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Technical Data Sheet (TDS)

1. Product Overview

- **Product Name**: Sodium Hypophosphite
- **English Name**: Sodium Hypophosphite
- **CAS Number**: 7681-53-0
- **Formula**: NaH_2PO_2
- **Molecular Weight**: 87.98 g/mol
- **Product Characteristics**: High-purity white crystalline powder, strong reducing agent, slightly hygroscopic, highly soluble in water, neutral pH. Non-combustible, chemically stable under normal storage, reacts violently with strong oxidizers and decomposes at high temperature. Excellent performance as a reducing agent in electroplating/chemical plating, low impurity content, consistent quality, suitable for electroplating, water treatment, organic synthesis and other industrial applications. Fully biodegradable in natural environment, no long-term environmental pollution.

2. Technical Specifications (Industrial Grade)

Item	Specification
Appearance	White crystalline powder/crystals
Purity (NaH_2PO_2)	≥ 98.0%
Moisture Content	≤ 0.5%
pH Value (10% aq. solution, 25℃)	5.0-7.0
Sulfate (SO_4^{2-}) Content	≤ 0.05%
Chloride (Cl^-) Content	≤ 0.05%
Heavy Metals (Pb)	≤ 5 ppm
Iron (Fe)	≤ 5 ppm
Insoluble Matter in Water	≤ 0.1%
Phosphite (HPO_3^{2-}) Content	≤ 0.5%
Solubility (water, 20℃)	≥ 95 g/100mL

3. Product Advantages

1. **High Purity & Low Impurities**: ≥98% purity with ultra-low sulfate/chloride/heavy metal impurities; ensures stable reducing performance in electroplating/chemical plating applications.
2. **Strong Reducing Property**: High reducing activity; ideal for electroplating/chemical plating of nickel, copper and other metals; improves plating layer uniformity and adhesion.
3. **Excellent Solubility**: Highly soluble in water and glycerol; easy to prepare aqueous solutions for on-site use in electroplating and water treatment.
4. **Chemical Stability**: Stable under normal storage (24-month shelf life); no degradation at room temperature; suitable for long-term storage and transportation.
5. **Eco-Friendly**: Fully biodegradable in natural environment; phosphate ions are natural microbial nutrients; no bioaccumulation and long-term environmental pollution.
6. **Multi-Functional Application**: Versatile use as reducing agent, water treatment agent and organic synthesis intermediate; reduces procurement costs for multi-scenario use.

4. Application Fields

- **Electroplating & Chemical Plating**: Core reducing agent for electroless nickel plating; reduces nickel ions to metallic nickel; improves plating layer brightness, uniformity and corrosion resistance; used in electronic components, auto parts and hardware plating.
- **Water Treatment**: Reducing agent for heavy metal ion removal (Cr^{6+}, Cu^{2+}) in industrial wastewater; reduces toxic heavy metal ions to low-toxicity elemental state for easy precipitation and removal.

- **Organic Synthesis**: Reducing agent in organic synthesis (e.g., pharmaceutical, pesticide and dye production); reduces carbonyl, nitro and other functional groups with high selectivity.
- **Food Industry**: Food-grade sodium hypophosphite used as antioxidant and color fixative (limited dosage, complying with food safety standards); prevents food oxidation and discoloration.
- **Other**: Reducing agent in metal surface treatment; raw material for hypophosphorous acid production; stabilizer in polymer synthesis.

5. Usage Methods

- **Electroless Nickel Plating**: Add 10-20 g/L of sodium hypophosphite to plating bath; dissolve in deionized water first; adjust bath pH to 4.5-5.5 with acid/alkali; plating temperature 80-90℃; ensure good ventilation to avoid gas accumulation.
- **Wastewater Heavy Metal Removal**: Add 0.5-2.0 g/L of sodium hypophosphite to wastewater; adjust pH to 2.0-3.0 with sulfuric acid; stir for 30-60 minutes; then adjust pH to 8.0-9.0 for precipitation and filtration.
- **Organic Synthesis**: Use as reducing agent in molar ratio according to synthesis process; control reaction temperature at 0-50℃; add slowly to reaction system to avoid local overheating.
- **Optimal Conditions**: Dissolve in deionized water for high-purity applications; use at 15-35℃; avoid mixing with strong oxidizers/acids; seal after use; no high-temperature processing (>200℃).

6. Packaging & Storage

- **Packaging Specifications**: 1 kg PE bags, 25 kg HDPE drums, 200 kg HDPE drums, 1000 kg IBC totes; customized packaging available upon request (food-grade packaging for food industry use).
- **Storage Conditions**: Cool, dry, well-ventilated warehouse (≤30℃); store in sealed moisture-proof containers; avoid direct sunlight and high humidity; keep away from strong oxidizers, strong acids and heat sources.
- **Shelf Life**: 24 months (unopened, specified conditions); 6 months after opening (seal tightly with moisture-proof tape).
- **Transportation**: Non-dangerous goods; transport by ordinary vehicles; avoid collision, leakage, direct sunlight and high temperature; keep sealed during transport; do not transport with strong oxidizers/strong acids.

7. Safety & Protection

- Wear safety goggles, nitrile gloves and N95 dust mask for bulk powder handling; face shield is recommended for bulk transfer to avoid eye contact.
- Avoid dust inhalation and skin/eye contact; rinse eyes with plenty of water if contact occurs and consult a doctor if irritation persists.
- Do not mix with strong oxidizers (e.g., potassium permanganate, hydrogen peroxide) and strong acids (e.g., hydrochloric acid, sulfuric acid); violent reaction may occur.
- No eating/drinking/smoking in the work area; wash hands thoroughly after handling.
- Use dust collection system for bulk processing to prevent dust dispersion; avoid high-temperature processing to prevent toxic phosphine gas release.

8. Quality Assurance

- Manufactured under ISO 9001 (quality) and ISO 14001 (environmental) management systems; strict production process control and raw material inspection.
- Each batch is tested for purity, impurities and reducing performance; accompanied by a Certificate of Analysis (COA) to ensure compliance with industrial standards.
- Customized purity grades (98%/99%/99.5%) and food-grade sodium hypophosphite available upon request; technical support for formulation optimization (electroplating bath, wastewater treatment).
- Provide on-site technical guidance for large-scale electroplating and water treatment applications; after-sales service for quality feedback and problem solving.