number)

Contact the poison centre designated in the country of placing on the market (CLP Art. 45).

2. Hazards identification

GHS:



PPE:



Danger

Hazard statements (H) [3][4][11]

H314	Causes severe skin burns and eye damage
H335	May cause respiratory irritation

Precautionary statements (P) [3][4][11]

P260	Do not breathe dust/fume/gas/mist/vapours/spray
P264	Wash thoroughly after handling
P271	Use only outdoors or in a well-ventilated area
P280	Wear protective gloves/protective clothing/eye protection/face protection
P301+P330+P331	IF SWALLOWED: Rinse mouth; Do NOT induce vomiting
P303+P361+P353	IF ON SKIN (or hair): Take off immediately all contaminated clothing; Rinse skin with water or shower
P304+P340	IF INHALED: Remove person to fresh air and keep comfortable for breathing
P305+P351+P338	IF IN EYES: Rinse cautiously with water for several minutes; Remove contact lenses, if present and easy to do. Continue rinsing
P310	Immediately call a POISON CENTER or doctor/physician
P312	Call a POISON CENTER or doctor/physician if you feel unwell
P321	Specific treatment
P363	Wash contaminated clothing before reuse
P403+P233	Store in a well-ventilated place: Keep container tightly closed
P405	Store locked up
P501	Dispose of contents/container to an approved waste collection point

Hazard class scope limited to the harmonised classification (CLP Annex VI); classes outside the harmonised entry may require supplier self-classification (CLP Art. 4(3)) — verify with the supplier safety data sheet.

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3. Composition/information on ingredients

Substance type	solution (commercial form)
CAS Number	7647-01-0
EC number	933-977-5
Molecular formula	ClH
Concentration	~35% (aqueous solution)
Clp index no	017-002-01-X

4. First aid measures



Inhalation

Move the affected person to fresh air. Keep at rest. If not breathing: artificial respiration (qualified personnel only). [1][2][19]

Skin contact

Remove contaminated clothing. Rinse skin with soap and water (min. 15 minutes). Call a physician immediately. [1][2][19]

Eye contact

Rinse eyes with running water (min. 15 minutes). Remove contact lenses if possible. If irritation persists — consult an ophthalmologist. [1][2][19]

Ingestion

Do NOT induce vomiting (unless directed by a physician). Rinse mouth with water. Never give anything by mouth to an unconscious person. Emergency number: 112 (EU-wide). Contact the poison centre designated in your country (CLP Art. 45). [1][2][19]

Symptoms and effects

cough, shortness of breath, headache, dizziness; skin redness and irritation. [3][11]

Notes for physician

Requires verification

Emergency numbers: Emergency: 112 (EU-wide). Poison centre: as designated in the country of placing on the market (CLP Art. 45).

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5. Firefighting measures

Suitable extinguishing media	Adapt extinguishing media to surroundings. CO2, dry powder, foam.
Unsuitable extinguishing media	No specific restrictions.
Specific hazards	Thermal decomposition products: HCl (hydrogen chloride). [20]
Advice for firefighters	Use self-contained breathing apparatus (SCBA). Full protective suit.
Flash point note	Non-flammable (aqueous solution)

6. Accidental release measures

Personal precautions	Use personal protective equipment (see Section 8). Avoid breathing vapours. [1][2][19]
Environmental precautions	Prevent entry into sewers, groundwater and surface water. [1][2][19]
Methods for containment and cleaning up	1. Ventilate — HCl vapours are irritating 2. PPE: butyl + face shield + E1P2 half-mask 3. SLOWLY neutralise with slaked lime (Ca(OH)2) or baking soda (NaHCO3) 4. Cover with inert absorbent (vermiculite, diatomaceous earth) 5. Do NOT use sawdust (flammable) 6. Collect into an HDPE container, neutralising to pH 6-9 7. Wash the area with water
Related sections	8; 13
Large spill	1. EVACUATE 5-10m, monitor HCl gas level (>5 ppm = danger) 2. FULL PPE: acid-resistant suit + full-face mask E2P3 3. Contain with slaked lime (Ca(OH)2) — EXOTHERMIC REACTION, cool 4. Do NOT use pressurized water (splashing + HCl fumes) 5. Water mist from a distance is OK 6. Collect by pump into a PE drum with stepwise neutralization 7. Notify WIOŚ (environmental protection inspectorate) if >50L
Absorbent	vermiculite + Ca(OH)2
HAZMAT response required	Yes
Required PPE	Gloves: butyl rubber (>0.6mm); Safety goggles: Yes; Face shield: Yes; Respiratory protection: half mask E1P2; Protective clothing: PVC apron

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7. Handling and storage

Precautions	Work in a fume hood or with adequate ventilation. No eating, drinking or smoking in the work area. [1][2][19]
Storage temperature	Store at room temperature (15-25°C) or as indicated on the label. [1][2][19]
Humidity	Store in a dry place (<60% RH). [1][2][19]
Light	Protect from direct sunlight. [1][2][19]
Incompatible materials	Strong oxidizers, strong bases, Base metals (hydrogen evolution). [20]

8. Exposure controls/personal protection

8.1 Control parameters

OEL — NDS (Poland)	NDS = 5 mg/m³ (TWA) · NDSCh = 10 mg/m³ (STEL) — Rozp. MRiPS Dz.U.2024 poz.1017 [24]
OEL (EU)	OEL-TWA: 5 ppm (8 mg/m³) · OEL-STEL: 10 ppm (15 mg/m³) — IOELV 2000/39/EC [12]

DNEL	No data available.
PNEC	No data available.

8.2 Personal protective equipment (PPE) [5][6][21]



9. Physical and chemical properties

Property (item 9.1)	Value	Source
Physical state	Liquid	
Colour	Colorless gas [7]	
Odour	Pungent, irritating odor [7]	
pH (1% aqueous solution)	No data available.	
Melting point	approx. −25°C (~35% solution)	*Curated list (commercial form)*
Boiling point	approx. 48–110°C depending on concentration (azeotrope 20,2% boils at 108,6°C) (experimental data)	*Curated list (commercial form)*
Flash point	Non-flammable (aqueous solution)	*Curated list (commercial form)*
Flammability	No data available.	
Lower and upper explosion limit	No data available.	
Density (20°C)	1,16–1,18 g/cm³ (~35% solution, 20°C) (experimental data)	*Curated list (commercial form)*
Vapour pressure	4326.566 kPa (32452 mmHg, 21.1°C) (experimental data) [7]	
Relative vapour density	No data available.	
Dynamic viscosity	0.405 mPa·s [7]	
Kinematic viscosity	No data available.	
Refractive index nD^{20}	1.254 (experimental data) [7]	
Auto-ignition temperature	No data available.	
Decomposition temperature	Not applicable	
Water solubility	No data available.	
Particle characteristics	Not applicable (REACH 9.1(r))	

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Property (item 9.1)	Value	Source
log Kow (XLogP3)	Not applicable — substance ionizes in water (solution) [7]	*Curated list (commercial form)*
Molar mass	36.46 g/mol [7]	
Molecular formula	ClH [7]	

Where a property above reads "No data available", no measured value was found in the public sources consulted for this substance. The property has not been determined by MolGod.org and no value is inferred. "Not applicable" means the property has no meaning for this substance in the form supplied.

10. Stability and reactivity

Reactivity	Stable under normal storage and handling conditions.
Chemical stability	Thermally stable under recommended conditions.
Hazardous reactions	No hazardous reactions known under normal conditions.
Conditions to avoid	High temperatures, direct sunlight, moisture.
Incompatible materials	Strong oxidizers, strong bases, Base metals (hydrogen evolution).
Decomposition products	Thermal decomposition products: HCl (hydrogen chloride).

11. Toxicological information

LD50 (oral)	700 mg/kg (rat) [9][10]
LD50 (dermal)	No data available.
LC50 (inhalation)	No data available.
Skin irritation	Category 1 (H314) — corrosive; sub-category (1A/1B/1C) per CLP Annex VI entry. [3][11]
Eye irritation	Serious eye damage — covered by the corrosive classification (H314; CLP Annex I 3.3.2.1). [3][11]
Sensitisation	Not classified for this hazard (outside the scope of the harmonised classification in CLP Annex VI; verify supplier self-classification) [3][11]
Mutagenicity	Not classified for this hazard (outside the scope of the harmonised classification in CLP Annex VI; verify supplier self-classification) [3][11]
Carcinogenicity	No harmonised CLP classification as carcinogenic; for carcinogenicity assessment see the IARC classification below. [22]
IARC classification (carcinogenicity)	IARC Group 3 — not classifiable as to its carcinogenicity to humans. [local snapshot — not verified against the current IARC list] [22]
Reproductive toxicity	Not classified for this hazard (outside the scope of the harmonised classification in CLP Annex VI; verify supplier self-classification) [3][11]
STOT — single exposure	Category 3 (H335): May cause respiratory irritation. [3][11]
STOT — repeated exposure	Not classified for this hazard (outside the scope of the harmonised classification in CLP Annex VI; verify supplier self-classification) [3][11]
Aspiration hazard	Not classified for this hazard (outside the scope of the harmonised classification in CLP Annex VI; verify supplier self-classification) [3][11]

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12. Ecological information

Aquatic toxicity	LC_{50} (fish, 96h): 282 mg/L (Gambusia affinis, 96h, pH-dependent)
Persistence / biodegradability	Mineral acid — not biodegradable. Neutralized by alkaline buffers in natural waters ($CO3^{2-}$/$HCO3^{-}$).
Bioaccumulative potential	No data available.
Mobility in soil	No data available.
PBT/vPvB assessment	Not applicable (inorganic substance)
Endocrine disrupting properties	Reported endocrine effects in aquatic organisms (ecotoxicological data, US EPA ECOTOX; not a regulatory ED classification under 2018/605). [23]

13. Disposal considerations

Disposal method	Slow neutralisation with 10% NaOH or Ca(OH)2 to pH 6-9, continuous measurement, temperature control (strongly exothermic). After neutralisation → NaCl brine + water → discharge to the sewer WITH WIOŚ APPROVAL.
Waste code (EWC)	06 01 02* — Hydrochloric acid [18]
Packaging	Cleaned packaging may be recycled. Contaminated packaging must be treated as hazardous waste.
Licensed waste contractors (PL)	Ekoindustrol Sp. z o.o.; PCC Rokita SA
BDO required	Yes

14. Transport information



Class 8 — Corrosive substances

UN number	UN 1789 [15]
Proper shipping name	HYDROCHLORIC ACID [15]
Transport hazard class	8 — Corrosive substances [15]
Packing Group	II [15]
Environmental hazard	Not classified as environmentally hazardous for transport (no H400/H410/H411 in CLP Annex VI; no marine pollutant mark required) [3]
Special precautions	Handle as dangerous goods according to the assigned class (ADR/IMDG/IATA); apply the precautions appropriate to that class.
CN/HS code	2806 10 00 [17]
Notes	Transport classification per ADR / UN Model Regulations (UN number, class and packing group above). Verify the ADR/IMDG/IATA edition in force on the date of shipment. [15]
EmS code (IMDG)	F-A, S-B [16]
Tunnel restriction code (ADR)	(E)
Limited quantities (LQ)	1 L (LQ22)
Marine pollutant	No

15. Regulatory information

SVHC status	SVHC status not verified against the available dataset — check the current ECHA Candidate List; do not assume absence. [1]
REACH Annex XIV	Not verified against the ECHA Authorisation List — check REACH Annex XIV. [1]
REACH Annex XVII	Not confirmed in the available Annex XVII dataset — verify against the current ECHA list before placing on the market; do not assume absence of restriction. [1]
REACH registration number	01-2119484862-27-XXXX (the last part of the number is confidential — the full number is held by the registrant; verify with ECHA)

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Index number (CLP Annex VI)	017-002-01-X
Harmonised classification	Yes (solution — index 017-002-01-X)
IARC classification (carcinogenicity)	Group 3 — not classifiable as to its carcinogenicity to humans (hydrochloric acid/HCl). Note: the separate IARC monograph on mists of strong inorganic acids containing sulfuric acid (Group 1) does NOT apply to pure HCl.
OEL — Journal of Laws (Poland)	Dz.U. 2024 poz. 1017 (NDS 5 mg/m³, NDSCh 10 mg/m³)

16. Other information

Legal status of classification: harmonised under CLP Annex VI — Reg. (EC) No 1272/2008 (as at the date of issue).Entries with an entry-into-force date after 21.10.2026 were omitted as future (not yet applicable).

Data aggregated automatically from public reference databases (PubChem, ECHA, NIST and others).

Scientific citations (5)

Nathalia M. C. Tolentino, Luana S. M. Forezi. *Hydrochloric Acid (CAS No. 7647-01-0)*. Revista Virtual de Química (2014). DOI: 10.5935/1984-6835.20140072

Hydrogen Chloride 7647-01-0. Sax's Dangerous Properties of Industrial Materials (2012). DOI: 10.1002/0471701343.sdp13942

Hydrochloric Acid 7647-01-0. Sax's Dangerous Properties of Industrial Materials (2012). DOI: 10.1002/0471701343.sdp13908

Kim SY, Yoon JH, Jung DH et al.. *Fexuprazan safeguards the esophagus from hydrochloric acid-induced damage by suppressing NLRP1/Caspase-1/GSDMD pyroptotic pathway.*. Frontiers in immunology (2024). DOI: 10.3389/fimmu.2024.1410904

Schneider C, Nürnberger S. *Decellularization of Articular Cartilage: A Hydrochloric Acid-Based Strategy.*. Methods in molecular biology (Clifton, N.J.) (2023). DOI: 10.1007/978-1-0716-2839-3_21

Full text of H statements

H314	Causes severe skin burns and eye damage
H335	May cause respiratory irritation

Full text of P statements

P260	Do not breathe dust/fume/gas/mist/vapours/spray
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P312	Call a POISON CENTER or doctor/physician if you feel unwell
P321	Specific treatment
P363	Wash contaminated clothing before reuse
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P405	Store locked up
P501	Dispose of contents/container to an approved waste collection point

Abbreviations

ADR	European Agreement concerning the International Carriage of Dangerous Goods by Road
ATE	Acute Toxicity Estimate
CAS	Chemical Abstracts Service
CLP	Classification, Labelling and Packaging (Reg. (EC) 1272/2008)

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CMR	Carcinogenic, Mutagenic, toxic to Reproduction
DNEL	Derived No-Effect Level
EC	European Community number
EPI	Personal protective equipment
GHS	Globally Harmonized System
IATA	International Air Transport Association
IMDG	International Maritime Dangerous Goods Code
SDS	Safety Data Sheet
LC50	Lethal Concentration, 50%
LD50	Lethal Dose, 50%
NDS	Maximum admissible concentration (workplace, PL)
NDSCh	Short-term exposure limit (PL)
OEL	Occupational Exposure Limit
PBT	Persistent, Bioaccumulative and Toxic
PNEC	Predicted No-Effect Concentration
REACH	Registration, Evaluation, Authorisation and Restriction of Chemicals (Reg. (EC) 1907/2006)
STOT	Specific Target Organ Toxicity
SVHC	Substance of Very High Concern
TPSA	Topological Polar Surface Area
vPvB	very Persistent and very Bioaccumulative

Version history

v7 (21.10.2026)	Based on ECHA harmonised classification (Annex VI to CLP, ATP 23).

References

[1] EP and Council. Reg.(EC) No 1907/2006 (REACH). Art.31, Annex II. OJ EU L 396/2006. URL: https://eur-lex.europa.eu/eli/reg/2006/1907/oj Accessed: 2026-10-21.

[2] European Commission. Reg.(EU) 2020/878 — amending Annex II REACH. OJ EU L 203/2020. From 01.01.2023. URL: https://eur-lex.europa.eu/eli/reg/2020/878/oj Accessed: 2026-10-21.

[3] EP and Council. Reg.(EC) 1272/2008 (CLP) + ATP 23. OJ EU L 353/2008. (2026-07-07) URL: https://eur-lex.europa.eu/eli/reg/2008/1272/oj Accessed: 2026-10-21.

[4] United Nations. GHS Rev.9. ST/SG/AC.10/30/Rev.9. New York and Geneva: United Nations, 2021. URL: https://unece.org/transport/dangerous-goods/ghs-rev9-2021 Accessed: 2026-10-21.

[5] ISO. ISO 7010:2019 — Graphical symbols. Safety signs. URL: https://www.iso.org/standard/72424.html Accessed: 2026-10-21.

[6] ISO. ISO 3864-1:2011 — Safety colours and safety signs. URL: https://www.iso.org/standard/51021.html Accessed: 2026-10-21.

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[9] OECD. Screening Information Data Set (SIDS) — Initial Assessment Report. UNEP Publications. URL: https://hpvchemicals.oecd.org

[10] NIOSH. Registry of Toxic Effects of Chemical Substances (RTECS). Cincinnati: NIOSH. URL: https://www.cdc.gov/niosh/rtecs

[11] ECHA. European Chemicals Agency — harmonised classification inventory (CLP Annex VI). URL: https://echa.europa.eu

[12] European Commission. Directive 2006/15/EC establishing a second list of indicative occupational exposure limit values. OJ EU L 38/36. URL: https://eur-lex.europa.eu/eli/dir/2006/15/oj

[13] European Parliament and Council. Regulation (EC) No 273/2004 on drug precursors, Annex I. OJ EU L 47/1. URL: https://eur-lex.europa.eu/eli/reg/2004/273/oj

[14] Council of the European Union. Regulation (EC) No 111/2005 laying down rules for the monitoring of trade between the Union and third countries in drug precursors. OJ EU L 22/1. URL: https://eur-lex.europa.eu/eli/reg/2005/111/oj

[15] UNECE. European Agreement concerning the International Carriage of Dangerous Goods by Road (ADR), 2025 edition (ECE/TRANS/352). Geneva: United Nations. URL: https://unece.org/adr

[16] IMO. International Maritime Dangerous Goods (IMDG) Code, 2024 ed. (Amendment 42-24, Res. MSC.556(108)). London: International Maritime Organization. URL: https://www.imo.org

[17] European Commission. Combined Nomenclature (Council Regulation (EEC) No 2658/87). Chapter 29. OJ EU L 256. URL: https://eur-lex.europa.eu/eli/reg/1987/2658/oj

[18] European Commission. Decision 2000/532/EC establishing a list of wastes (European Waste Catalogue). OJ EU L 226/3. URL: https://eur-lex.europa.eu/eli/dec/2000/532/oj

[19] European Chemicals Agency (ECHA). Guidance on the Compilation of Safety Data Sheets. Version 4.0. Helsinki: European Chemicals Agency, 2020. URL: https://echa.europa.eu/documents/10162/2324906/sds_en.pdf

[20] Urben, P.G., ed. Bretherick's Handbook of Reactive Chemical Hazards. 8th ed. Oxford: Academic Press.

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[23] U.S. EPA. ECOTOX Knowledgebase. Washington, DC: U.S. Environmental Protection Agency. URL: https://cfpub.epa.gov/ecotox/

[24] MRiPS Regulation of 12.06.2018 — NDS/NDN. Journal of Laws 2024 item 1017. URL: https://isap.sejm.gov.pl/isap.nsf/DocDetails.xsp?id=WDU20240001017 Accessed: 2026-10-21.

External links

NIST: https://webbook.nist.gov/cgi/cbook.cgi?ID=7647-01-0

ChEMBL: https://www.ebi.ac.uk/chembl/compound_report_card/CHEMBL1231821

NFPA 704 (supplementary information — NFPA/USA system; not a required element of an EU safety data sheet under REACH Annex II)



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