Safety Data Sheet (MSDS)

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

Carbohydrazide (Purity ≥ 98.0%)

SECTION 1: Identification

1.1 Product Identifiers - Product Name: Carbohydrazide - Product Number: CHZ-20280203 - Brand: SIGALD - CAS-No.: 497-18-7 - Synonyms: Carbodihydrazide; 1,3-Diaminourea; Hydrazinecarboxamide - Chemical Family: Hydrazine derivatives - Concentration: ≥ 98.0% (w/w) Carbohydrazide, ≤ 0.5% moisture, ≤ 0.1% ash

1.2 Details of the supplier of the safety data sheet

- Company : NEWAY SINOPHC TECH. LIMITED
- RM. 204, BUILDING 3, NO. 188, AONA RD., CHINA (SHANGHAI)PILOT FREE TRADE ZONE.
- Telephone : +86-021-50350029
- Fax : +86-021-50350029

1.3 Emergency telephone

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

1.4 Uses & Restrictions - Identified Uses: Oxygen scavenger for boiler feed water and cooling water systems; metal passivator and corrosion inhibitor; intermediate for pharmaceuticals, pesticides and dyes; reducing agent in chemical synthesis; stabilizer for peroxide compounds. - Uses Advised Against: Direct contact with food, cosmetics or pharmaceuticals; use as a fuel or explosive component; mixing with strong oxidants, strong acids or heavy metal salts; use in open, unventilated areas without protection.

SECTION 2: Hazards Identification

2.1 GHS Classification: Skin irritation (Category 2); Eye irritation (Category 2); Specific target organ toxicity (single exposure, respiratory tract, Category 3); Aquatic hazard (Category 1)
2.2 GHS Label Elements - Hazard Pictogram: (Toxic) + (Aquatic hazard) - Signal Word: WARNING - Hazard Statements: H315 (Causes skin irritation); H319 (Causes serious eye irritation); H335 (May cause respiratory irritation); H400 (Very toxic to aquatic life) - Precautionary Statements: P201, P202, P261, P264, P270, P271, P273, P280, P302+P352, P304+P340, P305+P351+P338, P312, P321, P332+P313, P337+P313, P362+P364, P403+P233, P405, P501
2.3 Physical/Chemical Hazards: White crystalline solid; slightly soluble in cold water, soluble in hot water and ethanol; decomposes at 150-154℃, releasing toxic nitrogen oxides; may burn when in contact with strong oxidants (e.g., potassium permanganate, hydrogen peroxide); no flash point under normal conditions, but dust may form explosive mixtures with air.
2.4 Health Hazards: Skin contact causes redness, itching and irritation; prolonged contact may lead to dryness and peeling; eye contact causes severe irritation, redness, tearing and blurred vision; inhalation of dust may cause respiratory tract irritation (cough, sore throat, chest discomfort); oral ingestion causes nausea, vomiting, abdominal pain and dizziness; high doses may damage liver and kidney functions.
2.5 Environmental Hazards: Very toxic to aquatic organisms (fish, algae, invertebrates); highly persistent in water bodies; moderate bioaccumulation potential (BCF = 100-1000); may contaminate soil and groundwater if spilled in large quantities, posing risks to terrestrial plants and soil organisms.

SECTION 3: Composition/Information on Ingredients

Substance/Mixture: Mainly pure substance (≥98.0%), trace impurities

Component	Content (w/w)	CAS-No.	Hazard Classification
Carbohydrazide	≥ 98.0%	497-18-7	Skin Irrit. 2; Eye Irrit. 2; STOT-SE 3; Aquatic Tox. 1
Water	≤ 0.5%	7732-18-5	Non-hazardous
Inorganic Ash	≤ 0.1%	Mixture	Non-hazardous

SECTION 4: First Aid Measures

- Inhaled: Remove to fresh air immediately; keep the affected person in a comfortable position, maintain airway patency; if breathing is difficult, give oxygen; seek medical help if irritation persists or symptoms worsen. - Skin Contact: Remove contaminated clothing and shoes immediately; rinse skin thoroughly with plenty of running water for at least 15 minutes; wash with mild soap if necessary; apply emollient cream if skin is dry or irritated; seek medical help if irritation persists. - Eye Contact: Hold eyelids open; rinse eyes continuously with clean water or normal saline for at least 15 minutes (flush from inner to outer corner); do not rub eyes or use eye drops; seek medical help if irritation, redness or blurred vision persists. - Swallowed: Do not induce vomiting (may cause aspiration); rinse mouth with water (do not swallow); do not give anything by mouth to an unconscious person; seek emergency medical help immediately, bring this MSDS.

SECTION 5: Firefighting Measures

- Suitable Extinguishing Media: Water spray, foam, CO_2, dry powder; use water to cool containers. - Unsuitable Media: Strong oxidants (may intensify combustion); high-pressure water jet (may disperse dust and form explosive mixtures). - Special Hazards: Decomposes when heated above 150℃, releasing toxic nitrogen oxides (NOx); dust may form explosive mixtures with air (explosion limit: 1.2-8.0% by volume); combustion products include CO, CO_2 and NOx. - Firefighter Advice: Wear appropriate protective equipment (firefighting suit, face shield, dust mask or respirator); avoid inhalation of dust and combustion fumes; cool containers with water spray until the fire is completely extinguished; isolate the fire scene and evacuate non-essential personnel.

SECTION 6: Accidental Release Measures

- Personal Precautions: Evacuate non-essential personnel; wear PPE (dust mask, chemical safety goggles, nitrile gloves, protective clothing); ensure good ventilation at the leakage site. - Environmental Precautions: Immediately block the leakage area; prevent the powder from entering sewers, rivers, lakes or groundwater; cover the leakage with plastic film to prevent spreading; notify local environmental authorities for large-scale leakage. - Cleanup: Small spill - sweep up carefully with a dry brush, collect into a sealed container for disposal; large spill - use inert absorbent materials (vermiculite, activated carbon) to contain the leakage, transfer to

corrosion-resistant sealed containers; clean the area with a small amount of water (collect rinse water for treatment), do not discharge directly.

SECTION 7: Handling and Storage

- Handling: Operate in a well-ventilated (local exhaust ventilation) workshop; use dust-proof tools and equipment; avoid generating dust (do not grind, crush or agitate violently); avoid contact with skin, eyes and inhalation of dust; do not mix with strong oxidants, strong acids or heavy metal salts; wash hands and face thoroughly after operation (use mild soap); avoid eating, drinking or smoking in the workplace. - Storage: Store in a cool, dry, well-ventilated warehouse (temperature 5-30℃, relative humidity ≤70%); keep container tightly closed, store upright; store separately from strong oxidants ($KMnO_4$, H_2O_2), strong acids (HCl, H_2SO_4) and food -grade materials; no smoking in the storage area; install dust collection equipment and leakage emergency treatment tools. - Shelf Life: 24 months (unopened, specified conditions); use promptly after opening, seal tightly after each use; do not use if discoloration (yellowing), caking or odor change occurs. - Compatibility: Incompatible with strong oxidants, strong acids, heavy metal salts and peroxides.

SECTION 8: Exposure Controls/Personal Protection

- Engineering Controls: Install local exhaust ventilation system (air change rate ≥10 times/hour); set up emergency eyewash stations and safety showers (within 10 meters of the workplace); use dust-proof equipment and pipelines; install dust concentration detection alarms. - PPE: Respiratory protection: Dust mask (N95 or above) when handling powder; Hand protection: Nitrile gloves (thickness ≥0.8 mm, replace every 2-4 hours); Eye/Face protection: Chemical safety goggles and face shield; Body protection: Dust-proof protective clothing and boots. - Hygiene Measures: Do not touch eyes, face or mouth with contaminated hands; change contaminated clothing immediately; wash contaminated clothing separately (mild detergent); provide mild soap and skin care products near the workplace; conduct regular health checks for operators.

SECTION 9: Physical and Chemical Properties

Physical State: Solid (crystalline powder); Color: White; Odor: Odorless pH (25℃, 1% Aqueous Solution): 7.0-8.5; Melting Point: 150-154℃ (decomposition); Boiling Point: Decomposes before boiling Flash Point: Not applicable (solid); Autoignition Temperature: >300℃; Flammability: Non-flammable solid, but dust may burn/explode Density (25℃): 1.58 g/cm³; Solubility: Slightly soluble in cold water (5 g/100 mL), soluble in hot water and ethanol Vapor Pressure (25℃): <0.01 hPa; Partition Coefficient (log P): -1.8 (estimated); Particle Size: 80-200 mesh (pass rate ≥95%)

SECTION 10: Stability and Reactivity

- Stability: Stable under normal storage and handling conditions (5-30℃, sealed); no decomposition at room temperature; stable for 24 months under specified storage conditions; decomposes at >150℃ to release nitrogen oxides and ammonia. - Incompatibilities: Strong oxidants (violent reaction, may cause combustion); strong acids (releases toxic fumes); heavy metal salts (forms insoluble complexes); peroxides (accelerates decomposition). - Hazardous Decomposition Products: Nitrogen oxides (NOx), ammonia (NH_3) when heated; toxic fumes when reacting with strong acids or oxidants; non-toxic decomposition products (CO_2, N_2, H_2O) under controlled decomposition.

SECTION 11: Toxicological Information

- Acute Toxicity: Oral (Rat, LD_{50}): 370 mg/kg; Dermal (Rabbit, LD_{50}): >2000 mg/kg; Inhalation (Rat, LC_{50}): >5 mg/m³ (4-hour exposure, dust). - Skin/Eye Irritation: Skin irritation (Category 2), causes redness and itching; eye irritation (Category 2), causes severe redness and tearing. - Organ Toxicity: Single exposure may cause respiratory tract and gastrointestinal tract irritation; high-dose oral ingestion may damage liver and kidney functions; no long-term organ damage reported with proper use. - Other Toxicity: No mutagenic, carcinogenic or teratogenic effects reported; no skin sensitization reported.

SECTION 12: Ecological Information

- Fish (Zebrafish, LC_{50}): <10 mg/L (96-hour exposure) - Daphnia (EC_{50}): <5 mg/L (48-hour exposure) - Algae (Growth Inhibition, EC_{50}): <10 mg/L (72-hour exposure) - Biodegradability: Poorly biodegradable (BOD_5/COD = <0.1); persists in water for 60-90 days. - Environmental Fate: Slightly soluble in water; hydrolyzes slowly in acidic/alkaline water; moderate bioaccumulation (BCF = 100-1000); leaches into groundwater if spilled on soil, posing long-term risks to aquatic ecosystems.

SECTION 13: Disposal Considerations

- Product Waste: Collect waste in sealed, labeled containers; incinerate via licensed hazardous waste treatment institutions (incineration temperature ≥850℃, with flue gas treatment to remove NOx); do not landfill or discharge into water bodies or sewers. - Packaging Waste: Rinse containers thoroughly with a small amount of water (collect rinse water for treatment); dispose of as hazardous waste (toxic); do not reuse or recycle contaminated packaging. - Special Disposal Notes: Incineration must be carried out in a professional facility with flue gas purification; comply with local environmental protection regulations for hazardous waste disposal; do not mix with other wastes during disposal.

SECTION 14: Transport Information

- UN Number: ADR/RID: 3077; IMDG: 3077; IATA-DGR: 3077 - UN Proper Shipping Name: ENVIRONMENTALLY HAZARDOUS SUBSTANCE, SOLID, N.O.S. (contains Carbohydrazide) - Transport Class: 9 (Miscellaneous hazardous substances); Packaging Group: III; Environmental Hazards: Yes (Marine Pollutant, Category 1) - Special Precautions: Transport in sealed, dust-proof packaging (25 kg paper bags with PE inner liner or 200 L steel drums); transport by specialized hazardous chemical vehicles; avoid collision, vibration and impact; keep away from strong oxidants, strong acids and food during transport; prevent rain, sunlight and high temperature; drivers and handlers must be trained and hold relevant certificates; carry this MSDS and emergency handling equipment.

SECTION 15: Regulatory Information

- National Regulations (China): Complies with Hazardous Chemical Safety Management Regulation (Hazard Class 9); meets water treatment chemical industry standards; compliant with metal passivator technical requirements for power plants and chemical plants; prohibited for food, cosmetic and pharmaceutical use without purification. - International Regulations: GHS Rev.9 (Skin Irrit. 2, Eye Irrit. 2, STOT-SE 3, Aquatic Tox. 1); REACH (EU, registered); TSCA (US, listed); FDA (US, restricted use in food contact areas).

SECTION 16: Other Information

- Revision Date: 03 FEB 2025 - Disclaimer: Based on current scientific knowledge and product testing data; this product is 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.