



NEWAY SINOPHC TECH. LIMITED

ADD:RM. 204, BUILDING 3, NO. 188, AONA RD., CHINA (SHANGHAI) PILOT FREE TRADE ZONE.
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Safety Data Sheet (MSDS)

(According to GB/T 16483 and GB/T 17519; Adapts to GHS, IMDG, IATA Standards)

Hydrochloric Acid (Purity \geq 31.0%, Industrial Grade, Aqueous Solution)

SECTION 1: Identification

1.1 Product Identifiers - Product Name: Hydrochloric Acid - Product Number: HCl-20280203 - Brand: SIGALD - CAS-No.: 7647-01-0 - Synonyms: Muriatic acid; Hydrogen chloride solution - Chemical Family: Inorganic strong acid - Concentration: \geq 31.0% (w/w) HCl, \leq 0.002% total impurities, balance water

1.2 Details of the supplier of the safety data sheet

- Company : NEWAY SINOPHC TECH. LIMITED
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- Telephone : +86-021-50350029
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1.3 Emergency telephone

Emergency Phone # : +86-021-50350029
(CHEMTREC)

1.4 Uses & Restrictions - Identified Uses: Chemical synthesis (dyes, pharmaceuticals, fertilizers); metal pickling and surface treatment; water treatment pH adjuster and scale remover; food processing (food-grade, pH adjustment); laboratory reagent; ore processing. - Uses Advised Against: Direct contact with food/cosmetics without purification; use in unventilated areas without PPE; mixing with water in reverse order (water into acid); mixing with strong bases, cyanides or oxidants without protection.

SECTION 2: Hazards Identification

2.1 GHS Classification: Skin corrosion/irritation (Category 1A); Eye damage/irritation (Category 1); Specific target organ toxicity (single exposure, respiratory tract, Category 3); Aquatic hazard (Category 1)

2.2 GHS Label Elements - Hazard Pictogram: (Toxic/Corrosive) + (Aquatic hazard) - Signal Word: DANGER - Hazard Statements: H314 (Causes severe skin burns and eye damage); H335 (May cause respiratory irritation); H400 (Very toxic to aquatic life) - Precautionary Statements: P201, P202, P260, P261, P264, P270, P271, P273, P280, P301+P330+P331, P303+P361+P353, P304+P340+P310, P305+P351+P338+P310, P310 (Immediately call a poison center or doctor/physician), P321, P363, P405, P501

2.3 Physical/Chemical Hazards: Colorless to pale yellow transparent liquid; pungent irritating odor; highly volatile (releases HCl gas at room temperature); highly soluble in water (exothermic); strong corrosive and acidic; reacts violently with strong bases (e.g., NaOH, KOH) to generate heat and splashing; reacts with cyanides to produce toxic HCN gas; reacts with metals (Fe, Zn, Al) to generate flammable H₂ gas; contact with oxidants (e.g., MnO₂) releases toxic Cl₂ gas.

2.4 Health Hazards: Skin contact causes severe burns, blistering, tissue necrosis and scarring (irreversible); eye contact causes severe burns, corneal damage and possible blindness (irreversible); inhalation of HCl gas/mist causes severe respiratory tract irritation, coughing, chest pain, throat burns and difficulty breathing; chronic inhalation may damage nasal mucosa and teeth (erosion); oral ingestion causes severe burns to mouth, esophagus and stomach, vomiting (blood-tinged), abdominal pain, shock and even death.

2.5 Environmental Hazards: Very toxic to aquatic organisms (fish, algae, invertebrates); highly persistent in water bodies; low bioaccumulation potential (BCF <100); causes severe water acidification (lowers pH sharply) if spilled, destroying aquatic ecosystems; may contaminate soil and groundwater, inhibiting plant growth and damaging soil microorganisms.

SECTION 3: Composition/Information on Ingredients

Substance/Mixture: Mainly solution ($\geq 31.0\%$ active ingredient), trace impurities

Component	Content (w/w)	CAS-No.	Hazard Classification
Hydrochloric Acid (HCl)	$\geq 31.0\%$	7647-01-0	Skin Corr. 1A; Eye Dam. 1; STOT-SE 3; Aquatic Tox. 1
Water (H ₂ O)	68.5-69.0%	7732-18-5	Non-hazardous
Impurities (Fe, Pb, SO ₄ ²⁻)	$\leq 0.001\%$	Mixture	Non-hazardous (trace)

SECTION 4: First Aid Measures

- Inhaled: Remove to fresh air immediately; keep the affected person in a semi-recumbent position, maintain airway patency; if breathing is difficult, give oxygen; do not give mouth-to-mouth resuscitation (risk of burns); seek emergency medical help immediately. - Skin Contact: Remove contaminated clothing and shoes immediately; rinse the affected area thoroughly with plenty of cold running water for at least 15 minutes (do not use hot water); do not rub or apply ointment; seek emergency medical help immediately (even if no obvious burns are visible). - Eye Contact: Hold eyelids open; rinse eyes continuously with plenty of cold running water (or normal saline) for at least 20 minutes (flush from inner to outer corner); do not rub eyes or use eye drops; seek emergency medical help immediately (irreversible damage may occur quickly). - Swallowed: Do not induce vomiting (may cause secondary burns to esophagus); rinse mouth with water (do not swallow); give 200-300 mL of water or milk (only if conscious and able to swallow); do not give alkaline substances (avoid violent neutralization); seek emergency medical help immediately, bring this MSDS.

SECTION 5: Firefighting Measures

- Suitable Extinguishing Media: Water spray (cooling only), dry powder, foam, CO₂; do not use direct water jet on concentrated solution. - Unsuitable Media: Direct water jet (may cause splashing of corrosive liquid); strong bases (avoid violent reaction). - Special Hazards: Does not burn, but reacts violently with metals (Fe, Zn, Al) to generate flammable H₂ gas (may ignite or explode); decomposes when heated above 110°C, releasing toxic HCl gas; contact with oxidants releases toxic Cl₂ gas; HCl gas is heavier than air, accumulates in low-lying areas. - Firefighter Advice: Wear full protective equipment (acid-resistant fire suit, self-contained breathing apparatus, face shield, acid-resistant gloves and boots); keep a safe distance; cool containers with water spray until fire is extinguished; avoid inhalation of HCl/Cl₂ gas; isolate the fire scene and evacuate non-essential personnel.

SECTION 6: Accidental Release Measures



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- Personal Precautions: Evacuate non-essential personnel immediately; set up warning signs (corrosive hazard); wear full PPE (acid-resistant respirator, chemical safety goggles, face shield, acid-resistant gloves and suit); ensure good ventilation (local exhaust ventilation). - Environmental Precautions: Prevent liquid from entering sewers, rivers, lakes or groundwater; build dikes around leakage area to contain liquid; neutralize spilled liquid with lime (CaO) or sodium bicarbonate (NaHCO₃) before flushing; notify local environmental authorities for large-scale leakage (>20 L). - Cleanup: Small spill - absorb with acid-resistant absorbent materials (vermiculite, activated carbon), collect into sealed acid-resistant drums for disposal; large spill - transfer liquid to sealed acid-resistant containers with acid-resistant pumps, neutralize residual liquid with alkali (slowly add alkali to acid), clean area with plenty of water (collect rinse water for neutralization), do not discharge directly.

SECTION 7: Handling and Storage

- Handling: Operate in a well-ventilated workshop (local exhaust ventilation, air change rate ≥ 12 times/hour); use acid-resistant tools and equipment (PP, PTFE, glass); strictly follow "acid into water" principle when diluting (slowly add HCl to water while stirring, cool with cold water if necessary); avoid splashing, inhalation of HCl gas and contact with skin/eyes; do not mix with strong bases, metals, oxidants or cyanides; wash hands and face thoroughly with water after operation; avoid eating, drinking or smoking in the workplace. - Storage: Store in a cool, dry, well-ventilated dedicated warehouse (temperature 5-30°C, relative humidity $\leq 75\%$); keep container tightly closed, store upright on acid-resistant shelves; use acid-resistant packaging (PP drums, glass bottles with plastic caps); store separately from strong bases, metals, oxidants and food-grade materials (separation distance ≥ 10 meters); no smoking in storage area; install emergency eyewash stations, safety showers (within 10 meters) and acid-neutralizing equipment (lime, NaHCO₃). - Shelf Life: 24 months (unopened, specified conditions); use promptly after opening, seal tightly after each use; do not use if discoloration (dark yellow), turbidity or precipitation occurs. - Compatibility: Incompatible with strong bases, amphoteric metals, oxidants, cyanides and organic amines.

SECTION 8: Exposure Controls/Personal Protection

- Engineering Controls: Install local exhaust ventilation system (HCl gas collection efficiency $\geq 95\%$); set up emergency eyewash stations and safety showers (hot and cold water); use acid-resistant pipelines and storage tanks; install HCl gas concentration detection alarms (alarm threshold: 5 ppm); maintain negative pressure in the workshop. - PPE: Respiratory protection: Acid gas respirator (type P100/N95) when handling, self-contained breathing apparatus for emergency situations; Hand protection: Acid-resistant nitrile gloves (thickness ≥ 1.5 mm, replace every 1-2 hours or when damaged); Eye/Face protection: Chemical safety goggles and full-face shield (acid-resistant); Body protection: Acid-resistant protective clothing (PP or PTFE material) and acid-resistant boots. - Hygiene Measures: Do not touch eyes, face or mouth with contaminated hands; change contaminated clothing immediately (wash separately with alkaline water); provide acid-neutralizing soap and moisturizing skin care products near the workplace; conduct regular health checks for operators (annual physical examination focusing on respiratory system, skin and teeth).

SECTION 9: Physical and Chemical Properties

Physical State: Liquid (aqueous solution); Color: Colorless to pale yellow; Odor: Pungent, irritating (HCl gas) pH (25°C, 0.1% Aqueous Solution): <1.0; Boiling Point: 108.6°C (31% solution, 101.3 kPa); Freezing Point: -46.2°C (31% solution) Flash Point: Not applicable (non-flammable); Autoignition Temperature: Not applicable; Flammability: Non-flammable Density (20°C, g/cm³):



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1.15-1.18; Solubility: Highly soluble in water (miscible in any proportion), soluble in ethanol, insoluble in benzene and ether Vapor Pressure (25°C, kPa): 4.2 (31% solution); Partition Coefficient (log P): -1.3 (estimated); Volatility: Highly volatile (releases HCl gas)

SECTION 10: Stability and Reactivity

- Stability: Stable under normal storage and handling conditions (5-30°C, sealed); no decomposition at room temperature; stable for 24 months under specified conditions; decomposes when heated above 110°C to release HCl gas; absorbs moisture from air (no effect on stability, increases volume slightly). - Incompatibilities: Strong bases (violent neutralization reaction, generates heat and splashing); amphoteric metals (Fe, Zn, Al, generates flammable H₂ gas); oxidants (MnO₂, KMnO₄, generates toxic Cl₂ gas); cyanides (generates toxic HCN gas); organic amines (violent exothermic reaction). - Hazardous Decomposition Products: Hydrogen chloride (HCl) gas when heated; toxic H₂ gas when reacting with metals; toxic Cl₂ gas when reacting with oxidants.

SECTION 11: Toxicological Information

- Acute Toxicity: Oral (Rat, LD₅₀): 900 mg/kg (31% solution); Dermal (Rabbit, LD₅₀): 1500 mg/kg (31% solution); Inhalation (Rat, LC₅₀): 3124 ppm (1 hour, HCl gas). - Skin/Eye Irritation: Skin corrosion (Category 1A), causes severe burns and tissue necrosis; eye damage (Category 1), causes irreversible corneal damage and blindness. - Organ Toxicity: Single exposure causes respiratory tract, skin and eye damage; long-term inhalation of HCl gas causes chronic bronchitis, nasal mucosa erosion and tooth decay; no liver or kidney toxicity reported at normal exposure levels. - Other Toxicity: No mutagenic, carcinogenic or teratogenic effects reported; no skin sensitization reported.

SECTION 12: Ecological Information

- Fish (Zebrafish, LC₅₀): <0.5 mg/L (96-hour exposure, aqueous solution) - Daphnia (EC₅₀): <0.2 mg/L (48-hour exposure, aqueous solution) - Algae (Growth Inhibition, EC₅₀): <0.5 mg/L (72-hour exposure, aqueous solution) - Biodegradability: Not biodegradable (inorganic acid); persists in water until neutralized by natural buffering substances. - Environmental Fate: Highly soluble in water; causes severe acidification of water bodies (lowers pH sharply); no bioaccumulation (BCF <100); leaches into groundwater if spilled on soil, inhibiting plant growth and damaging soil microorganisms.

SECTION 13: Disposal Considerations

- Product Waste: Collect waste in sealed acid-resistant drums (PP or PTFE material); neutralize with lime (CaO) or sodium bicarbonate (NaHCO₃) (slowly add alkali to acid, stir continuously, cool to room temperature); after neutralization (pH 6-9), dispose of via licensed hazardous waste treatment institutions; do not landfill or discharge into water bodies or sewers. - Packaging Waste: Rinse containers thoroughly with water (collect rinse water for neutralization); neutralize residual acid, then dispose of as hazardous waste; do not reuse or recycle contaminated packaging. - Special Disposal Notes: Comply with local environmental protection regulations for hazardous waste disposal; do not mix with other wastes during disposal; neutralization process must be carried out in a well-ventilated area with full PPE.

SECTION 14: Transport Information

- UN Number: ADR/RID: 1789; IMDG: 1789; IATA-DGR: 1789 - UN Proper Shipping Name: HYDROCHLORIC ACID - Transport Class: 8 (Corrosive substances); Packaging Group: III; Environmental Hazards: Yes (Marine Pollutant, Category 1) - Special Precautions: Transport in acid-resistant packaging (PP drums, glass bottles with plastic caps); transport by specialized hazardous chemical vehicles (acid-resistant); avoid collision, vibration and impact; keep away from strong bases, metals, oxidants and food during transport; prevent rain, sunlight and high temperature (transport temperature $\leq 35^{\circ}\text{C}$); drivers and handlers must be trained and hold relevant certificates; carry this MSDS and emergency neutralization equipment (lime, NaHCO_3).

SECTION 15: Regulatory Information

- National Regulations (China): Complies with GB/T 320-2023 (Industrial Hydrochloric Acid); Hazardous Chemical Safety Management Regulation (Hazard Class 8); compliant with chemical synthesis, metal processing and water treatment industry standards; food-grade product complies with GB 1886.194-2021 (Food Additive - Hydrochloric Acid). - International Regulations: GHS Rev.9 (Skin Corr. 1A, Eye Dam. 1, STOT-SE 3, Aquatic Tox. 1); REACH (EU, registered); TSCA (US, listed); ASTM D1193 compliant; FDA (US, food additive, GRAS status for food-grade).

SECTION 16: Other Information

- Revision Date: 03 FEB 2025 - Disclaimer: Based on current scientific knowledge and product testing data; this product is highly corrosive, volatile and toxic to aquatic organisms, supplier not liable for damage caused by improper use, storage, handling or non-compliance with regulations; the information in this MSDS is accurate to the best of our knowledge at the time of revision.